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TABLE *of* CONTENTS

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Special thanks to...

Our Chief Technology Officers, **Kalley Thompson** (*Fall 2014*) and **Michelle Koo** (*Spring 2015*)
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EDITOR'S NOTE

Welcome to the 8th edition of the Undergraduate Journal of Psychology at Berkeley. This edition showcases a diverse set of experiments and literature reviews conducted on a variety of topics from many different areas of psychology.

This publication is the product of the very best that undergraduates have to offer. From the quality of the research to the dedication of the editing team, this journal highlights the potential and professionalism of the undergraduates who contributed to it. I hope that this inspires, educates, and helps to foster a thriving community of bright minds working in one of the most fertile and fascinating areas of science.

I extend my thanks to the authors for the privilege of publishing their work, to the editing staff for their tireless efforts, and to our webmaster, whose work allows us to remain open source and available to all. Finally, I thank our readers for their invaluable support.

Please enjoy the 8th edition of UJPB.

KATHERINE WOOD
Editor-in-Chief
B.A. Psychology, Latin Minor
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PREFACE

I am pleased to introduce the 2015 edition of the Undergraduate Journal of Psychology. The discipline of psychology spans the social and life sciences. The papers contained in this volume reflect this breadth, with contributions spanning the many subfields of psychology. Here you will find articles that explore important problems faced by our society such as depression and depersonalization. It is also noteworthy that this collection reflects a major trend in the field of psychology, an emphasis on proactive steps we can take to promote positive mental health. This direction is reflected in a number of the contributions, including studies on the beneficial effects of laughter for mood enhancement or yoga for psychological well-being. This is an engaging and sophisticated body of work.

Our faculty are honored to have the opportunity to teach, and collaborate, with a very talented population of undergraduates at UC Berkeley. Psychology remains a very popular major, frequently resulting in large classes at the lower and upper division. Nonetheless, as shown by the work presented here, undergraduate students are able to create an intimate learning experience through their research projects. They are able to not only engage in the intensive study of a problem that reflects their personal interests, but, as important, gain skills in the scientific method. An important part of this skill set is translating laboratory observations into a written work, one that makes clear the question at hand and then presents the results and conclusions in a concise and engaging manner. The reporting process is what makes science a cumulative, community endeavor. The articles you will find here have been selected as representative examples of this excellent body of work.

I want to congratulate the student editors for assembling the journal. They have refined a different set of skills, helping shape the ideas and writings of other individuals to ensure that the papers are maximally impactful.

Congratulations to all of the participants who have put together this year's edition of the Undergraduate Journal of Psychology.

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The Role of Yoga's Rituals in Psychological Well-being

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Yoga is an ancient discipline that has been shown to increase both mental and physical health and well-being. Individuals are constantly looking for a way to counter the psychological effects of a rapid paced life, and yoga has been a solution for many. While past research identifies physiological changes associated with yoga practice that lead to a decrease in stress and increased well-being, little is known about the psychological processes that lead to well-being. Past research connects synchronous rituals of yoga with increases in prosocial behavior. Other research finds correlations between yoga and psychological well-being, but little research has looked at the connections between synchronous rituals of yoga, prosocial behavior and well-being. A theoretical model is proposed to explain the effect of yoga's rituals on psychological well-being, where prosocial behavior mediates the relationship between the synchronous rituals of yoga and psychological well-being. Limitations and directions for future research are discussed.

Yoga is popular for the many benefits that it provides – increased health, longevity, and the much-needed relief from stress. In today's world of advancing technology, where speed, accessibility, and multitasking prevail, stress is becoming an ever-increasing problem (Beiter et al., 2015; Sapolsky, 1994). More and more people suffer from insomnia and stress-related diseases, such as diabetes and heart disease, than ever before (Coffey, Cox, & Williams, 2014; Hu, 2011; Hysing, Pallesen, Stormark, Lundervold, & Sivertsen, 2013; Sapolsky, 1994). People are looking to find anything that will help to take off the edge, and many have found refuge in yoga (Goldberg, 2010).

Yoga is part of an ancient Indian tradition and philosophy. It is one of the oldest systems of self-development in the world, encompassing practices that are aimed to improve body, mind, and spiritual connections. The term yoga means union, or to yoke. The union here refers to union of body, mind, and spirit; of the lower self with the higher mind; or the individual with the Supreme (Vishnudevananda, 1960).

Research on yoga demonstrates that yoga has shown efficacy for a broad range of physical and mental health conditions, including (but not limited to) stress (Chong et al., 2011), depression (Uebelacker et al., 2010), arthritis (Haaz & Bartlet, 2011), metabolic syndrome (Innes & Vincent, 2007), asthma (Posadzki & Ernst, 2011), and pain (Posadzki, Ernst, Terry, & Lee, 2011).

Practicing yoga has also been shown to influence blood pressure, heart rate, urinary catecholamines (Granath et al., 2006), and cortisol levels in healthy subjects (Vera et al., 2009; Rocha et al., 2012). The effects of yoga seem to be mediated via multiple paths such as reduction in sympathetic tone, activation of antagonistic neuromuscular systems, relaxation in the neuromuscular system, and stimulation of the limbic system (Riley, 2004) which yield to the restoration of homeostasis in the stress response systems (Streeter, Gerbarg, Saper, Ciraulo, & Brown, 2012). However, little attention has been paid to the psychological causes of yoga's effect on well-being, mostly focusing on psychological benefits that result as a side-effect

of increased parasympathetic activation (Khattab, Khattab, Ortak, Richardt, & Bonnemeierm 2007), decreases in stress hormones (Monnazzi, Leri, Guizzardi, Mattioli, & Patacchioli, 2002), and increases in vagal tone (Streeter et al., 2012).

In a recent study, Ivtzan and Papantoniou (2013) identified a positive correlation between hedonic (gratitude) and eudaimonic (meaning) aspects of psychological well-being in long-term yoga practitioners, linking yoga's psychological benefits to constructs in positive psychology. The Itzvan and Papantoniou study (2013) offers some insight into the psychological benefits of yoga, stating that both meaning of life and gratitude are increased by yoga practice, which are thought to be important indicators of overall well-being in positive psychology (Straume & Vittersø, 2012). However, although the Itzvan and Papantoniou

(2013) study identifies important markers of psychological well-being, the process that leads to hedonic and eudaimonic well- being through yoga practice is not clearly addressed. It fails to address group processes that may be acting as a mediator in yoga practice as a possible explanation for increased sense of meaning and gratitude that has been shown to be correlated with yoga practice.

Theoretical Model

We propose a three-factor model for the relationship between yoga and psychological well-being (see fig. 1). Our model posits that the ritualization of yoga practice contributes in large part to the effect of psychological well-being found in yoga practice. It further suggests that synchronous rituals in particular work to bring about an increase in prosocial behavior, which is
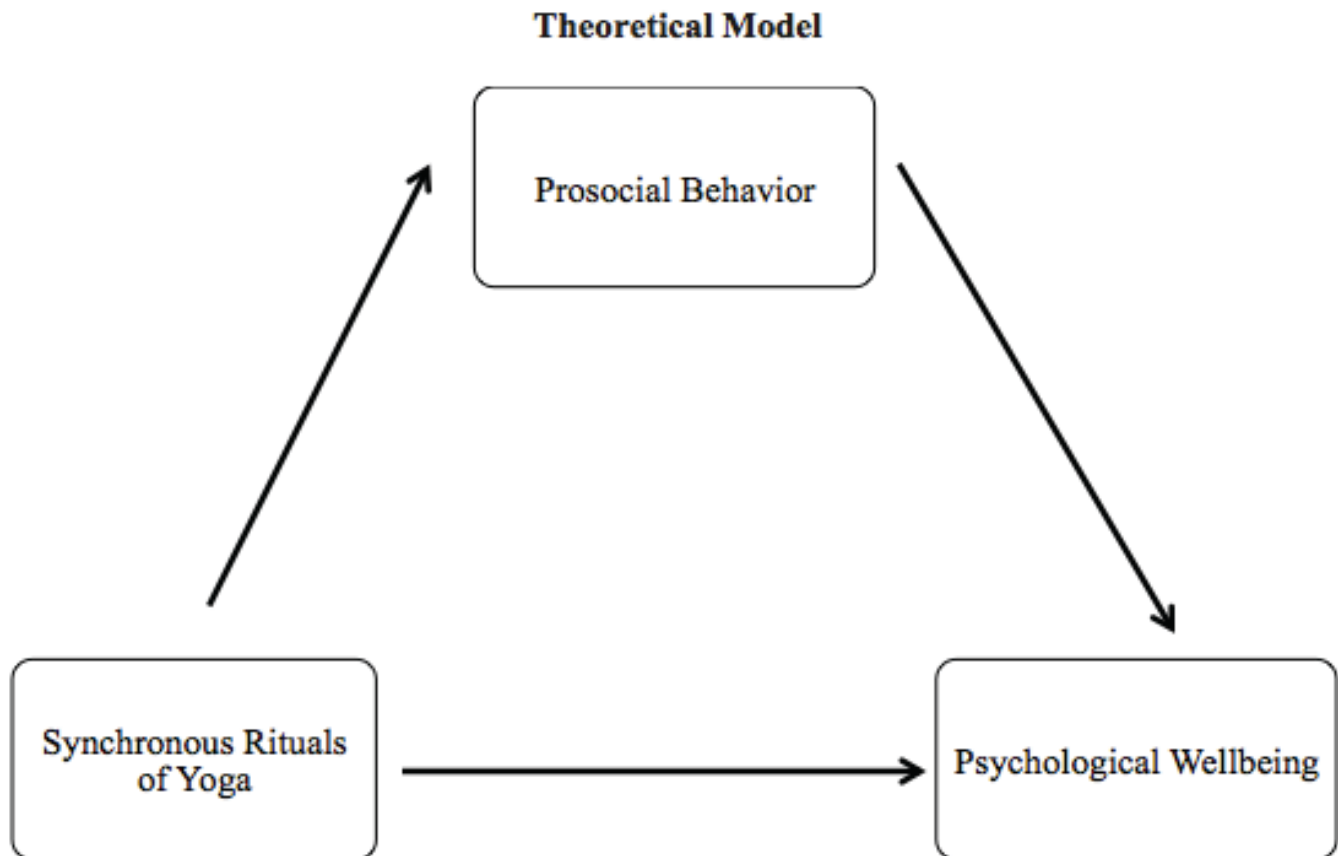
Fig. 1. *Mediated model demonstrating the relation between synchronous rituals, prosocial behavior, and psychological well-being.*

an important process that contributes to the effects of psychological well-being that are associated with yoga practice, and has been overlooked by past research. Thus, the three factors of the proposed model are synchronous rituals of yoga, prosocial behavior, and well-being, where prosocial behavior mediates the relationship between synchronous rituals of yoga and psychological well-being.

Synchronous Rituals of Yoga Lead to an Increase in Prosocial Behavior

Rituals in yoga. Rituals can be defined as follows: 1) a religious or solemn ceremony consisting of a series of actions performed according to a prescribed order; 2) the prescribed order of performing a ceremony, especially one characteristic of a particular religion or church; and 3) a series of actions or type of behavior regularly and invariably followed by someone (Oxford English Dictionary, 2003).

Traditional yoga is often practiced in a highly ritualized fashion (White, 2012). Eastern based yoga practices involve systematic ritualization of the practice, which may involve performing certain postures in a particular order, a prescribed length of time for holding each posture, and setting aside a particular time and place for the practice of yoga. However, to our knowledge, there have been no systematic reviews of the psychological benefits of yoga that address the effect of rituals on psychological well-being.

We feel that this is an important aspect to consider, as ritualization has been shown to be effective in reducing grief and regulating emotions by past research (Norton & Gino, 2014). Furthermore, rituals that involve behavioral synchrony—coordinated movements that occur between individuals in a social interaction—have been shown to have the power to increase group affiliation (Hove & Risen, 2009), prosocial behavior (Sosis, 2000; Wiltermuth & Heath, 2009), and positive affect (Collins, 2004; Haidt, Seder, & Kesebir, 2008; Watson, Clark, & Tellegen, 1988).

We now turn to a brief review of the literature on behavioral synchrony and synchronous rituals.

Synchronous rituals. Past research (Wiltermuth & Heath, 2009) suggests that rituals involving synchronous activity may produce positive emotions that weaken the psychological boundaries between the self and the group. The article found that people acting in synchrony with others cooperated more during group economic exercises that followed, even in situations that required personal sacrifice. The results showed that positive emotions do not necessarily need to be generated for synchrony to foster cooperation. This suggests that acting in synchrony with others can increase cooperation by strengthening social attachment and bonding among group members.

Yoga is often practiced in a group setting where members of the group are moving in synchrony with one another (Singleton, 2010). Some yoga teachers may chant 'Om' or other sacred sounds at the beginning and end of each class (White, 2012). Other teachers may include a short meditation at the end of the yoga session. What matters here is not the type of ritual performed, but the fact that the practice is ritualized by practitioners in one way or another; the most common and ubiquitous way being practicing yoga in a group setting and in a synchronous fashion (Singleton & Byrne, 2008).

A study examining the effects of rituals on positive affect, group unity, and prosociality (Callander, 2013) compared 19 naturally occurring rituals with varying levels of synchrony. Some examples of such rituals include yoga, meditation, running, choir practice, Zumba, and potluck dinners. Coders evaluated the degree of synchrony using three levels: 1) Exact synchrony (all participants performing same movements in a shared rhythmic patter), 2) complimentary synchrony (participants perform full synchrony within subgroups, complimentary to the whole, as in choir practice), and 3) no synchrony (participants perform movements independently of their own accord). Results showed that activities with higher levels of synchrony (i.e. exact synchrony), such as yoga, increase positive affect, group unity, and

prosociality significantly more than those with less synchrony (i.e. potluck dinners).

Yoga as a synchronous ritual. Taking into account past research on rituals, yoga, and behavioral synchrony, we refer to yoga in our model as a synchronous ritual, or the "synchronous rituals of yoga" – a series of movements done in conformity with a group in a prescribed, ritualistic manner. Given the widely held belief that yoga is an ancient practice that has an element of sacredness (Goldberg, 2010) and that yoga is often practiced in a group setting, we believe that this is an apt definition of yoga as it relates to ritual and behavioral synchrony.

Given that past research on behavioral synchrony in general and synchronous rituals in particular shows that engaging in synchronous rituals increases social attachment and bonding among group members (Wiltermuth & Heath, 2009), we propose that the synchronous rituals of yoga will also act increase social attachment and bonding.

Prosocial Behavior Leads to an Increase in Psychological Well-being

Prosocial behavior. Prosocial behaviors are those actions that benefit other people, or society as a whole even at cost to the individual (e.g. helping, sharing, donating, cooperating, and volunteering) (Brief & Motowidlo, 1986). Although there is little agreement about how ritual promotes cooperation, it is widely accepted that its collective nature is an essential feature (Sosis, 2000).

Research by Fischer et al. (2013) examined eleven rituals and their effects on prosociality, as measured by a prosocial attitudes questionnaire and the results of a public goods game. They found that rituals with synchronous body movements were more likely to enhance prosocial attitudes, and were associated with the largest contributions in the public goods game. Similarly, Wiltermuth and Heath (2009) found that synchronous rituals increased cooperation during group economic exercises, even when requiring personal sacrifice. While Fischer et al. (2013) proposed that shared sacred beliefs mediate the relationship between synchronous

rituals and prosocial behavior, Wiltermouth and Heath (2009) proposed that increased feelings of group affiliation acted as a possible mediator between the two. Thus, while it remains unclear what causes the relationship between yoga's synchronous rituals and prosociality, it is clear that a positively correlated relationship exists, providing support for the first part of our model.

Psychological well-being. Broadly, well-being has been defined from two perspectives. The clinical perspective defines well-being as the absence of negative conditions, whereas the psychological perspective defines well-being as the prevalence of positive attributes (Fraillon, 2004). Positive psychological definitions of well-being generally include six general characteristics (Ryff, 1989). These include Self-acceptance, Positive relations with others, Autonomy, Environmental mastery, Purpose in life, and Personal growth (1989). Ryff's seminal work integrated the views of Erikson (1959), Maslow (1968), Rogers (1961), Allport (1961), and Jahoda (1958) into the well-known six-factor model (Dierendonck et al., 2001). This spawned research on each of the various dimensions and how they each contribute to psychological well-being.

Past research has shown that yoga is closely related to several of Ryff's six dimensions of well-being, particularly Self-acceptance (Schure et al., 2008), Autonomy (Gonçalves et al., 2011), and Purpose in life (Voigt, Howatt, & Brown, 2010). However, research looking at yoga's effects on Positive relations with others has been scarcer, although recent studies by Callander (2013), suggest that the synchronous rituals of yoga increase Positive relations with others by increasing prosociality.

There is a rich psychological literature that shows that prosocial behavior leads to increased happiness and well-being (Aknin, Norton, & Dunn, 2009; Andreoni, 1989, 1990; Anik, Aknin, Norton, & Dunn, 2009; Lyubomirsky, Shelden, & Schkade, 2005; Kurtz & Lyubomirsky, 2008; McGowen, 2006; Post, 2005; Rucker, DuBois, & Galinsky, 2011). Although initial research showed a correlational

relationship between prosocial behavior and well-being (Anik, Aknin, Norton, & Dunn, 2009), recent research suggests there may be a causal relationship. For example, when Field, Hernandez-Reif, Quintino, Schanberg, and Kuhn (1998) asked a volunteer group of retired senior citizens to give infants a massage three times a week for three weeks, these seniors experienced less anxiety and depression, as well as reduction in stress–related hormones and improved health overall. Further support comes from work by Lyubomirsky, Tkach, and Sheldon (2004), which shows that simply asking people to commit random acts of kindness can significantly increase their happiness levels for several weeks. Specifically in their investigation, Lyubomirsky and colleagues randomly assigned students to a no-treatment control group or to an experimental group, in which students were asked to commit five random acts of kindness a week for six weeks. Students who engaged in random acts of kindness were significantly happier than controls.

Volunteer work – a prototypical form of prosocial behavior – enhances happiness, life satisfaction, self-esteem, sense of control over life, physical health, and long-term well-being, while mitigating depression (Piliavin & Siegl, 2007; Thoits & Hewitt, 2001). Other research shows that committing acts of kindness boosts both temporary mood and long-lasting well-being (Lyubomirsky, Sheldon, & Schkade, 2005; Kurtz & Lyubomirsky, 2008; McGowen, 2006).

Psychological well-being is an important predictor of many positive real-world outcomes, including physical health (Diener & Chan, 2011), longevity (Danner, Snowden, & Friesen, 2001), life satisfaction (Diener, 2000; Schimmack et al., 2002), and interpersonal relationships (Ryan & Deci, 2000). While psychological well-being has many facets, research has shown that prosocial behavior is an important predictor of well-being (Kahana et al., 2013; Aknin et al., 2013, Ryff & Singer, 1996; Ryan & Deci, 2000), perhaps because it is so closely related to the six-factor model's dimension of Positive relationships with others.

In sum, research shows that supportive social relations are an important part of well-being, and that prosocial behaviors, such as helping a friend, are crucial to developing strong and positive social bonds between family and community members alike (Keltner & Kring, 1998). Thus, prosocial behavior proves to be an important link in our model between yoga's synchronous rituals and psychological well-being.

Contributions and Limitations

Our model contributes to the past literature on yoga in addressing two important areas of yoga previously ignored by psychological researchers: 1) the importance of yoga's rituals in generating psychological well-being; and 2) explaining the processes that lead to psychological well-being. It further contributes to the literature of social psychology by offering a novel explanation for the effects of synchronous rituals on behavior and psychological well-being.

The limitations of the model include the fact that it is drawn from inferences based on past research, much of which has not commented on the direct relationships between synchronous rituals and yoga. The model provided gives one of many possible explanations for the processes that lead to psychological well-being as a result of yoga practice. For example, mindfulness is another component of yoga practice that could contribute to the increased well-being experienced by its practitioners (Salmon, Lush, Jablonski, & Sephton, 2009). Perhaps practicing yoga alone might increase well-being through mindfulness and meditation elements, whereas practicing yoga in a group might have the added benefit of behavioral synchrony among group members, leading to further well-being via increased prosocial behavior. Examining the effects of practicing yoga alone versus in a group setting would help to test the proposed model. Empirical support is needed in order to reach strong conclusions regarding the proposed three-factor model explaining the relationship between yoga and psychological well-being.

Directions for Future Research

In order to test the proposed model, further research is needed. A paradigm could be set up in the following manner to test the effect of synchronous rituals of yoga on well-being. Researchers could set up a controlled experiment where three groups are tested on three levels of synchrony. One group of participants could perform yoga exercises alone in a solitary room, and the second group could perform yoga in the same room but in a non-synchronous fashion. A third group could practice yoga in a group in the traditional, synchronous fashion. Researchers could then ask participants to perform a group task, such as those used in Wiltermouth and Heath (2009), where a prosocial element is involved, to test whether levels of giving vary with the level of synchrony. Perhaps the same goals could be accomplished using archival data. Regardless of the method, a novel contribution to the literature would result in taking a measure of well-being and correlating the three variables of our model – synchronous rituals of yoga, prosocial behavior, and psychological well-being – in one study.

In order to test the effects of synchronous rituals on prosocial behavior, parameters would need to be established for which prosocial behaviors are most relevant to yoga practice. Given that yoga practice is associated with increased vagal tone (i.e. resiliency of the vagus nerve; Streeter et al. 2012), it would make sense to measure those prosocial behaviors that have been found to be associated with greater vagal tone, such as the 3-item Relations Subscale of the Psychological Well-Being Scales (Ryff, 1989) and a 10-item measure of agreeableness (Goldberg et al., 2006) from the International Personality Item Pool, which captures enduring individual differences in prosocial personality (Kogan et al., 2014). This is just one idea; many other possible measures could be used. One could then rate yoga practitioners on these scales and compare to a measure of overall psychological well-being, as was used in Straume and Vittersø, 2012. Since yoga interventions are increasingly popular (Khattab et al., 2007), and yoga practices are varied (Singleton,

2010), understanding more about the mechanisms through which yoga increases well-being could help psychologists and medical health care practitioners to determine which aspects of yoga are helpful to the individual in order to target yoga practice regimes that lead to maximal well-being.

Conducting these preliminary studies could provide initial evidence for the three-factor model, and if supportive evidence is found, they could provide the groundwork for more rigorous empirical testing of the model.

Conclusion

This paper reviews the literature on yoga and rituals, and presents a new theoretical model for the role of yoga's rituals in creating psychological well-being. This three-factor model posits that the synchronous rituals of yoga act as the independent variable on psychological well-being, the dependent variable; and that prosocial behavior acts as a mediator between the two. Limitations are addressed, and directions for further research are given.

Understanding the effects of rituals on well-being and the role of behavioral synchrony in facilitating prosocial behaviors that lead to well-being can help yoga practitioners and social psychologists alike. Yoga practitioners can be helped by understanding the mechanisms through which yoga produces psychological well-being in order to achieve maximum benefit from the practice, and social psychologists can benefit by observing social-psychological phenomena that occur in the practice of yoga. Examining group processes, such as behavioral synchrony, that play a role in facilitating emotional and psychological well-being in yoga practitioners offers social psychologists an exciting new avenue of research that draws on the wisdom of an ancient Eastern tradition that has been shown to have both great power and great potential. Therefore, applications of such novel findings and an in-depth understanding of the processes at work in a practice that has stood the test of time could yield important discoveries for social psychologists about the nature of human social behavior. It is hoped that the

proposed model will provide a framework for future researchers in social psychology to empirically test the effects of yoga's rituals on prosocial behavior and psychological well-being.

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A Cross-Cultural Comparison of the PERMA Model of Well-being

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Seligman's (2011) PERMA theory of well-being describes a multi-dimensional approach in order to define what it means to flourish in life. The PERMA constructs include Positive emotion (P), Engagement (E), Relationships (R), Meaning (M), and Accomplishment (A). Butler and Kern (2014) developed the PERMA-Profiler, a brief measure of PERMA. In this study, we extend the PERMA-Profiler to a Malaysian sample, in order to examine how well the measure works in another culture. Participants (N = 322) completed the PERMA-profiler, and subset of participants (n = 268) also answered two qualitative questions about their perspectives on well-being. We compared the sample means to data previously collected from participants in the United States (N = 5,456). The Malaysian sample was significantly lower than the US sample on all of the PERMA domains   Next, we used factor analysis to examine the proposed five-factor structure. A three-factor model (positive emotion/ relationships, meaning/accomplishment, and engagement) fit the data better than the proposed five factors. We then coded and examined the qualitative questions on perceptions of well-being. While the PERMA constructs were generally represented, there were also other constructs that went beyond the PERMA model, such as religion, health, and security. Examining the PERMA-Profiler in Malaysia provides the opportunity to understand well-being more comprehensively in different cultures and evaluate how individuals in specific cultures flourish.

The field of positive psychology has grown in leaps and bounds over the past two decades, and not without reason. Evidence shows that subjective well-being and associated constructs such as life satisfaction, happiness, and optimism have numerous positive effects on health, success, education, and other important life outcomes (Diener & Chan, 2011; Diener & Tay, 2012; Lyubomirsky, King, & Diener, 2005; Pressman & Cohen, 2005). A key focus for the field is defining, understanding, and supporting human flourishing.

There are multiple definitions and theories surrounding human flourishing, but it can generally be defined as feeling good and functioning well in life (Huppert & So, 2013). Subjective well-being is an important prerequisite for flourishing. Seligman's (2011) PERMA theory suggests that flourishing arises from five well-being constructs: Positive Emotion, Engagement, Relationships, Meaning, and Accomplishment. In

order to measure Seligman's theory of well-being, Butler and Kern (2014) developed the PERMA-Profiler measure. Although this multidimensional instrument has demonstrated good reliability, cross-time stability, and convergence with other measures, there is a need to test the measure and the PERMA theory across different cultures. Cross-cultural studies are crucial in developing valid measures of psychological constructs in order to take into account variations in culture, response styles, and judgment biases that may be country specific (Oishi & Schimmack, 2010).

In this article, we extend the PERMA-Profiler to a sample from Malaysia – a diverse, multi-ethnic and multi-cultural country in Southeast Asia. We combine quantitative and qualitative methods to examine cross-cultural applications of the measure and the concept of well-being as a whole within the Malaysian culture.

Why Well-being?

Well-being is important for human flourishing. People supported by close friendships, family, and support groups have higher well-being, and are found to be less vulnerable to sickness and premature death, while loneliness has been found to be an important risk factor for poor health outcomes and functional decline (Hawkley & Cacioppo, 2010; Perissinotto, Cenzer, & Covinsky, 2012). Positive affect has been shown to engender successful outcomes, as well as behaviors that parallel success (Lyubomirsky, King, & Diener, 2005). Furthermore, studies have also shown an association between positive affect and health outcomes, including lower incidence of morbidity and decreased reported symptoms and pain (Howell, Kern, & Lyubormirsky, 2007; Pressman & Cohen, 2005).

Traditionally, national well-being has been defined through the lens of economic prosperity, often in terms of Gross National Product (GNP) or Gross Domestic Product (GDP) (Boarini, Johansson, & d'Ercole, 2006). However, extensive research shows that GDP and GNP measures do not capture the full extent of well-being (e.g., Helliwell

& Barrington-Leigh, 2010; Kahneman & Krueger, 2006). As a result, subjective well-being (SWB) measures have recently emerged as a valid alternative to traditional measures of national well-being.

Ed Diener (1984) suggests that SWB measures have three hallmarks. First, the measure is subjective, residing with the experience of the individual. Second, it includes positive measures. Third, it includes a global assessment of all aspects of a person's life. SWB measures can provide invaluable information in the measurement of consumer preferences and social welfare, provided that the measures are reliable and valid (Kahneman & Krueger, 2006). In recent years, governments worldwide have shown increasing interest in using measures of SWB in public policy and also in measuring national well-being (Dolan & Metcalfe, 2012). For example, since 1971, Bhutan has adjusted its national policy to focus on Gross National Happiness (GNH) instead of GDP. Instead of the traditional marker of prosperity, material growth, Bhutan's new approach to development measures prosperity through the principles of GNH, including the spiritual, physical, social, and environmental health of its citizens and the natural environment (Thimphu, 2012; United Nations, 2013).

In order to increase the clarity of the role of SWB in public policy, Dolan, Layard, and Metcalfe (2011) distinguished three broad types of SWB measures: (1) Evaluation – global assessments; (2) Experience – feelings over short periods of time; and (3) Eudaimonic - reports of purpose and meaning. These different types of SWB measures correspond to different policy purposes, and could serve as a valuable tool in informing the design of public policy in a particular country. For example, evidence shows that life satisfaction measured with SWB measures is correlated with income, employment status, marital status, health, personal characteristics, and major life events (Dolan et al., 2011).

Easterlin (2003) builds his theory of well-being on his observation that mainstream economic theory overwhelmingly focuses on fiscal conditions and overlooks non-monetary rewards. However,

according to evidence, both monetary and non-monetary factors affect well-being. Lyubomirsky et al. (2005) suggest that in fact, positive affect engenders success, and happiness precedes successful outcomes. They argue that positive affect may be the cause of many of the desirable characteristics and successes correlated with happiness.

With the increasing awareness that positive affect is not just the opposite of negative affect (Cacioppo & Berntson, 1999), various scholars have argued for multiple constructs and dimensions being the foundational building blocks of well-being. For example, Ryff and Keyes (1995) distinguish six core dimensions of well-being: self-acceptance, positive relations with others, autonomy, environmental mastery, purpose in life, and personal growth. Kahneman (1999) distinguishes two aspects of well-being: subjective happiness is primarily concerned with how happy the respondents state they are, while objective happiness is derived from tracking and aggregating the instant utility over the relevant periods. Ryan and Deci (2001) characterize well-being as falling into hedonic and eudaimonic domains. The hedonic domain focuses on emotion, whereas the eudaimonic domain emphasizes the good life, with a focus on meaning and related well-being constructs. Keyes (1998) suggests that due to the societal nature of life in general and the challenges that accompany it, well-being includes social dimensions such as coherence, integration, actualization, contribution, and acceptance. More recently, Seligman (2011) defined well-being in terms of five constructs: Positive Emotion, Engagement, Relationships, Meaning, and Accomplishment (summarized by the acronym PERMA). In this article, we focus specifically on Seligman's model.

The PERMA Theory of Well-Being

The PERMA theory has quickly risen in the psychological discourse, although empirical support and measure of the model are still needed (Butler & Kern, 2014; Kern, Waters, Adler, & White, in press; Kern, Waters, White, & Adler, 2014), especially in different cultures. In the PERMA theory, Seligman (2011) argues that each element of well-being must have the following three properties:

1. It contributes to well-being;
2. People pursue it for its own sake, not merely to get any of the other elements;
3. It is defined and measured independently of the other elements (exclusivity).

The five elements are defined, in Seligman's theory and for our purposes here, as follows.

Positive Emotions. Positive emotion encompasses hedonic feelings such as happiness, pleasure, and comfort. Positive emotions serve as a marker for flourishing. However, Frederickson (2001) suggested that positive emotions also produce flourishing and are worth cultivating. For example, according to the broaden-and-build model of positive emotions, positive emotion can broaden an individual's thought-action repertoire, which will in turn build enduring personal resources for the individual (Frederickson, 1998).

Engagement. Engagement refers to a deep psychological connection (e.g., being interested, engaged, and absorbed) to a particular activity, organization, or cause. Complete levels of engagement have been defined as a state of flow. Csikszentmihalyi (1990, 1997) defines the flow state as a single-minded immersion, an optimal state of concentration on an intrinsically motivating task. Awareness of time may fade, and positive thought and feeling may be absent during the flow state.

Relationships. Relationships include feelings of integration with society or a community, feelings of being cared for by loved ones, and being satisfied with one's social network. Much of our experience as humans revolves around other people. Support from social relationships has been linked to less depression and psychopathology, better physical health, lower mortality, and other positive outcomes (Cohen, 2004; Perissinotto et al., 2012). There is evidence that social relationships are beneficial for health behaviors such as chronic illness self-management and decreased suicidal tendencies (Tay, Diener, & Gonzalez, 2013).

Meaning. Meaning refers to having a sense of purpose and direction in life, and feeling connected to something larger than the self. People who claim that they have more meaningful lives often also report being fairly happy and satisfied with their lives as a whole, although the meaningful life is not necessarily the happy one (Baumeister, Vohs, Aaker, & Garbinsky, 2013).

Accomplishment. Across many cultures, making progress towards one's goals and achieving superior results can lead to both external recognition and a personal sense of accomplishment. Although accomplishment can be defined in objective terms, it is also subject to personal ambition, drive, and personality differences. For example, a mother who raises a beautiful, compassionate family might see her life as extremely successful, whereas her husband may define success as achieving a promotion at work (Butler & Kern, 2014). Additionally, accomplishment is often pursued for its own sake. For example, research shows that expert bridge players are driven to play to the best of their ability; even if they lose, they feel a sense of accomplishment in the knowledge that they played well (Seligman, 2011).

Measuring PERMA. A theory of well-being is only as good as the ability to measure and test it empirically. To comprehensively measure the components of PERMA, Butler and Kern (2014) recently developed and validated the PERMA-Profiler. To capture the specificity of the multiple dimensions, the PERMA-Profiler uses a multidimensional approach that attempts to pinpoint each domain. The questionnaire includes 15 items that measure PERMA (three items per domain), as well as eight additional items that assess physical health, negative emotion, loneliness, and overall happiness. Our analyses focus primarily on the 15 main PERMA items. The PERMA-Profiler has been shown to successfully measure PERMA as separate but correlated constructs, while maintaining acceptable internal reliability and good overall fit across over 15,000 people worldwide. We expand on the details of the PERMA-Profiler section in the Methods section.

The Influence of Culture

The emergence of cultural psychology has inspired discussions about cross-cultural studies and methods of study. According to Fiske (2002), psychologists should be aware of multiple aspects of culture when characterizing and contrasting cultures, including, subsistence and economic systems, religion, kinship systems, marriage, sex and food, and institutions and practices. For example, Diener (2000) presented several divergent patterns of SWB due to national and cultural differences. There were countries that were unexpectedly high or low in life satisfaction after controlling for income. Mean levels of SWB in Argentina, Brazil, and Chile were higher compared to the level predicted by their wealth. On the other end of the spectrum, Japan was an outlier, with high income and a relatively low SWB. Although the PERMA-Profiler has demonstrated reliability and validity across a large international sample, how the measure functions in specific cultures needs to be studied within individual countries.

There are various approaches for studying cross-cultural differences. Mixed methods research, in which the researcher combines quantitative and qualitative techniques, is one approach that can be useful within a cultural context. Quantitative and qualitative methods are inextricably intertwined; qualitative studies inform the research questions, measures, and strategies of quantitative studies, and quantitative studies generalize and extend observations and theories that arise through qualitative research. The goal is essentially to examine a given research question from any appropriate relevant angle; maximizing the strengths and minimizing the weaknesses of both the quantitative and qualitative paradigm in order to develop the most useful findings. In this study, we adopt the within-stage mixed-model design (Johnson & Onwuegbuzie, 2004), where our survey incorporates 15 well-being items placed on a 0 to 10 Likert scale (quantitative aspect) and two free-response questions (qualitative aspect).

We specifically examine the PERMA-

Profiler within the Malaysian culture. Malaysia is a diverse, multi-ethnic, multicultural and multilingual Southeast Asian country with a population of 29 million people (World Bank, 2013). The main ethnic groups in Malaysia include the Malays, Chinese, Indian communities in West Malaysia, and other ethnic tribes in East Malaysia, including but not limited to, the Kadazan-dusuns, Muruts, Ibans, Dayaks. Malaysian society is multi-religious. Islam as the official religion, but freedom of religion is enshrined in the Malaysian constitution.

The Current Study

Bringing this together, in this study, we seek to test the PERMA-Profiler in the Malaysian culture to examine how well it functions in a different culture. We compare PERMA-Profiler data from Malaysian participants to data from a large US sample that was previously collected. We examine the factor structure of the 15 PERMA items using the Malaysian data. Finally, in order to better understand the nature of the responses, we analyze subjects' qualitative reports defining well-being and the meaningful life.

Methods

Participants

From September 2013 to January 2014, 342 Malaysian residents (105 males, 177 females, 40 unknown/other) completed the PERMA-Profiler and additional questions through an online survey. On average, participants were 26 years old (SD = 10.48, range = 18-63). Fifty percent of the sample was students, 23% were employed, and the rest were either part-time employees, retired, or unemployed.

In order to participate in the study, subjects had to be at least 18 years old, born in Malaysia, and able to read and understand English. In order to recruit a larger sample of Malaysians, we included participants from universities and organizations in Malaysia, the United Kingdom, United States, Australia, and Hong Kong via email blasts. A brief description of the study was provided, along with the survey link. In addition, participants were encouraged to forward the recruitment email to friends and family, post the survey link on relevant Facebook groups, or retweet the survey link on Twitter. As most of the Malaysians in our sample who were living abroad (N = 188) were university students, they grew up in Malaysia, and we believe that they adequately represent Malaysian culture and norms.

Measures

The survey questions were administered online through Qualtrics software. Participants were informed that the survey would take between 10 to 15 minutes to complete. All procedures were approved by the University of Pennsylvania Institutional Review Board.

The online survey consisted of four sections. The first section provided an introduction to the study, a brief background on the PERMA model, contact information, and an opportunity for participants to consent before taking part in the study. Participants were given a brief background on the PERMA model and the purpose of the study; as is standardly done when the PERMA-Profiler is used in other studies (Butler & Kern, 2014). This was to encourage participants to be honest in their responses.[1]

The second section comprised the 23-item PERMA-Profiler, which includes the 15 main

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[1] Specifically, the introduction noted: "Often, people think of well-being in terms of happiness – what makes you feel good? We believe that well-being entails more than simply feeling good. In his book Flourishing, Dr. Martin Seligman of the University of Pennsylvania presents the PERMA model – five measurable elements that count towards well-being. Specifically, the PERMA model consists of Positive Emotion, Engagement, Relationships, Meaning and Purpose, Accomplishment. The PERMA model has been researched in the United States. This study seeks to expand the research to Malaysia, a diverse country of 28 million people, and a melting pot of cultures and ethnic groups. We are interested to study the cross-country similarities and differences in well-being measurements from Malaysia and the norms procured in the United States."

PERMA items (three items per domain), as well as eight filler items that assess overall well-being (1 item), physical health (3 items), negative emotion (3 items), and loneliness (1 item) (Butler & Kern, 2014). To allow for broad range of responses with sufficient variation, each item is placed on a 0 to 10 Likert scale with 0 indicating extremely low levels and 10 indicating extremely high levels, with only the endpoints of the scale labeled. Composite scores for each domain are calculated by taking the mean of the three items. Overall well-being is calculated as the mean of the 15 PERMA items, plus a single item on overall well-being ("Taking all things together, how happy would you say you are?"). For the purposes of this study, we focused on the main 15 PERMA items, as well as overall well-being and negative emotion.

The third section of the survey included two free-response questions: (1) "The questions you just answered are one way of measuring well-being. We now want to know your thoughts on things. What is well-being or happiness to you?" and (2) "What makes life meaningful to you?"

The fourth and final section of the survey consisted of several basic demographic questions, including age, gender, ethnicity, level of education attained, employment, marital status, and number of children. At the end of the survey, we included an additional free-response section for additional comments or feedback. The survey ended by thanking the participants and encouraging them to send the link to the survey on to family and friends.

Results

Descriptive and Correlations

The overall descriptive statistics and correlations among the PERMA factors are shown in **Table 1**. Some participants skipped some of the items; rather than exclude their data, we used their partial responses, resulting in different numbers on some factors. Participants scored highest on Engagement (M = 7.18) and lowest on Accomplishment (M = 6.52). They were above the middle point of the scale (5) on all domains except negative emotion, in which they were slightly below. As was found in the original study (Butler & Kern, 2014), all of the PERMA factors were significantly positively correlated with each other. As a person reported greater Positive Emotion, he or she also tended to report higher levels of Engagement (r = .50), Relationships, (r = .60), Meaning (r = .71), and Accomplishment (r = .58).

Comparison of Malaysia and US Samples

Table 2 compares the Malaysian sample with a large US sample (M. L. Kern, 2014, personal communication). The Malaysian sample was

Table 1. *PERMA-Profiler descriptive statistics and correlations among the PERMA factors.*

	N	Mean	SD	Min	Max	1	2	3	4	5	6	7
1. Positive emotion	327	6.78	1.59	1.00	10.00							
2. Engagement	329	7.18	1.38	2.67	10.00	.50**						
3. Relationships	323	6.95	1.65	1.33	10.00	.60**	.39**					
4. Meaning	342	6.92	1.75	1.00	10.00	.71**	.41**	.48**				
5. Accomplishment	335	6.52	1.55	1.33	9.67	.58**	.41**	.39**	.68**			
6. Overall well-being	342	6.87	1.27	2.31	9.50	.87**	.67**	.74**	.85**	.79**		
7. Negative emotion	331	4.58	1.79	0.67	10.00	-.46**	-.14*	-.35**	-.39**	-.39**	-.46**	
8. Physical health	326	6.69	1.97	0.67	10.00	.50**	.25**	.30**	.43**	.39**	.48**	-.30**

Note. Differing Ns are due to missing data, as some participants skipped some items.
* p < .05, ** p < .01

Table 2. *Independent samples t-tests comparing PERMA scores in the Malaysian sample to US respondents*

	Malaysia			US					
	N	Mean	SD	N	Mean	SD	t	df	p
Positive emotion	327	6.78	1.59	5428	7.47	2.01	-7.41	5753	< .001
Engagement	329	7.18	1.38	5456	8.24	1.86	-13.30	5783	< .001
Relationships	323	6.95	1.65	5456	7.64	2.36	-7.11	5777	< .001
Meaning	342	6.92	1.75	5456	7.89	2.42	-9.63	5796	< .001
Accomplishment	335	6.52	1.55	5455	8.03	1.94	-17.03	5788	< .001
Overall well-being	342	6.87	1.27	5456	7.83	1.80	-13.27	5796	< .001
Negative emotion	331	4.58	1.79	5426	5.05	2.07	-4.53	5755	< .001

Note: Comparisons between Malaysian and US respondents are statistically significant at the 1% level.

Table 3. *Principle Components Analysis of the 15 PERMA items, extracting five correlated factors*

	Component				
	1	2	3	4	5
To what extent do you lead a purposeful and meaningful life? (M1)	**0.90**	-0.08	-0.05	-0.01	-0.02
In general, to what extent do you feel that what you do in your life is valuable and worthwhile? (M2)	**0.86**	-0.02	-0.04	0.08	0.05
How much of the time do you feel you are making progress towards accomplishing your goals? (A1)	**0.60**	-0.17	0.02	**0.53**	0.05
To what extent do you generally feel you have a sense of direction in your life? (M3)	**0.57**	0.16	-0.05	0.31	-0.08
In general, to what extent do you feel contented? (P3)	**0.53**	0.30	0.20	-0.09	0.02
In general, how often do you feel positive? (P2)	**0.51**	0.30	-0.03	0.04	-0.40
In general, how often do you feel joyful? (P1)	**0.44**	0.33	0.16	-0.07	-0.24
How satisfied are you with your personal relationships? (R3)	-0.08	**0.89**	-0.11	0.13	-0.02
To what extent have you been feeling loved? (R2)	0.03	**0.81**	0.05	0.05	0.02
How often do you lose track of time while doing something you enjoy? (E3)	-0.11	-0.06	**0.92**	-0.05	-0.01
How often do you become absorbed in what you are doing? (E1)	0.04	-0.04	**0.55**	0.50	-0.02
How often are you able to handle your responsibilities? (A3)	-0.08	0.24	-0.01	**0.82**	-0.04
How often do you achieve the important goals you have set for yourself? (A2)	0.27	0.04	0.01	**0.67**	-0.02
In general, to what extent do you feel excited and interested in things? (E2)	0.20	0.17	0.36	0.00	**-0.65**
To what extent do you receive help and support from others when you need it? (R1)	0.28	0.41	0.29	-0.09	**0.57**

Note. Principle components analysis with oblimin rotation (i.e., factors can correlate with one another). The numbers indicate how strongly each item loads on each factor. To aid interpretation, we bolded the factor that each item most strongly loads upon.

significantly lower than US participants for all five of the PERMA constructs, with the greatest difference for the Accomplishment construct. Interestingly, the Malaysian sample was also significantly lower than the US sample for Negative emotion (t(5,755) = -4.53, p = < .001). This implies that while subjects in the US reported experiencing greater well-being, they also reported experiencing higher Negative emotion, whereas the Malaysian sample showed fewer extremes in both the positive or negative direction.

PERMA Factor Structure

So far, we assumed that the five-factor PERMA structure works in the context of the Malaysian sample. To check if the PERMA model is appropriate to the Malaysian sample, we next examined the factor structure of the 15 PERMA items. We conducted two exploratory Principle Component Analyses (PCA). PCA is a type of exploratory factor analysis, which identifies underlying latent variables within a set of items. The procedure reduces a larger set of items (each considered a dimension) into a smaller set of dimensions, based on items that best correlate with one another. You can indicate a specific number of factors to extract, or use several criteria to determine the number of factors that best represent the data. You can also specify that the factors are orthogonal (non-correlated; varimax rotation), or correlated (oblimin rotation). As we expected the factors to be correlated, we used oblimin rotation.

In the first analysis, we specified that five factors should be extracted. The resulting factor loadings are summarized in **Table 3.** The numbers indicate how correlated an item is with each factor. Items are correlated to each of the five factors, but are most associated with a single factor (the primary loading), which we bolded for emphasis. We would expect that the three positive emotion items would load on one dimension, the three engagement items would load on a second dimension, etc. The table shows that the responses from the Malaysian sample differed somewhat from the five-factor PERMA

theory. Seven items load on the first component, including items from the Meaning and Positive Emotion constructs, as well as an Accomplishment item. The second, third, and fourth components include items from the Relationship, Engagement, and Accomplishment categories, respectively. The fifth component includes an Engagement item and a Relationship item.

We next explored whether an alternative structure would better fit the data. Rather than specifically extracting five factors, we examined several criteria that have been developed as heuristics for determining the number of factors that should be extracted. First, the Kaiser-Guttman criterion examines the eigenvalues, using an eigenvalue of 1.00 as a cut-off criterion for meaningful factors. Eigenvalues indicate how much variance is accounted for by each component. High eigenvalues indicate that much of the variance in the data is explained by that component, whereas an eigenvalue of zero would indicate that none of the variance is explained by that dimension. Second, we used a scree test to plot the eigenvalues associated with each factor, versus the factor number. The plot is visually inspected, and the point where the plot levels off indicates the number of factors that should be extracted.

In our data, three components had eigenvalues greater than 1.00, accounting for 59.7% of the total variance. The scree plot suggested retaining two to four components. Based on the eigenvalues and scree plot, we decided to extract three components. As summarized in **Table 4**, this was a much cleaner structure. Accomplishment and Meaning items loaded on the first factor, Positive Emotion and Relationship items loaded on the second factor, and Engagement loaded on the third factor.

Qualitative Reports of Well-being

To understand the nature of the responses in greater detail, we turned to the subjects' qualitative reports of well-being. In total, 268 participants answered the free-response section of the survey.

We went through all responses for both questions, and created a list of categories that seemed to best capture the themes of the responses. Then, we recruited raters (4 raters for Question 1 and 5 raters for Question 2) to rate how often each of these categories appeared in the responses. Raters read each response, and rated a category 1 if the response reflected that category, or 0 if the response did not reflect the category. Each response could receive a 1 in multiple categories (e.g., "Having good health and relationships with family and friends" was rated as both "health" and "positive social relationships"). We then summed up how many times each category received a 1 by any of the raters across all 268 responses. **Table 5** summarizes the 21 categories, listed from the most often mentioned category (top) to the least mentioned category (bottom).

For Question 1 (what is well-being or happiness to you?), the five most common themes were *Positive Emotion* (316 summed ratings, 13%), *Connectedness with Others* (292, 12%), *Positive Social Relationships* (277, 11%), *Satisfaction/ Fulfillment* (247, 10%) and *Health and Achievement* (152, 6% and 151, 6%, respectively). For example, raters agreed that the two following responses could be categorized as connectedness with others and positive social relationships, respectively.

> 1)"When the people you love are there for you in desperate times. It makes you feel that you are loved and cared for. You can count on these people when necessary."
> 2)"Being at peace with myself and maintaining positive and healthy relationships with people that I love."

For Question 2 (what makes life meaningful to you?), the five most common themes were *Connectedness/Close Relationships* (440, 18%), *Purpose/Goals/Passion* (289, 12%),

Table 4. *Principle Components Analysis of the 15 PERMA items, extracting three correlated factors*

	Component		
	1	2	3
How much of the time do you feel you are making progress towards accomplishing your goals? (A1)	**0.93**	-0.14	0.03
How often do you achieve the important goals you have set for yourself? (A2)	**0.81**	-0.08	0.06
To what extent do you generally feel you have a sense of direction in your life? (M3)	**0.71**	0.23	-0.07
In general, to what extent do you feel that what you do in your life is valuable and worthwhile? (M2)	**0.69**	0.23	-0.13
How often are you able to handle your responsibilities? (A3)	**0.68**	-0.05	0.10
To what extent do you lead a purposeful and meaningful life? (M1)	**0.67**	0.21	-0.14
In general, how often do you feel positive? (P2)	**0.49**	0.45	-0.08
To what extent have you been feeling loved? (R2)	-0.02	**0.82**	0.01
How satisfied are you with your personal relationships? (R3)	-0.01	**0.80**	-0.12
To what extent do you receive help and support from others when you need it? (R1)	-0.09	**0.58**	0.18
In general, to what extent do you feel contented? (P3)	0.26	**0.54**	0.10
In general, how often do you feel joyful? (P1)	0.29	**0.54**	0.09
In general, to what extent do you feel excited and interested in things? (E2)	0.29	**0.33**	**0.33**
How often do you lose track of time while doing something you enjoy? (E3)	-0.17	0.13	**0.86**
How often do you become absorbed in what you are doing? (E1)	0.46	-0.06	**0.57**

Note. Principle components analysis with oblimin rotation. The strongest loadings for each item is bolded for emphasis.

Family (261, 11%), *Helping Others* (254, 10%) and *Accomplishment/Achievement* (187, 8%). For example, the two following responses reflected connectedness/ close relationships and purpose/ goals/ passions, respectively.

> 1) "Having meaningful relationships with people one cares about."
> 2) "Having a purpose and contributing towards the well-being of your society."

Discussion

The aim of this study was to test a new well-being measure, the PERMA-Profiler, in the Malaysian culture. As in the original study (Butler & Kern, 2014), all of the PERMA factors were significantly positively correlated with each other. Malaysians scored lower on all of the PERMA constructs and Negative emotion compared to the US sample. Examining the factor structure of the 15 PERMA items, a three-factor structure fit the data better than the proposed five-factor structure. Finally, to understand the nature of the responses better, we looked at the subjects' qualitative reports of well-being. Although the PERMA domains were identified, additional categories such as financial security, health, and spirituality were apparent.

Table 5. *Categories appearing in free response questions, ordered from most often mentioned (top) to least often mentioned (bottom)*

What is well-being or happiness to you?	Share (%)	What makes life meaningful to you?	Share (%)
Positive Emotion	13	Connectedness / Close Relationships	18
Connectedness with Others	12	Purpose / Goals / Passion	12
Positive Social Relationships	11	Family	11
Satisfaction / Fulfillment	10	Helping Others	10
Health	6	Accomplishment / Achievement	8
Accomplishment / Achievement	6	Contributing to Society	7
Acceptance	5	Religion / Spirituality	7
Freedom / Independence	5	Personal Satisfaction / Fulfillment	6
Meaning / Purpose	5	Experiences	4
Hope / Optimism	5	Appreciation of life	3
Security / Comfort	4	Freedom / Independence	3
Religion / Spirituality	3	Health	2
Mastery / Control	3	Optimism / Positive Outlook	2
Mindfulness/Living in the Present	2	Personal Development	2
Lack of Negativity	2	Career	2
Passion	2	Finance / Wealth	2
Balance	2	Nature	1
Career / Finance	2	Universal Perspective	1
Gratitude	1	Comfort / Security	1
Personal Development	1	Balance	1

Note. Raters indicated whether a response reflected each category (0 = no, 1 = yes). We summed the number of times a category received a 1 rating, and divided by the total number of ratings, resulting in the percentage of ratings that were allocated to each category. The total number of ratings for Question 1 and Question 2 were 2490 ratings and 2467 ratings respectively.

PERMA Comparisons and the Impact of Culture

Seligman's (2011) PERMA model of flourishing describes a multi-dimensional approach to well-being that includes constructs of Positive emotion, Engagement, Relationships, Meaning, and Accomplishment. As expected, all of the PERMA factors were significantly positively correlated with each other, as expected, as these are all positive constructs that together represent flourishing. Similarly, Kern and colleagues (2014) found that the five PERMA components were positively correlated with one another in a sample of school staff, yet the factors differentially related to physical health, life satisfaction, and job satisfaction outcomes. Thus, although the factors are correlated, there is still value in measuring them separately.

Results from the PERMA-Profiler showed that Malaysians scored significantly lower on all the PERMA constructs and on Negative emotion compared to the US sample. This could indicate that Malaysians have a lower sense of well-being than Americans. Alternatively, with a Likert rating scale, individuals of Asian heritage may prefer the middle response options on a (moderate response style) more than Western individuals, who may prefer the highest and lowest response options (extreme response style) (Chen, Lee, & Stevenson, 1995). Future research should further examine the extent to which the scales used impact the reported levels of well-being.

Further, in cross-cultural studies such as this, differences across cultures may come from true cultural differences, or from different perceptions of constructs themselves. For example, Suh, Diener, Oishi, and Triandis (1998) found large cultural differences in how people from different countries made life satisfaction judgments. They found that people in individualistic cultures relied more strongly on emotional experiences and their current affect to gauge life satisfaction, whereas in collectivist cultures, cultural norms were the driving force behind life satisfaction judgments. Similarly, in our sample, qualitative responses suggested that well-being from the Malaysian culture extends beyond the PERMA domains.

To be culturally sensitive, rather than simply assuming that the PERMA model is comparable across cultures, we examined the factor structure of the 15 PERMA items. We found that a three-factor structure fit the data better than a five-factor model. Based on the data, these three factors were Positive emotion/ Relationships, Meaning/ Accomplishment, and Engagement. It could be that Malaysians did not interpret the questions in the PERMA-Profiler in the way that was intended, and therefore items grouped together due to a different understanding of the question or construct. Additional cognitive interviews would be needed to determine how people are reading and understanding the questions.

Alternatively, it could be that the PERMA model may not be capturing some of the factors that contribute to well-being that is unique to the particular culture. For example, in the first free-response question, the raters rated Health as the fifth highest factor (152 ratings), but health is not part of Seligman's (2011) five PERMA components. The notion that subjective well-being is related to better self-reported health, longevity, and reduced pain is well known (Cohen & Pressman, 2006; Diener & Chan, 2011; Howell et al., 2007; Pressman & Cohen, 2005). The emphasis on good health in Malaysia transcends ethnicity, age, and other demographics. Each Chinese New Year, people would wish each other "good health", among other more standard wishes such as "good luck" and "good prosperity". Ariff and Beng (2006) report that some rural communities in Malaysia take health very seriously and depend on traditional methods of medicine that involves concepts such as 'Yin Yang', Ayurveda, and notions of 'hot and cold' despite having a modern rural health system. While our results show that Malaysians indicate health as a significant element of well-being, Friedman and Kern (2014) argue that it is the intimate connection between personality, health, and well-being that determines the outcome of health and well-being in an individual. Thus, the missing health factors may be unique to the Malaysian culture, or alternatively

may be a missing element of the PERMA model. Future research should consider whether Health constructs should be included as a main construct and not simply as additional items.

Another factor that was not captured by the PERMA model that seemed to be a part of well-being for Malaysians was Religion/Spirituality. In the second free-response question, the raters rated Religion/Spirituality as the 6th highest factor (167 ratings). This finding is unsurprising, as the Malaysian Department of Statistics (2010) reported that only 0.7% Malaysian citizens identified themselves as having no religion.

Although some aspects were seemingly missing from the PERMA model for the Malaysian culture, the Relationship component was clearly visible in the qualitative responses. Social relationships, connectedness to others, family, and helping others appeared as top categories both in defining well-being, and in defining what makes life meaningful. This suggests that Malaysians consider positive relationships as quite a significant contributor to overall well-being. This finding aligns with other literature that indicates the importance of social relationships in various health outcomes, which in turn affects well-being (Tay et al., 2013; Taylor, 2011). In their study, Perissinotto et al. (2012) demonstrated that loneliness is an identifiable and measurable risk factor for morbidity and mortality. Furthermore, social support and social integration have been found to reduce effects of stressful experiences and to promote positive psychological states (Cohen, 2004). It is possible that relationships are an important part of well-being regardless of culture. Future studies should further explore such possibilities.

Limitations

There are several main limitations to the current research. First, we relied on self-reported measures. The limitations of self-report measures are clear (Lucas & Baird, 2006; Paulhus & Vazire, 2007). Even while PERMA-Profiler displayed acceptable psychometric properties across a large international sample (Butler & Kern, 2014), there may be variance in responses between cultures and also within cultures. Differences in perception of the measure and inherent cultural idiosyncrasies may skew the results.

A second limitation is that the sample of participants was recruited solely through online methods, including, Facebook, Twitter, and email. Many of these participants were students living in Malaysia, as well as abroad in the UK, US, and Australia. This method limited the sample to the urban, educated population, leaving out those in lower income communities who may not have consistent Internet access.

Third, because the survey was administered in English, only participants who were proficient in the English language were able to participate. Malaysia is a country with a rich and diverse population, and spoken languages include Malay, Mandarin Chinese, Tamil, Cantonese, Hokkien, and the Iban language. The diversity in languages reflects a multiethnic and multiracial population that may not have been reflected fully in our study. Further research is needed in order to gain a more comprehensive perspective of the Malaysian population as a whole.

Finally, in the survey, we included a description of the PERMA model in the introduction to the study. It is possible that with this knowledge, participants may have intentionally adjusted their responses in a biased manner. The qualitative responses may have been influenced by completing the quantitative questions and the description of the model. But in line with the idea of participatory research, we treated participants as collaborators, helping us to understand their experience, rather than treating them as subjects providing an objective metric of flourishing for the country. As the sample is a convenience sample, it is not meant to represent flourishing levels of the country as a whole. Further, due to the popularity of Seligman's (2011) book, many people in the US comparison sample were already aware of the PERMA model before taking the survey, and this information provides a common base of understanding.

In conclusion, with this extension of the PERMA-Profiler in Malaysia, we have shown that in addition to the factors of the PERMA model, Malaysians also take into account health and spirituality as significant components of well-being. The results suggest that the PERMA-Profiler offers a tool for measuring well-being cross-culturally, but culture-based modifications may be necessary. We hope that future iterations of the PERMA-Profiler measures will be able to inform and help people from various cultures to better understand themselves and to better develop their own flourishing.

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Depersonalization/ Derealization Disorder: A Neglected Disease in Psychiatry

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Depersonalization/ derealization disorder is an overlooked, common, and debilitating dissociative condition. Core features include persistent or recurrent depersonalization and/or derealization (i.e., profound sensations of unreality and detachment). The disorder affects both sexes equally and usually begins in adolescence. Etiological factors include illicit drug use, emotional abuse, and prolonged stress. Neural substrates include ventrolateral-prefrontal dysfunction, anomalies in the parietal and temporal lobes, and dysregulated serotonergic neurotransmission. The disorder has been deemed refractory to medication; however, tricyclic antidepressants, anticonvulsants, and opioid antagonists have helped some patients. Repetitive transcranial magnetic stimulation, cognitive behavioral therapy, and mindfulness-related exercises have shown promise. More research is required to further the efficacy of treatment and to raise awareness of the disorder in both clinical and public settings.

Depersonalization/ derealization disorder, a dissociative disorder, is estimated to affect up to 2.8% of the world's population (American Psychiatric Association [APA], 2013). Accordingly, it represents a condition that is more common than schizophrenia and anorexia nervosa combined, two conditions that are well established (Carlson, 2013; Comer, 2011). Despite this fact, "most psychiatrists are still trained to believe that [it] is extremely rare or non-existent" (Sierra, 2009, p. 3), a flawed conviction that has led to many misdiagnoses and treatment attempts designed for entirely irrelevant conditions (Medford, Sierra, Baker, & David, 2005). The intent of this article is to prevent these problems. A review of the disorder is prefaced with a discussion on dissociation for better interpretation.

Dissociation

Dissociation is a hardwired, adaptive mechanism elicited during periods of overwhelming stress or trauma (Steinberg & Schnall, 2001). It is a "disruption of and/or discontinuity in the normal integration of consciousness, memory, identity, emotion, perception, body representation, motor control, and behavior" (APA, 2013, p. 291). In some cases, dissociation does not function as a defense mechanism. Indeed, there are many expressions of dissociation, which can be conceptualized as fragments on a spectrum that correspond with pathology and severity. For example, the continuum begins with absorption (i.e., a narrowed state of focus that diminishes awareness of outside stimuli) and ends with dissociative identity disorder (Seligman & Kirmayer, 2008). Thus, a normal and non-invasive manifestation of dissociation is present on one side, while a pathological and incapacitating

one is present on the other. Somewhere amidst these extremes are two dissociative presentations called depersonalization and derealization.

Depersonalization. Depersonalization is a subjective experience of unreality and detachment felt with respect to one's self, mental processes, sensations, and agency (e.g., speech and movements). Depersonalization gives rise to disturbing sensations, which include a sense of not existing; acting without control; and being outside of the body. Additionally, depersonalization is accompanied by physical and/or emotional numbing (APA, 2013).

Derealization. The term 'derealization' has similar components but refers to feelings of unreality and detachment towards the world. That is, one's surroundings appear distant and unreal. Derealization engenders feelings of unfamiliarity, which make family, friends, and familiar places seem foreign (Steinberg & Schnall, 2001). Many liken derealization to a dream state, yet those who experience derealization are fully awake (Mayer-Gross, 1935).

Relevance to dissociation. Depersonalization and derealization appear to be coping strategies intended to assuage intense emotional reactions and remove unpleasant stimuli from consciousness. If a traumatic event did not seem real, for example, one could be spared from significant distress. However, depersonalization and derealization seem to be non-selective mechanisms. That is, feelings of unreality and detachment do not become circumscribed to specific events but instead infiltrate the perception of everything. Depersonalization and derealization are also not always warranted responses. Thus, depersonalization and derealization can manifest as both useful coping mechanisms and terrifying intrusions.

Prevalence, triggers, and duration. Depersonalization and derealization are common as transitory phenomena in the general population (Giesbrecht, Jongen, Smulders, & Merckelbach, 2006; Hunter, Sierra, & David, 2004; Seth, Suzuki, & Critchley, 2012) and usually arise in the contexts of life-threatening danger, emotional stress, and

illicit drug use. In addition, depersonalization and derealization manifest as symptoms in certain psychiatric and medical conditions (see subsequent references). In most cases, depersonalization and derealization are fleeting phenomena; however, as Seth et al. (2012) note, depersonalization and derealization can become unremitting disturbances and lead to depersonalization/ derealization disorder, a chronic, disabling condition.

Depersonalization/ Derealization Disorder

The core features of depersonalization/ derealization disorder are persistent or recurrent episodes of depersonalization and/or derealization (APA, 2013). Additional features include unrestrained existential thinking and philosophical inquiries, which lead to significant distress (Neziroglu & Donnelly, 2010); micropsia and macropsia, two phenomena related to distorted size perception (Simeon & Abugel, 2006); and impairments in visual memory (Sierra, 2009).

Depersonalization/ derealization disorder affects men and women equally (Simeon & Abugel, 2006) and appears to arise in adolescence, with an average age onset of 16 years (Simeon et al., 1997). The disorder usually takes a chronic course (Simeon & Abugel, 2006), which, in extreme cases, has lasted decades (APA, 2013; Schilder, 1939). To be diagnosed with depersonalization/ derealization disorder, one must have persistent or recurrent episodes of depersonalization, derealization, or both; show impairment in important areas of functioning; and have intact reality testing. Additionally, the disturbance must not be attributable to a substance or medication, or the symptoms of a psychiatric or medical condition (APA, 2013).

History

The delayed awareness of depersonalization/ derealization disorder is perplexing when considering how chronic cases of depersonalization and derealization have been documented in medical literature (Sierra, 2009) and personal diaries (Simeon & Abugel, 2006) since the

1800's. It has taken until 1946 for such phenomena to become well recognized (Sierra, 2009). Toward the end of the 20th century, research programs became established and "more has been learned about the condition in the last 10 years than the previous 100 years" (Sierra, 2009, p. 3). Nevertheless, the same problems that were addressed nearly 80 years ago still remain today: "Textbooks give [depersonalization/ derealization disorder] scant attention [and] special papers on the topic deal with a small number of cases" (Mayer-Gross, 1935, p. 103).

A Look in the DSM. When the American Psychiatric Association published its first edition of the DSM in 1952, it viewed depersonalization as a symptom of a dissociative response but not as a disorder, and not one word was written about derealization. In its second edition (1968), the American Psychiatric Association acknowledged the phenomenon of chronic depersonalization and called it "depersonalization syndrome." However, it wrote only three short sentences about it. In its next edition (1980), the name was changed from "depersonalization syndrome" to "depersonalization disorder" and listed among the dissociative disorders. In its current edition (2013), the name was changed to "depersonalization/ derealization disorder," to include derealization, which is now recognized as a frequent associated feature of the disorder.

Although depersonalization/ derealization disorder has an extensive history, it is clearly a novelty in modern psychiatry. It may be safe to say that the disorder is officially established. The next step, then, is raising awareness and contributing to the literature. The remainder of this article reviews research relevant to the etiology, physiology, neurobiology, and treatment of the disorder.

Precipitants

Depersonalization and derealization can occur in the context of neurological disorders such as migraine (Cahill & Murphy, 2004), temporal lobe epilepsy (Medford et al., 2005), brain lesions (Sierra, Lopera, Lambert, Phillips, & David, 2002),

and vestibular disease (Sang, Jáuregui-Renaud, Green, Bronstein, & Gresty., 2006). In addition, the two symptoms can occur as side effects of pharmaceutical drugs, namely Minocycline (Cohen, 2004), and recreational and illicit drugs such as marijuana, hallucinogens, ketamine, and ecstasy (Favrat et al., 2005; Medford et al., 2003; Simeon, Knutelska, Nelson, & Guralnik, 2003). Depersonalization and derealization can also arise during sleep deprivation (Medford et al., 2006); in panic disorder, borderline personality disorder, and acute stress disorder (APA, 2013); and during and/or after emotional, physical, and sexual abuse (Simeon & Abugel, 2006).

Although the precipitants above can activate episodes of depersonalization and derealization, the pathological presence of depersonalization and derealization (i.e., depersonalization/ derealization disorder) has been thought to follow trauma or abuse (Steinberg & Schnall, 2001), with emotional abuse being the greatest predictor (Simeon, Guralnik, Schmeidler, Sirof, & Knutelska, 2001). However, studies have shown that the full criteria for the disorder can still be met in the absence of traumatic and abuse-related antecedents (Baker et al., 2003; Simeon, Knutelska, Nelson, & Guralnik, 2003). Simeon and Abugel (2006) report cases of people who have developed the disorder after a divorce, a stressor of similar severity, or illicit drug use. Thus, what triggers a temporary reaction for some may induce an ongoing disorder for others.

Autonomic Arousal

The paradox of depersonalization/ derealization disorder is that many patients feel anxious but show blunted physiology in response to anxiety provoking stimuli. Kelly and Walter (1968) note that "in physiological terms, anxiety is experienced but is not translated into defense reaction arousal," (as quoted by Sierra, 2009, p. 133). Indeed, people with depersonalization/ derealization disorder and people with anxiety disorders have shown similar ratings of anxiety but different skin conductance levels (SCL), with the latter group

displaying greater levels of arousal (Sierra, Senior, Phillips, & David, 2006). SCL are frequently used in research to measure physiological arousal.

Scientists have also observed a discriminatory effect on arousal in depersonalization/ derealization disorder. For example, Sierra, Senior, et al. (2002) found that patients had attenuated SCL in response to unpleasant imagery but not pleasant or neutral imagery, a finding that supports the view that depersonalization/ derealization disorder functions to inhibit emotional responses to unpleasant stimuli.

In addition, many people with depersonalization/ derealization disorder report emotional numbness but show normal emotional motor expressions and present themselves as emotional individuals (Sierra, 2009), which may be explained by a "disruption of the process which allows emotions to gain conscious representation" (Sierra, 2009, p. 144). Michal et al. (2013) found that people with depersonalization/ derealization disorder showed normal autonomic activity but reported low levels of arousal. Thus, emotions seem to be dissociated from awareness, which presents an illusion that emotions do not exist.

In light of the studies, not all people with depersonalization/ derealization disorder show normal or blunted physiology. Indeed, Schoenberg, Sierra, and David (2012) found that people with the disorder had greater resting SCL in comparison to healthy volunteers. Similar differences have been observed in cortisol studies. Giesbrecht, Smeets, Merckelbach, and Jelicic (2007) found higher cortisol levels in people with depersonalization and derealization, while others found lower levels (Sierra, 2009). Thus, since cortisol levels reflect arousal, these studies support the observation that levels of arousal are not homogenous among patients. Disparities may reflect the severity of patients' symptoms. For example, Sierra, Medford, Wyatt, and David (2012) found comorbid anxiety in depersonalization/ derealization disorder but only in patients who reported low levels of dissociation. In line with this finding, levels of norepinephrine, which are important in arousal (Simeon & Abugel,

2006), have been found to be inversely correlated with dissociative severity (Simeon, Guralnik, Knutelska, Yehuda, & Schmeidler, 2003). Thus, levels of arousal vary among patients and may be contingent on the degree of patients' symptoms. Additionally, overt emotional expressions may hide subjective numbness and contribute to the lack of attention this disorder has received.

Neurobiology

Certain neurological disorders have been used as models to map the neural substrates of depersonalization/ derealization disorder. Visual hypoemotionality and asomatognosia have been particularly used, as the former is related to a lesion in the temporal lobe and derealization, and the latter is associated with a lesion in the right parietal lobe and depersonalization (Sierra, Lopera, et al., 2002). There is some evidence that suggests a relation between these two sites of the brain and depersonalization and derealization. Neurosurgeon Wilder Penfield produced phenomena redolent of depersonalization and derealization in patients when he stimulated their middle and superior temporal gyri (as cited in Simeon & Abugel, 2006), as did De Ridder, Van Laere, Dupont, Menovsky, & Van de Heyning (2007) when they stimulated a patient's right superior temporal gyrus. There seems to be a particular association between depersonalization and the parietal areas, namely the inferior parietal lobule and its substructure: the angular gyrus. Tumors in the angular gyrus, and stimulation to this area, have been implicated in depersonalization (Simeon & Abugel, 2006). Moreover, a PET study showed a positive correlation between activity in parietal areas and depersonalization intensity (Simeon et al., 2000).

In addition, scientists have considered separate facets of the disorder and their relevance to different brain systems. For example, reduced arousal has been proposed to follow hyperactivity in the prefrontal cortex (Sierra & Berrios, 1998), which increases frontal-limbic inhibitory regulation and relays inhibitory signals to structures involved

in emotion (Jay, Sierra, Van den Eynde, Rothwell, & David, 2014). Astoundingly, when Jay et al. (2014) used transcranial magnetic stimulation to inhibit activity in patients' ventrolateral prefrontal cortices, patients showed increased SCL and reported reduced emotional numbness.

A dysregulated serotonergic system has also been suspected because of the obsessive properties in the disorder (i.e., excessive philosophizing) and because of drugs that have acted on this system and precipitated dissociative phenomena. For example, chronic depersonalization and derealization have followed LSD (Medford et al., 2003), a drug that increases serotonergic input at 5-HT2A and 5-HT2C receptors (Simeon & Abugel, 2006). In addition, Psilocybin, a potent 5-HT2A agonist, has also led to dissociation (see Sierra, 2009), as has m-CPP, another serotonin agonist (Simeon et al., 1995). Thus, specific serotonin receptors may receive too much serotonin in depersonalization/ derealization disorder and treatment may therefore lie in balancing this system. (For a complete review of the neurobiology of depersonalization/ derealization disorder see Abugel, 2010; Sierra, 2009; Simeon & Abugel, 2006.)

Pharmacological Efficacy

The efficacy of medicine in treating depersonalization/ derealization disorder has been inconsistent and unreliable. Sierra et al. (2001) found that some patients improved while taking Lamotrigine, an anticonvulsant, but a follow-up study did not replicate these findings (Sierra, Phillips, Glynis, Krystal, & David, 2003). Lamotrigine has been deemed overall ineffective when used alone; however, combining it with SSRIs has helped patients (Rosagro-Escámez, Gutiérrez-Fernández, Gómez-Merino, de la Vega, & Carrasco, 2011; Sierra, Baker, et al., 2006).

Naloxone and Naltrexone, two opioid antagonists, have benefited some, but not all, patients (Nuller, Morozova, Kushnir, & Hamper, 2001; Simeon & Knutelska, 2005). SSRIs, such as Fluoxetine, have been ineffective when used alone

(Simeon, Guralnik, Schmeidler, & Knutelska, 2004). Inconsistent with this finding, however, are trials with Clomipramine, a tricyclic antidepressant with potent SSRI properties. In a very small sample (n = 4), Clomipramine led to significant improvement, where in one case, near complete remission lasted for years with continuous use (Simeon, Stein, & Hollander, 1998).

Although depersonalization/ derealization disorder does not reflect psychosis (Hunter, Phillips, Chalder, Sierra, & David, 2003), atypical antipsychotic Aripiprazole has shown promise. Uguz and Sahingoz (2014) report three patients who have been treated successfully with Aripiprazole, and Janjua, Rapport, and Ferrara (2010) present a case of a patient who showed complete remission after 4 months of using Aripiprazole as an augmenting medication with Clomipramine and Diazepam. Aripiprazole may be effective because of its function as a 5-HT2A receptor antagonist (Celik, Tahiroglu, Firat, & Avci, 2011), which may restore balance in the serotonergic system. Claiming efficacy or inefficacy of any of these drugs, however, is premature, as such findings represent few cases. The dearth of treatment trials and participants in studies merit further investigation.

Other Treatment Avenues

It has been proposed that depersonalization/ derealization disorder is the corollary of a "catastrophic appraisal of the normally transient symptoms of [depersonalization and derealization]" (Hunter et al., 2003, p. 1451). That is, individuals blow dissociative episodes out of proportion and develop causal attributions that perpetuate the disturbance (e.g., permanent brain damage). Hunter et al. (2003) devised a CBT treatment plan, which functions to resolve causal attributions, among other things (see Hunter et al., 2003). This model has been used in 13 sessions with 21 patients and showed efficacy, where at 6-month follow-up, 29% of the sample no longer met the criteria for the disorder (Hunter, Baker, Phillips, Sierra, & David, 2005).

Recent research has transcended the parameters

of conventional psychotherapy. Michal et al. (2007) found an inverse relation between patients' symptoms and mindfulness (i.e., present moment awareness). Michal et al. (2013) demonstrated immediate symptom reduction and attachment restoration with a mindful breathing exercise in patients with depersonalization/ derealization disorder. Repetitive transcranial magnetic stimulation (rTMS) has also been used in recent treatment trials and shows promise (Christopeit et al., 2014; Jay et al., 2014; Mantovani et al., 2011). Thus, although depersonalization/ derealization disorder has been viewed in the past as a refractory condition (Simeon et al., 1997), it is clearly "far from being the unassailable rock early writers led us to believe" (Sierra, 2009, p. 130).

Discussion

Depersonalization/ derealization disorder affects a considerable proportion of the population and is nothing new. Extant medical literature, outmoded diary entries, and early publications show an extensive history. It can be extrapolated from these documents that the disorder has been an ever-present human affliction, and the now established prevalence rate may have always been the same.

The disorder is neglected but not entirely abandoned in that research teams in various pockets of the world have been studying it. However, investigations have been blatantly overshadowed by superfluous interest in well-established disorders, which has resulted in both poor circulation of basic information about the disorder and important findings. Thus, although recent research has shown promise with respect to treatment, discoveries unlikely seep into mainstream psychiatry and are applied. The neglect may exist for many reasons. Foremost, the disorder cannot be objectively studied. For example, a psychiatrist can observe delusional ideation and low mood but cannot see dissociation. Second, there are discrepancies between what a patient reports and displays. That is, a patient reports emotional numbness but presents

emotions; loss of control but shows autonomy. To a psychiatrist, incongruities may strongly invalidate patients' complaints and, theoretically, the disorder. Third, psychiatrists may have difficulty relating to dissociative phenomena and are at odds with its validity. Further, the disorder is belittled by overpublicized literature on other disorders; descriptions, such as feeling like an automaton, confuse most psychiatrists and are interpreted differently; and serious psychopathology is masked by lucidity and normal appearance, which gives a false impression that the disorder is not serious, or even non-existent.

As previously discussed, people with depersonalization/ derealization disorder often receive false diagnoses (Medford et al., 2005). Misdiagnoses may arise from the belief that the disorder is nonexistent but may also follow patients' descriptions, which could be mistaken as delusions (e.g., "feeling out-of-body"). Likewise, the dissonance between description and demonstration may lead to the assumption of psychosis. In addition, misdiagnoses may follow anxious and distressed presentations, which are assumed to reflect anxiety disorders, when they are merely reactions to the effects of the disorder. Proper diagnoses will therefore follow when it is understood that 1) patients' descriptions reflect feelings and not beliefs; 2) discord between what is described and displayed is normal and expected; 3) overt anxiety is a reaction to the effects of the condition; and, above all, 4) the disorder is a legitimate and common condition. To get this far, however, existing literature must be more adequately investigated.

Indeed, more literature will convey a message that the disorder is prevalent and deserves attention. However, it is challenging to accomplish this goal with only a small population of scientists. Thus, more scientists must involve themselves in the research enterprise. More research will not merely stimulate awareness but also generate more findings, advancing what is known about the disorder. In addition, it will fill holes in

current research. Many studies involve as little as 6-15 participants (Giesbrecht, Merckelbach, van Oorsouw, & Simeon, 2010; Lemche et al., 2007; Medford et al., 2006; Phillips et al., 2001; Sierra, Senior, et al., 2002; Simeon, Guralnik, et al., 2003), which makes it difficult to extrapolate patterns and make conclusions about the larger population. Thus, it is critical to replicate both studies that have shown and not shown promise in the lab and get more patients involved.

While the neural substrates of the disorder seem established, medicine seems unreliable. A starting point for medicinal treatment trials is reassessing drugs that have helped some patients (i.e., Aripiprazole, Clomipramine, Lamotrigine, Naloxone, and Naltrexone). In addition, those well versed in medicine may consider testing drugs that heighten awareness. Research in the future should give attention to CBT, rTMS, and mindfulness-related exercises, which have all helped patients. Mindfulness should be particularly investigated in that symptoms of the disorder are contingent on low levels of awareness. That is, mindfulness could be used as an invaluable tool to restore normal levels of awareness and, therefore, relieve symptoms.

Depersonalization/ derealization disorder affects millions and is more common than bipolar disorder (Comer, 2011). In addition, current estimates indicate that there may be more cases of the disorder than cases of autism spectrum disorder and obsessive-compulsive disorder combined, and the disorder may be equally as common as generalized anxiety disorder and panic disorder (APA, 2013). Depersonalization/ derealization disorder is both among the most common and, paradoxically, the most neglected. Its subjectivity makes outside detection difficult and detecting dissociative phenomena will likely remain challenging. While we may never be able to visualize the condition, we can strive to understand it. By recognizing its legitimacy, concealed nature, distressing properties, and prevalence, we may just end what Jeffrey Abugel (2010) calls "the hidden epidemic."

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A Comparative Look at the Effectiveness of Adlerian Therapy versus Gestalt Therapy for Major Depressive Disorder

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Major Depressive Disorder (MDD) is a serious and consuming mental illness that affects a large portion of the population. As such, extensive research has been dedicated to finding effective methods for its remission. Throughout this body of work, researchers have not only identified the most effective, but least effective methods as well. There are numerous benefits to studying why and how a particular treatment works, but even more so for studying why and how it does not. This approach can illuminate inconsistencies between treatment and patient needs, allowing already effective methods to increase their applicability. Countering flaws in this manner can improve therapy methods in general, by providing another technique with which treatment information can be gathered and used. Adlerian and Gestalt therapy are two methods which meet these requirements. Discussing each treatment's ineffectiveness as well as its comparative effectiveness will shed light into the nature of MDD. This discussion demonstrates that Adlerian therapy (AT) is more effective than Gestalt therapy (GT), thereby suggesting that people with MDD respond to a slow, sensitive, and mental therapy that allows for a world-view restructuring well.

Major depressive disorder (MDD) affects and disables many adults throughout their lives (Jakobsen, Hansen, Simonsen, & Gluud, 2012). Considering MDD's global, individual, and economic impacts, it is not surprising that much research has gone into finding which is the most effective way to cure the disorder. Even though antidepressants are most common (and believed to be most effective) (Grobler, 2013), it is still worth inquiring into less effective therapies or methods. The goal of this is to assist in understanding the nuances of MDD treatment. Firstly, being familiar with MDD is required. Then, detailing the techniques and theories of both therapies will occur, followed by comparison between AT and GT on MDD effectiveness. Together, this will demonstrate that although AT and GT are rather ineffective in helping remission of adult depression, the former is more effective than the latter. These results have interesting implications for general methods of treatment for the disorder.

Major Depressive Disorder

The Diagnostic and Statistical Manual of Mental Disorders (5th ed.; DSM-5; American Psychiatric Association, 2013) defines MDD as the presence of five out of seven predetermined symptoms for a period of at least two weeks. Out of the five symptoms, one has to be either depressed mood or the loss of interest and/or pleasure. The other symptoms experienced could be: (1) change from the individual's previous manner of functioning, (2) change not caused or attributable to another medical condition or the use of narcotics, (3) significantly distressing and/or cause impairment in daily life (socially, occupationally, etc.), and (4) not better explained by another condition (e.g., psychotic spectrum disorders). The individual must, furthermore, never have had a manic or hypomanic episode.

Various other examinations are required before an individual is diagnosed with MDD (Grobler, 2013). A general medical and psychiatric

history of both family and client are amongst some of the suggested assessments (Grobler, 2013). Once diagnosis is made, treatment strives for remission. There is no one way in which this is accomplished since goals and plans tend follow the needs of the client as defined by the severity of their disorder and any personal factors. However, in terms of treatment, cognitive-behavioural therapy (CBT), cognitive therapy (CT), and interpersonal therapy (IPT) are often recommended with or without the addition of antidepressants (Grobler, 2013).

Although CBT, CT, and IPT are most commonly prescribed (Grobler, 2013), this does not mean other psychotherapies cannot be used. DYN has become less significant in the treatment of MDD (Schwartz and Petersen, 2006), but several meta-analyses have shown that it can help in remission (Driessen et al., 2010; Jakobsen et al., 2012; Braun et al., 2013; Cuijpers et al., 2008). Other research also shows that GT is an effective treatment for depression (Cook, 1999; Yoo, 2011; Greenberg & Watson, 1998). Both are, therefore, viable therapies for MDD. However, before comparing them on their effectiveness in the treatment of depression, two things are required. First, analysis of why AT and GT are ineffective and, second, a basic understanding of both therapies.

Ineffectiveness

Both AT and GT assume a lot about the nature of a client's depression. In focusing on only the social effects influencing a person's MDD, not all possible causes are identified. This is most obvious from the multitude of medical and biological models available as explanation for depression onset and cause. As such, differences in treatment can often come down to the explanations of MDD presumed to be correct. Environmental approaches, for instance, lead to theories like the Chronic Mild Stress (CMS) model (Venzala, Garcia-Gacria, Elizalde, & Tordera, 2013). Social conflict approaches, on the other hand, lead to theories like the Chronic Social Defeat Stress (CDSC) model (Venzala et al., 2013). The

former posits that depression is caused by stress from the environment and the latter, by social subordination. It is intuitive how treatment for MDD would differ depending on the explanation of disorder causation and perpetuation. This, however, is precisely the drawback with AT, GT, and the use of different models.

The very fact that different explanations, approaches, treatments, and subtypes of MDD exist makes the statement that depression has many varying causes, sources, stressors, and pressers; which depend on the individual themselves rather than the disorder. As such, a model of MDD causation and onset has to be flexible in both method and application. Depression with anxiety, for instance, is related to genetics and the (5-HTT) serotonin transporter gene (Lichtenberg & Belmaker, 2010). Restructuring beliefs about the world or getting back to your basic desires will not change how the 5-HTT gene works and will unlikely treat the disorder. Furthermore, an inflexible approach can result in a degree of victim blaming. If a patient is in a healthy situation according to the principles of AT or GT, then the suggestion is that no depression should be present. Yet individuals with healthy families, lifestyles, and social lives can still be depressed.

Thus, the ineffectiveness of both therapies originates from the very nature of their theories about the causes of MDD. These theories are simply not inclusive. Appreciating and recognizing that ideology restructuring is not applicable in every case would increase each therapy's effectiveness.

Psychodynamic Therapy

Since the focus here is AT—which belongs in the DYN category of treatment—it's important to understand AT's therapeutic 'family' (i.e., Psychodynamic Therapy). DYN is a Neo-Freudian approach to treatment whose core concepts are similar to psychoanalysis' (PSA; Prochaska & Norcross, 2010). The most relevant theory they share is that psychopathologies are subconscious responses to faulty 'ideologies' (e.g., habits, beliefs, and values), which have been influenced by early

experiences. However, even with this similarity, DYN still takes relatively less time and tends to focus more on the individual's future. This is achieved through concern with directly pressing issues, interpersonal conflicts, coping strategies, social forces (Prochaska & Norcross, 2010), and client-driven discovery.

Understanding these fundamental aspects of DYN provides insight about the general nature of this therapeutic family. This has one important consequence; if subtypes of DYN (like AT) are effective for MDD remission, then DYN in general (and its other subtypes) should be as well. Therefore, being aware of the theories shared within the DYN family can be a great asset for MDD treatment.

Adlerian Therapy

As sexual conflict is to humanity in Freud's work, so is superiority to mankind in AT. Superiority is understood as the striving for perfection or completeness and can be achieved in a variety of ways (Prochaska & Norcross, 2010). Pathologies, for instance, are one such way. Born from early experiences, they develop into negative ideologies and coping behaviours. This often occurs when people make errors in their development of a world view. One example is by generalizing certain relationships from their early experiences. Such that an aggressive and unloving father from childhood turns into the belief that all men are aggressive and unloving. These maladaptive life patterns allow individuals to play various excusatory roles and it is these roles which help one achieve superiority. However, many people are unaware that they are in engaged in these roles or behaviours.

The point of AT therapy is to make clients aware of these destructive forces. Therapists reveal these truths by employing techniques like family constellation analysis, dream analysis, early memory analysis, bibliotherapy, and lifestyle evaluation. Each technique serves a different function. Family constellations (birth order), for instance, provide the therapist with a view of family dynamics, shedding light on how and why negative ideologies are developed. Adlerians —here understood to refer

to any therapist practicing Adlerian therapy at any particular moment—are not overly concerned with past experiences though. These are only important as far as they are relevant to understanding basic life structures and their connection to the future.

Of more concern to Adlerians is social welfare. Therapists help direct their client's destructiveness (e.g., acting sick so others are forced to take care of them) towards behaviour that embodies social interest and selflessness. This is, of course, only if the individual chooses to do so; one can either continue their old life pattern—with full awareness of the excusatory and destructive behaviour they engage in—or take up the Adlerian philosophy. Hostility, control, anxiety, compensation, and a host of other defenses are often problems during this time of change. Especially since an irresponsible and selfish lifestyle is easier and more secure than one of social and personal responsibility. During this redirection is when individuals finally gain a sense of self-esteem, proper superiority, and the ability to be intimate and communicate properly.

In summation, AT is the process by which a therapist uses their relationship with clients as the basis for the development of a healthy lifestyle. This is achieved through the positive regard, genuineness, faith, and encouragement they show their clients; and it allows a therapist to direct and help individuals transcend their old, selfish, irresponsible, and empty life. The therapeutic environment itself can assist this process since it often provides the client with a basic experience and relationship that undermines earlier life events. Compounded, these mend an individual's view of the world. An unsupportive family is thus undermined by the therapist who shows faith in a patient's abilities, giving the client an opportunity to break away from old habits. In transcending this behaviour, one can embrace gemeinschaftsgefühl (i.e., "social interest with which we add to the world"; Prochaska & Norcross, 2010). In the end the client becomes a responsible individual with a meaningful life and healthy self-esteem.

Gestalt Therapy

In a general respect, GT is very much antipode to AT. Although, they do share in the importance placed on personal responsibility, awareness of excusatory behavior, the role of early experiences, and dream analysis (whereby one is required to act their dreams out rather than talk about them). Still, GT is very much action-oriented rather than mind-oriented. As such, Gestaltists—here understood to refer to any therapist practicing Gestalt therapy at any particular moment—would criticize Adlerians for telling their clients to; (1) adopt yet another role; (2) teaching them to endlessly rehearse for it with thought processes; and (3) forcing on them responsibility for others (i.e., social responsibility).

In the Gestalt 'philosophy', the individual is a biological being who lives around their daily goals (i.e., end goals). These goals are primal forces such as hunger, survival, shelter, breathing, and sex. The healthy being is, thus, engaged in the circular pattern of fulfilling the body's basic needs and desires. Satisfying this pattern is also how the human being (e.g., their identity, personality, or personhood) develops and pathologies are born when this development is stunted. Usually that occurs when one's lifestyle is focused on everything and anything but the physical self and its natural urges.

Unfortunately, the nature of our social world prohibits such basic satisfaction; and for this reason Perls believed that only the sick assimilated to and lived there. In his view, the entirety of society ignores the basic biological body and forces people to assimilate to a rigid existence and personality. The process of healthy growth and existence is interrupted by this kind of life. Thus, all those within the social world are left sick and stunted. To be a healthy, responsible, and mature individual is to rely on and be responsible for oneself, leave other to their own lives, disregard habit and routine, and live—whilst allowing others—by one's own expectations (Prochaska & Norcross, 2010). All this is, unfortunately, against the tenets of social existence.

Therefore, pathologies are developed by those who remain in society, creating a breeding ground for the sick, childish, irresponsible, and dependent. Many tend to stay in this reality because early experiences and relationships give them the impression that there are no other options. An overbearing parent, for instance, gives their child the impression that they are incapable of supporting or taking care of themselves (i.e., catastrophic expectations; Prochaska & Norcross, 2010). This experience results in the development of an adult who fears independence. These psychopathologies—of which dependency is only one—are deeply ingrained, existing in the person in five different layers (see Prochaska & Norcross, 2010, Chapter 6 for discussion).

The therapists' job is to employ various gestalt techniques in order to break these layers. Empty chair dialogue, frustrating the patient, preventing avoidance, and refusing to accept responsibility are some of the available options (Prochaska & Norcross, 2010). By employing these techniques, a therapist raises awareness and breaks the constructs of each psychopathological layer. For instance, Maya is found in the first layer (the phobic layer) and embodies the unrealistic and inauthentic self (Prochaska & Norcross, 2010). By focusing on the reality of now (instead of the fantasy of 'should be') and in acting out or releasing frustrations individuals break out of this pseudo reality and role. This forces them to embrace their authentic and independent selves. The entire process of GT is, thus, client-driven because clients are often their own source of feedback and responsible for the continuation and content of therapy (Prochaska & Norcross, 2010). The therapist's only role is to set the stage for emotional release and offer methods with which people can progress towards authentication. The Gestalt approach is, thus, an active one. It views society as destructive, pathological, and the core of human disorder. Treatment seeks to tear people away from the unhealthy ideas, expectations, and habits that the world at-large has forced on them through assimilation to society. This break

is best achieved through movement and activity rather than thinking. Since continuous mental repetition and internal focus is the root of all psychopathologies, in taking the focus away from the internal and putting it on the external, clients rid themselves of social teachings and revert to their intended and natural form; the biologically-driven being.

Effectiveness of Adlerian Therapy

Clinically and empirically speaking, AT tends to be just as effective as other forms of psychotherapy. Braun, Gregor, and Tran (2013) found that at the end of treatment, DYN was just as effective as other therapies in the sample. Although no statistically significant superiority between CBT, DYN, IPT, or behavior activation therapy (BA) was found; patient self-ratings, clinician ratings, and their clinical significance were significantly worse for DYN than all other therapies. Furthermore, the effectiveness ratings of DYN were found to be impacted by reporting bias. As Braun, Gregor, and Tran (2013) pointed out, this does not mean that DYN is not as effective as other therapies; just that studies of higher quality are required. Similar results regarding the effectiveness of DYN on MDD in adults were obtained in a meta-analysis of 53 studies (Cuijpers, van Straten, Andersson, & van Oppen, 2008). A variety of data, thus, support the conclusion that DYN is as equally effective as the other psychotherapies.

Evidence also points to the fact that DYN and anti-depressants work effectively on the treatment of MDD. A meta-analysis—consisting of 365 participants with a primary diagnosis of MDD—found that DYN in conjunction with antidepressants reduced symptoms of depression more than medication alone (Jakobsen, Hansen, Simonsen, & Gluud, 2012). As such, DYN consists of aspects which have positive effects on the symptoms of MDD. However, this meta-analysis did not include data on effects of DYN after treatment. It is therefore not clear how beneficial DYN was in the long run.

Adding to this data is Driessen and colleagues (2010) who—in their meta-analysis—showed that short-term psychodynamic psychotherapy (STPP) is an effective treatment for depression in adults. STPP is not exactly DYN, but the two still share many tenets and practices. Thus, the meta-analysis in question is a valid addition to the body of empirical evidence on the effectiveness of DYN. Of particular interest in this research was the inclusion of a 3-month, 6-month, and 1 year follow up. Data from these follow-ups showed that STPP was more effective than no treatment in post-treatment depression levels of community and clinically recruited patients of various age, depression levels, and gender. These results suggest that DYN does have positive effects on MDD symptoms in the long run.

The data of the reviewed literature suggest that Adlerian approaches to therapy can be effective, but are likely to be dependent on individual preference and the nature of the disorder itself. For instance, AT may not be beneficial to those whose MDD is largely sourced by their over concern with the mental. Techniques of raising awareness and directing change would be useless for someone who is far too ingrained in their repressive ideologies and doesn't notice their destructive behaviour. In this case, one instance of being contradicted would simply lead to another excuse and so on and so forth. For this individual however, participating in Gestalt role play (e.g., taking the role of their parent in a discussion about themselves) could promote a cathartic release of emotion. Helping the client realize what they have been repressing all this time. However, AT could be helpful for a client whose MDD is largely sourced by perfectionism (see Blatt, 1995 for discussion). Having the opportunity to restructure a world view based on an example of a healthy relationship can, for example, help one get rid of childhood anxieties about not being good enough or living up to parental expectations. In the end, AT applicability can largely be a question of who the patient is and the nuances of their depression.

Effectiveness of Gestalt Therapy

The effectiveness of GT is severely under-tested. As Prochaska and Norcross (2010) point out, Gestaltists have not taken to the scientific method of empirical research. This does not mean, however, that studies on the effectiveness of GT for MDD do not exist.

Yoo (2011) makes several compelling arguments about the potential of GT for the treatment of depression in adolescent Korean males. Specifically, this research found that Gestalt techniques are effective in remission of depression (Yoo, 2011). The suggestion is that using dream work, I – Thou, and two chair interventions are useful in treating symptoms of MDD, since either techniques would allow individuals to disclose personal concerns in a safe and active environment. Similar evidence suggests that GT is also effective for lowering depressive symptoms in adolescent girls (Cook, 1999). Unfortunately, only sixteen participants took part in this research and depressive symptoms were self-reported. However, the most essential conclusion this evidence helps draw out is that the techniques of GT are useful. Regardless of sample or methodology, these methods of treatment appear to be supportive of the changes and needs encountered during the healing process. GT achieves this by providing a safe and powerful method with which one can explore their internal dynamics and concretely examine abstract personal issues. In general then, this treatment targets the source of the developmental problems which cause and are a part of depression as a whole (Cook, 1999).

Although not directly assessing GT, research looking at the effects process-experiential psychotherapy (PEP) has on MDD is relevant. PEP is not fully Gestaltian in nature, but it does include Gestalt techniques (such as two-chair dialogue and empty-chair dialogue). Looking at symptoms of depression during treatment, termination, and 6 months post-treatment, Greenberg and Watson (1998) found that PEP—at mid-treatment and termination of treatment—had superior scores on the total level of symptom reduction. Thus, GT can have a positive effect on the symptoms of MDD at particular points of treatment.

As in the case of AT, literature on GT suggest that Gestalt approaches to MDD may largely come down to the nature of the disorder and a patient's personal preferences. Gestaltists, for instance, tend to work in a group setting, but on an individual basis. A client is, generally, expected to sit in the hot seat and enact a gestalt exercise in front of a group. GT is, in addition, very active; often including dramatic exercises like role play and 'acting out'. Someone who isn't comfortable around others or dramatic activities might not, as such, benefit from this type of approach. GT has also been critiqued on its exclusion of the cultural and social sources of pathologies (Prochaska & Norcross, 2010). If someone suffering from MDD had a recent traumatic event occur, for example, offering anything other than support would unlikely be helpful. On the other hand however, someone with MDD caused by perfectionism (see Blatt, 1995 for discussion) could benefit from the gestalt tenet of not living up to anyone else's standard but one's own.

Discussion

Research suggests that, for the remission of adult MDD, AT is more effective than GT. Although DYN is the empirically supported therapy, it is not a stretch to claim that the results are applicable to AT. As per earlier discussion, although there are many variations to DYN, they share core principles, techniques, and ideas. This makes the differences between DYN and AT miniscule in the broader sense. Furthermore, studies testing DYN likely include AT, EP, and others since DYN is the broader therapy category. Meaning that, indirectly, results of studies on DYN are also results about AT. Thus, AT is just as effective as other psychotherapies and is, additionally, more effective in the long run. GT is, on the other hand, unfortunately largely unsupported by evidence. Most literature, instead, asserts that various GT techniques—not the therapy itself—are useful. As a whole, therefore, GT may be ineffective even though it employs particular exercises that can help some cases of MDD.

These differences in effectiveness may be largely explained by the contrasting techniques each therapy employs and how these techniques help heal the underlying forces behind adult MDD. For instance, adults with perfectionistic qualities tend to be susceptible to MDD and suicide (Blatt, 1995). Perfectionistic qualities include, amongst many other characteristics, being highly self-critical. An Adlerian therapist faced with this type of case could help a client restructure their belief about the necessity of always being one hundred percent perfect. In showing compassion, acceptance, and respect for their client, the therapist would provide the necessary personal experiences a client would need to begin their world-view restructuring. Knowing that there are people out there—or even just one—who believes your effort are enough could sufficiently help a client change how they relate to other individuals. By taking the time to construct proper examples of what relationships are like, a therapist can help their client analyze personal experiences using a different schema. If a client feels that they are capable of having a normal human relationship (e.g., with their therapist), they may begin to get the sense that their efforts and achievements are enough. The simple knowledge that a proper and supportive human relationship is possible, can thus, help someone re-evaluate how they experience the world and the people around them.

A Gestalt therapist might achieve these exact results, but with a different route. Instead of using the therapeutic relationship as grounds for re-building the client's world the Gestalt therapist would make their client act everything out. For example, the therapist would ask the client to talk to an imaginary form of the parent, communicating the repressed feelings. This role-playing exercise should conclude in a cathartic release. If this is achieved, the therapist would demonstrate that the client does not have to live up to the expectations of others; that only they are responsible for how life progresses.

Both methods sound effective, especially if they achieve the same goal (e.g., changing ideas about perfection). Individual preferences could, however, make a difference. This may make it appear as if no concise conclusion about treatment for depression could be reached; and it may make the idea of inquiry seem pointless. However, the saving grace is that MDD can be generalized while still keeping to certain particularities. Earlier discussion emphasized the importance of flexibility in treatment. This particular fact continues to be the case even if depression is defined or understood, more generally, as a mental disorder. Disorders of this nature are, quite obviously, internal, with treatment looking to assist in the inward concerns of patients (e.g., feelings, thoughts, impressions, or brain mechanisms). In line with this sense, MDD can also be considered a 'sensitive' disorder.

This is not to say that people with MDD need to be handled as if they are fragile objects. However, depression—like other mental disorders (e.g., phobias or anxiety)—does need to be approached with a certain finesse. A therapist who presents the object of a patient's fear at the very first session is unlikely to do any good. There is a degree of support and easing-into that is required of a treatment for MDD. Those suffering from a particularly sensitive disorder, then, are not likely to be supported by Gestalt 'philosophy'. The feeling that one is unloved by parents who have abused and stolen from them, for example, isn't something that can alleviated by being put in front of a group of strangers and told to take responsibility. In the case of depression particularly a therapy that's more sensitive and that doesn't blame the victim (Prochaska & Norcross, 2010) would be more effective.

Restructuring a client's view of the world and self is also an important goal for treatment (even though it may not always be necessary). This too, however, seems to be more easily achievable by AT rather than GT. With an Adlerian therapist, a client has the chance to slowly build up a reassuring relationship, which they may then use to change their beliefs. This type of positive and slow change is not very conducive through the Gestalt philosophy. Especially since with AT, not GT, is genuineness

and support employed. The Gestalt model thus, in general, makes ill use of concepts and techniques (e.g., support) that could be helpful to a client with a disorder of this nature. The conclusion this discussion forms is that a therapy based on a philosophy which ignores the internal is not likely to assist someone whose problems are, in many ways, internal.

It is clear then that MDD in adults is a mental, internal, and sensitive disorder which likely has roots in negative generalizations about oneself and the world. An Adlerian philosophy and therapy targets these basic principles underlying depression more so than a Gestalt one. Thus, adults with MDD would respond more to AT than to GT.

Limitations

Aside from the limitations of each specific study itself, there are several worth noting about the method employed in these discussion. Studies included in support for the effectiveness of AT and GT have drastic differences between them. This may explain the conclusion that AT is more powerful than GT for the remission of MDD in adults. The literature used to support the Adlerian approach to depression were mostly meta-analyses. Hence, in general, quality and quantity were on the side of AT. GT, on the other hand, was supported by various dissertations and singular studies that— although didn't support the therapy itself—used Gestalt techniques. Therefore, comparing the two therapies using studies which differ so drastically in methodology skews perceptions of effectiveness.

The concern with methodology is, firstly, in content compared. The full procedures and treatments used in AT are substantially more thorough and, therefore, more widely applicable than just a few exercises from GT. If only one or two methods of AT were compared to only one or two methods of GT, the two could have had equally effective or ineffective results. The second concern is with sample populations. Meta analyses include hundreds of studies and can, therefore, consist of data of hundreds of participants. This makes the results of comparison between meta-analyses and singular samples inconclusive. Especially since the former has a higher probability of including more diverse samples and, therefore, results (from the sheer amount of participants). The concern is more pressing when considering the fact that the research included on GT was proposed for and conducted on adolescents. Depression in adults is different than in teenagers or children (American Psychiatric Association, 2013). Therapies and techniques that benefit one age group do not necessarily benefit another. The studies used in defense of AT were, therefore, more diverse and inclusive of the population at large, allowing for a broader investigation into its effects.

Lastly, since Gestaltists have not been taken to empirical research—as previously mentioned— there is the issue of scientific validity. Studies provide a chance for psychologists to present, test, analyze, and report their methods. Without having a concise list of processes, how they've been analyzed or used, and what results these tests indicate, there is no objective way for others to validate the techniques in question. Gestalt methods being applied in the literature may not, thus, be similar enough as another's use of these very same techniques. These small changes in execution from literature to literature could have drastic effects— and not just on MDD remission—thereby skewing the data on empty chair dialogue. Additionally, by studying only some of the techniques available from GT, there could be a chance that a more effective method is being overlooked.

Therefore, if a near equal amount of diverse (e.g., all age groups and different genders) meta-analyses or studies looked at the complete body of GT and AT techniques, data might show that both are equally in/effective. To claim that AT should be recommended over GT to an adult with MDD is, therefore, a tentative conclusion at best. Nonetheless—taking the focus away from logistics—AT may still be a more viable suggestion than GT. If the effectiveness of Adlerian therapy is more tested and understood, it is likely a better

(barring any experimental requirements that an individual's particular case may bring) clinical recommendation than a therapy whose effects are currently hidden to the world at large.

Future Research

Considering the inequalities between quantity and quality, GT needs to be applied more frequently to adults diagnosed with depression (although there are ethical considerations in doing so). A body of research comparable to those of other psychotherapies will, thus, be formed. Armed with this type of data, skewing of results is less likely to occur when comparisons between therapies are made. This body of research will, furthermore, allow for thorough analyses into what it is about GT that makes it in/effective for treatment of adult MDD. Since comparative research has implied that GT is more effective in adolescents, further research will also make clearer the differences between depression in children, adolescents, and adults. This could provide fundamental information for the creation of techniques that target specific underlying causes of MDD per age group; thereby assisting general techniques for the treatment of depression. Considering the breadth and intensity of MDD, such advances can help the population, in general, with a much needed release from such a consuming disorder.

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Self-Efficacy, Experience, and Appraisal of Situations in the Academic and Social Domains of College Life

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This paper investigates the relationship between perceived self-efficacy and several situation-based variables in the academic and social domains of college life. A sample of 99 Brown University undergraduates responded to a series of self-report measures through an online survey. Analyses of these responses revealed fundamentally different relationships between reported levels of self-efficacy, experience with demanding situations, and perceived stress and coping abilities in the academic and social domains. Connections to social learning theory and previous findings, as well as implications for future research, are discussed.

The novel environment of a college campus presents students with a variety of challenges that lend themselves well to the study of perceived self-efficacy. Conceptualized by Bandura (1997), perceived self-efficacy involves "people's beliefs in their capabilities to produce given attainments" (as cited in Bandura, 2006, p. 307). Rather than a global trait, self-efficacy is a domain-specific construct (Bandura, 2006). In the present paper, perceived self-efficacy will refer to an individual's expectation that his or her behavior will be effective in achieving a goal within a given domain. Particularly relevant to the college setting is self-efficacy within the academic and social realms. By extension of Bandura's theory, academic self-efficacy has been defined as one's perceived "ability to perform successfully at designated levels" on school-related tasks (Joo, Bong, & Choi, 2000, p. 5). Social self-efficacy describes "an individual's

confidence in his/her ability to engage in the social interactional tasks necessary to initiate and maintain interpersonal relationships" (Smith & Betz, 2000, p. 286).

For perceived self-efficacy to be accurate in its description of one's true abilities, it should be related to the outcomes of one's behaviors in the relevant domain. In a meta-analysis, Multon, Brown, and Lent (1991) found a significant positive correlation between perceived academic self-efficacy and performance as measured by standardized test scores and teacher evaluations. This association was significantly stronger in studies that experimentally manipulated perceived ability than in non-experimental studies, suggesting a causal relationship through which increasing perceived self-efficacy in a given domain may lead to an improvement in the outcome of the action. Since the obtained average correlation is moderate

(r = .38), however, additional factors must mediate this relationship.

A likely intermediate that facilitates the connection between self-efficacy perceptions and actual behavioral outcomes is one's experiences with the environment, particularly how one interprets and reacts to demanding situations. Research has investigated the role of self-efficacy in the appraisal of stressful situations, which naturally test the limits of one's perceived and actual ability in a given domain. According to one influential dichotomy, individuals who deem a stressful situation a challenge feel that their coping abilities are sufficient to overcome its demands, whereas those who experience it as a threat feel that their coping tendencies are insufficient (Chemers, Hu, & Garcia, 2001). In order to parse out the psychological factors associated with such appraisals, Skinner and Brewer (2002) asked college students to assess their feelings regarding an upcoming exam using two self-report scales: (1) a measure of enthusiasm toward testing knowledge (challenge perceptions) and (2) a measure of worries or concerns about exam results (threat perceptions). They found positive correlations between challenge perceptions and approach emotions, such as excitement about the upcoming exam, and between challenge perceptions and beliefs that this affective profile would benefit performance. In contrast, threat ratings were positively correlated with both anxiety and the belief that this emotion would harm exam performance. An individual's appraisal of a particular situation as challenging or threatening is therefore associated with a specific affective state. This finding helps distinguish the challenge-threat dichotomy from the concept of self-efficacy, which focuses more on one's overall ability in a given domain.

Although distinguishable concepts, research suggests that situation appraisal and self-efficacy are indeed related. In one such study, Chemers et al. (2001) asked college students to rate their confidence in performing several academic tasks (such as taking notes and exams), the level of "pressure or demand" they anticipated from their schoolwork in the coming year, and their expected ability to cope with this stress (p. 59). Each participant's rating of expected pressure was subtracted from his or her coping score. This difference score was used to measure appraisal, with positive values indicating a perceived challenge and negative values indicating a perceived threat. Chemers et al. (2001) found that compared to students reporting low self-efficacy, those with high self-efficacy achieved significantly higher difference scores, appraising expected academic demands as challenging rather than threatening. The results also revealed a positive correlation between reported self-efficacy and coping ability, suggesting that there is an underlying relationship between the former and the coping-related aspect of the challenge-threat appraisal construct. Moreover, Zajacova, Lynch, and Espenshade (2005) found a negative correlation between college students' self-efficacy and stress perceptions regarding a given set of academic tasks. Structural equation analyses indicated that a model including both self-efficacy and stress ratings best accounted for between-subjects variance in behavioral outcome measures like grade point average, suggesting that perceived stress partially underlies the relationship between self-efficacy and domain-specific performance. The work of Chemers et al. (2001) and Zajacova et al. (2005) together indicates that self-efficacy in a given domain is associated with perceptions of both environmental stressors and individual coping ability, mediating its relation to situation appraisal.

The current study will further investigate several factors related to perceived self-efficacy in college students through a series of self-report measures. Academic and social situations are among the most salient aspects of college life, yet previous research investigating self-efficacy in these two domains has often focused on only one or the other. We thus chose to investigate both the academic and social self-efficacy of a single sample of college students using a common protocol. Furthermore,

few if any previous studies have accounted for the frequency with which individuals encounter stress-inducing events in each domain, which likely has implications for their subsequent assessments of similar situations and their perceived ability to handle them. We thus measured students' prior experience with stressful situations, along with their current appraisals of similar occurrences, in terms of both perceived stress and expected coping ability. In addressing these gaps in previous research, we tested a set of predicted relationships between self-efficacy and its mediating variables that should appear in both the academic and social domains.

We propose four main hypotheses about the relations between perceived self-efficacy, prior experience with stressful situations, and appraisals of stress and expected coping in the academic and social domains. First, since self-efficacy is negatively related to perceived stress and positively related to behavioral outcome and thus coping ability (e.g. Multon et al., 1991), students reporting low self-efficacy should rate the level of stress associated with given situations as greater than their perceived ability to cope with them, regardless of their levels of prior experience with similar scenarios. Second, individuals reporting high self-efficacy and highly frequent encounters with stressful situations should rate their ability to cope with them as greater than levels of associated stress. This hypothesis is based on the finding that high self-efficacy predicts effective performance within a domain, but that accurate efficacy beliefs are rooted in experience (Multon et al., 1999; Smith & Betz, 2000).

Predictions for individuals reporting high self-efficacy but low situation frequency are less clear, and we thus propose two alternative hypotheses to address this circumstance. Given the potential for high self-efficacy beliefs to reflect self-enhancement when not based on ample experience (Bandura, 2006), one possibility is that these individuals will report correspondingly inflated coping expectancies that exceed their ratings of perceived stress. Another plausible explanation is that, compared with overall self-efficacy within a domain, situation-

specific appraisal is more removed from core beliefs about personal competence, suggesting that one's assessment of a situation may be less vulnerable to self-enhancement effects. Therefore, students reporting high self-efficacy but few encounters with stressful situations should exhibit ill-supported efficacy beliefs, with subsequent perceptions of stress exceeding their coping ability in novel situations.

Methods

Participants

The participants of this study were Brown University undergraduates (ages 18 to 23). Of the original 146 students who responded, 33 were excluded because they did not complete all parts of the survey. Another 13 participants were removed for taking an unreasonable amount of time (an hour or more) to respond, and one was excluded because box-and-whisker plots revealed that his or her responses to several scales were clear outliers. Data from the remaining 99 participants (39 male, 60 female) were used in the following analyses.

The students conducting this study recruited participants by emailing a link to the online survey to friends and acquaintances within the Brown community. Email recipients were asked to complete a 15-minute survey as part of a final project for the course CLPS1790 Personality and Clinical Assessment. These individuals were told that they would be eligible to win a raffle of one of two $20 Visa gift-cards if they chose to participate and that they would enter all necessary contact information through a form separate from their survey responses in order to maintain anonymity. Prospective participants were asked to forward the email to any other Brown undergraduates they knew who might be interested in participating.

Materials

The electronic survey employed in this study was designed and administered online using Qualtrics Online Survey Software. It consisted of six measurement scales (see Appendix), an informed consent form, a debriefing page, and a

set of demographic questions. One scale measured academic self-efficacy using items compiled from the College Self-Efficacy Scale (Barry & Finney, 2009) and the College Academic Self-Efficacy Scale (Owen & Froman, 1998). Another assessed social self-efficacy using items from the College Self-Efficacy Scale (Barry & Finney, 2009) and the Perceived Social Self-Efficacy Scale (Smith & Betz, 2000). The self-efficacy items asked participants to rate, on scale of one to seven, how certain they are that can accomplish several tasks within the relevant domain such as the ability to "get the grades I want" (academic self-efficacy) or to "ask a potential friend out for coffee" (social self-efficacy). The next two scales assessed academic and social experience by asking students to consider themselves as they have been since starting college and to rate, on a one to seven scale, how frequently they have encountered each of the listed or similar situations within the relevant domain. An example of an academic situation that was asked was, "It is the night before an exam, which you realize will cover several chapters that you had forgotten about," while a social situation example was "You join a table of new acquaintances at the dining hall and they completely exclude you from the conversation." The prompt for this section was adapted from protocol used by Vansteelandt and Van Mechelen (1998), and the items were created by the experimenters for the purpose of this study. The final two scales presented students with the same academic and social situations, now asking them to rate, on a scale

of one to seven, the level of stress they would feel during each situation and their expected ability to cope with each situation if faced with it.

Procedure

Upon opening the electronic survey, participants read an informed consent form providing them with an overview of the study, the potential risks or benefits they might experience by participating, and the contact information of the experimenters. They were told that their responses would be anonymous and confidential, and that they could discontinue their participation at any time. Once they provided consent, participants were presented with the measurement scales. The self-efficacy items appeared first, followed by the frequency ratings, and then the stress/coping measures. Within each of these sections, participants received the academic and social scales in a random order. Finally, participants entered demographic information, read a debriefing page explaining the goals of the study, and were directed to a Google Form that asked them to enter their email address into the raffle. The survey remained active for eight days, during which participants could respond at any time.

Results

Preliminary Analyses

Before proceeding with statistical tests, several variables were created from the data collected. For each participant, average scores were

Table 1.

	Minimum Score	Maximum Score	Mean Score	Standard Deviation	Median
Academic Self-Efficacy	2.70	7.00	5.34	.97	5.30
Social Self-Efficacy	2.70	7.00	5.38	.94	5.50
Academic Frequency	1.00	4.17	1.99	.72	2.17
Social Frequency	1.00	3.67	2.09	.69	1.83

Note. Scores indicate ratings on a 1 to 7 scale.

computed for the following sets of items: academic self-efficacy, social self-efficacy, frequency of academic situations (academic frequency), frequency of social situations (social frequency), perceived stress in academic situations (academic stress), perceived stress in social situations (social stress), perceived coping in academic situations (academic coping), and perceived coping in social situations (social coping). **Table 1** displays descriptive statistics regarding some of these measures. We found similar mean scores for the academic and social components of both self-efficacy and situation frequency, indicating no systematic difference in these measures from either domain.

The internal consistency of the academic self-efficacy (α = .90), social self-efficacy (α = .88), academic coping (α = .84), and social coping (α = .84) scales were acceptable at the .80 threshold. The academic stress (α = .78) and social stress (α = .76) scales were near adequate.

Median splits were performed to create groups of participants with low self-efficacy, high self-efficacy, low frequency ratings, and high frequency ratings within both the academic and social domains. **Table 2** displays the distribution of students with each combination of self-efficacy and frequency level. All groups contained similar numbers of students. Correlations were computed among the eight variables as a preliminary assessment of their relationships. Theses results appear in **Table 3** and will be referred to in the discussion section.

Table 2.

	Low Academic Self-Efficacy	High Academic Self-Efficacy
Low Academic Frequency	25	33
High Academic Frequency	25	16

	Low Social Self-Efficacy	High Social Self-Efficacy
Low Social Frequency	18	25
High Social Frequency	26	21

Note. Values represent the number of participants falling into each group, created by splitting the distribution of each variable at its median.

Table 3.

	Academic Stress	Academic Coping	Social Stress	Social Coping	Academic Self-Efficacy	Social Self-Efficacy	Social Frequency	Academic Frequency
Academic Stress	__	-.39**	.49**	-.27**	-.24*	-.17	.25*	.06
Academic Coping	-.39**	__	-.24*	.59**	.58**	.39**	-.44**	-.15
Social Stress	.49**	-.24*	__	-.61**	-.07	-.10	.12	-.09
Social Coping	-.27**	.59**	-.61**	__	.33**	.39**	-.27**	-.04
Academic Self-Efficacy	-.24**	.58**	-.07	.33**	__	.46**	-.48**	-.36**
Social Self-Efficacy	-.17	.39**	-.10	.39**	.46**	__	-.21*	-.09
Social Frequency	.25*	-.44**	.12	-.27**	-.48**	-.21*	__	.50**
Academic Frequency	.06	-.15	-.09	-.04	-.36**	-.09	.50**	__

Note. * Indicates significant correlation, p < .05. **Indicates significant correlation, p < .001.

Primary Analyses

The following results report only statistically significant findings unless otherwise indicated. The first analysis assessed the predicted relationships between self-efficacy, situation frequency, and ratings of coping and stress within the academic domain. A 2 (measure: stress, coping) x 2 (self-efficacy level: low, high) x 2 (frequency: low, high) repeated measures ANOVA was conducted, with academic self-efficacy level and academic frequency as between-subjects factors and academic coping and stress measures as within-subjects factors. This revealed a significant main effect for measure, $F(1, 95) = 45.62$, $p < .001$. **Figure 1** indicates that stress ratings were significantly higher than coping ratings in the academic domain. There was also a significant main effect for academic self-efficacy: students with high academic self-efficacy produced higher overall ratings on the stress and coping measures than those with low academic self-efficacy, $F(1, 95) = 13.30$, $p < .001$. The results revealed no significant 3-way interaction ($F(1, 95) = .05$, p

= .82), but there was a significant interaction between measure and academic self-efficacy, $F(1, 95) = 21.69$, $p < .001$. As suggested by **Figure 2** and revealed by independent-samples t-tests, students with low self-efficacy trended toward scoring higher than those with high self-efficacy on the stress measure ($t(97) = 1.89$, $p < .10$), but the reverse was true for the coping measure, $t(97) = -5.93$, $p < .001$.

We next investigated relationships among the social domain variables. A 2 (measure: stress, coping) x 2 (self-efficacy level: low, high) x 2 (frequency: low, high) repeated measures ANOVA was conducted, with social self-efficacy level and frequency as between-subjects factors and social stress and coping ratings as within-subjects factors. The results revealed a significant main effect for measure, $F(1, 86) = 53.30$, $p < .001$. Figure 1 indicates that social coping ratings were higher than social stress ratings. There was also a main effect for social self-efficacy level, with the high self-efficacy group reporting higher scores on the two appraisal measures than students

Figure 1. *Mean ratings on scales of academic and social stress and coping. Variable names are located on the x-axis, and mean scores appear on the y-axis. Error bars represent 95% confidence intervals.*
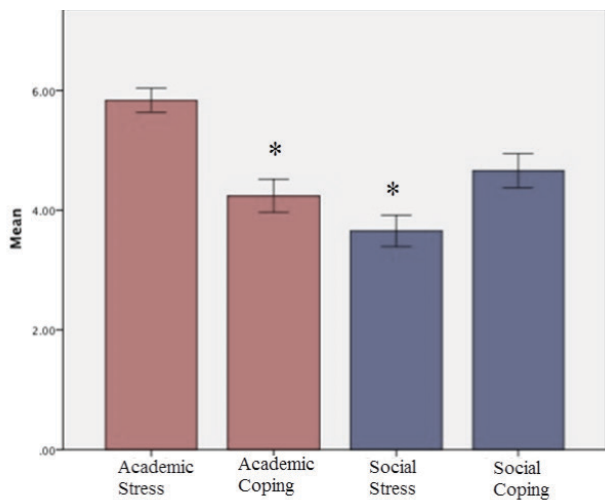
* Significant difference between variables in a given domain, p < .001.

Figure 2. *Mean academic stress and coping ratings by self-efficacy level. The x-axis displays self-efficacy level categorization, and the y-axis shows mean values of the other two variables. The blue line indicates academic stress scores, and the green line shows academic coping scores. Error bars represent standard errors.*
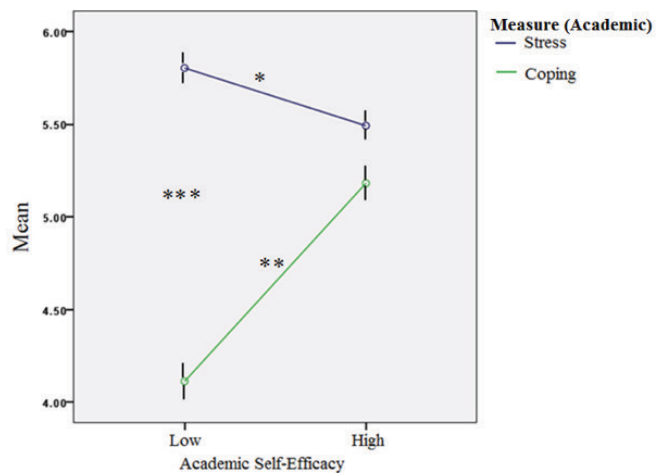
* Trending toward significance, between-groups comparison, p < .10
** Significant, between-groups comparison, (p < .001)
*** Significant, within-group comparison, p < .001

in the low self-efficacy group. There was a main effect for frequency, with students encountering fewer social situations scoring higher on the two appraisal measures than those reporting high situation frequency, $(F(1, 86) = 6.47, p < .05)$. The analysis also revealed a 3-way interaction that trended toward significance, $F(1, 86) = 5.21$, $p < .10$. As displayed in **Figure 3** and revealed by post hoc t-tests, there were no significant differences in either the stress or coping ratings within the low social self-efficacy group group based on situation frequency. Within the high self-efficacy group, students with different frequency scores did not differ in stress ratings, but coping ratings $(t(44) = 2.67, p < . 05)$ were significantly higher for those with low frequencies. Embedded in this 3-way interaction was a significant 2-way interaction between measure and self-efficacy, indicating higher coping scores for the high self-efficacy group compared to those with low self-efficacy, but similar stress scores between the two groups.

Secondary Analyses

The results of the primary analyses suggested unpredicted differences between variables in the academic and social domains. To further illuminate these contrasts, a 2 (domain: academic, social) x 2 (measure: stress, coping) repeated measures ANOVA was conducted, with both domain and measure as within-subjects factors. This test revealed a significant main effect for domain, indicating that the academic and social variables yielded different ratings, $F(1, 98) = 359.81, p < .001$. There was a significant interaction between domain and measure, $F(1, 98) = 208.83, p < .001$. Figure 1 indicates that average academic stress exceeded average academic coping, but average social coping exceeded average social stress.

Discussion

This study investigated the relations between perceived self-efficacy, stress and coping appraisals, and prior experiences with stressful situations in

Figure 3. *Mean social stress and coping scores by social self-efficacy level and social situation frequency. The x-axes display levels of self-efficacy. The y-axes display mean social stress scores (left panel) and mean social coping scores (right panel). Blue lines represent low frequency groups, and green lines represent high frequency groups. Error bars reflect standard errors.*
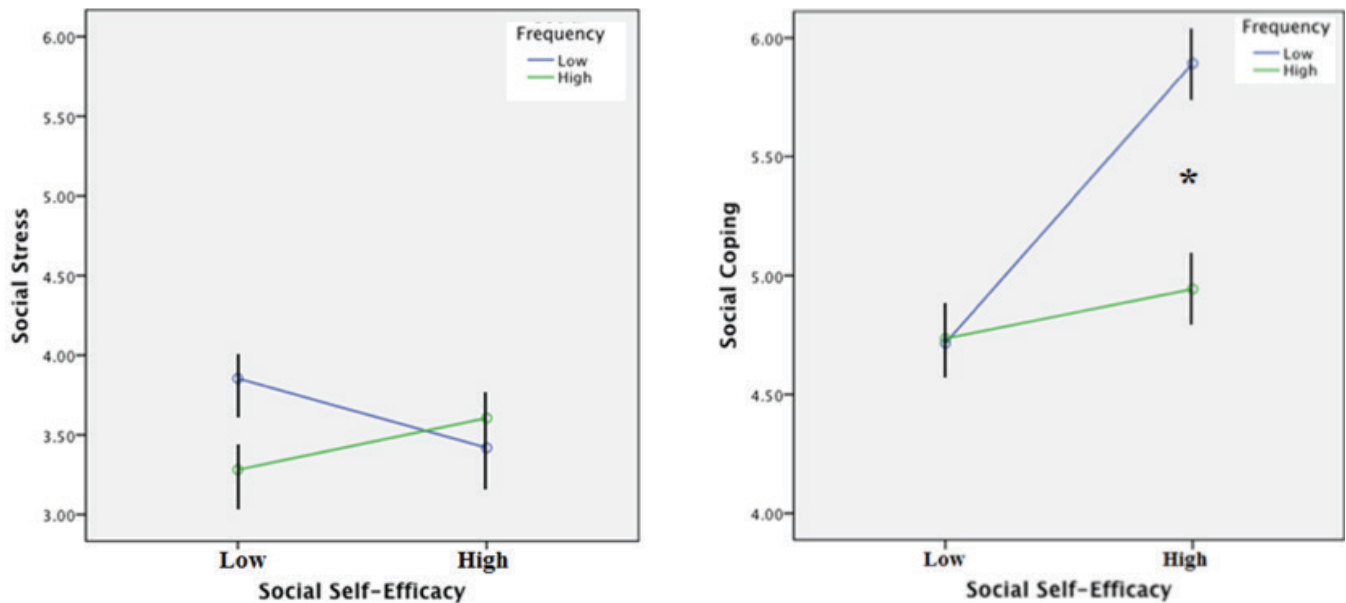
* Significant within-group comparison, p < .05.

both the academic and social domains in a single sample of college students. The results revealed very different patterns in each area. Participants who reported low academic self-efficacy had higher average stress ratings than coping expectations in academic situations. This trend supports the first hypothesis that students with low self-efficacy beliefs would exhibit higher stress than coping scores regardless of levels of prior situation frequency. The result is consistent with Chemers et al.'s (2001) finding that highly efficacious students tend to perceive academic stressors as challenges rather than threats, with their expected coping ability outweighing perceived stress. Furthermore, Table 3 displays a significant negative correlation between academic self-efficacy and academic stress, but a significant positive correlation between the former and academic coping. Thus, low levels of perceived self-efficacy should predict both high levels of stress and low coping expectancies in academic situations. These results are consistent with Zajacova et al.'s (2005) finding that there is a negative relationship between self-efficacy and stress, as well as with the aforementioned work of Chemers et al. (2001). In summary, our first set of findings lend support to the complex links between self-efficacy perceptions, coping expectations, and levels of stress.

Chemers et al. (2001) found evidence supporting a model in which students' perceived self-efficacy had a direct effect on their appraisals of academic stressors as challenges or threats, which directly influenced their levels of stress. According to this account, self-efficacy has only an indirect effect on stress, mediated by its direct effect on situation appraisal. Zajacova et al. (2005) argue that perceived self-efficacy and stress together influence performance in the academic domain, which can potentially create a feedback loop in which performance outcomes alter or strengthen perceived self-efficacy or stress levels. Our study cannot decipher the relative viability of either of these explanations, but our results nonetheless support the notion of an important relationship

between perceptions of academic ability, coping, and stress in the lives of college students.

Our first analysis also revealed an interesting contrast between groups of students reporting different levels of efficacy beliefs in the academic domain. Students with high self-efficacy perceived lower levels of stress in the demanding academic situations and reported higher coping expectancies than their low self-efficacy counterparts. These differences illuminate the previous finding that self-efficacy predicts domain-specific performance (Multon et al., 1991). The significant positive correlation between academic self-efficacy and academic coping ratings (Table 3) indicates that efficacy beliefs might facilitate effective coping strategies and the subsequent academic performance of these students. Alternatively, behavioral outcomes may drive both perceived self-efficacy and coping expectations.

Our analyses of measures within the social domain illustrated a very different set of findings. Students reporting high social self-efficacy had higher coping expectancies than did those reporting low self-efficacy (Figure 3, right panel), but the two groups did not differ in perceived stress (Figure 3, left panel). A comparison of the two panels of Figure 3 indicates that students reporting high social self-efficacy but low situation frequency had higher coping than stress scores. This difference speaks to our alternative a priori prediction that students with high perceived self-efficacy but few encounters with stressful situations would report exaggerated coping expectancies that exceed their ratings of perceived stress. Perhaps students with prior experience with the social stressors examined in this study developed specific strategies for coping with them, which would explain the difference in coping scores among students with different frequency ratings. One might consider perceived self-efficacy to be a broader concept than coping strategies, since the latter are specific reactions to particular stressors whereas the former encompasses one's ability to perform effectively within the context of a given domain. This

interpretation might help explain our finding that students differing in social coping and frequency scores could nonetheless exhibit similarly high levels of perceived self-efficacy.

The finding that students with different levels of perceived self-efficacy did not differ in stress ratings contrasts with previous research indicating a consistent, negative correlation between the efficacy beliefs and perceived stress in a given domain (Zajacova et al., 2005). It is possible that this discrepancy occurred because the social situations described in this study may not have been truly "stressful" in nature. Low average frequency ratings (Table 1) indicate that students did not commonly encounter these situations and, therefore, could have had trouble concretely relating to them. Thus, the nature of the social scenarios presented in this study may have obscured any existing relationship between self-efficacy and perceived stress. A similar interpretation extends to the finding that participants with low social self-efficacy but different frequency ratings did not differ from one another in measures of either stress or coping. This trend is consistent with our first hypothesis, but it is possible that such is the case because of the nature of the items included in this study rather than a systematic effect.

The present study addresses a gap in the literature regarding the relation of experienced situation frequency to perceived self-efficacy and situational appraisals. Students reporting high social self-efficacy did not differ by frequency levels in perceived social stress, but those with lower frequency scores did have higher coping expectancies than those with high frequency scores. These results are inconsistent with the prediction that accumulated experience facilitates greater coping ability and provides a basis for accurately high self-efficacy. There are several possible explanations for this unexpected finding. The absence of frequency effects on perceived stress may reflect the fact that most students produced low frequency ratings overall, implying that they had little experience managing feelings of pressure in these scenarios.

For those students with relatively higher frequency ratings within this low distribution, there was an unexpected relationship between experience and perceived coping ability, with lower frequency ratings predicting higher coping scores. These results suggest that students who reported greater experience with the hypothetical situations presented in the survey found them somewhat difficult to cope with. Students who seldom, if ever, encountered the situations, however, did not have experience on which to base their expected coping ratings. Thus, this group may have overestimated their actual ability to cope with these situations. This interpretation speaks to Bandura's caution about the questionable validity of hypothetical scenarios in measurement scales (Bandura, 2006), since respondents have to estimate how they might feel in scenarios they have never encountered.

The results of our primary analyses uncovered an unexpected juxtaposition between the effects of academic and social self-efficacy. We thus conducted a secondary investigation, revealing that students tended to experience levels of stress that exceeded their expected coping abilities in academic situations, whereas the opposite was true in social situations. In the view of Chemers et al. (2001), these results imply that students tended to appraise academic situations as threats but social ones as challenges. It is possible that differences in the academic and social realms of the Brown University environment contributed to this stark contrast. This Ivy League institution is known for its rigorous coursework and its diverse student body. Thus, Brown students may tend to feel less insecure or intimidated socially but are often overwhelmed by academic pressures. Indeed, students accepted to Brown are generally those who were academically successful in high school, but the courses they encounter at this university are often more advanced, more work-intensive, and require more independent time-management than the courses they excelled in during high school. This transition requires adjustment even for top high school students. Furthermore, one's performance

in college academics is indicative of one's prospects as a graduate school applicant or a job candidate. These long-term implications seem to outweigh those of social competence in situations such as joining student clubs or getting along with college roommates, thus leading to greater pressure and stress with respect to academics. These concerns about the future indeed apply to students at most colleges and universities, so one might argue that students at institutions with less-rigorous course loads might also be more likely to appraise academic stressors as threats rather than challenges. However, at schools with less diverse student bodies and a greater prevalence of often-exclusive organizations such as Greek life, student are likely to experience greater pressure to "fit in" with particular social crowds than at Brown and other universities with similarly liberal social cultures. Although for many students this might still pale in comparison to the pressure of achieving academic, and ultimately career, success, others might greatly internalize this social stress and perceive it as quite threatening. Thus, while most college students are likely to perceive academic stressors as more threatening than challenging, appraisal of social situations may vary as a function of a school's extracurricular atmosphere and culture.

An alternative explanation for domain-dependent results is that the hypothetical social situations presented in the survey may have been generally less stressful than the academic scenarios posed. The academic situations used in this study may have been so inherently stress-inducing that individuals expected difficulties in coping with them regardless of any amount of previous exposure. Still, the distinct results regarding the function of psychological variables within the academic and social realms reiterates the domain-specificity of perceived self-efficacy and suggests that this property extends to the appraisal of different types of stressful situations in both areas of life.

Several limitations may have influenced the results of this study. Average frequency ratings for both academic and social situations displayed floor effects, especially in relation to average self-efficacy scores, which fell above the middle of 7-point scale (i.e. closer to "always or almost always" than "never or almost never"). Furthermore, the scales employed each contained few questions, to keep the survey a reasonable length. This limitation may have contributed to the modest internal consistencies of the stress rating scales. Whereas items measuring self-efficacy were compiled from previous work, these appraisal scales were created for the purposes of this project, which questions their psychometric properties. Also in the interest of manageable survey length, participants were asked to consecutively assess the levels of stress and coping expectancies they associated with each situation, creating the possibility of a reporting bias.

This study sought to shed further light on previous research by assessing the relationships among perceived self-efficacy and its situational correlates in two of the most pervasive aspects of college life. We investigated the role of the frequency with which students previously encountered stressful academic and social situations. This variable exhibited complicated implications for perceived self-efficacy and the appraisal of stressors. Its impact, as well as the relationship between perceived stress and coping abilities, differed greatly by domain. These contrasting results not only underscore the notion of domain-specificity in efficacy expectations, but also suggest that improving one's confidence in academic or social situations likely involves very different approaches. Future research should further investigate these relationships and their implications for actual behavioral outcomes. Given the limited personal relatability of hypothetical situations, it would be telling to ask participants to submit lists of difficult situations they have actually encountered and to assess their stress and coping expectancies with respect to these real-life scenarios. Furthermore, it is important to investigate the role of real-time, state-level feelings of stress on perceptions of personal

ability. Some studies have assessed the affective states and stress levels of students before taking an exam (Skinner & Brewer, 2002). Since state-level stress responses directly influence behavioral outcomes, additional research should use this approach to assess the relation of these variables to perceived ability in other real-life academic as well as social settings. Investigations focusing on links between one's appraisal of or reaction to common stressors and the success of their resulting behavior may aid in discovering points of clinical intervention for individuals with anxiety and other forms of compromised functioning. Perceived competency, stress levels, and coping strategies have important implications for students' effective adjustment to the academic and social realms of college life. The field is in need of research efforts aimed at better understanding the relationship between these variables and translating this knowledge into behavioral interventions.

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Appendix: Measurement Scales

Academic Self-Efficacy Scale

Please rate how certain you are that you can do the things described below by selecting the appropriate number on a scale from 1 to 7.

1	2	3	4	5	6	7
Highly Certain Cannot Do			Moderately Certain Can Do			Highly Certain Can Do

1. Finish my homework assignments by deadlines.
2. Manage time effectively.
3. Participate in class discussions.
4. Do well on my exams.
5. Keep up to date and plan my schoolwork.
6. Take multiple tests in the same week.
7. Get the grades I want.
8. Do well in my toughest class.
9. Understand most ideas presented in class.
10. Relate course content to material in other courses.

Social Self-Efficacy Scale

Please rate how certain you are that you can do the things described below by selecting the appropriate number on a scale from 1 to 7.

1	2	3	4	5	6	7
Highly Certain Cannot Do			Moderately Certain Can Do			Highly Certain Can Do

1. Start a conversation with someone I don't know very well.
2. Ask a group of people, who are planning to go to a movie, if I can join them.
3. Keep up my side of the conversation.
4. Join a lunch or dinner table where people are already sitting and talking.
5. Make friends in a group where everyone else knows each other.
6. Ask a potential friend out for coffee.
7. Carry on a group conversation with peers.
8. Make close friends at college.
9. Join a student organization.
10. Get along with others I live with.

Situation Frequency

Please think of yourself as you have been in general since starting college. Now rate how often you have encountered situations described below during that time. In some cases you may not have encountered the situation exactly as described, but did encounter a situation that was very similar to it. You can include these "similar" situations as you make your ratings.

1	2	3	4	5	6	7
Highly Certain Cannot Do			Moderately Certain Can Do			Highly Certain Can Do

Academic Situations

1. You have to give a presentation to your entire department, and your classmates will be critiquing or discussing your work.

2. You have to take a final exam, which accounts for at least 50% of your grade, in a class that is required for concentration credit.

3. It is the night before an exam, which you realize will cover several chapters that you had forgotten about.

4. In a class required for your concentration, your professor changed the deadline for a paper to today, but you forgot and have not started it.

5. You are completing a semester of independent research but you lost a large amount of data. If you fail this independent research course then you cannot fulfill your concentration requirements

6. You are working on a project, and you are having difficulty completing it. There is no way you will be able to meet with a TA or professor before the deadline.

Social Situations

1. Your close friends exclude you from their housing plans for the next academic year, and you have no one to live with.

2. You are excited about joining a particular club, but realize that you don't know any of its existing members, who all seem like close friends.

3. You invite a group of friends to a party, but no one shows up.

4. You find out people have been talking about you behind your back and you have already made plans with them for the weekend.

5. You join a table of new acquaintances at the dining hall and they completely exclude you from the conversation.

6. You ask that your roommates to respect certain parts of your living area as your own personal space, but they continue to violate it.

Stress and Coping

Please think of yourself as you have been in general since starting college as you consider the following situations.

Please rate how stressed you would feel in each of the following situations.
 1 2 3 4 5 6 7
 Not Much A Very
 At All Great Deal

Additionally, please rate your ability to cope with the situations described below.
 1 2 3 4 5 6 7
 Not Very Very
 Capable Capable

Each of the following items was presented with each of the two rating scales and prompts above, so that participants made two consecutive responses to each item.

Academic Situations

1. You have to give a presentation to your entire department,

and your classmates will be critiquing or discussing your work.

 2. You have to take final exam, which accounts for at least 50% of your grade, in a class that is required for concentration credit.

3. It is the night before an exam, which you realize will cover several chapters that you had forgotten about.

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Social Situations

1. Your close friends exclude you from their housing plans for the next academic year, and you have no one to live with.

2. You are excited about joining a particular club, but realize that you don't know any of its existing members, who all seem like close friends.

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6. You ask that your roommates respect certain parts of your living area as your own personal space, but they continue to violate it.

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The Association between ADHD and Creativity

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Are children and adults with ADHD more creative? This review will discuss the relationship between creativity and Attention Deficit Hyperactivity Disorder (ADHD) and will investigate related biological models and behavioral experiments. By examining research that studied ADHD children, ADHD adults, high-creativity individuals and control subjects, this review will present discrepant research regarding the relationship between ADHD and creativity. Spontaneous Eye Blink Rate (EBR) has been found to be a valid measure for creativity and dopamine. Children with ADHD not on medication display lower dopamine levels and EBR when performing goal-directed tasks. Interestingly, other researchers have observed that children and adults with ADHD symptoms are more likely to score higher in divergent thinking tasks and lower in convergent thinking tasks than controls. A possible explanation is that the dopamine levels mediate ADHD symptoms, and also, lead to different performances in convergent thinking tasks and divergent thinking tasks. Hopefully further research can help attain accurate diagnoses for children with high creativity and improve treatments for people with ADHD.

A re individuals with ADHD symptoms more or less creative than normal controls? A clearer relation between creativity and ADHD cannot only increase the validity of ADHD diagnosis and treatment, but also provide policy implications for education programs. Independently, Attention Deficit Hyperactivity Disorder (ADHD) and creativity have been heavily studied, both empirically and theoretically in the past few decades. However, the relation between creativity and ADHD has been less investigated and presents clinical psychology with increasingly controversial and limited literatures. The purpose of this study is to explore the theoretical models on the potential relationships between ADHD and creativity at different levels (i.e. cognitive function,

genetic prevalence, neurochemical). The major hypothesis: individuals with ADHD perform better in divergent thinking tasks but worse in convergent thinking tasks than normal controls. Although there are no current studies with random assignment directly investigating the relationship between ADHD and creativity, the related theoretical models and laboratory findings can provide important implications for future research.

Definitions
I. ADHD

According to the newest Diagnostic and Statistical Manual of Mental Disorders (DSM-V; American Psychiatric Association, 2013), characteristics of ADHD include impulsivity,

hyperactivity or inattentiveness. Up to 12% of children in the United States receive a diagnosis of ADHD (Hinojosa et al., 2012). Children with ADHD usually experience peer rejection, academic underachievement, markedly worse parent-child interactions, decreased self-esteem and lowered independence. ADHD is also persistent throughout adolescence and adulthood; the negative psychosocial factors from childhood continue to affect them in adolescence and adulthood. These factors include decision making, occupational, interpersonal, and behavioral problems (Hinojosa et al., 2012; Miller et al., 2013). According to Faraone and Biederman (2005), 2.9% of adults in the United States received diagnoses for Narrow ADHD and 16.4% received diagnoses for Broad ADHD.

II. Creativity

Creativity is usually marked by novelty and appropriateness (Abraham et al., 2011; Sternberg, 2005; Runco, 2004). More specifically, novelty is measured by how a response is different from the average. Appropriateness indicates how well the response can be accepted and suitable to social norms or requirements. At an individual level, creativity is associated with novel ideas, innovative approaches, and academic and career achievement. At a societal level, creativity is essential for technology, arts and literature. However, creativity is relatively subjective and abstract, so it is hard to find a universal method of operationalizing it, especially in clinical contexts.

Due to the social recognition and benefits of creativity, "creative achievement" has been recognized as one of the most popular and valid measures (Johnson et al., 2012). Nonetheless, it is still very difficult for researchers to study children participants, as it is hard to define and/or predict creative achievements in longitudinal studies. Individuals usually need persistency, experiences, knowledge and opportunities to attain creative achievement, which requires a large time frame not usually accessible in childhood (Johnson et al. 2012). Thus, most empirical investigations are

focused on creative "potential" instead of creative "achievement" for child and adolescent research (White & Shah, 2007). Researchers have different ways of measuring creativity, of which common measures in the past decades include creative thinking, performance, ability, cognition, behavior, and imagination. Despite overlap, these creative constructs are not synonyms. In this paper, we measure creativity through divergent thinking tasks and convergent tasks in laboratory settings.

III. Divergent thinking and convergent thinking

Creative divergent thinking is a bottom-up process in which solutions are not restricted by one correct answer. Researchers measure the frequency, flexibility, and originality in divergent thinking responses. The most commonly used task is the alternative use task (AUT; Guilford, 1967), in which participants are required to list as many possible uses as they can for a common object, such as a brick. In contrast, convergent thinking is a top-down process requiring constant attention to finding one single right answer. Researchers measure creative pathways in this goal-directed task. The most commonly used convergent thinking task is the Remote Association Task (RAT; Mednick, 1962), in which participants are required to present a single word to associate all three of the presented words (e.g. cottage, blue, mouse).

Experimental Evidence

Only a few current empirical literatures explore the relation between ADHD and creativity, and a clear relationship cannot be found if we do not distinguish between divergent thinking and convergent thinking. In a study by Healey and Rucklige (2006), researchers investigated the relationship between ADHD and creativity. They measured ADHD symptomatology of children with parent and teacher reports of Conners' Rating Scales Revised long version (CPRS-R; Conners, 1997). Formal diagnosis of ADHD was not required to be included in the ADHD group in the study. The ADHD group included children who received

T-scores of 65 or above, per parent report of CPRS-R. Healey and Rucklige (2006) measured creativity using the Torrance Tests of Creative Thinking (TTCT; Torrance, 1998), which is usually regarded as a measure of divergent thinking. Children receiving scores above the 90th percentile were included in the creative groups. The authors found that 40% of recruited creative children displayed ADHD symptoms. Although this 40% of the sample can possibly suggest a connection between ADHD and creativity, it is unclear whether children with ADHD were more creative or that creative children were more likely to be diagnosed with ADHD. The underlying mechanisms have been investigated in divergent research lines within the past few decades.

White and Shah (2006) seem to find a solution for this puzzle, suggesting that there appears to be a positive correlation between ADHD and creativity in divergent tasks, but a negative correlation in convergent tasks. With a sample of 90 undergraduate students, they find that adults with past ADHD diagnoses outperform in AUT but underperform in RAT tasks compared to non-diagnosed. However, we should always be aware of the objectivity of methods in the behavioral experiments of creativity research. Due to the blurring definition and constructs of creativity, AUT and RAT may not be the greatest measurements of creativity despite their popularity. The following sections will investigate the potential mechanisms underlying this correlation.

Neuroscientific Model

Several researchers have provided genetic explanations of the relationship between ADHD and creativity (Dietrich, A., 2004; Dietrich & Kanso, 2010; DiMaio, Grizenko, & Joober, 2003; Ding et al., 2002; Stelzel et al., 2009). Certain genes are defined as possible etiological factors for the development of ADHD symptoms. The Dopamine D4 Receptor (DRD4) is important for synaptic dopamine signaling (Mayseless et a., 2014), which is present in the general population. DRD4-7R allele can be a potential mediator to explain the mentioned relationship between ADHD and creativity. DRD4-7R allele is found to be associated with deficits in sustained attention, impulsivity/hyperactivity, and novelty seeking.

In a study conducted by Auerbach and his collaborators (2001), infants with DRD4-7R had lower sustained attention(De Dreu et al., 2011). Individuals with DRD4-7R displayed attention problems rather than inhibitory control (Albrecht et al., 2014). As earlier mentioned, this lack of sustained attention in infancy may be persistent into adolescence and adulthood. This finding about inconsistent attention is in coherence with our theoretical analysis in the working memory cerebellum model. As earlier mentioned, sustained attention is crucial for convergent thinking tasks. Therefore, it is possible that children with inattentive problems perform worse in convergent thinking tasks. Meanwhile, their lack of attention may also lead to "thinking outside the box", which is essential for divergent thinking tasks. Considering the relationship between DRD4 and creativity, we would expect individuals with ADHD to be more creative in divergent tasks. However, Albrecht's team (2001) also found that infants with DRD4-7R scored lower on novelty-seeking (a facet of creativity). Although deficits in sustained attention are different from ADHD diagnosis, Albrecht's finding can provide potential empirical evidence for the relationship between ADHD and creativity.

Additional empirical evidence may provide explanation on the inconsistent findings of this research line regarding the association between ADHD and creativity in divergent tasks. In a sample of 184 healthy participants, with a statistical control for both age and education, individuals with DRD4-7R scored lower in the fluency domain and had lower cognitive flexibility in AUT, compared to people without DRD4-7R (Mayseless et al., 2013). Mayselseless' team (2013) explained their finding by pointing out that DRD4-7R allele is associated with impulsivity and hyperactivity; therefore, they reasoned, participants with the 7R allele were less capable of suppressing those common, less

creative ideas. Based on their findings regarding the relationship between impulsivity and creativity, they also suggest that ADHD is likely to be associated with lower creativity.

However, it is questionable whether their deduction about ADHD can be generalized into real-world situations. Most children with ADHD are medicated for relieving symptoms. Therefore, it is uncertain whether children with ADHD are more or less creative when their hyperactive/impulsive symptoms are relieved by medication. Also, the children carrying the DRD4-7R allele may need higher doses of methylphenidate to relieve their symptoms (Hamarman et al., 2004) and this may be a moderator of their cognitive flexibility, which can explain their underperformance of flexibility dimension in AUT. Although higher doses are different from the substance dependence of methamphetamine, findings on substance dependence of methamphetamine (excessive amount of methamphetamine) can possibly link the the dosing of stimulants and creativity. Researchers report poorer performance of cognitive flexibility tasks within substance dependent patients using methamphetamine (Verdejo-García, Bechara, A., Recknor, & Pérez-García, 2006). At the same time, we have to be aware of the fact that the stated genotypes can only provide possible explanations on group tendencies, indicating vulnerability of the ADHD subgroups. Correlation is very different from causation. The genes cannot be identified as a causal factor for diagnosis on individual levels.

One alternative explanation is that there are three different forms of ADHD. According to the Fifth Edition of the Diagnostic and Statistical Manual of Mental Disorders (DSM–5; American Psychiatric Association, 2013), ADHD is categorized into three subtypes: ADHD Predominantly Inattentive Type, ADHD Predominantly Hyperactive-Impulsive Type, and ADHD Combined Type. These three forms of ADHD are very different in terms of etiology, symptomatology, and impairment between the three forms of ADHD. It is possible that inattentive

symptoms and hyperactive/impulsive symptoms play different roles in children's performance of divergent and convergent tasks.

From a microscopic angle, theories on dopamine levels seem to integrate well with working memory to provide an underlying mechanism for our major hypothesis. Many researchers have found that genetic factors play an important role in connecting dopamine activities to the topic of creativity and ADHD. DAT1, DRD2, DRD4, and COMT, are involved in dopaminergic activities (DA) such as binding on dopamine receptors, inhibiting dopamine receptor uptake and increasing dopamine synthesis (Auerbach et al., 2011; DiMaio, Grizenko, & Joober, 2003; Kutanvich et al., 2004). These mentioned dopamine activities have been found within individuals who scored higher on divergent thinking tasks and have ADHD symptoms. Therefore, they have also been identified as possible gene candidates to explain the heritability of ADHD and creativity (Auerbach et al., 2011; Kutanovich et al., 2004).

Besides genetic investigations, this theoretical hypothesis has also been supported in laboratory settings. Eye Blink Rate (EBR) measures how many times a person blinks their eyes spontaneously per minute. EBR has been identified as an indirect, but valid, clinical mark for irregular dopamine levels in the brain with good reliability (Shukla, 1985). More specifically, increased dopaminergic activities in the brain can make an individual spontaneously blink their eyes more. In a study with 18 young healthy adults, Colzato, Wouwe and Hommel (2007) discovered a positive correlation ($r=0.14$) between EBR and how relevant the responses are. In other words, the finding is correspondent to support that EBR is associated with the efficiency of the forward dynamics process in the working memory cerebellum model. EBR is thus indirectly measuring dopamine levels.

The dopamine levels are found to be associated with individuals' performance in divergent thinking tasks and convergent thinking tasks. Chermahini and Hommel (2010) found a

negative correlation (r=-0.2) between EBR and creative performance in convergent thinking tasks with a sample of thirty-five college students. This not only provides laboratory data on the association between creativity and dopamine levels, but also more importantly, stimulates valid inquiry about the major hypothesis that people with ADHD symptoms may outperform in creativity tasks in convergent thinking scenarios (RAT). Because dopamine deletion is one of the potential causal factors of deficits in working memory (Ellis et al., 2005) and people with ADHD usually have lower dopamine levels than normal average people, it would be reasonable to assume that people with ADHD have lower EBR (Konrad et al., 2003) and then higher creative performance in convergent thinking tasks based on the negative correlation shown (Konrad et al., 2003). On the other hand, the empirical evidence, at the neurotransmitter level, for creative performance of healthy college students in divergent thinking tasks presents more disagreement on the topic. Chermahini and Hommel (2010) find a quadratic relationship (U-shape) between EBR and creative performance in divergent thinking tasks within a sample of 117 college students without clinical screening. Creative performance in the divergent thinking tasks peak at average dopamine. Two years later, the same study was reproduced and the same U-shape graph was obtained with 81 students without clinical screening in the same university (Chermanhini and Hommel, 2012). The U-shape graph is included at the end of this paper (see Appendix). More explicitly, creative performance in AUT tasks increase as EBR increases, but, when EBR is greater than 25 times per minute, creative performance is negatively related to EBR. The first half of the result (before 25 times per minute) contradicts within the initial hypothesis. According to the initial hypothesis, the creative performance in AUT should have kept increasing as EBR increases in the divergent thinking tasks. It is questionable whether their finding can be generalized to child samples, in either medicated or unmedicated scenarios.

Additionally, the empirical finding that creative performance in the divergent thinking tasks peak at average dopamine levels is an inconsistent with the previously mentioned major hypothesis, which states that Children with ADHD performed better in divergent thinking tasks of creativity. Chermanhini and Hommel (2010) did not find strong support for the correlation of creativity and EBR; this presents us with conflicts of current research, meaning there is a need for future research with more sophisticated design and larger sample size.

Although children with ADHD have been found to have an inefficient dopaminergic system due to deficits in functioning dopamine receptors (Auerbach et al., 2011), there is no universal agreement on how to quantify dopamine neurotransmitter levels within children with ADHD diagnosis or symptoms. Non-medicated children with ADHD were reported to have lower levels of dopamine. Despite the side effects and trepidation of using stimulants, medication has proved to be the most efficient and prevalent treatment for ADHD so far. Children with ADHD on medication (stimulants) have a boosted dopamine level, which is higher than normal controls. Considering that dopamine levels are related to ADHD symptoms, medication use, and creativity, it is possible that medicated children with ADHD may perform differently than non-medicated children with ADHD. Children with ADHD not on medication have significantly lower EBR than normal control during cognitive functioning tasks (Caplan, Guthrie & Komo, 1996). This corresponds to the negative correlation between EBR and convergent thinking (Chermahini & Hommel, 2010) in adult controls. Despite the mentioned effects of stimulants, the children still have working memory deficits and lack of sustained attention compared to their normal control group due to earlier dopamine depletion before being medicated. Therefore, children with ADHD are not able to perform appropriately in goal-directed tasks and are more likely to score lower in convergent thinking tasks.

Discussion

Based on our literature review, our major hypothesis is that creative thinking of individuals with ADHD may depend on task type. More specifically, children with ADHD may perform better in divergent thinking tasks but worse in convergent thinking tasks. This can be partially validated by most of the theoretical models regarding working memory, genetic prevalence, and dopamine levels. However, a small part of the current research findings contradict our major hypothesis, such as the U-shape relationship presented by Chermahini and Hommel (2010). Although their findings display that ADHD symptoms are associated with lower creative performance in convergent thinking tasks, it is questionable whether EBR, normally measured non-ADHD adults, is applicable in children with ADHD. In order to test the main hypothesis in a more direct and valid way, we need to do random assignment with a control group and an experimental group to examine the relationship between EBR and creative performance in convergent thinking tasks and divergent thinking tasks. Besides the disagreement in the field, there are few empirical and review articles on ADHD and EBR. It is questionable whether people with ADHD show the same EBR pattern presented in the college-student sample in Iran (Chermahini and Hommel, 2010; 2012) and whether the same structures follow through from childhood to adulthood. Also, ADHD is categorized into three subtypes: Impulsive, Inattentive, and Combined, and It is not clear whether the three subtypes share the same pattern in terms of creativity. This is an important focus in this line of research, since the large variance of ADHD symptoms and characteristics across different subgroups might lead to differences in creativity in divergent and convergent thinking tasks.

Exploring underlying mechanisms of interaction between ADHD and creativity is particularly important for the following two reasons. First, more consistent and valid research evidence on the correlation between ADHD and creativity can help reduce the stigma against ADHD. Second, the underlying mechanisms of the existing association can provide valuable educational systems on managing ADHD students. The gene-environment interaction model presents that children with an ADHD predisposition can have social and academic impairments in both home and school environments. In other words, externalizing behaviors of ADHD children might be associated with increasingly negative parent-child interactions, thus exacerbating the child's symptoms (Hinojosa et al., 2012; McCabe et al., 2003; Miller, Nigg & Miller, 2009). Reducing stigma can help break this cycle. A clearer and more accurate understanding of the genes in a multiracial/multiethnic environment will also reduce stigma and prejudice in increasingly diverse classroom settings.

Second, a more convergent research line on the relationship between ADHD and creativity can help improve diagnostic efficiency and treatment outcomes. Misdiagnosing creative behaviors as ADHD symptoms can have persistent influences on children across their lifespan (Cramond, 1994; Golsh, 2000). Stimulants combined with behavioral therapy have been the most efficient and popular treatment for children diagnosed with ADHD (Faraone et al., Short, 2002). Misdiagnosing and prescribing stimulants to those who do not have ADHD might have persistent negative impacts on a child's life overall. On the other hand, children's ADHD symptomatology might be hidden by their creativity and therefore they do not receive diagnosis and treatment (Fugate et al, 2013; Leroux and levitt Perman, 2000). This situation of false negatives might lead to severe impairments in both home and school environments for individuals with a misdiagnosis (Fugate et al., 2013).

Most researchers investigating the correlation between EBR and creative performance in convergent thinking tasks and divergent tasks, conducted the experiment in university laboratories with college students rather than clinical setting with children with attention problems. It would be incorrect to assume that there is the same linear

relationship among all aging groups, considering no scientific research has shown a similar pattern within children and adolescent samples. Due to this uncertainty about EBR and dopamine activities in children with ADHD, it is possible that EBR prediction of creation show different patterns compared to normative college students. The conflicting research findings presented in current studies question the underlying mechanisms of the relationship between ADHD and creativity. Further investigations with more sophisticated research designs and large sample sizes are needed. Exploration in this line of research will provide valuable implementations on classroom management and education policy for children with ADHD and creative children.

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Appendix

Graph 1. *This graph displays the U-shaping relationship between creativity and spontaneous eye blink rate (Chermanhini and Hommel, 2012).*
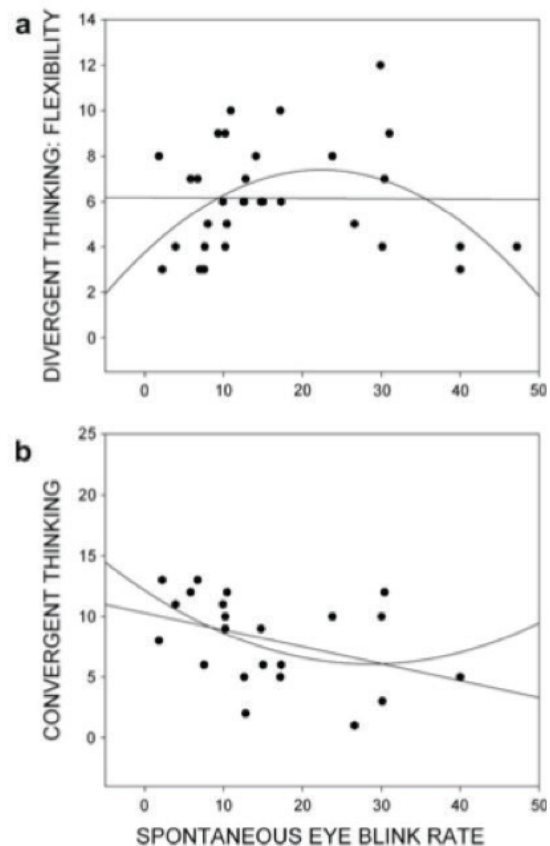
Fig. 2. Performance in (a) the divergent-thinking task (flexibility score) and (b) the convergent-thinking task in Experiment 2 as a function of spontaneous eye blink rate (EBR) per min. Regression lines for linear and quadratic fits are also given.

Alternative Therapies for Mood Enhancement: Is Laughter Truly the Best Medicine?

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Although research investigating the use of complementary and alternative medicine (CAM) is currently minimal, there is evidence that both Laughter Yoga and Mindfulness Meditation are effective in raising mood. However - there are significant gaps in existing research. Firstly, the two treatments have never been directly compared. Additionally, previous studies have not used a control group. With that in mind, this study was created to evaluate differences in the effectiveness of Laughter Yoga and Mindfulness Meditation on elevating mood after viewing a sad video. We hypothesized that individuals in the Laughter Yoga group would display an increased mood following the intervention when compared to the Mindfulness Meditation and control groups. An Analysis of Covariance (ANCOVA) elucidated that the specific intervention group (either Laughter Yoga or Mindfulness Meditation) was significantly impactful on happiness levels, even after controlling for baseline happiness. As hypothesized, post-hoc tests revealed that the Laughter Yoga intervention resulted in more dramatically elevated happiness when compared to both the Mindfulness Meditation and control groups. Results showed Laughter Yoga to be a promising and fast-acting form of therapy for mood enhancement, when compared to Mindfulness Meditation or no intervention.

The use of complementary and alternative medicine (CAM) has increased notably in the western world as clinicians and clients alike seek more integrative treatment methods. CAM addresses both mental and physical illnesses, with exercise and mindfulness-based interventions comprising the most widespread approach (MBIs) (Edenfield & Saeed, 2012). Origins of these practices date back centuries to Buddhist and Hindu cultures throughout Southeast Asia. We are interested in the use of these techniques and their effectiveness in enhancing mood, and will specifically focus on Laughter Therapy and Mindfulness Meditation. Alternatives to using cognitive, behavioral, or medical techniques in therapy are of current interest, as they are easier to implement and more economical in regions with low resources. Accordingly, we will first define Laughter Therapy and Mindfulness Meditation and review the current studies available. Next, we will describe the limitations of past studies and introduce our current study on Laughter Yoga and Mindfulness Meditation.

Humor and laughter, experiences generally associated with joy and positivity, are shared by all of Earth's inhabitants. The common statement "laughter is the best medicine" expresses the perceived powers of humor in enhancing mood, yet laughter is not typically implemented in formal treatment (Jacobs, 2009). Current interest in this area has sparked research on the preliminary benefits of laughter and humor on health. Kaspar, Baldwin, Johnson, Edling and Sethi (2012) evaluated the clinical utility of Laughter Yoga

in improving psychological and physiological measures in outpatients awaiting organ transplants. These patients already had their heart rate, heart rate variability, and blood pressure closely monitored as part of the transplant process, so researchers were able to easily examine whether Laughter Yoga caused changes in heart rate variability and mood. Each patient participated in a short 20-minute Laughter Yoga exercise which integrated both breathing and stimulated laughter, twice a week, over the course of a month. Participants showed an increased heart rate variability and an improved mood immediately following the month-long Laughter Yoga intervention when compared to control scores during a no-treatment control week (Kaspar, Baldwin, Johnson, Edling, & Sethi, 2012). The study suggests that laughter elevates mood through biological mechanisms. Theories regarding the benefits of laughter and humor posit four mechanisms: physiological changes such as relaxing muscles, positive emotional states, stress moderation, and increased levels of social support (Martin, 2002). More immediate effects such as a positive change in perception are often observed due to the release of endorphins; this further solidifies the beneficial effects of Laughter Yoga on elevating mood.

While Laughter Yoga is a fairly new practice, Mindfulness Meditation (known as vipassana) has been used for centuries in Buddhist traditions to release negative emotions and simultaneously generate feelings of happiness. The goal is to center one's focus on the present situation and attend to thoughts, emotions, and perceptions as they arise without judgment. Mindfulness Meditation requires focused attention and careful examination of the body, which is achieved through practice and learning to avoid distractions. By collectively integrating each mental component into one experience, the goal is to generate awareness of current internal and external experiences with a nonjudgmental stance. Meditation is especially attractive as a treatment for physical and mental health due to its effectiveness, feasibility, and low

cost. Specifically, Mindfulness Meditation has been shown to reduce stress, improve overall health, and enhance self-compassion (Giscombé & Gaylord, 2014). Studies have also shown a reduction in anger and pain after meditation therapy, in addition to lower cortisol levels and improved immune functioning. Current proposed mechanisms by which meditation improves health include: attention regulation, body awareness, emotion regulation, and a change in perspective of the self (Hözel et al., 2006).

The benefits of Mindfulness Meditation are not only biologically evident, but also impactful on psychological levels, as seen in Ando et al. (2009), where substantial psychological benefits were found in regards to the anxiety, depression, and spiritual well-being of patients undergoing cancer treatments. The subjects participated in two sessions of Mindfulness Meditation, each of which included breathing, yoga, and self-reflection. The results showed that those who participated in Mindfulness Meditation had significantly decreased anxiety and depression scores following the intervention (Ando et al., 2009). However, the study had poor internal validity, as it failed to include a control group.

Although the reviewed studies display the efficacy of Laughter Yoga and Mindfulness Meditation as treatment mechanisms for psychological and psychosocial illnesses, no studies have compared the effectiveness of the two interventions. Therefore, our current study intended to examine and compare the effectiveness of Laughter Yoga and Mindfulness Meditation in elevating mood. The addition of a control group in our study offered baseline data to accurately determine whether our interventions acted as the causal force of exhibited mood improvement, or if differences simply resulted from the passage of time. Our incorporation of this group eradicated a significant limitation present in aforementioned studies.

We hypothesized that individuals in the two active treatment groups would experience higher post-intervention moods--more happiness

and less sadness--following their respected intervention when compared to the control condition, even after controlling for baseline mood. Furthermore, we hypothesized that Laughter Yoga would foster higher post-intervention mood than Mindfulness Meditation.

Methods

Participants

Forty-one undergraduate participants (87.8% female, n =36) were recruited from The University of North Carolina at Chapel Hill from a research methods course as part of a class project. Participants were 20.8 years old on average (SD = 1.22, age range: 19 –26 years). The majority of participants identified as White (73.2%, n =30), with the remaining identifying as Black/African American (9.8%, n = 4), Hispanic/Latino (4.9%, n = 2), Asian (7.3%, n = 3), or Other (2.4%, n = 1). The majority of participants reported not practicing yoga or meditation regularly (80.5%, n =33).

Measures and Procedure

Undergraduates were recruited from a research methodology course for a study of "Alternative Medicine Techniques on Mood Behavior." Data collection took place in a one-room group lab setting and was collected via Qualtrics, an online survey software. Participants received course credit for their participation and were debriefed upon completion of the study.

After signing consent, participants watched a 5-minute video clip from the Fresh Prince of Bel-Air intended to induce sadness. The video depicted a scene where Will, the main character, felt dejected and undervalued by his family. The Fresh Prince of Bel Air clip was chosen because it is short and relatable from the student perspective. The clip's content portrayed family relationships, and hence we assumed a college-aged subject would be able to "feel for" the well-known character.

Following the video, participants were asked to rank how much the words "sad" and "happy" related to their present feelings on a scale

from 1 to 5 (1= not at all to 5 = a great deal). Next, participants were assigned to an intervention group. Participants present on the first day were assigned to Laughter Yoga intervention (36.6%, n = 15), while participants on the second day were assigned to Mindfulness Meditation intervention (39%, n = 16). A subset of 5 participants from each day were randomly assigned to the control condition based on their participant ID (24.2%, n=10), and were instructed to follow an experimenter into the hallway before the intervention videos were shown. The Laughter Yoga and Mindfulness Meditation videos were each displayed on a projector for approximately five minutes. Participants were instructed to interact and follow all directions in the video. For example, the Laughter Yoga video instructor guided the participants through effective breathing techniques and laughter exercises that incorporated full body movement, as well as engagement with other participants throughout the laughter exercise portions. The Mindfulness Meditation video consisted of a voice directed meditation session in which participants were asked to focus on breath management and engage in insightful self-reflection.

Participants in the control condition were instructed to silently complete Sudoku puzzles; participants worked on puzzles to imply a purposeful task during this time. The Sudoku activity was chosen because previously examined studies utilized a puzzle as the control condition activity. Sudoku puzzles are easily accessible, well-known, and convey neutral stimulation. A moderately easy puzzle was chosen to accommodate all experience levels. After the intervention video was complete, the control group rejoined the other participants. Finally, all participants were again asked to rate their current state of happiness and sadness.

Data Analysis

We performed a one-way Analysis of Covariance (ANCOVA) to control for pre-mood and performed post-hoc tests to analyze the effectiveness of each intervention treatment,

accounting for effects of any extraneous variables (i.e. prior mood influenced by external environment) that may have influenced the results.

Results

Chi-square test results revealed no relevant differences in gender between the three conditions (Laughter Yoga, Mindfulness Meditation, control), $\chi2(2) = .065$, p = .99. Additionally, an ANCOVA test revealed no significant group differences for age, $F(2, 38) = .20$, p = .817 suggesting that any differences following the intervention were not due to pre-existing demographic differences.

After watching the sad video, participants rated their baseline sadness (M = 3.12, SD = 1.05) as moderate, although ratings covered the entire range of the scale (range = 1-5), and rated their baseline happiness as low (M = 1.80, SD = .93), although ratings covered higher scale values (range = 1-4). On average, participants rated their post-intervention sadness (following either the Sudoku or video segment consisting of a Laughter Yoga or Mindfulness Meditation session) as low (M = 1.37, SD = .77) , although ratings covered higher scale values (range = 1-4), and rated their post-intervention happiness as moderate (M = 2.78, SD = 1.13), although ratings covered the entire range of the scale (range = 1-5).

We conducted a one-way Analysis of Covariance (ANCOVA) comparing the three intervention groups on ratings of happy mood following the intervention (i.e., "post-intervention happiness"), after controlling for the effect of happiness before the intervention began (i.e., "pre-intervention happiness"). The pre-intervention covariate was significantly related to participants' happiness following the intervention, $F(1, 37) = 4.56$, p = .04, ηp2 = .11. There was a significant intervention effect on levels of post-intervention happiness (post-IH) even after controlling for the effect of pre-intervention happiness (pre-IH), $F(2, 37) = 12.11$, p < .001, ηp2 = .40. Post-hoc tests revealed that after controlling for pre-IH, individuals who received Laughter Yoga (M = 3.67, SE = .23) rated their post-IH significantly higher than those who received

Mindfulness Meditation (M = 2.46, SE = .23; p = .002) or the control condition (M = 1.97, SE = .29; p < .001). The post-IH levels of participants who received the Mindfulness Meditation intervention (M = 2.46, SE = .23) did not differ from those who received the control condition (p = .56) after controlling for pre-IH.

Lastly, we did a one-way ANCOVA comparing the three intervention groups on ratings of sad mood following the intervention (i.e., "post-intervention sadness") after controlling for the effect of sadness before the intervention began (i.e., "pre-intervention sadness"). The covariate, pre-intervention sadness (pre-IS) was not significantly related to participants' sadness following the intervention, $F(1, 37) = .78$, p = .38, ηp2 = .02. The intervention had a significant effect on levels of sadness after controlling for the effect of pre-IS, $F(2, 37) = 4.00$, p =.027, ηp2 = .18. Post-hoc tests revealed that, after controlling for pre-IS levels, individuals who received Mindfulness Meditation (M = 1.21, SE = .18; p = .047) and Laughter Yoga (M = 1.13, SE = .20; p = .048) rated their sadness significantly lower than those who received the control condition (M = 1.96, SE = .24). The levels of sadness of participants who received the Laughter Yoga intervention did not differ from those who received Mindfulness Meditation (p = 1.00) after controlling for pre-IS.

Discussion

We hypothesized that individuals in the Laughter Yoga intervention would report the highest levels of happiness and the lowest levels of sadness followed by Mindfulness Meditation and lastly the control condition. Our results partially supported these hypotheses: we found that after controlling for mood before intervention, individuals in the control condition rated higher sadness levels when compared to Laughter Yoga and Mindfulness Meditation. However, sadness levels of individuals in the two intervention sessions did not differ from one another. As we predicted, participants in the Laughter Yoga intervention reported higher

post-IH ratings compared to the Mindfulness Meditation and control condition interventions. Contrary to our hypothesis, the two (Mindfulness Meditation and control condition) did not differ from one another in terms of increased happiness. The higher happiness levels in the Laughter Yoga group support the idea that laughter can elevate mood and reduce anxiety over a relatively short session (Jacobs, 2009). Results additionally align with current research on Mindfulness Meditation confirming extended exposure, active attention, and careful practice are necessities for positive results. This may explain why control condition participants reported comparable levels of happiness (Hözel et al., 2006).

Implementing a control condition to compare intervention conditions constitutes a prominent strength of our study. No prior study of either intervention included a control group to generate baseline data for accurate comparisons. Our study provided a direct method to compare the causal force of mood enhancement behind the two interventions, an aspect absent in previous studies. Nonetheless, it should be noted that certain limitations of the study may have influenced our results. First, participants were not randomly assigned to intervention groups; however, this was intentional to prevent the mixing of intervention sessions. We decided that due to the noise and action that Laughter Yoga entails, it would be distracting to those trying to engage in Mindfulness Meditation and hence we did not mix the intervention sessions. Because only one laboratory room was available for the duration experiment, the two intervention sessions had to be performed on separate occasions. While including a randomization process here would have improved our study, it should be noted that no stark differences were seen after measuring for gender and demographic disparities between each group. Additionally due to time constraints, we did not implement a manipulation check to determine whether or not the Fresh Prince of Bel-Air video actually induced sadness among participants. In order to avoid the possibility of a confounding factor, future studies should include a measurement of participants' mood before and after the video to ensure that it is effective. Additionally, it would be valuable to obtain a collection of "negative" videos to then randomize for each subject's viewing.

Next, our interventions were relatively brief (13 minutes) compared to previous studies which had repeated interventions over a longer period of time. Extended exposure to Mindfulness Meditation would have likely generated more noteworthy results. Despite the weakness the intervention's brevity poses, our results remained significant enough to verify the short-term effects of Laughter Yoga and Mindfulness Meditation in inducing a more positive mood. We would recommend that future researchers implement a longitudinal study in which participants partake in the interventions for at least a month. Lastly, the sudoku activity assigned to the control condition may have affected the participant's mood due to frustration, enjoyment, confusion, etc. As part of our observations, no participant conveyed any signs of distress; if a participant expressed distress, his/her data would not have been used in the analyses.
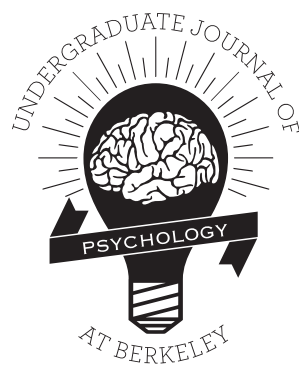
Due to the relative novelty of complementary and alternative medicine practices in the western world, we are met with a deficiency of research on dose-response relations between CAM and more popular practices. Our results underscore Laughter Yoga's simplicity and effectiveness as a causal force in mood improvement. An act already incorporated into everyday lives, laughter holds promise as a fast-acting, natural therapeutic technique. It is also fairly easy to implement, as there are many online videos where Laughter Yoga gurus (teachers) go through lessons for the viewer to follow. Further, Laughter Yoga precludes resource and medication expenses that other methods often require. Further research could compare Laughter Yoga to pharmaceuticals or psychotherapy to determine if it can be implemented as a beneficial treatment for populations who may not have access to all

healthcare resources. If future studies find similar results, Laughter Yoga could potentially become a cost-effective alternative for depression, anxiety, and chronic illnesses.

As this is a reasonably new topic and the first study to compare two different types of CAM interventions on mood enhancement, it is just the tip of the iceberg for this field. It would be interesting to see if Laughter Yoga will be equally effective in different age groups and cultures. Shahidi et al. (2011) looked at elderly patients in Tehran and our study looked at undergraduate students, but future research could investigate effects on children or middle-aged adults. It would also be interesting to compare Laughter Yoga to other forms of mood-enhancement therapy such as exercise or nutritional supplementation. Future research should address possible humor differences across individuals by using different forms of humor (e.g. jokes, games, etc.) to demonstrate the effects of laughter in clinical settings, as patient preference in intervention technique may play a role in openness to treatment. Limited openness of individuals to try new experiences such as Mindfulness Meditation or Laughter Yoga may impede results in a clinical situation. Manufacturing a comfortable environment in which to express meditation techniques or to share humor will be an important component of the success of therapy, as well as the instructor providing the intervention technique in a clear manner.

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