Journal sur l'identité, les relations interpersonnelles et les relations intergroupes
*Journal of Interpersonal Relations, Intergroup Relations and Identity*
Volume 8, Hiver/Winter 2015

# The Role of Yoga's Rituals in Psychological Well-Being

**Natalia Van Doren**
University of California, Berkeley

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.

*Keywords*: behavioral synchrony, prosocial behavior, rituals, social psychology, yoga philosophy

Il a été démontré que le yoga, une discipline ancestrale, améliore la santé physique et mentale et le bien-être. Étant constamment à la recherche d'un moyen pour neutraliser les effets psychologiques de la vie moderne et de son rythme effréné, beaucoup se tournent vers le yoga. Alors que les recherches ont identifié les changements physiologiques associés à la pratique du yoga qui mènent à une diminution du stress et à une augmentation du bien-être, les processus psychologiques qui mènent au bien-être restent méconnus. Les recherches ont associé le rituel synchronique du yoga à une augmentation des comportements pro-sociaux et ont trouvé des corrélations entre le yoga et le bien-être psychologique, mais très peu d'entre elles ont lié le rituel synchronique du yoga, les comportements pro-sociaux et le bien-être. Nous proposons un modèle théorique pour expliquer l'effet du rituel synchronique du yoga sur le bien-être psychologique, avec pour variable médiatrice les comportements pro-sociaux.

*Mots-clés* : synchronie comportementale, comportements pro-sociaux, rituels, psychologie sociale, philosophie du yoga

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 (Vishnu-Devananda, 1960). It encompasses practices that are aimed to improve body, mind and spiritual connections. It is one of the oldest systems of self-development in the world. 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.

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, Tsunaka, Tsang, Chan, & Cheung,

I would like to thank Dr. Linda Kelly, Dr. Richard Ivry, Dr. Crystal Park, and Fausto Gonzalez, M. A., for their invaluable input in bringing this manuscript together. I would also like to thank the team at JIRIRI for helping to prepare this manuscript for publication. Please address all correspondence to Natalia Van Doren (email: nataliavandoren@berkeley.edu).

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 is also associated with several biochemical effects such as influence on blood pressure, heart rate, urinary catecholamines (Granath, Ingvarsson, von Thiele, & Lundberg, 2006) and cortisol levels in healthy subjects (Rocha et al., 2012; Vera et al., 2009). 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 the homeostasis of the stress response systems (Streeter, Gerbarg, Saper, Ciraulo, & Brown, 2012). However, little attention is given 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, & Bonnemeier, 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 (2014) 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 (2014) study 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 (2014) 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. This study 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.

Although yoga has been found to have positive effects for psychological well-being, little is known about the processes that lead to well-being. Since yoga is most often practiced in a group setting and in a highly ritualized fashion, it follows that an examination of the effect of rituals and group processes on well-being is in order. Can rituals explain the psychological benefits of yoga? If so, what other variables might mediate the relationship between rituals and benefits of yoga? To formulate answers to these questions, we must first examine former research studies on rituals and behavioral synchrony to form a theoretical model that may help to explain how yoga's rituals increase psychological health.

**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 (e.g., a particular religion or church) and 3) a series of actions or a type of behavior regularly and invariably followed by someone (Simpson, Weiner, & Proffitt, 2003).

Both sociological and psychological research on rituals highlight the importance of family rituals in increasing psychological well-being (Markson & Fiese, 2000), particularly for children and adolescents, showing that families who engage in rituals have children who are more well-adjusted (Resnick et al., 1997) and less prone to behavioral problems (Kiser, Bennett, Heston, & Paavola, 2005).

A study on family rituals and child well-being examined the relationship between childhood adjustment and family rituals in clinical and non-clinical samples (Kiser et al., 2005). Results showed that family ritual functioning made a unique contribution to childhood adjustment, such that families with higher scores on measures of family rituals were less likely to have childhood behavior problems in both clinical and non-clinical samples. The results indicate that rituals have the capacity to increase childhood well-being and lessen behavior problems in children, regardless of clinical status.

Norton and Gino (2014) outlined what they call the "real benefits to rituals" (p. 1). Their research suggests that rituals may be more rational than they appear, because even simple rituals have proven to be extremely effective in relieving grief, reducing anxiety and increasing people's confidence. Furthermore, they found that rituals appear to benefit people who claim not to believe that rituals work. Norton and Gino (2014) also state that recent research done by psychologists have revealed intriguing new results demonstrating that rituals can have a causal impact on people's thoughts, feelings and behaviors. Some of the examples from the article include highly ritualized practice and pre-game routines of sports professionals, and grieving rituals in indigenous cultures. The outcomes were that rituals helped people to perform better in the sports setting and also to deal with grief more so than doing a non-ritualized activity. Rituals

helped not only to alleviate grief of a deceased loved one, but also for more mundane grief as well, such as the pain of losing the lottery.

Traditional yoga is often practiced in a highly ritualized fashion (White, 2011). 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**

Behavioral synchrony is the coordination of movement that occurs between individuals during a social interaction, featuring similarity of: 1) form, the manner and style of movements, and 2) time, the temporal rhythm of movements (Kimura & Daibo, 2006). Early studies of behavioral synchrony showed that successful language acquisition results from behavioral synchrony between newborn infants' movements and adult speech patterns (Condon & Sander, 1974), and that increased rapport within teacher–student dyads stems from behavioral synchrony (Bernieri, 1988). More recently, experimental manipulations of synchrony show that it breeds compassion (Valdesolo & DeSteno, 2011), cooperation (Wiltermuth & Heath, 2009), affiliation (Hove & Risen, 2009), emotional support satisfaction (Jones & Wirtz, 2007), and even elevated pain thresholds (Cohen, Ejsmond-Frey, Knight, & Dunbar, 2010).

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 in group economic exercises that followed, even in situations that required personal sacrifice. Furthermore, the results showed that positive emotions do not necessarily need to be generated for synchrony to foster cooperation. The results suggest that acting in synchrony with others can increase cooperation by strengthening social attachment and bonding among group members.

Yoga is often practiced in group settings where members of the group are moving in synchrony with one another (Singleton, 2010). Additionally, some yoga teachers may chant ‘Om’ or other sacred sounds at the beginning and end of each class (White, 2011). 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, where movements are repeated in sync with other practitioners in a particular order (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 include yoga, meditation, running, choir practice, Zumba and potluck dinners. Callander (2013) evaluated the degree of synchrony using three levels: 1) exact synchrony (all participants performing the same movements in a shared rhythmic pattern), 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).

To the best of our knowledge, no prior studies address the effect of synchronous rituals of yoga on psychological well-being. We propose that the synchronous rituals of yoga may help explain the psychological benefits of yoga, and that the increase in prosocial behavior is what leads to the increase in well-being associated with yoga practice.

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. Next, we review research on prosocial behavior as it relates to synchronicity and yoga.

## Prosocial Behavior

Prosocial behaviors are those actions that benefit other people, or society as a whole even at a cost to the individual such as 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 a critical feature (Sosis, 2000).

Anthropological research has examined and discussed the relationship between ritual, group affiliation, and prosociality (e.g., d'Aquili & Newberg 1999; Hayden, 1987; Sosis, 2000; Steadman & Palmer, 1995; Turner 1969). Durkheim (1912/1965) suggests that rituals in which movement is stereotyped across participants enhance conformity to the group, and by moving together as a unit, participants tend to think and value themselves as a unit, which enhances their cooperation. However, empirical evidence of cooperative effects due to rituals has, until recently, been scarce (Haidt et al., 2008).

This scarcity has been lessened by recent studies from psychology laboratories that have extended work on dyadic pairs by showing that partners who match each other's postures, motions, and vocalizations, tend to express higher levels of charity (Campbell, 1958; Hove & Risen, 2009; Miles, Nind, & Macrae, 2009; Valdesolo & DeSteno, 2011; van Baaren, Holland, Steenaert, & van Knippenberg, 2003). These results have also been extended to small groups and in doing so have provided empirical support to the theories that rituals increase cooperative behaviors (Reddish, 2012; Valdesolo & DeSteno, 2011; Wiltermuth & Heath, 2009). A field study of Fischer, Callander, Reddish and Bulbulia (2013) has given support to these laboratory findings associating ritualistic activity with cooperative behaviors, suggesting that shared sacred values mediate rituals' prosocial effect. Thus, there is a growing body of literature that provides evidence that synchronous rituals lead to prosocial behavior.

## 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 some of six general characteristics (Ryff, 1989). The six characteristics of well-being as defined by Carol Ryff are most prevalent in definitions of well-being and include self-acceptance, positive relations with others, autonomy, environmental mastery, purpose in life, and personal growth. Since Ryff's seminal work integrating the views of Erikson (1959), Maslow (1968), Rogers (1961), Allport (1961) and Jahoda (1958) into the well-known six-factor model (van Dierendonck, Díaz, Rodríguez-Carvajal, Blanco, & Moreno-Jiménez, 2008), it has spawned much 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, including self-acceptance (Schure, Christopher, & Christopher, 2008), autonomy (Gonçalves, Vale, Barata, Varejão, & Dantas, 2011), and purpose in life (Voigt, Howat, & Brown, 2010). However, research that looks at yoga's effects on positive relations with others has been scarcer, although recent studies by Callander (2013) suggest that rituals of yoga increase positive relations with others by increasing prosociality.

Psychological well-being is an important predictor of many outcomes, including physical health (Diener & Chan, 2011), longevity (Danner, Snowdon, & Friesen, 2001), life satisfaction (Diener, 2000; Schimmack, Radhakrishnan, Oishi, Dzokoto, & Ahadi, 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 (Aknin et al., 2013; Kahana, Bhatta, Lovegreen, Kahana, & Midlarsky, 2013; Ryan & Deci, 2000; Ryff & Singer, 1996), perhaps because it is so closely related to positive relations with others.

In sum, research shows that supportive social relations are an important part of well-being, and that prosocial behavior, 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 behaviors play a crucial role in the development of psychological well-being.

## Theoretical Model

We propose a three-factor model for the relationship between yoga and psychological well-being (see Figure 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 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 psychological well-being.

**Synchronous Rituals of Yoga Lead to an Increase in Prosocial Behavior**

Given that past research on behavioral synchrony in general and synchronous rituals in particular show 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 in a similar way. Specifically, the synchronous rituals of yoga will increase social attachment and bonding through the mechanism of behavioral synchrony.

Research by Fischer et al. (2013) examined eleven rituals and their effects on prosociality as measured by attitudes about fellow participants and decisions in 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 in 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, Wiltermuth and Heath (2009) proposed that increased feelings of group affiliation acted as a possible mediator between synchronous rituals and increased prosociality. Thus, while it remains unclear what causes the relationship between synchronous rituals of yoga and prosociality, it is clear that synchronous rituals of yoga increase prosocial behavior, providing support for the first part of our model.

**Prosocial Behavior Leads to an Increase in Psychological Well-Being**

Prior research shows that prosocial behaviors, such as charitable spending, giving time to others, and empathy, lead to increased psychological well-being and positive affect (Aknin, Dunn, & Norton, 2012; Mogilner, Chance, & Norton, 2012; Shanafelt et al., 2005). Research by Ryan ad Deci (2000) suggests that intrinsic prosocial behavior increases well-being by fulfilling a basic need for autonomy. Other research (Kahana et al., 2013) shows that volunteering and altruistic attitudes predict well-being, especially in later life, and the authors suggest that fulfilling a need for generativity (Erikson, 1959) may explain the link between prosociality and well-being.

Prior social psychological theoretical frameworks concerned with understanding positive indicators of psychological well-being offer some intriguing suggestions about the processes that may link prosocial orientations and positive well-being outcomes. Diener's definition of happiness in his landmark 1984 article in *Psychological Bulletin* refers to leading a virtuous life as a requisite of happiness. Such a life calls for prosocial attitudes and behaviors. The connection between positive affect and altruistic orientations is a central theme within positive psychology. Formulations that focus on positive, rather than negative affectivity, typically invoke other directed orientations, such as expressing gratitude and concern for others (Sheldon & Lyubomirsky, 2006). Experimental studies observed increased positive affect after committing acts of kindness (Seligman, Steen, Park, & Peterson, 2005). Positive affect is also embedded in the dynamics of human flourishing. Flourishing is defined as living "with an optimal range of human functioning, one that connotes goodness, generativity, growth and resilience" (Fredrickson & Losada, 2005, p. 678).

Again, while it is not entirely clear what psychological mechanisms work to explain the link between prosociality and well-being, it is clear that such a link exists, providing support for the second part of our model. Thus, our model posits that prosocial behavior mediates the relationship between the synchronous rituals of yoga and psychological well-being.

**Contributions and Limitations**

Our model contributes to the past literature on yoga in that it addresses two important areas of yoga that were previously ignored by psychological researchers: 1) the importance of yoga's rituals in generating

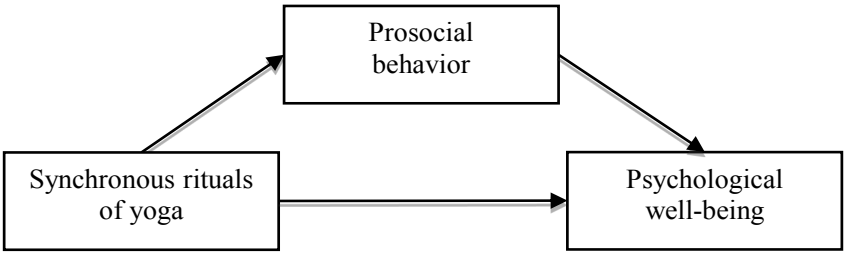


*Figure 1* . The three-factor model for the relationship between yoga and psychological well-being.

psychological well-being; and 2) explaining the processes (behavioral synchrony as a mechanism that encourages prosocial behavior) that lead to the well-being associated with ritualized yoga practice.

It further contributes to the literature of social psychology by offering a novel explanation for the effects of rituals on behavior and psychological well-being, drawing from an ancient tradition that has been practiced for thousands of years.

The limitation of the model is 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 added benefits of behavioral synchrony, enhanced group affiliation, and resultant prosocial behavior, which may have additional benefits for psychological well-being. 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 in which three groups are tested on various levels of the independent variable of synchronous yoga rituals, defined as practicing yoga in a group setting where both temporal, form and style of movement are synchronous. One group of participants could perform yoga exercises alone in a solitary room, the second group could perform yoga in the same room but in a non-synchronous fashion; and 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 the one used in Wiltermuth and Heath (2009), where a prosocial element is involved, to see whether level of giving would vary as a function of 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 by taking a measure of well-being and testing the relationship between the three variables in one study – synchronous rituals of yoga, prosocial behavior and psychological well-being.

In order to test the effects of synchronous rituals on prosocial behavior, parameters would need to be established for which the 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 these to a measure of overall psychological well-being, such 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, lay the groundwork for more rigorous empirical testing of the model.

## Conclusion

Yoga has been shown both anecdotally and empirically to provide mental and physical health benefits. However, little is known about the processes that lead to the mental health benefits of yoga. This paper reviews the literature on yoga and rituals, and presents a new theoretical model of the role of yoga's rituals in creating psychological well-being. Specifically, a three-factor model is proposed, where the synchronous rituals of yoga act as the independent variable on psychological well-being, the dependent variable; and prosocial behavior acts as a mediator between rituals and well-being. Limitations are addressed, and directions for further research are given. 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.

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, an ancient discipline that has been shown both anecdotally and empirically to be effective in facilitating a broad range of positive emotions and mental health benefits. 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 an ancient but powerful practice such as yoga that has stood the test of time could yield important discoveries for social psychologists about the nature of human social behavior.

## References


Aknin, L. B., Barrington-Leigh, C. P., Dunn, E. W., Helliwell, J. F., Burns, J., Biswas-Diener, R., … Norton, M. I. (2013). Prosocial spending and well-being: Cross-cultural evidence for a psychological universal. *Journal of Personality and Social Psychology*, *104*, 635-652.

Aknin, L. B., Dunn, E. W., & Norton, M. I. (2012). Happiness runs in a circular motion: Evidence for a positive feedback loop between prosocial spending and happiness. *Journal of Happiness Studies*, *13*, 347-355.

Allport, G. W. (1961). *Pattern and growth in personality*. Austin, TX: Holt, Rinehart & Winston.

Beiter, R., Nash, R., McCrady, M., Rhoades, D., Linscomb, M., Clarahan, M., & Sammut, S. (2015). The prevalence and correlates of depression, anxiety, and stress in a sample of college students. *Journal of Affective Disorders*, *173*, 90-96.

Bernieri, F. J. (1988). Coordinated movement and rapport in teacher-student interactions. *Journal of Nonverbal Behavior*, *12*, 120-138.

Brief, A. P., & Motowidlo, S. J. (1986). Prosocial organizational behaviors. *The Academy of Management Review*, *11*, 710-725.

Callander, R. (2013). *The effects of collective ritual on affecty, unity and prosociality: A naturalistic study* (Unpublished master dissertation). Victoria University of Wellington, New Zealand.

Campbell, D. T. (1958). Common fate, similarity, and other indices of the status of aggregates of persons as social entities. *Behavioral Science*, *3*, 14-25.

Coffey, S., Cox, B., & Williams, M. J. (2014). Lack of progress in valvular heart disease in the pre–transcatheter aortic valve replacement era: Increasing deaths and minimal change in mortality rate over the past three decades. *American Heart Journal*, *167*, 562-567.

Collins, R., (2004). *Interactional ritual chains*. Princeton, NJ: University Press.

Chong, C. S., Tsunaka, M., Tsang, H. W., Chan, E. P., & Cheung, W. M. (2011). Effects of yoga on stress management in healthy adults: A systematic review. *Alternative Therapies in Health and Medicine*, *17*, 32-38.

Cohen, E. E., Ejsmond-Frey, R., Knight, N., & Dunbar, R. I. (2010). Rowers' high: Behavioural synchrony is correlated with elevated pain thresholds. *Biology Letters*, *6*, 106-108.

Condon, W. S., & Sander, L. W. (1974). Neonate movement is synchronized with adult speech: Interactional participation and language acquisition. *Science*, *183*, 99-101.

Danner, D. D., Snowdon, D. A., & Friesen, W. V. (2001). Positive emotions in early life and longevity: Findings from the nun study. *Journal of Personality and Social Psychology*, *80*, 804-813.

d'Aquili, E. G., & Newberg, A. B. (1999). *The mystical mind: Probing the biology of religious experience*. Minneapolis, MN: Fortress Press.

Diener, E. (2000). Subjective well-being: The science of happiness and a proposal for a national index. *American Psychologist*, *55*, 34-43.

Diener, E., & Chan, M. Y. (2011). Happy people live longer: Subjective well-being contributes to health and longevity. *Applied Psychology: Health and Well-Being*, *3*, 1-43.

Diener, E. (1984). Subjective Well-Being. *Psychological Bulletin*, *95*, 542-575.

Durkheim, É. (1965). *The elementary forms of the religious life*. (J. W. Swain, Trans.). New York, NY: Free Press. (Original work published 1912).

Erikson, E. H. (1959). *Identity and the life cycle: Selected papers*. New York, NY: International Universities Press.

Fischer, R., Callander, R., Reddish, P., & Bulbulia, J. (2013). How do rituals affect cooperation? *Human Nature*, *24*, 115-125.

Fraillon, J. (2004). *Measuring student well-being in the context of Australian schooling: Discussion paper*. Carlton South: The Australian Council for Educational Research.

Fredrickson, B. L., & Losada, M. F. (2005). Positive affect and the complex dynamics of human flourishing. *American Psychologist*, *60*, 678-686.

Goldberg, L. R., Johnson, J. A., Eber, H. W., Hogan, R., Ashton, M. C., Cloninger, C. R., & Gough, H. G. (2006). The international personality item pool and the future of public domain personality measures. *Journal of Research in Personality*, *40*, 84–96.

Goldberg, P. (2010). *American Veda: From Emerson and the Beatles to yoga and meditation: How Indian spirituality changed the West*. New York, NY: Harmony Print.

Granath, J., Ingvarsson, S., von Thiele, U., & Lundberg, U. (2006). Stress management: A randomized study of cognitive behavioural therapy and yoga. *Cognitive Behaviour Therapy*, *35*, 3-10.

Gonçalves, L. C., Vale, R. G., Barata, N. J., Varejão, R. V., & Dantas, E. H. (2011). Flexibility, functional autonomy and quality of life (QoL) in elderly yoga practitioners. *Archives of Gerontology and Geriatrics*, *53*, 158-162.

Haaz, S., & Bartlett, S. J. (2011). Yoga for arthritis: A scoping review. *Rheumatic Disease Clinics of North America*, *37*, 33-46.

Haidt, J., Seder, J. P., & Kesebir, S. (2008). Hive psychology, happiness, and public policy. *The Journal of Legal Studies*, *37*, S133-S156.

Hayden, B. (1987). Alliances and ritual ecstasy: Human responses to resource stress. *Journal for the Scientific Study of Religion*, *26*, 81-91.

Hove, M. J., & Risen, J. L. (2009). It's all in the timing: Interpersonal synchrony increases affiliation. *Social Cognition*, *27*, 949-960.

Hu, F. B. (2011). Globalization of diabetes: The role of diet, lifestyle, and genes. *Diabetes Care*, *34*, 1249-1257.

Hysing, M., Pallesen, S., Stormark, K. M., Lundervold, A. J., & Sivertsen, B. (2013). Sleep patterns and insomnia among adolescents: A population-based study. *Journal of Sleep Research*, *22*, 549-556.

Innes, K. E., & Vincent, H. K. (2007). The influence of yoga-based programs on risk profiles in adults with type 2 diabetes mellitus: A systematic review. *Evidence-Based Complementary and Alternative Medicine*, *4*, 469-486.

Ivtzan, I., & Papantoniou, A. (2014). Yoga meets positive psychology: Examining the integration of hedonic (gratitude) and eudaimonic (meaning) well-being in relation to the extent of yoga practice. *Journal of Bodywork and Movement Therapies*, *18*, 183-189.

Jahoda, M. (1958). *Current concepts of positive mental health*. New York, NY: Basic Books.

Jones, S. M., & Wirtz, J. G. (2007). "Sad monkey see, monkey do:" Nonverbal matching in emotional support encounters. *Communication Studies, 58,* 71-86.

Kahana, E., Bhatta, T., Lovegreen, L. D., Kahana, B., & Midlarsky, E. (2013). Altruism, helping, and volunteering: Pathways to well-being in late life. *Journal of Aging and Health*, *25*, 159-187.

Keltner, D., & Kring, A. M. (1998). Emotion, social function, and psychopathology. *Review of General Psychology*, *2*, 320-342.

Khattab, K., Khattab, A. A., Ortak, J., Richardt, G., & Bonnemeier, H. (2007). Iyengar yoga increases cardiac parasympathetic nervous modulation among healthy yoga practitioners. *Evidence-Based Complementary and Alternative Medicine*, *4*, 511-517.

Kimura, M., & Daibo, I. (2006). Interactional synchrony in conversations about emotional episodes: A measurement by "the between-participants pseudosynchrony experimental paradigm". *Journal of Nonverbal Behavior*, *30*, 115-126.

Kiser, L. J., Bennett, L., Heston, J., & Paavola, M. (2005). Family ritual and routine: Comparison of clinical and non-clinical families. *Journal of Child and Family Studies*, *14*, 357-372.

Kogan, A., Oveis, C., Carr, E. W., Gruber, J., Mauss, I., Shallcross, A., … Keltner, D. (2014). Vagal activity is quadratically related to prosocial traits, prosocial emotions, and observer perceptions of prosociality. *Journal of Personality and Social Psychology*, *107*, 1051-1063.

Markson, S., & Fiese, B. H. (2000). Family rituals as a protective factor for children with asthma. *Journal of Pediatric Psychology*, *25*, 471-479.

Maslow, A. H. (1968). *Toward a psychology of being* (2nd ed.). New York, NY: Van Nostrand.

Miles, L. K., Nind, L. K., & Macrae, C. N. (2009). The rhythm of rapport: Interpersonal synchrony and social perception. *Journal of Experimental Social Psychology*, *45*, 585-589.

Mogilner, C., Chance, Z., & Norton, M. I. (2012). Giving time gives you time. *Psychological Science*, *23*, 1233-1238.

Monnazzi, P., Leri, O., Guizzardi, L., Mattioli, D., & Patacchioli, F. R. (2002). Anti-stress effect of yoga-type breathing: Modification of salivary cortisol, heart rate and blood pressure following a step-climbing exercise. *Stress and Health*, *18*, 195-200.

Norton, M. I., & Gino, F. (2014). Rituals alleviate grieving for loved ones, lovers, and lotteries. *Journal of Experimental Psychology*, *143*, 266-272.

Posadzki, P., & Ernst, E. (2011). Yoga for asthma? A systematic review of randomized clinical trials. *Journal of Asthma*, *48*, 632-639.

Posadzki, P., Ernst, E., Terry, R., & Lee, M. S. (2011). Is yoga effective for pain? A systematic review of randomized clinical trials. *Complementary Therapies in Medicine*, *19*, 281-287.

Reddish, P. (2012). *Why sing and dance? An examination of the cooperative effects of group synchrony* (Unpublished doctoral dissertation). Victoria University of Wellington, New Zealand.

Resnick, M. D., Bearman, P. S., Blum, R. W., Bauman, K. E., Harris, K. M., Jones, J., … Udry, J. R. (1997). Protecting adolescents from harm: Findings from the national longitudinal study on adolescent health. *Journal of the American Medical Association*, *278*, 823–832.

Riley, D. (2004). Hatha yoga and the treatment of illness. *Alternative Therapies in Health Medicine*, *10*, 20-21.

Rocha, K. K. F., Ribeiro, A. M., Rocha, K. C. F., Sousa, M. B. C., Albuquerque, F. S., Ribeiro, S., & Silva, R. H. (2012). Improvement in physiological and psychological parameters after 6 months of yoga practice. *Consciousness and Cognition*, *21*, 843-850.

Rogers, C. R. (1961). *On becoming a person: A therapist's view of psychotherapy*. Boston, MA: Houghton Mifflin.

Ryan, R. M., & Deci, E. L. (2000). Self-determination theory and the facilitation of intrinsic motivation, social development, and well-being. *American Psychologist*, *55*, 68-78.

Ryff, C. D. (1989). Happiness is everything, or is it? Explorations on the meaning of psychological well-being. *Journal of Personality and Social Psychology*, *57*, 1069-1081.

Ryff, C. D., & Singer, B. (1996). Psychological well-being: Meaning, measurement, and implications for psychotherapy research. *Psychotherapy and Psychosomatics*, *65*, 14-23.

Sapolsky, R. M. (1994). *Why zebras don't get ulcers: A guide to stress, stress related diseases, and coping*. New York, NY: W.H. Freeman.

Salmon, P., Lush, E., Jablonski, M., & Sephton, S. E. (2009). Yoga and mindfulness: Clinical aspects of an ancient mind/body practice. *Cognitive and Behavioral Practice*, *16*, 59-72.

Schimmack, U., Radhakrishnan, P., Oishi, S., Dzokoto, V., & Ahadi, S. (2002). Culture, personality, and subjective well-being: Integrating process models of life satisfaction. *Journal of Personality and Social Psychology*, *82*, 582-593.

Schure, M. B., Christopher, J., & Christopher, S. (2008). Mind-body medicine and the art of self-care: Teaching mindfulness to counseling students through yoga, meditation, and qigong. *Journal of Counseling and Development*, *86*, 47-56.

Seligman, M. E., Steen, T. A., Park, N., & Peterson, (2005). Positive psychology progress: Empirical validation of interventions. *American Psychologist*, *60*, 410-421.

Shanafelt, T. D., West, C., Zhao, X., Novotny, P., Kolars, J., Habermann, T., & Sloan, J. (2005). Relationship between increased personal well-being and enhanced empathy among internal medicine residents. *Journal of General Internal Medicine*, *20*, 559-564.

Sheldon, K. M., & Lyubomirsky, S. (2006). How to increase and sustain positive emotion: The effects of expressing gratitude and visualizing best possible selves. *The Journal of Positive Psychology*, *1*, 73-82.

Simpson, J. A., Weiner, E. S., & Proffitt, M. (2003). Ritual. In *Oxford English Dictionary*. Oxford: Clarendon Press.

Singleton, M., & Byrne, J. (Eds.). (2008). *Yoga in the modern world: Contemporary perspectives*. London and New York: Routledge.

Singleton, M. (2010). *Yoga body: The origins of modern posture practice*. Oxford: Oxford University Press.

Sosis, R. (2000). Religion and intra-group co-operation: Preliminary results of a comparative analysis of utopian communities. *Cross-Cultural Research*, *34*, 70-87.

Steadman, L. B., & Palmer, C. T. (1995). Religion as an identifiable traditional behavior subject to natural selection. *Journal of Social and Evolutionary Systems*, *18*, 149-164.

Straume, L. V., & Vittersø, J. (2012). Happiness, inspiration and the fully functioning person: Separating hedonic and eudaimonic well-being in the workplace. *The Journal of Positive Psychology*, *7*, 387-398.

Streeter, C. C., Gerbarg, P. L., Saper, R. B., Ciraulo, A., & Brown, R. P. (2012). Effects of yoga on the autonomic nervous system, gamma-aminobutyric-acid, and allostasis in epilepsy, depression, and post-traumatic stress disorder. *Medical Hypotheses*, *78*, 571-579.

Turner, V. W. (1969). *The ritual process: Structure and anti-structure*. Chicago, Il: Aldine Pub.

Uebelacker, L. A., Epstein-Lubow, G., Gaudiano, B. A., Tremont, G., Battle, C. L., & Miller, I. W. (2010). Hatha yoga for depression: Critical review of the evidence for efficacy, plausible mechanisms of action, and directions for future research. *Journal of Psychiatric Practice*, *16*, 22-33.

Valdesolo, P., & DeSteno, D. (2011). Synchrony and the social tuning of compassion. *Emotion*, *11*, 262-266.

van Baaren, R. B., Holland, R. W., Steenaert, B., & van Knippenberg, A. (2003). Mimicry for money: Behavioral consequences of imitation. *Journal of Experimental Social Psychology*, *39*, 393-398.

van Dierendonck, D., Díaz, D., Rodríguez-Carvajal, R., Blanco, A., & Moreno-Jiménez, B. (2008). Ryff's six-factor model of psychological well-being, A Spanish exploration. *Social Indicators Research*, *87*, 473-479.

Vera, F. M., Manzaneque, J. M., Maldonado, E. F., Carranque, G. A., Rodriguez, F. M., Blanca, M. J., & Morell, M. (2009). Subjective sleep quality and hormonal modulation in long-term yoga practitioners. *Biological Psychology*, *81*, 164-168.

Vishnu-Devananda, S. (1960). *The complete illustrated book of yoga*. New York, NY: Julian Press.

Voigt, C., Howat, G., & Brown, G. (2010). Hedonic and eudaimonic experiences among wellness tourists: An exploratory enquiry. *Annals of Leisure Research*, *13*, 541-562.

Watson, D., Clark, L. A., & Tellegen, A. (1988). Development and validation of brief measures of positive and negative affect: The PANAS scales. *Journal of Personality and Social Psychology*, *54*, 1063-1070.

White, D. G. (Eds.). (2011). *Yoga in practice*. Princeton, NJ: Princeton University Press.

Wiltermuth, S. S., & Heath, C. (2009). Synchrony and cooperation. *Psychological Science*, *20*, 1-5.

---

Received July 12, 2014

Revision received January 2, 2015

Accepted January 18, 2015 ■