Half Day Tutorial on Measuring Mindfulness Behaviorally: Onsite and Online Data Collection with jsPsych

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General Purpose

This ***half day*** tutorial will introduce participants to breath counting, a recent innovation in mindfulness research methodology that offers the first opportunity to collect a relatively direct behavioral measure of mindfulness (Levinson et al., 2014). This tutorial will review the basics of mindfulness practice before providing attendees with the knowledge, skills, and tools required to implement breath counting procedures in their own research. The widespread adoption of this quantitative measure could positively impact the field by offering a more straightforward and transparent methodology that would improve the overall consistency of mindfulness research across studies and between investigators.

Mindfulness Research: Technical Challenges

Although the quality of research has steadily improved, perspectives on mindfulness may remain skewed among scientists with exposure to past research of questionable quality (see Ospina et al., 2007). Misgivings aside, the scientific, clinical, and popular interest surrounding mindfulness research remains strong, as an extensive list of beneficial effects have been reported. Meta-analyses focusing on more recent research suggest that some of these effects may include: stress reduction; reductions in symptoms and relapse rates of anxiety and depression; improved physical functioning and quality of life (Gotink et al., 2015); improved selective, sustained, and executive attention capacities; enhanced working memory and executive functioning (Chiesa, Calati, & Serretti, 2011); reductions in anger, hostility, negative affect, and substance use in prison populations (Shonin, Gordon, Slade, & Griffiths 2013); and mitigation of age-related cognitive decline (Gard, Hölzel, & Lazar, 2014). Although the authors of these reviews are cautiously optimistic about the potential benefits associated with practicing mindfulness, they nevertheless raise methodological concerns about the research, and are careful to report findings as preliminary. Even the most well-designed and well-executed investigations of mindfulness are typically dogged by two major methodological hurdles: **(1)** data on the duration and frequency of practice sessions are typically taken from self-report measures, thus making it difficult to determine whether subjects have recorded their participation honestly or accurately (Vettese et al., 2009), and **(2)** as mindfulness is primarily an introspective task, individual differences in practice session quality have historically been difficult to measure.

Measuring Mindfulness with Breath Counting

Breath counting is a simple technique that has been recommended for centuries as a tool to help beginners practice mindfulness effectively. The process typically entails practitioners being given the basic instructions for practicing mindfulness: to focus and attempt to hold their attention on their breath, and then to return their attention to the breath when they realize that their mind has wandered. Although simple to explain, noticing that one's attention has wandered can be surprisingly difficult, as a striking amount of time can pass between becoming distracted and becoming aware of that fact. Counting one's breaths facilitates the recognition of mind-wandering episodes: beginners continue paying attention to their breath, while also counting their exhalations (in their heads) in cycles of 10; the tendency to count consecutively occurs automatically when one is distracted, and "hearing" numbers greater than 10 serves as an easily-noticeable cue indicating that the mind has wandered (at which point they redirect focus back to the breath and begin a new count cycle). By slightly modifying this breath-counting task—specifically by externalizing the count in some form—mindfulness researchers can easily record the frequency, duration, and approximate quality of practice sessions for all subjects.

Presenters

Samuel Nordli and Thomas Gorman are doctoral students working under Dr. Peter Todd and Dr. Robert Goldstone (respectively) in the Department of Psychological and Brain Sciences and the Cognitive Science Program at Indiana University, Bloomington. Both presenters have years of collective experience practicing and teaching mindfulness, and have each conducted mindfulness experiments specifically using the breath counting technique (e.g., Gorman & Green, 2016; Nordli & Todd, in prep.).

Participant Background

This tutorial will not assume any specific prior knowledge, so ***no personal or professional background in mindfulness***

is required. The tutorial will feature the breath-counting technique implemented in JavaScript (to facilitate online data collection); ***prior experience with programming or JavaScript is recommended but not required.***

Material to be Covered

1. The first section will introduce the practical and conceptual fundamentals of practicing mindfulness. The presenters will briefly cover their personal backgrounds/ experiences with mindfulness in an attempt to convey what they consider makes the practice compelling and worthwhile, aside from the kinds of general effects that are typically studied and reported in the literature (such as stress reduction). Please note: although the practice of mindfulness has its roots in the Buddhist tradition, the entirety of this tutorial will reflect the completely secular and scientific perspectives of the presenters. (20 min).
2. Next we will discuss the technique of breath counting, briefly reviewing its history and its rough practical equivalence to mindfulness practice, before moving on to explore how cognitive scientists can use a version of this technique in order to easily gather a set of objective behavioral measures that would otherwise be nearly impossible to collect. (40 min).
3. The tutorial will conclude with a hands-on demonstration of the breath counting methodology, exploring and manipulating a basic experimental design created with jsPsych, a JavaScript library for creating web browser-based behavioral experiments (de Leeuw, 2015). Participants will be given the opportunity to adjust experimental parameters and then observe the effects of those adjustments (e.g., varying the number of breaths per cycle, or the presence or absence of feedback or mind-wandering probes). Finally, we will cover several different methods of analyzing the breath counting data, and discuss the pros and cons of the different metrics that can be extracted from the data. (2 hr).

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