Running Head: PHENOMENOLOGY OF MINDFULNESS

Investigating Musicians' Mindfulness through a Phenomenological Matrix

Frank M. Diaz

Associate Professor of Music Education

Co-Director, Music and Mind Lab

Indiana University

Jacobs School of Music

fmdiaz@indiana.edu

Jason M. Silveira

Associate Professor of Music Education

University of Oregon

School of Music and Dance

jsilveir@uoregon.edu

Katherine Strand

Dottie Sink Sykes Distinguished Professor of Music Education

Appalachian State University

Hayes School of Music

strandkd@appstate.edu

Abstract

We investigated the efficacy of a phenomenological matrix of mindfulness as a framework for examining expectations, formal meditation experiences, and appraisals of first-year college music students ($N = 18$) who participated in a 5-day mindfulness module offered through an introductory course in music education. Participants expressed hopes that meditation would help them manage stress and anxiety, improve their focus and relationships, and support their personal growth and motivation. With respect to lived experiences of formal meditation, we found that without explicit prompting, approximately 86% percent of coded phrases reflected dimensions of experience that could be mapped within the matrix, suggesting its efficacy for coding. Furthermore, almost all participants attributed mindfulness to improving their general wellness, with dereification, breathing, and non-aversive affect frequently mentioned as key factors leading to these improvements. Additionally, consistent with the neurophenomenological aims of the matrix, we list cognitive outcomes and neurophysiological mechanisms potentially attributable to the nature of selected appraisal statements by participants.

Investigating Musicians' Mindfulness through a Phenomenological Matrix

Mindfulness meditation practices, conceptualized here as “a set of attention-based, regulatory, and self-inquiry training regimes” (Lutz, Jha, Dunne, & Saron, 2015) have garnered considerable interest within higher education due in part to their purported influence on well-being among college students (Ramler, Tennison, Lynch, & Murphy, 2016; Shapiro, Schwartz, & Bonner, 1998). Collegiate music students also seem to benefit from mindfulness, with researchers finding that music performance anxiety (Farnsworth-Grodd, 2012) and socially-prescribed perfectionism are attenuated among musicians who report higher levels of dispositional mindfulness (Diaz, 2018). Despite promising findings, however, researchers highlight several conceptual and methodological issues within mindfulness research that merit ongoing clarification. These include the role of context as a potential mediator of wellbeing among meditators (Dorjee, 2016), inclusion of first-person perspectives as a means to a more nuanced understanding of meditative phenomena (Davidson & Kaszniak, 2015), and the development of frameworks that can accommodate the various meanings of mindfulness for the purposes of empirical research (Lutz et al., 2015). In this study, we examined expectations, formal meditation experiences, and appraisals of undergraduate music students who engaged in a 5-day self-guided mindfulness module, tempered by the aforementioned concerns.

Methodological and Conceptual Issues

The issue of contextualization features prominently in a recent account of meditation research by Dorjee (2016), in which he states, “most studies take a limited view of meditation focused on a particular practice taken out of a complex contemplative system, without a more systematic perspective of the role the practice plays in a person’s life-long trajectory of well-being and purpose.” (p. 2) The premise is that the value of meditation as employed within

religious, contemplative, and secular frameworks varies and is contingent upon the axiological framework in which it is practiced. We define axiology here as values, goals, and ethics that inform the practice of mindfulness. Among music student populations, these variables have yet to be examined. However, as context and axiological concerns serve as potential mediators of wellbeing, understanding what music educators expect from mindfulness seems important for understanding its value withing contexts such as music teaching and performance.

Along with context, the introspective nature of mindfulness presents an ongoing challenge for empirical research, as lived-experiences of meditation are often unexamined within these types of investigations. To addrees this, Davidson and Kazniak (2015) propose employing first-, second-, and third-person methods in research on meditative experience. According to the authors, first-person methods include accounts of subjective experience borne from disciplined introspection, while third-person data refers to objective measures such as those obtained by researchers in the sciences. Data solicited from someone in a mediating role, such as that of an interviewer or meditation teacher, are considered second-person perspectives and deemed important for establishing a common frame of reference between subjects and researchers (Frith, 2002). Aspects of this research program, known as neurophenomenology, have been employed in various psychological studies, resulting in nuanced accounts of relationships between subjective and objective features of cognition (Lutz, Lachaux, Martinerie, & Varela, 2002; Garrison et al., 2013). Currently, empirical investigations of mindfulness among musicians have dealt primarily with third-person accounts of the phenomena as measured by surveys and questionnaires (Diaz, 2013; Diaz, 2018; Farnsworth-Grodd, 2012), with no accounts of musicians' lived experience of meditation presently available.

An additional area of concern within meditation research is the lack of an agreed-upon conceptual or operational definition. In psychological contexts, mindfulness is conceptualized variously as a stable trait, as a soteriological (i.e., religious) path for promoting wellness, and as a cognitive process that can be trained across various domains of human endeavor (Lutz et al., 2015). While these constructs are useful for investigating specific facets of mindfulness, they are not interchangeable, and individually, do not account for the breadth of contexts in which the term is used and applied. For instance, investigations of mindfulness as a trait do not provide insight into the impact of meditative training, and soteriological conceptions are often too broad for the purposes of generating scientific hypotheses. Conceptualizations of mindfulness as a trainable cognitive process are also problematic, as notions of “present-centeredness” and “non-judgmental attention” are not features of every style of practice (Dunne, 2015). It seems important then, that a common frame of reference be established for examining mindfulness among musicians, specifically with respect to establishing the efficacy of specific practices.

Responding to many of these limitations, Lutz and colleagues propose a “family resemblance” approach to investigating mindfulness based on the premise that all meditative practices share common instructable, manipulable, and reportable targets of experience. These targets can be represented within a multi-dimensional matrix that can be used to map different styles and stages of practice for the purposes of empirical research. Furthermore, as dimensions of the model have been mapped to potentially related psychological and neuroanatomical features of cognition (Lutz et al., 2015), the Phenomenological Matrix of Mindfulness (PM) provides a framework for neurophenomenological explorations of mindfulness as proposed by Davidson and Kazniak (2015). In the section that follows, we explain relevant features of the

PM, with the intention of framing it as a possible means for exploring phenomenological features of formal as well as everyday experiences of mindfulness among musicians.

The Phenomenological Matrix of Mindfulness-Related Practices

Lutz et al. (2015) describe the phenomenological matrix of mindfulness as a heuristic tool that allows for different styles and levels of practice to be mapped into a multi-dimensional space consisting of seven categories. The three “primary” dimensions of the matrix¹; (FD1) object orientation, (FD2) dereification, and (FD3) meta-awareness, represent features of experience differentially targeted by mindfulness approaches from various contemplative, clinical, and psychological frameworks. The secondary dimensions of (Q1) aperture, (Q2) clarity, (Q3) stability, and (Q4) effort are relevant qualities of meditative experience affected by these styles. As all dimensions of the PM are either explicitly or implicitly targeted during meditation, they are considered manipulable by the task-set prescribed for each practice. Different states of mindfulness may be captured in the PM as the variance associated with some location in the matrix space measured for a defined (arbitrary) unit of time, while traits refer to the degree to which individuals vary reliably with respect to these locations. All dimensions of the matrix have purported neurocorrelates, making the PM amenable to neurophenomenological hypotheses.

Shared Contextual Features of Mindfulness

While a comprehensive and nuanced description of the PM is beyond the scope of this article (see Lutz et al., 2015), we will describe features of the matrix necessary for understanding the general analytical underpinnings that guide one of the main purposes of this study — what can be instructed, experienced, and reported on during formal meditation? First, it is important to note that Lutz and collaborators have identified four shared contextual features of mindfulness

---

¹ “FD” refers to “functional dimension” and “Q” refers to secondary qualities as described by Lutz et al. (2015). A fuller definition of these dimensions is provided in a subsequent section of the paper.

that are common to most practices. These include (a) prescribed physical posture, (b) non-aversive affect, (c) axiological framework, and (d) task-set maintenance. Physical posture is prescribed during formal meditation in order to facilitate an embodied orientation conducive to the aims of a specific practice. Non-aversive affect refers to maintaining an accepting, non-judgmental, or otherwise neutral or positive emotional stance toward thoughts and feelings that may arise during formal meditation. Axiology concerns values, goals, and ethical frameworks that inform the practice of mindfulness. These are either explicitly articulated, as in Buddhist or other religious contexts, or left implicit as is often the case in clinical and educational approaches. In most cases, however, axiological frameworks for mindfulness can be broadly conceived as promoting wellbeing or alleviating suffering. Finally, these three global features can be said to constitute a “task-set” which in combination with the instructional variants that distinguish different styles of practice, is to be maintained during formal mindfulness meditation.

Phenomenology

The first category delineated in the PM is object orientation, which refers to the felt sense that one’s attention is directed toward an object or class of objects. Objects can be purposefully selected, as is the case during meditative practices that require deliberate attention to the breath or other physical sensations, or non-selected, such as in instances of mind-wandering. For each primary dimension of the PM, there is a magnitude of cognitive demand needed in order for an individual to maintain a given state. During focused attention (FA) meditation², for instance, the demand placed on object orientation would be much higher than in a spontaneous state such as

---

² Focused-attention (FA) meditation refers to one of two broad families of meditative practices, the other being open-monitoring (OM). A key distinction between FA and OM is object orientation, in which the former is aimed at a specific and selected phenomenal object, while the latter eschews any object selection, relying instead on reflexive awareness of experience. For an in-depth explanation of these practices, please see Lutz, Slagter, Dunne, & Davidson (2008).

mind-wandering, as these styles of meditation feature sustained focal attention on a selected object. The same could be said of dereification, which describes the degree to which mental events are interpreted as either transient or “real.” Dereification demands during FA meditation would be higher than during states such as anxious rumination, as the latter would be characterized by a sense that an imagined or remembered event feels real enough to engender a concomitant physiological response. To increase dereification, FA task-sets often prescribe that meditators reorient their attention to a selected object when a distraction is noticed. This process is often facilitated through prompts to “let go” or label potentially reifying cognitions as “just thoughts.” The final primary dimension, meta-awareness, signifies the ability to deliberately monitor one’s overall experience, including both focal and non-focal features of awareness. During certain FA styles of practice, this feature of cognition is prompted through directions such as “notice when your mind has wandered and return to the breath,” or “just notice” in cases when the practice does not call for deliberate selection of any specific phenomenal object. High levels of meta-awareness characterize open-monitoring (OM) styles of mindfulness, as these practices task meditators within remaining vigilant to anything arising in awareness while simultaneously eschewing focus on a specific object. Accordingly, demands associated with deliberate maintenance of specific meditative states likely varies based on an individual’s degree of meditative experience. However, this has yet to be empirically established.

With respect to secondary qualities, the scope of an individual’s attention during meditative practice is referred to as aperture. An object such as the breath, a standard anchor for attention in many styles of mindfulness meditation, would be considered narrow. In open monitoring (OM) practices, where the entire field of experience is attended to through deliberate release of all object fixation, the aperture would be considered wide. Clarity refers to the felt

degree of vividness or detail experienced with respect to a phenomenological object. An example of a low clarity mental state is daydreaming, whereas during meditation, the clarity of an object might increase due to sustained and more intense focus of attention. Within the PM, the degree to which an experience persists over time is defined as stability. Frequent or lengthy moments of distraction from a meditative task-set could be characterized as having low stability, whereas meditative absorption or states of craving might be emblematic of high magnitude stability. Finally, effort is an indicator of the relative ease or difficulty experienced by an individual attempting to maintain a specific mental state. Novice meditators, as an example, are likely to report more effort in attempting to maintain a meditative task-set when compared to more experienced practitioners.

Based on assumptions derived from neurophenomenological approaches (Davidson & Kazniak, 2015; Lutz & Thompson; Lutz et al., 2015; Varela, 1996) individuals who practice mindfulness should, over time, develop introspective capacities that give them access to phenomenological features of meditative experience that are reportable in a manner congruent with the PM. Using first- and second-person methodologies, these reports could then be mapped to the matrix, and relationships determined with respect to mappings and differences between practice style and experience among meditators. As neuroanatomical correlates of these categorical features have been tentatively proposed, data gathered from PM mappings could then be used as a basis for establishing more finely-grained relationships between meditative experience and empirical research findings in the psychological and neurosciences.

According to Dahl, Lutz, and Davidson (2015), these investigations may shed light on how different styles of meditation affect aspects of neurofunction and cognition, and on how these changes relate to experiences of wellbeing. Additionally, these types of investigations may

be useful for educators interested in implementing, designing, and communicating research on mindfulness in a manner consistent with scientific approaches. Furthermore, knowing that wellness outcomes attributed to mindfulness are likely mediated by contextual factors (Dorjee, 2016), data concerning the axiological frameworks in which mindfulness practices are interpreted could be useful for determining the value of these changes to cognition, affect, and social outcomes among meditators.

The issues identified by mindfulness scholars from multiple disciplines deserve serious consideration among the music education community. For instance, current studies do not account for what musician educators expect from mindfulness, nor on how these expectations mediate the value of outcomes typically associated with the practice. As musicians' concerns likely vary in some ways from other populations, investigating why and how mindfulness might be valuable for this population seems important. There is also no research that has examined the phenomenology of formal meditation among musicians, nor on how these processes differ as a function of practice style, duration, and degree of previous engagement with meditative practice. If mindfulness meditation affects aspects of cognition relevant to enhanced wellbeing, teaching, or performance, then examining how these processes are experienced and evolve during and after formal meditation practice seems warranted. Furthermore, there is still uncertainty regarding the relationship between psychological process relevant to meditation and hypothesized features of anatomical and functional connectivity in the brain. A better understanding of these potential relationships may be useful for generating and disseminating research informed by neurophenomenological methods.

To address the aforementioned limitations, this study examined expectations, formal meditation experiences, and appraisals of first-year college music education students who

participated in a 5-day mindfulness module offered through an introductory course in music education. Addressing Dorjee's (2016) concerns about contextualization, we designed a protocol that accounted for musicians' expectations about mindfulness, as well as how the changes they experienced during formal meditation affected their everyday experiences. Additionally, we used the PM as a potential means for coding psychological processes relevant to formal as well as everyday features of meditative lived-experience. As dimensions of the PM have been tentatively mapped to potential neurocognitive outcomes and mechanisms, our study extends on previous work by Lutz and colleagues by mapping appraisals of mindfulness to findings in the psychological and brain sciences. consistent with developing neurophenomenological hypotheses. Additionally, informed by suggestions that more first-person data is needed in order to validate the proposed phenomenological matrix – specifically among inexperienced meditators (Lutz et al., 2015) – we focused on musicians who reported limited to no previous engagement with mindfulness meditation. Our research questions were as follows:

- (a) How do collegiate music education students who are novice meditators contextualize their engagement with mindfulness with respect to expectations, formal meditation, and perceived benefits during everyday life experiences?
- (b) What psychological features of formal meditative lived-experience are collegiate music education students sensitive to, and how do these evolve as a function of time and practice style? Additionally, how well do these experiences conform to a phenomenological matrix of mindfulness?
- (c) How well do appraisals of mindfulness by musicians accord to the phenomenological matrix and related cognitive and neural mechanisms as hypothesized within the psychological sciences?

Method

Participants in this study ($N = 18$) self-selected from a class of 41 undergraduate music students enrolled in an introductory course in music education at a large (40,000+ students) state university in the Midwest. All participants, seven females and eleven males, were in their first semester of college. Eleven participants identified as instrumentalists and seven as vocalists. One of the participants indicated limited experience with meditation through participation in yoga, however, no participants reported experience with formal mindfulness meditation practice. The class met twice a week for 50-minutes and covered multiple topics relating to music education, including but not limited to pedagogy, policy, curriculum, assessment, and philosophy. All procedures for the study were approved by the lead author's institutional review board (IRB).

All students in the class attended a 50-minute class on teacher wellness delivered by the lead author and course instructor (xxx). Several topics, including mindfulness, time-management, and other stress-reduction practices were covered in the presentation. At the conclusion of the presentation, students were instructed to select either a 5-day self-guided mindfulness module or a 5-day time-log module as part of their requirements for completing the wellness component of the course. The time log module was designed to capture students' actual use of time compared to their desired use of time based on personal values and priorities, and was adapted from a previously designed framework by Madsen and Madsen (1998). Students were informed that data from the mindfulness module might be used in a future study on teacher wellness, consistent with IRB procedures. Additionally, students were informed that assessment for the modules would be based on completion rather than on demonstrating any specific skill or outcome with respect to each module's prescribed tasks. To reduce potential investigator effects, students were informed that the module would be administered, collected, and assessed by a

graduate assistant, who would not share either the content nor name of participants until after final class grades had been entered. Out of 41 students, 18 selected the mindfulness module and 21 selected the time management module.

Students who selected the mindfulness module were provided access to a digital packet that included: (a) a 2-page overview of mindfulness and its potential benefits for musicians; (b) an open-ended questionnaire soliciting information on what participants hoped to gain from participating in the module; (c) links to audio³ of two separate guided mindfulness practices, along with accompanying prompts to journal their experiences; and (d) an open-ended questionnaire soliciting information regarding participants' overall appraisal of their experiences through participating in the module. Tempered by suggestions that research on meditation should account for both the style and duration of any practice employed during an intervention (Dahl, Lutz, & Davidson, 2015), we delimited our investigation to seven sessions of body-scan practices classified as focused-attention (FA) meditation by Lutz et al. (2008), tracked over a period of 5 consecutive days. For the first two days of the module, students participated in two, 5-minute, seated mindful body-scans, which were supposed to take place once in the morning and then once at night. They were also prompted to notice when their minds began to wander from the intended focus of attention and to label distractions with terms such as “thinking” and “wandering,” rather than engage in rumination or judgmental appraisals. For the final three days, students were again asked to engage in a mindful body scan, however, the second scan was 20-minutes long and required students to lay down on a mat or other comfortable surface. The second practice also guided students to notice their distractions but did not prescribe a particular

---

³ Five-minute body scan: http://marc.ucla.edu/mpeg/01_Breathing_Meditation.mp3

Twenty-minute body scan: https://health.ucsd.edu/av/mindfulness/20_Min_Body_Scan3.mp3

labeling strategy. Due to the self-guided nature of the module, and because participants could engage in the prescribed practices either at home, school, or other locations, it was not feasible to strictly verify whether each student completed all practices as prescribed. However, participants were encouraged to write freely about any difficulties they may have encountered while attempting to complete the module.

Consistent with the three primary functional dimensions of mindfulness as described by Lutz et al. (2015), the body-scans specified an object orientation (FD1), in this case, physical sensations, along with prompts for engaging in meta-awareness through noticing distractions (FD3). Dereification (FD2) was prescribed through prompts to re-engage with meditative objects after noticing distractions in both protocols, and facilitated in the 5-minute version through a thought-labeling strategy. Additionally, in accordance with shared contextual feature of mindfulness as described by Lutz and colleagues, both mindfulness protocols included: (a) prescribed physical postures; (b) prompts to maintain a non-aversive disposition to experience; and (c) instructions to maintain a meditative task-set. Axiological concerns were framed first by the introductory lecture dealing with mindfulness and wellness, and second by the two-page packet describing benefits of mindfulness for musicians. Furthermore, the open-ended questionnaire allowed each participant to articulate specific expectations for the mindfulness unit, helping to delineate individual axiological concerns. The delivery of this type of introductory material, followed by the opportunity for meditators to describe goals and expectations, is a common feature of many mindfulness delivery protocols and would be considered ecologically valid for this setting (Kabat-Zinn, 1994).

Digital module submissions served as our primary source of data. A grounded theory approach (Patton, 2003) informed our investigation of responses to the open-ended question

regarding participants' expectations for engaging in the mindfulness module. Previous investigations on the phenomenology of formal meditation using grounded theory have been conducted by Kerr, Josyula, and Littenber (2011) as well as Garrison et al. (2013). Using an iterative process, the two primary authors independently examined responses to identify recurring words, concepts, and phrases, until we could agree on a final coding scheme. We then applied the final coding scheme to all participant entries, and worked toward resolving any differences. All coding differences were resolved. Table 1 includes a list of final themes and sample responses. After the initial coding phase, we investigated participants' responses to a prompt asking them to describe any physical sensations, emotions, impressions, or thoughts that arose during the five prescribed practice periods. These five periods included the evening session of both sets of initial, 5-minute body scans, along with each of the three subsequent 20-minute scans. Participants were asked to write down their experiences immediately after each meditation period in order to mitigate any potential effect from memory lapses. The journaling prompt we used is consistent with prompts provided in similarly structured mindfulness-based interventions (Kerr, Josyula, & Littenber, 2011). However, we did not prompt participants to provide information specific to categories of the PM, as part of the aims of this study was to examine what if any categories of the PM novice meditators might be sensitive to in a more naturalistic setting.

To initiate procedures for coding journal entries from the formal meditation prompt, I (FMD) began by providing two co-authors, who also served as coders, with a copy of Lutz et al.'s (2015) article describing the phenomenological matrix of mindfulness (PM) in detail. Along with the article, I provided each author with a synthesis of the PM's dimensional features, informed by my conversation with one of the lead authors of the paper. I also provided the

authors with four randomly selected participant entries so that each could orient themselves to the matrix and begin practicing the coding process. All authors then independently coded the responses using a deductive content analysis approach, along with an open code for entries that did not conform to the matrix. Complete statements served as our basic unit of analysis, however, each statement could receive multiple codes, as several dimensions of the PM might be referenced in one statement. Coders, however, were instructed to label statements based only on explicit rather than implicit references to dimensions of the PM. So for instance, while the dimension of dereification might be implied in a statement in which a participant describes a clear and consistent orientation to an object such as the breath, the codes for object orientation, clarity, and stability would be assigned to the statement, but not dereification. This process facilitated capturing only the most salient aspects of participants' meditative experience, such that any inflated accordance with the matrix could be avoided.

After each author coded the entries independently, we met to discuss results of the coding, refine our understanding of the matrix, and propose strategies for improving agreement during the next round of coding. We then independently coded all 14 of the remaining module entries, resulting in 529 codes assigned to the remaining 247 statements. After the second round of coding was complete, I consulted with co-authors to determine their general assessment of the efficacy of the matrix, examined further areas of difficulty and disagreement, and noted suggestions for improving coding reliability in future studies.

As the authors agreed on the general usefulness of the PM as a deductive coding framework, our next step was to assess inter-rater reliability measures for categories of the PM as well as the open code. Based on considerations and procedures delineated by Campbell, Quincy, Osserman, and Pedersen (2013), we calculated the average pair-wise agreement for phrases

attributed to each category of the matrix. All categories demonstrated adequate reliability, ranging from a minimum of 78.42% to a maximum of 91.60%, and were retained for further analysis. Then, based on procedures adapted from Frewen, Lundberg, Mackinley, and Wrath (2011), we identified 516 instances in which at least two out of the three coders agreed on categorical classifications of a statement, and used these statements as a basis for calculating descriptive statistics relating to the coding scheme. Similar strategies using summary statistics with qualitative data to describe sensitivity to categories of a coding scheme have been employed by Miksza and Berg (2013), as well as Powell (2016).

Following the calculation of summary statistics, the two lead authors independently coded each of the 247 statements into one of three categories, in-state, other state, or not applicable, reflecting the more global measure of task-set maintenance. “In-state” (IS) statements were those in which participants described a mental state congruent with maintenance of the task-set as prescribed by each specific mindful body-scan. Statements classified as “other state” (OS) described states incongruent with the body-scan, for instance, rumination, mind-wandering, or experiences of pervasive negative affect. Descriptions not-addressing experiences that occurred during periods of meditation were classified as not-applicable (NA). All coding discrepancies were reconciled before summary statistics were calculated. In the final stage of the analysis, the two lead authors examined appraisals of the mindfulness module provided by participants at the end of the five-day period. For each statement, we derived a theme for the appraisal, then noted its valence as well as whether it accorded to dimensions of the matrix. For instance, the overall theme of one participant’s response was improved awareness during conversations with family, due primarily to the ability to notice and let go of intrusive thoughts. In this case, we classified the theme as positively valenced, and the attribution as consistent with

the dereification (FD2) and meta-awareness (FD3) categories of the matrix. After independently coding all statements, we met to resolve differences, and then calculated summary statistics with respect to valence as well as accordance with the matrix.

Results

Themes and sample quotes from participants' expectations of engaging in the mindfulness module are provide in Table 1, addressing aspects of our first research question. These include four general themes centered on management of stress and anxiety, improved focus and mindfulness, improved relationships, and personal growth and motivation. Within the theme of management of stress and anxiety, participants expressed hopes that they would feel less overwhelmed, experience less judgmental thoughts about themselves and others, and experience less general anxiety. These aspirations were further contextualized to reflect situations in which music students typically experience undesirable mental and emotional states, including academic work, music practice and performance, and social settings. For the theme of improved focus and mindfulness, participants expressed desires to increase their ability to focus during musical and academic tasks, and some hoped to be more present in their everyday lives. Mindfulness was also seen as a means to relax more among peers and family in the third theme, and as a way of "stepping back" in order to develop more meaningful goals in the fourth theme. In summary, participants expressed a wide range of expectations for reducing undesired mental states and improving specific cognitive capacities (i.e., attention and awareness), suggesting the manifestation of an explicit and contextualized axiological framework relating to the everyday life of typical college music students.

To address our second research question, results for our investigation of meditative experience during the 5-day module centered on two concerns; (a) the efficacy of the matrix as a

means for classifying participants' lived experiences of formal meditation, and (b) classification of said experiences with respect to both discrete as well as global features of the PM. Concerning efficacy, the authors agreed on the general usefulness of the matrix for classifying meditative experiences among the sample of novice meditators represented in the study. More specifically, all dimensions of the matrix were represented in participants' aggregate commentaries, and could be used to classify both in-state as well as other mental states. Also of relevance, participants routinely reported on at least 2-3 qualities of the matrix per statement. Overall ratios for discrete coding of PM and open code categories indicated that object orientation (FD1) (26.55%) and meta-awareness (FD3) (22.09%) were most frequently represented within participant statements, followed closely by effort (Q4) (14.92%) and non-task related comments (O) (14.34%). Aperture (Q1) (2.33%) and dereification (F3) (3.10%) were the least represented dimensions of the PM (see Table 2 for all summary statistics). Over the five-day period, a notable increase in the mean for comments regarding effort coincided with the third day of the module, in which participants were asked to increase the duration of their meditation practice from 5 to 20 minutes (see Table 2). Trend lines for means from both in-state (IS) and other-state (OS) related comments paralleled each other until the third day, followed by a slight downward trend for OS and slight upward trend emerged for IS. More notably, means for non-task related comments declined steadily over the 5-day period (see Figure 2).

For comments centering on object orientation, participants often clearly described attending to targeted physical sensations and areas of their bodies as prompted in both the 5-minute body scan, which focused around more general sensations, and the 20-minute scan, which moved from general sensations to focus on specific body parts (e.g., left toe, right index finger). For example, on day 1, one participant commented, "I found myself being more aware of

physical sensations of my body, like how the air is cooler when breathing in, but warmer when breathing out, and how it pushes back up toward my feet.”⁴ When commenting on meta-awareness, participants described successful attempts at task re-engagement after noticing their minds had wandered, “Multiple times I found myself wondering when it was going to be over, though I’d quickly turn my attention back to what I was supposed to be focused on.”

Unsuccessful attempts were noted as well, “I would be thinking about something and then realize minutes had gone by while I was distracted and I had missed parts of what was being said.”

Effort also played a prominent role in participants’ descriptions of their meditative states. During day three, one participant noticed it was becoming less difficult to stay in-task, “It was easier in this exercise to guide my mind and thinking back to what it was supposed to be on when it wandered.” However, on the same day, another participant commented, “I found it much harder to concentrate for this whole 20-minute exercise than the last one, which was only five minutes.” Addressing additional aspects of our first research question, comments in the open-code category centered mostly around evaluations of the sessions, “Today the exercise was slightly less effective,” along with descriptions on how sessions affected participants’ daily experiences, “I felt more calm and prepared to deal with the day’s activities than I did normally, for maybe 45 minutes after the end of the exercise.”

Comments centering on dereification occurred infrequently and were rarely indicative of successful dereification. For instance, one participant could not let go of thoughts about school, and the accompanying anxiety, “While I intended to make the final day of this exercise the most successful in terms of focus, I found myself actually becoming more distracted as I realized that

---

⁴ We note that sample comments can imply or explicitly include more than one dimension of the PM, however, we provide them here as examples of when a specific dimension seemed more prominent or central to the statement than others.

the anxieties of school were rapidly approaching.” Another was distracted about an upcoming event, “My mind kept flowing to the upcoming basketball game tonight with excitement.” Statements about aperture, which were also infrequent, referenced the ability to perceive sensations in very specific parts of the attentional field. For example, one participant noted, “During the practice, I actually felt my breath in nostrils and throat in ways I’ve never felt before.” Others were less successful, “I would try to focus on my left toes for example, but I don’t even really know what it means to or what it would feel like to heighten my perception of my toes.” There were a moderate number of comments on clarity, as well as stability. One participant noted an increase in clarity after the second day of engaging in the module, “I increased my physical awareness, like noticing the sound of my breath, which allowed me to connect to my practice in a deeper way.” Another participant was unable to maintain a meditative state during the longer, 20-minute version of the body scan, “I also found that each time I would get closer to being aware and in the moment, the narrator would speak and I’d lose focus again, listening to what he was saying.” Overall, most participants were able to report both in-state and other-state related information throughout the five day-period, providing a rich tapestry of detail about what aspects of the matrix they were most sensitive to, as well as how these changed over time.

Our third research question was designed to capture how well appraisals of the mindfulness module accorded with the matrix, along with the potential neurocognitive underpinning of these appraisals. Results from the last step of our analysis indicated that all participants attributed at least some level of positive change to their general wellness from participating in the module. However, at least three participants also reported negligible or no changes with respect to some dimension of their anticipated experience. Out of the 41 codes

assigned to attribution statements, 24% ($n = 10$) referred to dereification as well as the open code ($n = 10$). Object orientation, aperture, and clarity were the least represented PM dimensions in statements, with only 5% ($n = 2$) attributable to each. Other dimensions represented in the statements included stability at 20% ($n = 8$), meta-awareness at 15% ($n = 6$), and effort (7%, $n = 3$). Within the open code, attributions to wellness often referenced physiological changes due to breathing, experiences of non-aversive affect, and to no specific dimension of the matrix. A summary of perceived wellness outcomes, along with sample statements, are included in Table 3. We also provide potential cognitive and neuroscientific mechanisms of statements related to matrix dimensions based on extensive literature reviews by Lutz et al. (2015), Dahl, Lutz, and Davidson (2015), as well as the authors.

Discussion

In this study, we examined undergraduate music education students' expectations, meditative experiences, and appraisals of a 5-day, self-guided focused attention mindfulness module offered through an introductory music education course. Before engaging in the module, students expressed hope that their meditation practice would help them manage stress and anxiety, improve their focus and relationships, and support their personal growth and motivation. Some also hoped that they would become more generally mindful in their everyday lives. These expectations were further contextualized to reflect situations common to the lives of collegiate music students, including academics, music practice, and music performance. With respect to lived experiences of formal meditation, we found that even without explicit prompting, approximately 86% percent of coded phrases reflected aspects of experience that could be mapped within a phenomenological matrix of mindfulness (Lutz et al., 2015). Sensitivity to object orientation and meta-awareness seemed most prevalent among these phrases, while

dereification and aperture appeared less frequently. There was also an increase in phrases regarding effort at the mid-point period (third day) of the module, and increases in statements reflecting successful maintenance of the meditative tasks set from the third to final day of the module. Notably, almost all participants attributed mindfulness to improving their general wellness, with dereification, breathing, and non-aversive affect frequently mentioned as key factors leading to these improvements.

Dorjee's (2016) counsel to examine the role of contextual meaning-making as a mediator of potential outcomes was one of the primary aims of this study. Our analysis of this factor suggested that participants expected both general as well as academic and music-specific benefits from their practice, and would relate and evaluate perceived cognitive, affective, and social outcomes to these domains of experience. Similar to previous qualitative work by Pepping, Walters, Davis, and Donovan (2016), participants in this study hoped for relief from emotional distress, better focus, and improved relationships through practicing mindfulness. However, consistent with concerns typical for this demographic, music students also wanted these improvements to alleviate performance anxiety, enhance their concentration during academic work, improve their practice and performance, and help them get along better with peers. Appraisals of the mindfulness module were also largely framed with musical concerns in mind, with students crediting improvements in focal stability, dereification, and meta-awareness to improved academic, artistic, and personal outcomes. Further evidence of contextualization was also apparent in reports of meditative experience after each of the designated formal practice periods. For instance, even though daily response prompts were intended to solicit information about formal meditative experience, rather than everyday life, several participants chose to frame

how perceived changes in focus, affect, or general mindfulness during formal meditation affected their general mood, academic and musical work, and relationships.

The issue of contextualization remains a largely unexamined area in the field of mindfulness. Yet, it was clear that perceived changes to cognition, affect, and relationship quality as experienced by participants in this study were frequently assessed in relationship to some personally relevant axiological goal. This finding suggests the need for more research, along with intervention strategies, that account for how mindfulness practices are perceived by practitioners with respect to meaning and wellness. As previously mentioned, individuals engage in mindfulness for a wide range of purposes and in various settings. An athlete may be troubled by their inability to let go of negative thoughts and may practice dereification to improve performance. Couples dealing with relationship issues might find themselves practicing focused attention to engage more mindfully with their partners. Or, like one of the musicians in this study, a gradual increase in mindful awareness may reveal previously unnoticed areas of physical tension during practice, which now conscious, might be purposefully addressed to improve performance. Understanding these concerns, both a priori and as a means of prescribing and assessing the efficacy of specific mindfulness interventions, seems critical to developing a deeper understanding of the ways in which personal meaning and specific practices interact to promote wellness. Current empirical approaches toward mindfulness, which often rely exclusively on decontextualized, third-person data for describing these dynamics, could be greatly enhanced by the inclusion of first-person methods similar to the ones employed here. Moreover, interventions could be more clearly targeted and refined through the examination of axiological concerns.

Along with understanding the role of axiology and context on expectations, experiences, and appraisals of mindfulness, we also sought to document what aspects of formal meditative experience seemed most salient to meditation-naïve music students, and how these affected relevant dimensions of cognition. Specifically, we used a phenomenological model of meditation that identifies features of experience targeted by a wide-range of mindfulness practices, and that is theoretically compatible with **neuroscientific investigation**. Our analysis of responses suggest that contrary to predictions by Lutz et al. (2015), this particular group of novice meditators could indeed report on fine-grained features of their phenomenological experience in a manner congruent with all dimensions of the matrix. Not surprisingly, approximately 49% of phrase codes concerned object orientation and meta-awareness, which were features of experience deliberately instructed and reinforced throughout the guided meditations. However, this did not occur for dereification, which was similarly instructed. With respect to secondary qualities, effort and stability accounted for 25% of overall assigned codes. This result was likely driven by the sudden increase in time demands that occurred on the third day of the module, when meditation periods increased from five to twenty minutes.

Our findings suggest that the matrix was useful for coding relevant dimensions of meditative experiences among participants in our study. Of note, while only three participants commented on every dimension of the matrix, most participants commented on at least 5 out of the 7 categories of the PM at some point throughout the five-day period. Dereification was the most frequently omitted dimension, followed by aperture. We also found that roughly 62% of matrix-related statements referenced between two to three dimensions, suggesting a level of phenomenological depth that was unexpected considering participants' relative inexperience with formal meditation (Lutz et al., 2015). The general absence of dereification as a reported

dimension of formal meditative experience deserves further exploration. Dereification and related processes (e.g., decentering) have been proposed as potentially strong causal mechanisms of wellbeing among meditators (LeBois et al., 2015). That it was mostly absent from reports could suggest that dereification was either not a salient or familiar dimension of experience for this group of novice meditators. However, as the process was commonly referenced as a means to wellbeing among participants' overall appraisals of the module, its relative absence during meditative practice may be more likely due to saliency than familiarity. It is also possible that dereification is a more meaningful facet of wellbeing when contextualized through everyday experience, a sentiment reflected in several of the appraisal statements.

The relative usefulness of the PM for coding meditative experience within our sample suggests a number of interesting implications. One of these might be the ability to provide a common framework for investigating and comparing the effects of various meditation practices on musicians. As Lutz and colleagues point out, most mindfulness and related meditative practices either implicitly or explicitly target dimensions of experience as delineated by the PM. In our study, we were able to develop an initial profile of how an FA practice, such as the body-scan, might be experienced by novice musician meditators over a five-day period. We noted, for instance, a noticeable increase in sensitivity to effort between the second and third day of formal meditation, when task-demands increased. However, this factor decreased to levels similar to the second day of meditation after the third day, perhaps suggesting some level of acclimation by participants. We also note a general increase in the meditative task-maintenance trend line from the first through the fifth day, despite increased task demands.

Expanding on our protocol, we may be able to compare changes to these features of cognition through assigning individuals to different practices, and use both narrow and global

properties of the PM as indicators of potential state as well as trait changes. These analyses could be facilitated with the addition of psychometric measurements to the dimensional and aggregate properties of the PM, and measured over longer period times. Furthermore, as the dimensions highlighted are also putatively linked to neuroscientific findings on brain function and connectivity, continuing efforts could be made in examining if and how these perceived changes in cognition related to neurocognitive features of the matrix. Results from these investigations might be useful for those interested in neurophenomenological approaches to meditation, which among other advantages provides a framework for reporting about meditative experiences in a way that honors the potential of both first- and third-person perspectives. To this end, we provide a list of cognitive outcomes and neural mechanisms that may potentially relate to appraisal experiences among participants, along with supporting literature (see Table 3).

Our final question involved examining participants' appraisals of how mindfulness affected their everyday life. Here again, we found that most attributions accorded to dimensions of the matrix, regardless of whether they were positive or negative. Dereification followed by stability featured most prominently among attributions that aligned with the PM. In previous studies, similar acts of successful dereification during meditation have been linked to decreases in stress (Lebois et al., 2015). With respect to stability, we were unable to locate any empirical study on meditation that directly links this feature of experience to a specific wellness outcome. However, improvements in the ability to sustain goal-directed attention during musical and academic tasks seemed a common theme among our participants. We suggest two possible reasons this specific dimension of improvement may have resulted in feelings of wellbeing. The first is self-efficacy. It is likely that the ability to improve performance on selected tasks due to attentional stability may have resulted in improved feelings of control, which in other studies,

has been shown to relate to reductions of self-doubt about task performance (McCormick & McPherson, 2013). Another possibility is that attentional stability during FA meditation reduced the amount of time spent in ruminative or mind-wandering states, both of which have been associated with negative wellness outcomes in other studies (Simon & Egström, 2015). Moreover, while the methods used in this study are insufficient for establishing the presence of a trait change, extending the duration of the protocol, along with including more refined and frequent measurements of dimensional qualities, may provide insights regarding this kind of dispositional quality.

We also note the presence of several wellness attributions that did not accord to dimensions of the matrix. These included decreases in stress attributed to changes in breathing patterns, the ability to carry over the maintenance of non-aversive affect during everyday experiences, and general changes in mood not tied to any specific dimension. Aspects of breathing as well as maintenance of non-aversive affect accord to the shared contextual factors of mindfulness as defined by Lutz and colleagues, and while not directly tied to the discriminatory role of the PM in differentiating between practices and levels, still warrant further investigation as potential mechanisms for mindfulness-based wellness. Finally, we note that at least five participants found limited to no value from engaging in mindfulness. The most common attribution for this result were a sense that changes to experience from formal meditation failed to transfer to everyday life, and frustration with the overall difficulty of the prescribed practices. These findings, while possibly due to the limited time in which participants engaged in practice, might also suggest the need for more studies that account for limitations of mindfulness with respect to promoting wellbeing. The authors agree with the call by other scholars that a more nuanced approach to exploring both the benefits and potential pitfalls of mindfulness is

warranted in light of recent concerns about the practice being promoted as a panacea for wellness (Van Dam et al., 2018). Indeed, one of the overall goals of this study was to initiate a methodological approach that might allow for these more fine-grained and contextualized investigations of the practice.

The findings in this study are not intended to generalize to any broader population, rather, they provide a profile of what was experienced by a group of collegiate musicians before, during, and after they engaged in an ecologically valid mindfulness protocol, limited to two styles of FA meditation. What our interpretations of these experiences might imply with respect to the meditating role of context, phenomenological acuity during formal meditation, and appraisals of the benefits and limitations of specific practices may be useful for music educators interested in investigating or implementing mindfulness with musicians. Of note, we highlight the very prominent role that personal values and goals played in mediating experiences both during and after formal meditation, and of the usefulness of the PM as a means for coding dimensions of experience targeted by various styles of mindfulness practice. Future investigations and implementations of mindfulness protocols should include opportunities for musician participants to articulate what they expect to gain from mindfulness, and the degree to which these expectations were met through specific practices and their according changes in affect and cognition, specifically during everyday experiences. We also suggest the use of the PM as a means for coding formal meditation experiences, and propose that future studies account for variations within PM dimensions due to meditation style and practice experience. These types of investigations may be useful for prescribing specific practices based on individually relevant goals, and provide a means for describing more fine-grained relationships between subjective

and objective features of cognition in service of a more nuanced understanding of mindfulness as experienced and as observed within the psychological sciences.

References

- Brefczynski-Lewis, J. A., Lutz, A., Schaefer, H. S., Levinson, D. B., & Davidson, R. J. (2007). Neural correlates of attentional expertise in long-term meditation practitioners. *Proceedings of The National Academy of Sciences*, *104*, 11483-11488. <https://doi.org/10.1073/pnas.0606552104>
- Brewer, J. A., Worhunsky, P. D., Gray, J. R., Tang, Y. Y., Weber, J., & Kober, H. (2011). Meditation experience is associated with differences in default mode network activity and connectivity. *Proceedings of the National Academy of Sciences*, *108*, 20254-20259. <https://doi.org/10.1073/pnas.1112029108butl>
- Butler, A. C., Chapman, J. E., Forman, E. M., & Beck, A. T. (2006). The empirical status of cognitive-behavioral therapy: A review of meta-analyses. *Clinical Psychology Review*, *26*, 17-31. <https://doi.org/10.1016/j.cpr.2005.07.003>
- Castellanos, F. X., Sonuga-Barke, E. J., Milham, M. P., & Tannock, R. (2006). Characterizing cognition in ADHD: Beyond executive dysfunction. *Trends in Cognitive Sciences*, *10*, 117-123. <https://doi.org/10.1016/j.tics.2006.01.011>
- Campbell, J. L., Quincy, C., Osserman, J., & Pedersen, O. K. (2013). Coding in-depth semistructured interviews: Problems of unitization and intercoder reliability and agreement. *Sociological Methods and Research*, *42*, 294-320. <https://doi.org.proxyiub.uits.iu.edu/10.1177/0049124113500475>
- Cohen, R., Lohr, I., Paul, R., & Boland, R. (2001). Impairments of attention and effort among patients with major affective disorders. *The Journal of Neuropsychiatry and Clinical Neurosciences*, *13*(3), 385-395. doi/abs/10.1176/jnp.13.3.385
- Corbetta, M., & Shulman, G. L. (2002). Control of goal-directed and stimulus-driven attention in

- the brain. *Nature Reviews Neuroscience*, 3(3), 201. <http://dx.doi.org/10.1038/nrn755>
- Dahl, C. J., Lutz, A., & Davidson, R. J. (2015). Reconstructing and deconstructing the self: cognitive mechanisms in meditation practice. *Trends in Cognitive Sciences*, 19(9), 515-523. <https://doi.org/10.1016/j.tics.2015.07.001>
- Davidson, R. J., & Kaszniak, A. W. (2015). Conceptual and methodological issues in research on mindfulness and meditation. *American Psychologist*, 70, 581. doi: 10.1037/a0039512
- Diaz, F. M. (2013). Mindfulness, attention, and flow during music listening: An empirical investigation. *Psychology of Music*, 41, 42-58. <https://doi.org.proxyiub.uits.iu.edu/10.1177/0305735611415144>
- Diaz, F. M. (2018). Relationships among meditation, perfectionism, mindfulness, and performance anxiety among collegiate music students. *Journal of Research in Music Education*, 66, 150–167. <https://doi.org/10.1177/0022429418765447>
- Dorjee, D. (2016). Defining contemplative science: The metacognitive self-regulatory capacity of the mind, context of meditation practice and modes of existential awareness. *Frontiers in Psychology*, 7, 1788. <https://doi.org/10.3389/fpsyg.2016.01788>
- Dunne, J. D. (2015). Buddhist styles of mindfulness: A heuristic approach. In B. D. Ostafin, M. D. Robinson, & B. P. Meier (Eds.), *Handbook of mindfulness and self-regulation* (pp. 249-270). New York, NY: Springer.
- Farnsworth-Grodd, V. A. (2012). *Mindfulness and the self-regulation of music performance anxiety* (Doctoral dissertation). University of Auckland, New Zealand.
- Frewen, P., Lundberg, E., MacKinley, J., & Wrath, A. (2011). Assessment of response to mindfulness meditation: meditation breath attention scores in association with subjective measures of state and trait mindfulness and difficulty letting go of depressive

- cognition. *Mindfulness*, 2, 254-269. <https://doi.org/proxyiub.uits.iu.edu/10.1007/s12671-011-0069-y>
- Frith, C. (2002). How can we share experiences?: Comment from Chris Frith. *Trends in Cognitive Sciences*, 6, 374. [https://doi.org/10.1016/S1364-6613\(02\)01978-2](https://doi.org/10.1016/S1364-6613(02)01978-2)
- Garrison, K., Santoyo, J., Davis, J., Thornhill, T., Kerr, C., & Brewer, J. (2013). Effortless awareness: Using real time neurofeedback to investigate correlates of posterior cingulate cortex activity in meditators' self-report. *Frontiers in Human Neuroscience*, 7, 440. <https://doi.org/10.3389/fnhum.2013.00440>
- Kabat-Zinn, J. (1994). *Wherever you go, there you are: Mindfulness meditation in everyday life*. New York: Hyperion.
- Kerr, C. E., Josyula, K., and Littenberg, R. (2011). Developing an observing attitude: an analysis of meditation diaries in an MBSR clinical trial. *Clinical Psychology and Psychotherapy*, 18, 80–93. doi: 10.1002/cpp.700
- Lebois, L. A., Papies, E. K., Gopinath, K., Cabanban, R., Quigley, K. S., Krishnamurthy, V., ... & Barsalou, L. W. (2015). A shift in perspective: Decentering through mindful attention to imagined stressful events. *Neuropsychologia*, 75, 505-524.
- Lutz, A., Brefczynski-Lewis, J., Johnstone, T., & Davidson, R. J. (2008). Regulation of the neural circuitry of emotion by compassion meditation: Effects of meditative expertise. *PlosOne*, 3, e1897. <https://doi.org/10.1371/journal.pone.0001897>
- Lutz, A., Lachaux, J. P., Martinerie, J., & Varela, F. J. (2002). Guiding the study of brain dynamics by using first-person data: Synchrony patterns correlate with ongoing conscious states during a simple visual task. *Proceedings of the National Academy of Sciences*, 99, 1586-1591. <https://doi-org.proxyiub.uits.iu.edu/10.1073/pnas.032658199>

- Lutz, A., Jha, A. P., Dunne, J. D., & Saron, C. D. (2015). Investigating the phenomenological matrix of mindfulness-related practices from a neurocognitive perspective. *American Psychologist*, 70, 632. <http://dx.doi.org/10.1037/a0039585>
- Lutz, A., Slagter, H. A., Dunne, J. D., & Davidson, R. J. (2008). Attention regulation and monitoring in meditation. *Trends in Cognitive Sciences*, 12, 163-169.
<http://dx.doi.org/10.1016/j.tics.2008.01.005>
- Lutz, A., Slagter, H. A., Rawlings, N. B., Francis, A. D., Greischar, L. L., & Davidson, R. J. (2009). Mental training enhances attentional stability: Neural and behavioral evidence. *Journal of Neuroscience*, 29, 13418-13427.
<https://doi.org/10.1523/JNEUROSCI.1614-09.2009>
- MacCoon, D. G., Imel, Z. E., Rosenkranz, M. A., Sheftel, J. G., Weng, H. Y., Sullivan, J. C., ... & Lutz, A. (2012). The validation of an active control intervention for Mindfulness Based Stress Reduction (MBSR). *Behaviour Research and Therapy*, 50, 3-12.
<https://doi.org/10.1016/j.brat.2011.10.011>
- Madsen, C. K., & Madsen, C. H. (1998). Teaching/discipline: A positive approach for educational development. Raleigh, NC.
- Mason, M. F., Norton, M. I., Van Horn, J. D., Wegner, D. M., Grafton, S. T., & Macrae, C. N. (2007). Wandering minds: The default network and stimulus-independent thought. *Science*, 315, 393-395. <http://dx.doi.org/10.1126/science.1131295>
- McCormick, J., & McPherson, G. (2003). The role of self-efficacy in a musical performance examination: An exploratory structural equation analysis. *Psychology of Music*, 31, 37-51. <https://doi.org/10.1177/0305735603031001322>
- Miksza, P., & Berg, M. H. (2013). A longitudinal study of preservice music teacher

- development: Application and advancement of the Fuller and Brown teacher-concerns model. *Journal of Research in Music Education*, 61, 44-62.
<https://doi.org.proxyiub.uits.iu.edu/10.1177/0022429412473606>
- Patton, M. Q. (2001). *Qualitative research and evaluation strategies* (3rd ed.). Thousand Oaks, CA: Sage.
- Pace, T. W., Negi, L. T., Sivilli, T. I., Issa, M. J., Cole, S. P., Adame, D. D., & Raison, C. L. (2010). Innate immune, neuroendocrine and behavioral responses to psychosocial stress do not predict subsequent compassion meditation practice time. *Psychoneuroendocrinology*, 35, 310-315. <https://doi.org/10.1016/j.psyneuen.2009.06.008>
- Pepping, C. A., Walters, B., Davis, P. J., & O'Donovan, A. (2016). Why do people practice mindfulness? An investigation into reasons for practicing mindfulness meditation. *Mindfulness*, 7, 542-547. <https://doi-org.proxyiub.uits.iu.edu/10.1007/s12671-0160490-3>
- Powell, S. R. (2016). The influence of video reflection on preservice music teachers' concerns in peer-and field-teaching settings. *Journal of Research in Music Education*, 63, 487-507. <https://doi.org/10.1177/0022429415620619>
- Ramler, T. R., Tennison, L. R., Lynch, J., & Murphy, P. (2016). Mindfulness and the college transition: The efficacy of an adapted mindfulness-based stress reduction intervention in fostering adjustment among first-year students. *Mindfulness*, 7, 179-188. <https://doi.org.proxyiub.uits.iu.edu/10.1007/s12671-015-0398-3>
- Shapiro, S. L., Schwartz, G. E., & Bonner, G. (1998). Effects of mindfulness-based stress reduction on medical and premedical students. *Journal of Behavioral Medicine*, 21, 581-599. <https://doi-org.proxyiub.uits.iu.edu/10.1023/A:1018700829825>

- Simon, R., & Engström, M. (2015). The default mode network as a biomarker for monitoring the therapeutic effects of meditation. *Frontiers in Psychology*, 6, 776.
- Tang, Y. Y., Hölzel, B. K., & Posner, M. I. (2015). The neuroscience of mindfulness meditation. *Nature Reviews Neuroscience*, 16, 213. <http://dx.doi.org/10.1038/nrn3916>
- Teasdale, J. D., Segal, Z., & Williams, J. M. G. (1995). How does cognitive therapy prevent depressive relapse and why should attentional control (mindfulness) training help? *Behaviour Research and Therapy*, 33, 25-39. [http://dx.doi.org/10.1016/0005-7967\(94\)E0011-7](http://dx.doi.org/10.1016/0005-7967(94)E0011-7)
- Travis, F., & Shear, J. (2010). Focused attention, open monitoring and automatic self transcending: categories to organize meditations from Vedic, Buddhist and Chinese traditions. *Consciousness and Cognition*, 19, 1110-1118. <https://doi.org/10.1016/j.concog.2010.01.007>
- Van Bockstaele, B., Verschuere, B., Tibboel, H., De Houwer, J., Crombez, G., & Koster, E. H. W. (2014). A review of current evidence for the causal impact of attentional bias on fear and anxiety. *Psychological Bulletin*, 140, 682-721. <http://dx.doi.org/10.1037/a0034834>
- Van Dam, N. T., van Vugt, M. K., Vago, D. R., Schmalzl, L., Saron, C. D., Olendzki, A., . . . Meyer, D. E. (2018). Mind the hype: A critical evaluation and prescriptive agenda for research on mindfulness and meditation. *Perspectives on Psychological Science*, 13, 36-61. <https://doi.org/10.1177/1745691617709589>
- Van Leeuwen, S., Singer, W., & Melloni, L. (2012). Meditation increases the depth of information processing and improves the allocation of attention in space. *Frontiers in Human Neuroscience*, 6, 133. <https://doi.org/10.3389/fnhum.2012.00133>

Varela, F. J. (1996). Neurophenomenology: A methodological remedy for the hard problem.

Journal of Consciousness Studies, 3(4), 330-349.

Table 1. Themes and Sample Quotes for Student Expectations about Mindfulness Unit

<i>THEMES</i>	<i>EXAMPLE</i>
Management of Stress and Anxiety	
Overwhelm	“I personally get very stressed out when I have a lot on my plate, and I am terrible at managing life when I have a lot of things to get done. That being said through this unit I want to get better at finding ways to not be stressed.”
Judgmental thoughts (self)	“I hope that I am able to find a way to relax and manage anxiety in many aspects of my life, but primarily performance-based and academically-based anxiety ... I often become my own worst critic and as soon as I miss a note or play something different from what I intended, my mind lingers on this moment in general.”
Judgmental thoughts (others)	“I often feel overwhelmed by the fear of judgment by others, although I know that this is an irrational concern. I believe that this unit will help to alleviate some of this stress by allowing me to become more mindful of these issues.”
Generalized	“I suffer from overall anxiety. I experience performance anxiety, but also social anxiety. I often feel overwhelmed when I am performing, in social situations, and in life in general. I hope this exercise will be another way for me to stray away from these anxieties.”

Table 1 (cont). Themes and Sample Quotes for Student Expectations about Mindfulness Unit

<i>THEMES</i>	<i>EXAMPLE</i>
Improved Focus and Mindfulness General Focus Mindfulness	“I hope to gain a better focus in managing my time. Perhaps doing these exercises before my homework or before my practice will help me focus and be more on task while doing these activities.” “Hopefully, through participating in this unit I’ll be able to stay more in touch with the present moment.”
Mindfulness in Relationships	“I hope to relax more in my relations with others that stress me, whether these be peers, parents, church members, or others.”
Personal Growth and Motivation	“Through this project, I want to be able to take one big step back and look at the big picture, because right now, it feels like I am doing random tasks without a goal in sight.”

Table 2 Sums, Means, and Ratios (in %) of Assigned Codes over 5-day Module

	Day 1			Day 2			Day 3			Day 4			Day 5		
	Sum	M	%	Sum	M	%	Sum	M	%	Sum	M	%	Sum	Mean	%
FD1	30	2.14	28.57	24	1.71	25.81	35	24.8	61.40	24	1.71	25.26	24	1.71	30.00
FD2	4	.29	3.81	2	.14	2.15	4	2.80	7.02	5	.36	5.26	1	.07	1.25
FD3	26	1.86	24.67	24	1.71	25.81	26	18.18	45.61	19	1.36	20.00	19	1.36	23.75
Q1	5	.36	4.76	2	.14	2.15	3	2.10	5.26	1	.07	1.05	1	.07	1.25
Q2	6	.43	5.71	4	.29	4.30	10	6.99	17.54	6	.43	6.32	6	.43	7.50
Q3	13	.93	12.38	7	.50	7.53	16	11.19	28.07	9	.64	9.47	9	.64	11.25
Q4	7	.50	6.67	10	.71	10.75	39	27.27	68.42	13	.93	11.25	8	.57	10.00
O	14	1.00	13.33	20	1.43	21.51	10	6.99	17.64	18	1.29	10.47	12	.86	15.00

Figure 1. Means for In-Task (IS), Other State (OS), and Not Applicable (NA) over 5-days

Table 3. Potential Neuroscientific Mechanisms and Psychological Outcomes Associated with Participant Statements

<i>Matrix Dimensions</i>	<i>Potential Neural Mechanisms</i>	<i>Outcome</i>	<i>Selected Related Literature</i>	<i>Participant Samples</i>
FD1 Object Orientation	CEN activation Deactivation of DMN	Ability to retain goal-oriented behavior, less mind-wandering and distraction	Brefczynski-Lewis, Lutz, Schaefer, Levinson, and Davidson (2007); Tang, Hölzel, and Posner (2015); Van Bockstaele et al. (2004)	“I noticed drastic differences in my focus and awareness for extended periods of time directly after each mindfulness meditation session. I especially found myself finding I it easier to focus on studying and doing traditional schoolwork.”
FD2 Dereification	Deactivation of DMN, specifically PCC, and stronger coupling between PCC and regions of DMN	Less “stickiness” of thought, resulting in increased ability to disengage from rumination, negative judgments of self, and social threat appraisals	Brewer et al. (2011); MacCoon et al. (2012); Butler et al. (2006); Pace et al. (2010); Teasdale et al. (1995)	“I also became more accepting of things that happen to me, and I became better at merely letting negative feelings wash over me, instead of letting those negative feelings bother me.”
FD3 Meta-Awareness	Activation of SN and subcomponents of the CEN	Ability to monitor corporeal and affective states while maintaining goal-oriented attention or behavior	Corbetta and Shulman (2002); Mason et al. (2007); Farb et al. (2007); Khalsa et al. (2008); Travis ad Shear (2010)	“I did notice practicing after doing the meditation that I was more aware of my body and the technique I used to play my instrument. I find focusing on breath to be really helpful in calming myself down in a stressful situation. By paying attention to my breathing when playing, I became aware that I held some tension in my chest and would sometimes actually hold my breath when practicing.”

KEY: Central Executive Network (CEN), Default Mode Network (DMN), Posterior Cingulate Cortex (PCC), Salience Network (SN), Event-Related Potential (ERP)

Table 3 (cont). Table 3. Potential Psychological and Neuroscientific Outcomes Associated with Participant Statements

<i>Matrix Dimensions</i>	<i>Potential Neural Mechanisms</i>	<i>Outcome</i>	<i>Selected Related Literature</i>	<i>Participant Samples</i>
Q1 Aperture	Enhanced ERP activity during targeting tasks	Improved ability to disengage from a global task and attend to a more local target	Van Leeuwen, Singer, and Melloni (2012)	“I don’t really think this impacted my reactions to stress or my quality of awareness. Especially with the body scan, I found it difficult to focus and impossible to, for example, notice how my left toes were feeling.”
Q2 Clarity	Activation of insular cortex	Increased perceptual clarity during practices related to generating compassion	Lutz, Brefczynski-Lewis, Johnstone, and Davidson (2008)	Not explicitly reported in appraisals.
Q3 Stability	Enhanced theta-band phase consistency	Decreases in attentional stability associated with ADHD and schizophrenia	Castellanos et al. (2006); Cohen et al. (2001); Lutz et al. (2009);	“I especially noticed that for about 30 minutes after a meditation session, my awareness would shift to a present-oriented perspective, causing me (to) worry less about things I need to do in the future.”
Q4 Effort	U-shaped activation in CEN and subcortical reward circuitry	Easier to maintain task sets, leading to less frustration	Brefczynski-Lewis et al., (2007)	“It was much easier to guide my focus throughout the day. I never got sleepy in my morning classes after meditating, and could improve much more efficiently in the practice room.”

KEY: Central Executive Network (CEN), Default Mode Network (DMN), Posterior Cingulate Cortex (PCC), Salience Network (SN), Event-Related Potential (ERP)