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Anthony Scialla
Granite State College

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Mindfulness Meditation and Flow State Experiences

by Anthony Scialla

FILE	3964_ANTHONY_SCIALLA_MINDFULNESS_MEDITATION_AND_FLOW_STATE_EXPERIENCES_1583001_1556241541.DOCX (262.14K)		
TIME SUBMITTED	28-MAR-2019 12:01AM (UTC-0400)	WORD COUNT	6847
SUBMISSION ID	1101199165	CHARACTER COUNT	44329

Mindfulness Meditation and Flow State Experience:
Unlocking human potential

By

Anthony Scialla
Granite State College

Abstract

Mindfulness meditation (MM) and flow state experiences (FSE) share psychophysiological and behavioral parallels. Rarely presented are evidentiary resources on MM and FSE that explore the similarities and differences through research to fulfill gaps in knowledge. Another study proposed that MM and FSE are inherently incompatible with each other and could not exist in concert. Coupled with the similarities this author found in the behavioral, psychological, and social aspects of MM and FSE was the need for immersion of participants in research that would test the relationship. The research conducted an interactive experiment where participants participated in a computer-driven reflex game. The participants meditated and played the game again. Afterwards, the participants completed a qualitative self-report survey based on their experience. The experiment conducted by this author filled gaps in the knowledge of MM and FSE, providing proof that these processes can be manifested by individuals and groups.

Keywords: mindfulness, meditation, flow, flow state, peak experience, psychology, performance, organizational development, leadership

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Introduction

Mindfulness Meditation and Flow State Experience: Unlocking Human Potential

The ability for individuals and groups to achieve states of heightened performance is an intrinsically available state of performance that garners attention from academic and professional research practitioners (Csikszentmihalyi, 2008; Kotler, 2014b; Fraher, Branicki, Grint, 2017; Yader et al., 2017; Shaner & Bird, 2018). And is of interest to individuals who want to improve their overall well-being (Reid, 2011; Hidalgo, M., Cruit, J., Yerdon, V. A., & Hancock, P. (2018). Mindfulness meditation (MM) or the utilization of breath, body and mind training is a growing research field that applies to various industries and populations. The practice has been proven to foster the ability for the individual to reframe their relationship with their emotional processing and improve awareness by training of brain centers responsible for regulation of these processes (Antanaitis, 2015). The psychological state of flow state experiences (FSE) researched by Mihaly Csikszentmihalyi (2008) describes a state of increased awareness, performance, and well-being of individuals who enter a FSE.

A meta-analysis conducted by Cranston and Keller (2013) with the McKinsey Institute found that leaders and employees are able to increase their perceived importance of work, described as their meaningful quotient (MQ), to enhance their job task performance. By spending 10% of their workweek in states of flow, the executives were 5 times more productive after being in a flow state. The increase of the MQ in organizations is created by having all team members emotionally invested in the mission or goal increases performance and success. Psychophysiological similarities in mindfulness meditation (MM) and flow state experiences (FSE) occur in addition to the behavioral similarities related to the anterior cingulate cortex, prefrontal cortex, hippocampus, and amygdala (Kotler, 2014a; Kotler, 2014b; Antanaitis, 2015;

Hidalgo, Cruit, Yerdon, & Hancock, 2018; Dixon et al., 2019). MM and FSE enhance the ability for individuals and organizations to increase personal and group performance. The basis for MM and FSE to enable enhanced performance to occur is rooted in psychological and behavioral resemblances.

Sheldon, Prentice, and Halusic (2014) have maintained that the similarities are mutually exclusive from MM and FSE. Critics of mindfulness meditation and flow state experience similarities maintain that MM and FSE are incompatible with each other due to MM requiring focused self-attention, and FSE requiring the loss of self (Sheldon, Prentice, & Halusic, 2014).

The example of the Sheldon, Prentice, and Halusic (2014) study provides the opportunity to close gaps in the research to test the relationship between MM and FSE by examining the history, psychological, and behavioral processes that exist in MM and FSE.

Literature Review

A Brief History of Mindfulness Meditation

Aspects of mindfulness and meditation define mindfulness meditation (MM). This paper utilizes the definition of mindfulness presented by Ellen Langer (Bercovitz, Pagnini, Phillips and Langer, 2017) is typified by process of awareness that recognizes the novelty of the present moment resulting in objective observation of the situation, social environment, and intrapersonal awareness (p.196). The increased ability to observe objectively gives the individual the ability to reframe their relationship with themselves by enacting increased emotional control during self-appraisal and interpretation of social situations. This emotional regulation also gives the individual the ability to use energy directed outward and convey a stronger version of the self as a social structure (Gard et al. 2014; Gard et al. 2015; Black & Slavich, 2016). As an individual objectively observes stimuli in social situations, coupled with reformatting of the socio-

psychological schema of oneself, the individual is able to reframe their social-self as being less influenced by misconceptions of affect.

Psychophysiological Effects of Mindfulness Meditation

Riddle (2015) states that practiced meditators have reported the ability to bring attention to one's subconscious thoughts and then train these thoughts to compliment the meditators optimal version of themselves. By using mindfulness meditation as a training process for thought process, the individual is able create new patterns of thought that will be enhance general well-being and resilience to negative emotions. Through meditative practice the individual penetrates through layers of the self by recognizing the fractal cognitive triad that consists of body, mind, and self (Riddle, 2015). The triad mentioned by Riddle (2015) represents the conscious and unconscious states of cognition and how consciousness works in concert with biological function and psychophysiological schemata that make up our being or sense of identity. It is fractal because consciousness devotes itself to thought processes that the individual is aware of and the triad performs each of their functions sub-consciously and consciously. Ellen Cho (2015) reports that the American Psychological Association (APA) conducted an eight-week mindfulness yoga study and found that the women who participated in mindfulness meditation (MM) had increased their sense of self-worth and appraised their body image in a much more positive way. The women's thought patterns and perceptions had the ability to retrain itself through mindfulness during the yoga study and the women were able to break down previously negative imagery in the identity of their social-self. Csikszentmihalyi (2008) wrote that the manifestations of flow all around us: he relates the disciplines of yoga and martial arts as exercises in bringing the body and mind into an expression of flow to create order out of the chaos of the world by creating a state of enlightened consciousness through personal control. The meditator can pierce through to

subconscious levels of the triad and recognize cognitive thoughts that arise below the surface of consciousness (Riddle, 2015).

Antanaitis (2015) reports that MM has shown to augment the function of vital brain centers by growing more grey cells that stimulate the strengthening of brain cells forming a nucleus or *cortex*. By strengthening these cortical structures, functions of the cortex are heightened, such as the Anterior Cingulate Cortex which aids in attention and decision making. The Prefrontal Cortex controls problem-solving and emotional control. The Hippocampus is the center for learning and memory, and the Amygdala strengthens, a center that corresponds to the fight or flight response (Antanaitis, 2015). The interaction between the Amygdala and the Hippocampus regulate the function of emotional episodic memory (Peterson, 1999), as noted by Richardson, Strange, and Dolan (2004) which explains the ability for mindfulness (and subsequently flow states) to enable the individual to reframe their perception of negative thoughts and memories (Riddle, 2015; Cho, 2016).

Mindfulness Meditation in the Workplace and Beyond

The psychophysiological benefits provided by mindfulness meditation, translate to an individual enhancing their relationships (Good et al., 2015) as it provides socio-psychological benefits to those who engage in mindfulness intervention. Good et al. (2015) conducted a meta-analysis of workplaces who provide their employees with mindfulness training and found that as mindfulness meditation (MM) increased the individual's faculties in their ability to focus and control their thoughts and behavior, these increased skills translated to pro-social behavior at work. The relationship between individual training of MM to aid in pro-social behaviors at work is shown in Figure 1 (Good, et al., 2015).

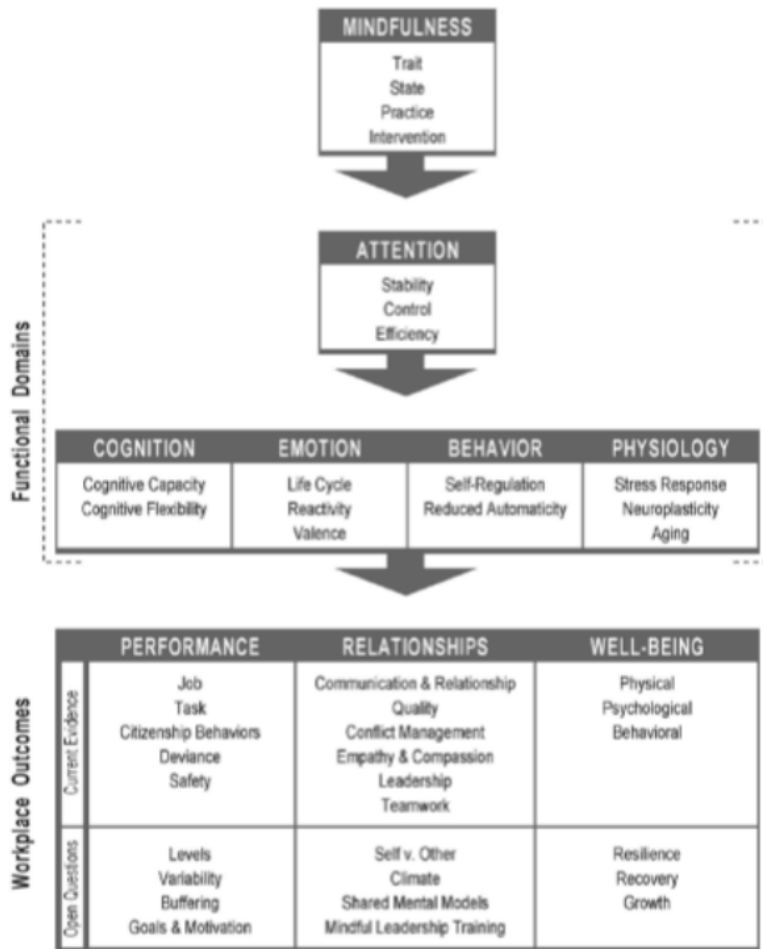


Figure 1. Integrative framework relating mindfulness to workplace outcomes. Good et al. (2015).

As the individual develops through meditative practices of mindfulness, attention, and awareness leads to outcomes in the social-psychological realm relating to performance, relationships, and well-being (Good et al., 2015). Mindfulness-based interventions have been featured in a variety of fields with productive results. Mindfulness meditation (MM) practiced for a specified duration of time is often characterized through the use of body scans or the practice of taking note of parts of the individual’s body, concentrated from head to toe that are also coupled with breathing focused meditations (Antanaitis, 2015; Black, 2016; Hamilton,

Schutte, & Brown, 2016; Fraher, Branicki, Grint, 2017; Shaner & Bird, 2018). The National Health Institute in the UK instituted a six-week program (Black, 2016) of MM: Stress decreased, performance increased, and general well-being increased for the participants, when qualitatively interviewed. In a similar study, featuring an 8-week MM program, the same beneficial results were discovered (Shaner & Bird, 2016).

Another study of note was conducted by Fraher, Branicki, and Grint (2017) who report that the military special-operators known as the United States Navy Seals (SEAL), an acronym from their ability to perform in a variety of terrain, Sea, Air, and Land instill mindfulness in their training program. The training program mindfulness is instituted due to the expectation that in the SEAL program, or in a live mission, conditions change. The orientation towards observation and adaptability aides in building resilience, and adaptability as discovered by Fraher, Branicki, and Grint (2017) through a meta-analysis of video tape, interview, and qualitative data. The SEALs develop deep attention and focus through mindfulness while remaining flexible to changing conditions and stimuli in the environment. Achieved through a positive orientation concerning failure, to learn and grow to become resilient. Rigorous training is focused on constant improvement and focus on the task at hand and team contributions to create this positive orientation to failure, flexibility, resilience, and task execution. The ethos is perhaps best illustrated by the SEAL's "Hell Week," a marathon of training and operations with no sleep. Those who succeed at Hell Week are the most proficient at task performance and are resilient. The researchers explain that the Navy incorporates collective mindfulness in the SEALS training that creates a high-reliability organization (HRO) that focus on "Mindfulness in action occurs when HROs achieve an attentive yet flexible focus capable of incorporating multiple—sometimes competing—realities to assess alternative solutions and take action in dynamic

situations” (Fraher, Branicki, & Grint, 2017, p. 240). MM and FSE considered in practice by The United States Department of Defense (DOD) instituted a review of how to make soldier’s performance and resilience increase through mindfulness and flow states. This study was conducted in response to the long hours of research and stress brought about by fighting various terrorist organizations (Deuster et al., 2007). Mindfulness in an organizational construct helps Navy SEALs and the DOD ready for goals to be completed in stressful environments and situations.

Mindfulness meditation (MM) benefits individuals from varied backgrounds, and organizations in various industries. In a meta-analysis of the psychophysiological and social benefits of mindfulness interventions in the workplace Good et al. (2015) found that middle-managers who practice mindfulness received better reviews from their superiors, and psychologists who practice mindfulness were reported to have increased success with helping their clients.

Grossman (2017) notes that leading business schools are conducting mindfulness programs, and businesses are investing in putting more mindfulness practices at work to enhance the performance of their employees. Grossman (2017) reports that mindfulness meditation increases productivity by 47 to 62 minutes per week (p.4). Harvard Business School and New York University’s Stern School of Business note that mindfulness increases the well-being of students but, also gives those students the ability to nurture leadership skills such as emotional intelligence and becoming results orientated (Grossman, 2017 p.7).

Mindfulness meditation brings results to various organizations through strategy, and adaptable performance. By having stakeholders orient themselves to mindfulness practices through meditation or observation the stakeholders increase their productivity and are able to develop habits that will benefit themselves and the organization.

Flow State Experiences

Brief History of Flow State Experiences

Flow can be defined by an individual losing themselves in the moment while doing a task they find arousing or enjoyable. Flow state experiences is defined by Csikszentmihalyi (2008) as a state of happiness and optimal experience where the individual's state of consciousness aligns to the optimal version of their reality and states these experiences that are typified by the balance of skill and challenge and the balance of anxiety and boredom which lead individuals to FSEs. In an article written by Forbes Magazine flow researcher Steven Kotler (2014a) states that flow is a transformational experience where users reorient themselves to their self-image and ability to perform. Csikszentmihalyi (2008); Kotler (2014a) present a psychological meta-analysis conducted by Csikszentmihalyi of several cultures that found flow to be a determining factor in happiness and well-being. Csikszentmihalyi described to the magazine Wired that flow is "every action, movement and thought follows inevitably from the previous one, like playing jazz (Kotler, 2014a p. 13)."

Kotler (2014b); Yader et al. (2017) mention the work of Harvard psychologist William James who explored the connection of religious experiences on the human psyche, noting that these experiences seem to open another reality for the individual and change an aspect of the person while experiencing the event. One of James' students Harvard physiologist Walter Cannon discovered the connection between psychological experience and physiological

processes. Cannon also discovered the fight or flight response, a parasympathetic physiological response to perceived threats in the environment. Cannon's work supplements James' work on religious experiences of events causing reactions in the psychophysiological system (Kotler, 2014b). Kotler (2014b); Yader et al. (2017) write that in the mid-1960s Ohio State psychologist Abraham Maslow defined the term peak experience describing a state of experience that borders on the religious or euphoric. Yader et al. (2017) connects the concept of flow, and subsequently mindfulness, as represented in self-transcendent experiences (STE).

Csikszentmihalyi (2008) builds on the work of James, Cannon, and Maslow (Kotler, 2014) by exploring happiness. Csikszentmihalyi (2008) explains that consciousness in dissonance creates ripple effects that manifest itself, these are mental blocks that stop psychic energy from manifesting STE, Csikszentmihalyi (2008) recalls the story of Julio, a lonely factory worker who ignored repairing his tires until he could get paid. Julio's inattention to his tires caused his work to suffer due to the anxiety of wondering if he will make it to work and then home. Csikszentmihalyi (2008) prescribes that if Julio had put more psychic energy into making friends, he might have been able to rely on them for rides to work and home. Moreover, if Julio spent more psychic energy on his finances, he could have managed to fix or replace his tires. Order of the consciousness, as described by Csikszentmihalyi (2008), has been studied relating to individual well-being and performance.

After numerous interviews with subjects, Csikszentmihalyi (2008) noticed that the happiest people, ones with ordered consciousness keep repeating the word "flow," leading Csikszentmihalyi to use the phrase flow state. A factory worker in Detroit does every job at his factory with efficiency and ease, a gang of teenage suburbanites finds happiness in riding

motorcycles, a lady in a remote village in the Alps lives a simple life full of work and enjoys every minute of it Csikszentmihalyi (2008).

Flow experiences causes individuals to complete tasks by a state of immersion in the activity, with an automatic process of skills that leads to fulfilment and happiness after engagement in the flow activity (Csikszentmihalyi, 2008; Phillips, 2015). By an individual completing a task in flow a state of satisfaction will occur that enriches a person with a sense of peak-experience and thus, satisfaction.

Psychophysiological Aspects of Flow State Experiences

The effects of flow can be seen in psychophysiological processes such as perception, motor control, and performance: Kotler (2014a) relates a United States military study where snipers were induced into flow states using transcranial induction (electrode stimulation into the brain) and snipers saw an increase of 230% in target acquisition (p. 19). Excelled performance initiated by flow states can also be induced if the individual finds the task challenging and arousing enough where immersion in the activity occurs.

The NASA Task Load Index (NASA-TLX) measures the amount of psychological and physiological demand that tasks require. In 2018, Hidalgo, Cruit, Yerdon, and Hancock proposed that this could be used as a measure to study the amount of cognitive attention that an individual allocates during FSE tasks. The authors cite the NASA-TLX use a game called Block Load at NASA where a block is moved to complete a goal. The authors present Sharek and Wiebe (Hidalgo, Cruit, Yerdon, & Hancock, 2018) who found that the physical and psychological loads were high but, the level of the astronaut's engagement was also high. Reid (2011) presents Csikszentmihalyi's concept of flow existing because of the relationship between challenge and

skill that explains the physiological and psychological demands that create flow experiences, presented below in Figure 2.

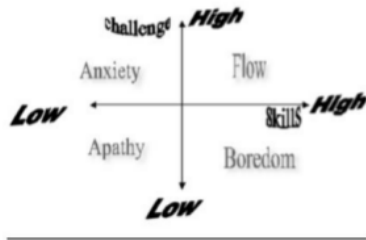


Figure 2. 2 Dimensional Flow Scale. Reid (2011).

According to Csikszentmihalyi (2008); Reid (2011) FSE is contingent selected individual and environmental dynamics

- Clear goals,
- Immediate feedback from the activity,
- A balance of skill in the person and challenge in the activity,
- Sense of Control,
- Focus and Concentration,
- Fluidity in one's actions during the task,
- Loss of self-consciousness, and
- Distorted Sense of Time.

By conducting a functional near infra-red spectroscopy (fNIRS) to measure brain activity, Yoshida et al. (2014) found that the prefrontal cortex (PFC) had a concentration of oxygenated hemoglobin when participants engaged in a flow activity game. Similar to the reports of activity mentioned earlier by Cho (2015) in her mindfulness meditation study of the female yoga participants.

The PFC is responsible for attention, emotional regulation, decision making, memory, and rewards processing (Yoshida et al., 2014). By graphing the brain and body during flow state activity; Cheron (2016) found that the subjects who engaged in flow activities have sympathetic reactions between the neurophysiological centers of the brain that control perception, and their motor function. The fluid nature of the activity described by is the culmination of perception, and muscle memory utilized in concert by the individual engaged in a flow activity (Reid, 2011; Kotler, 2014b; Hidalgo, Cruit, Yerdon & Hancock, 2018). The individuals whom Csikszentmihalyi (2008) surveyed who enjoyed their work and recreation increase in PFC and psychokinesis developed a state of activity that creates manifestations of self-transcendent experiences. Flow reminds individuals that they are an agent of intra-personal, interpersonal, and environmental change through ordering the psyche in alignment with the optimal-self (Csikszentmihalyi, 2008; Kotler, 2014; Cheron, 2016; Kelley, Pransky & Lambert, 2017; Hidalgo, Cruit, Yerdon, & Hancock, 2018).

Behavioral Manifestations of Flow State Experiences

Kotler (2014) relates that action-sports athletes have pushed the physical and mental boundaries of their crafts in a few short decades. Increasingly exotic techniques in action-sports are attributed to flow state experiences (FSE) and the increased ability to perform these techniques require the efficient firing of neurokinesis in flow activity Cheron (2016) and the ability for the prefrontal cortex to regulate memory, perception, and reward (Yoshida et al., 2014). Flow is reliant on the human ability to focus attention on tasks that are challenging and arousing for the experiencer. Flow state experiences (FSE) also show the ability to foster pro-social behaviors and promote individual well-being (Reid, 2011). Flow states open up the individual to the ability to navigate challenging tasks with fluidity (Csikszentmihalyi, 2008;

Kotler, 2014b; Cheron (2016); Hidalgo, Cruit, Yerdon, Hancock, 2018). The brain and the body will induce flow when conditions for a task present the individual where the challenge is just above their skill level and in doing so the individual will increase their skill levels by an average of 4% each flow state (Kotler, 2014b). Lakhiani (2018) describes scientists understanding of a way to trigger a flow state as the *4% rule of flow*: By increasing the level of challenge during a task that is slightly above an individual's skill level flow is typically triggered. The increase in challenge corresponds to a subsequent increase of skill by engaging in increasingly challenging tasks the body and mind learn to adapt to the increase in challenge and skill.

Criticism

Sheldon, Prentice, and Halusic (2015) present that mindfulness meditation (MM) and flow possibly are not able to exist in concert because MM is active engagement in self-appraisal, and flow is active engagement without concentration on the self. Sheldon, Prentice, & Halusic, (2015) present three studies that look at the relationship between Mindfulness M and FSE.

The first study and second studies included two self-report tools based on the Likert scale, a scale numbered 1 to 5 (1 being never and 5 being always) Five-Facet Mindfulness Questionnaire (FFMQ) to find how the subjects report facets of mindfulness on a Flow Factor Scale (FFS) in describing engagement, and challenge during an activity. For example, a participant would answer the truthfulness of statements related to flow activity participation, how the activity held their attention and if thoughts and behavior related to the task were fluid in nature. Participants were asked to do the FFMQ and the FFS during an activity chosen by the participants. The results showed that reported mindfulness did not relate to the occurrence of flow during the subject's chosen activity.

A similar study by Sheldon, Prentice, and Halusic (2015) included students being sent text messages with links to mindfulness, and flow surveys. The students were sent reminders three reminders a day until the total of the surveys totaled 21. The participants then recorded a diary entry on aspects of mindfulness and flow (awareness and engagement). No significant relationship was found between mindfulness and flow state experiences.

The third study administered by Sheldon, Prentice, and Halusic (2015) consisted of 101 psychology students in mindfulness meditation (MM) intervention or a control group of students without MM intervention. The intervention consisted of an MM audio recording from the University of New Hampshire Health System; the audio recording is 9m 23s. Participants were then to play the strategy game Tetris, picked for its challenge and perceived interest. The researchers found that performance was not increased in the MM intervention group when playing Tetris but, their sense of emotional detachment from the game did increase. Emotional detachment is a quality relate to objective appraisal found in mindfulness and loss of self in an activity that occurs in flow states.

The three studies by Sheldon, Prentice, and Halusic's (2015) found no strong correlation between reported mindfulness and flow experience but, the final study does describe qualities found in both mindfulness and flow. It is possible that the students may have been disengaged in the activities and surveys. It is possible that measurements of mindfulness and flow used in the study were difficult to correlate.

The Intersection of Mindfulness Meditation and Flow State Experiences

Scott-Hamilton, Schutte, and Brown (2016) studied cyclists in Australia that were divided into two groups: Twenty-seven cyclists participated in mindfulness meditation and mindful cycling where the participants would observe their own body while on a stationary bike

coupled with a control group of 20 cyclists who were put on a waiting list and therefore did not use mindfulness interventions during their exercises. All cyclists completed a Dispositional Flow Scale-2 where subjects report feelings of flow during activity using a 5-point Likert (1 being never true and five being always true) scale to measure the frequency or intensity of flow. Scott-Hamilton, Schutte, and Brown (2016) also another Likert based self-report tool (1 being never true and five being always true), the Five-Facet Mindfulness Questionnaire (FFMQ) before and after the MM intervention. Following the study, bikers who received the intervention scored higher on the mindfulness scale and reported flow states. No reported increases flow state experiences (FSE) was reported by the control group.

The benefits of mindfulness meditation and flow state experiences aren't mutually exclusive states; they are processes that can occur simultaneously. Cacioppe (2017) states that the overlap between the two is a state that the researcher terms as *mindflow*. Cacioppe (2017) builds his evidence from comparing the satisfaction of employees after mindful interventions and with anecdotal data of people experiencing flow states. Cacioppe's (2017) findings are similar to the evidence presented in this paper about the psychophysiological overlap of mindfulness and flow state experiences. When a person enters a state of mindflow, they are able to process intrinsic, social and environmental information at a heightened level of awareness. Cacioppe (2017) uses the example of a car crash: The driver is using most of their attention on the act of driving the car. When new information enters the driver's area of attention like an oncoming vehicle, the driver can process this new information into action seamlessly with the hopes of avoiding the crash by mindfully being attentive while the brain and body take action.

Meditation and flow state experiences also share neurobiological and behavioral similarities that readies the body and mind to be able to perform under arousing and stressful

tasks. Meditation and flow states share the quality of releasing the same neurochemicals within the individual (Krishnakumar, Shanmugamurthy & Lakshmanan, 2015; Kotler, 2014b; McFadyen, 2018; Phillips, 2013).

- Dopamine is transmitted from neurons to ready the body and mind for pleasurable rewards and creates a sense of euphoria when obtaining the reward (Krishnakumar, Shanmugamurthy & Lakshmanan, 2015; Kotler, 2014b; McFayden, 2018).
- Norepinephrine is a stress hormone that is released in the body to create heightened activity in the nerve endings to enhance blood flow to make the body ready to react quickly to stressful stimuli (Kotler, 2014b; McFadyen, 2018).
- Serotonin is shared by meditators and flow practitioners, as noted by Krishnakumar, Shanmugamurthy, and Lakshmanan (2015); Kotler (2014b); McFayden (2018), the neurotransmitter is popularly known to facilitate a feeling of happiness and in emotional learning and motor memory (Kotler, 2014b; Kotler, 2014c).

Kotler (2014c); McFayden (2018) present this neurochemical cocktail as one that promotes enhanced performance and unity in groups. Through the release of these neurochemicals the body produces feelings of cohesion throughout groups experiencing flow. McFayden (2018) notes that certain rhythms and vibrations in music provide a comparable release of dopamine that elicits listeners in groups (a concert for example) to feel a sense of unity with those who share the experience with them. Mindfulness meditation and flow states aren't only intrinsically occurring, group cohesion and functioning increase by members who practice mindfulness meditation and experience flow states (Kotler, 2014b; Good et al., 2015; Krishnakumar, Shanmugamurthy & Lakshmanan, 2015; Philips, 2015; Hidalgo, Cruit, Yerdon & Hancock, 2018). Mindfulness meditation and flow state experiences increase an individual's

sense of well-being (Reid, 2011; Yader et al., 2017) and ability to increase performance as reported by Scott-Hamilton, Schutte, and Brown (2016) in the cyclist study. Aspects of self-improvement, pro-social behavior, and increased performance will benefit the general, and workforce population.

Given the shared cognitive and psychophysiological qualities of mindfulness and flow Reid (2011); Yader et al., (2017). The author's study was conducted to see if mindfulness meditation can initiate flow experiences in subjects. Gaps in the literature exist because few of the resources explored the possible connection between mindfulness meditation (MM) and flow state experience (FSE) (Reid, 2011; Cacioppe, 2017; Yader et al, 2017) and one study stated the two states are mutually exclusive (Sheldon, Prentice, & Halusic, 2015). The aim of this study is to explore if MM can be used as a trigger for individuals to enter into FSE.

Methodology

To test the possible connection to mindfulness meditation (MM) and flow state experiences (FSE) a test of performance before and after mindfulness meditation was needed to see if a FSE occurred. By instituting a way for participants to test their skill during a task, engage in MM, and then see if performance increased through a triggering of flow states, the relationship between MM and FSE could be tested.

Participants interacted with a reflex game to test their reaction time with a computer mouse. The participants were asked to click on the screen when the image turns from red to green, to measure their reflex. Participants played five attempts during two total rounds with the reaction time game. One attempt before being asked to do a five-minute mindfulness meditation to initiate a process of mindful attention during a stimulating task, thereby creating a possible flow state trigger (Cacioppe, 2015) and then the participants were instructed to concentrate on

their breathing and relax. Following the meditation, the participants were asked to play the remaining attempt.

Following the remaining attempt, the participants completed a Modified Flow Short Scale (MFSS) that is based on the Flow Short Scale (FSS) created by Rheinberg et al. (2003), a self-report survey that measures an individual's feelings of flow during an activity such as feeling fluidity in their thoughts and actions, having the correct movement etc. The MFSS used a seven-point scale (1 Not at all 7 Very much) survey of flow activities and was modified to fit the nature of the experiment. Attempt 1 by representing the reflex game activity prior to the meditation and attempt 2 representing the attempt following the meditation. The original FSS will be shown below in Figure 3 and the modified FSS created by this author will be shown in figure 4.

Flow Short Scale

I feel just the right amount of challenge.	not at all	<input type="radio"/> - <input type="radio"/> - <input type="radio"/> - <input type="radio"/> - <input type="radio"/> - <input type="radio"/> - <input type="radio"/> - <input type="radio"/> - <input type="radio"/> - <input type="radio"/>	very much
My thoughts/activities run fluidly and smoothly.	not at all	<input type="radio"/> - <input type="radio"/> - <input type="radio"/> - <input type="radio"/> - <input type="radio"/> - <input type="radio"/> - <input type="radio"/> - <input type="radio"/> - <input type="radio"/>	very much
I don't notice time passing.	not at all	<input type="radio"/> - <input type="radio"/> - <input type="radio"/> - <input type="radio"/> - <input type="radio"/> - <input type="radio"/> - <input type="radio"/> - <input type="radio"/> - <input type="radio"/>	very much
I have no difficulty concentrating.	not at all	<input type="radio"/> - <input type="radio"/> - <input type="radio"/> - <input type="radio"/> - <input type="radio"/> - <input type="radio"/> - <input type="radio"/> - <input type="radio"/> - <input type="radio"/>	very much
My mind is completely clear.	not at all	<input type="radio"/> - <input type="radio"/> - <input type="radio"/> - <input type="radio"/> - <input type="radio"/> - <input type="radio"/> - <input type="radio"/> - <input type="radio"/> - <input type="radio"/>	very much
I am totally absorbed in what I am doing.	not at all	<input type="radio"/> - <input type="radio"/> - <input type="radio"/> - <input type="radio"/> - <input type="radio"/> - <input type="radio"/> - <input type="radio"/> - <input type="radio"/> - <input type="radio"/>	very much
The right thoughts/movements occur of their own accord.	not at all	<input type="radio"/> - <input type="radio"/> - <input type="radio"/> - <input type="radio"/> - <input type="radio"/> - <input type="radio"/> - <input type="radio"/> - <input type="radio"/> - <input type="radio"/>	very much
I know what I have to do each step of the way.	not at all	<input type="radio"/> - <input type="radio"/> - <input type="radio"/> - <input type="radio"/> - <input type="radio"/> - <input type="radio"/> - <input type="radio"/> - <input type="radio"/> - <input type="radio"/>	very much
I feel that I have everything under control.	not at all	<input type="radio"/> - <input type="radio"/> - <input type="radio"/> - <input type="radio"/> - <input type="radio"/> - <input type="radio"/> - <input type="radio"/> - <input type="radio"/> - <input type="radio"/>	very much
I am completely lost in thought.	not at all	<input type="radio"/> - <input type="radio"/> - <input type="radio"/> - <input type="radio"/> - <input type="radio"/> - <input type="radio"/> - <input type="radio"/> - <input type="radio"/> - <input type="radio"/>	very much
Something important to me is at stake here.	not at all	<input type="radio"/> - <input type="radio"/> - <input type="radio"/> - <input type="radio"/> - <input type="radio"/> - <input type="radio"/> - <input type="radio"/> - <input type="radio"/> - <input type="radio"/>	very much
I won't make any mistake here.	not at all	<input type="radio"/> - <input type="radio"/> - <input type="radio"/> - <input type="radio"/> - <input type="radio"/> - <input type="radio"/> - <input type="radio"/> - <input type="radio"/> - <input type="radio"/>	very much
I am worried about failing.	not at all	<input type="radio"/> - <input type="radio"/> - <input type="radio"/> - <input type="radio"/> - <input type="radio"/> - <input type="radio"/> - <input type="radio"/> - <input type="radio"/> - <input type="radio"/>	very much
For me personally, the current demands are...	too low	<input type="radio"/> - <input type="radio"/> - <input type="radio"/> - <input type="radio"/> - <input type="radio"/> - <input type="radio"/> - <input type="radio"/> - <input type="radio"/> - <input type="radio"/>	too high

Figure 3. Flow Short Scale. Rheinberg (2013).

Modified Flow Short Scale based on Rheinberg et al. (2003)
 Answer each question using the drop down menu

I had more control and focus on attempt 2

I felt the right amount of challenge

Fluidity in my thoughts and action on attempt 1

Fluidity in my thoughts and actions on attempt 2

I was more absorbed in the game following the meditation

My mind was clear on attempt 1

My mind was clear on attempt 2

I felt in control on attempt 1

I felt in control on attempt 2

The right thoughts and movements occurred on attempt 1

The right thoughts and movements occurred on attempt 2

I was absorbed in what I was doing on attempt 1

I was absorbed in what I was doing on attempt 2

Figure 4. Modified Flow Short Scale.

Participants

Participants were recruited through the Granite State College's e-mail system with an e-mail requesting participation in master's capstone research projects. The e-mail was sent to graduate students and staff of 120 potential recruits. The author also posted information on the study on his personal social-media pages with a link to the study's Informed Consent Form. The interactive experiment received 19 respondents. No compensation was given for participation in the study.

Apparatus

The study utilized an internet connection, a computer, and a mouse for the participants to take part in the experiment. The Modified Flow Short Scale (MSS) was created using Qualtrics.com's survey software as a collection point for the survey data.

Discussion**Results**

Shown in Figure 5 is the full results table from the 19 respondents following the reflex game attempts, meditation, and supplemental Modified Flow Short Survey. The Modified Flow Short Survey (Scialla, 2019) was then computed to find the percentage of the nineteen participants that recorded specific responses, from "not at all," all the way to "extremely."

Questions	Totals	Not at All	Slightly	Moderately	Very Much	Extremely	Total
I had more control and focus on attempt 2	19	26%	5%	37%	32%	0%	100%
I felt the right amount of challenge	19	0%	16%	32%	42%	11%	100%
Fluidity in my thoughts and action on attempt 1	19	5%	21%	42%	26%	5%	100%
Fluidity in my thoughts and action on attempt 2	19	5%	11%	26%	37%	21%	100%
I was absorbed in the game following the meditation	19	26%	11%	11%	26%	26%	100%
My mind was clear on attempt 1	19	32%	16%	11%	32%	11%	100%
My mind was clear on attempt 2	19	0%	11%	21%	53%	16%	100%
I felt in control on attempt 1	19	5%	37%	21%	16%	21%	100%
I felt in control on attempt 2	19	5%	5%	21%	37%	32%	100%
The right thoughts and movements occurred on attempt 1	19	11%	37%	32%	5%	16%	100%
The right thoughts and movements occurred on attempt 2	19	0%	11%	37%	37%	16%	100%
I was absorbed in what I was doing on attempt 1	19	16%	26%	26%	16%	16%	100%
I was absorbed in what I was doing on attempt 2	19	0%	5%	16%	47%	32%	100%

Figure 5. Modified Flow Short Survey Results Response Data Table

Question 2 had 42% of participants respond in the very much category and 11% in the extreme category that denotes the possible flow trigger “right amount of challenge” representing a total of 53% of the respondents feeling the correct amount of challenge. When participants were asked about their sense of control 32% of respondents cited more control following the meditation. Questions 3 and 4 asked the respondents if there was “...fluidity in my thoughts and actions” following from attempt 1 to 2 and there was an 11% increase in the very much category and a 17% increase in the extremely category.

Following the meditation, reported absorption in the experience doubled from 16% to 32% in respondents who felt extreme control. With slightly and moderately responses both garnering 11% each. Questions 6 and 7 compared how clear the respondents felt their mind was on each attempt. A 21% increase in reported clearness of mind occurred in the participants following the meditation. Questions 8 and 9 compared the amount of control respondents felt on attempt 1 and attempt 2 with 11% responding not at all on attempt 1 and 53% responding with very much control on attempt 2.

The remaining questions, 10, 11, 12, 13 each compare attempts 1 and 2: 10 and 11 compare the right thoughts and actions with post-meditation respondents seeing a 32% increase

in the very much category. Absorption in the task between the two attempts was asked in questions 12 and 13 with very much category respondents reporting a 36% increase in task absorption and a 16% increase in the respondents who felt extreme task absorption.

Respondents' performance after the meditation shows that a majority of the respondents felt that they had more control, fluidity in thoughts and action, and immersion in the task.

Mindfulness meditation (MM) shows a positive correlation with increasing one's performance by triggering a flow state experience (FSE).

Limitations

Respondents conducted their own surveys following the experiment and *ideal answer bias* may account for respondents responding how they perceived the ideal response to be. The author attempted to mitigate this effect by rephrasing and repeating the control and absorption questions throughout the survey, in addition to providing 7 Likert-style responses in lieu of the typical 5. More dimensions were added to the Likert scale to mitigate the occurrence of ideal-answer bias.

Ideal-answer bias maintains that most respondents will respond according to an ideal version of themselves would respond. Therefore, most individuals stay to the middle of the scale when answering. More options give the respondents the opportunity to gauge a possibly more accurate response based on their perception. Given the time involvement needed and the population pool being derived from busy graduate students and professionals, a larger respondent would be desirable.

Opportunities for Future Research

Around 16% of respondents felt more in control of their thoughts and action during the first attempt. This could mean that answering consistently was ideal for the respondent or that there exists the possibility that different personalities may have difficulty entering flow through the provided mindfulness exercise. Further study may try to fill these gaps that address personality types and how they enter pathways to flow. In an earlier paper, this author conducted research on personality traits and behavior, finding a weak-positive correlation between personality type and self-reported behavior. The research found that situation or perception of situation changes behavior in select occasions (Scialla, 2014). It may be possible that certain personality types may be triggered into flow with different stimuli and conditions.

Conclusion

Following the meditation, the respondents reported to be more centered and in control of their thoughts and action. Adding evidence to the body of knowledge supplementing Cacioppe's (2017) concept of mindflow and the psychophysiological similarities found in mindful meditation (MM) and flow state experiences (FSE) (Csikszentmihalyi, 2008; Reid, 2011; Kotler, 2014b; Fraher, Branicki, & Grint, 2017; Yader et al., 2017; Hidalgo, Cruit, Yerdon, & Hancock, 2018; Shaner & Bird, 2018).

Through the data provided by this study, proof exists that MM can help individuals enter states of flow. FSE through MM benefits people from all walks of life to recognize that they have the agency to take control over their thoughts, action, and performance. Socially, MM and FSE increase pro-social behavior that can benefit one's personal and professional life. From these pro-social experiences, group performance and cohesion increase in athletic, business, and military organizations. The 24hr availability through technology that is part of the modern

workforce creates the ability to collaborate and work remotely but it also may increase feelings of being busy, under stress, and overstretched. The power of MM and FSE can mitigate these feelings and help individuals and organizations open the doors of enhanced performance naturally.

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