



Children's metacognition and mindful awareness of breathing and thinking



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ABSTRACT

Children ages 4, 6, and 8-years old were tested for their introspective capacity to mindfully attend to the natural flow of their breath and thought as well as their objective knowledge of breathing and thinking as continuous, necessary bio-psychological processes. Results showed consistent developmental progression in breath awareness as well as process knowledge about both breathing and thinking. Distinctly, there was no improvement in thought awareness with age, which remained consistently poor. However, children who received the breath awareness task first performed better on the thought awareness task, suggesting that breath awareness may facilitate thought awareness. Process knowledge about breathing and thinking was significantly inter-correlated, but such knowledge was not significantly related to awareness abilities when controlling for age. The study points to the need for more systematic applied research examining development of mindfulness practices and metacognitive knowledge.

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1. Introduction

In recent years, research on mindfulness and mindfulness-based practices has exploded in “Contemplative Science,” and attention has focused on the importance of bringing a developmental perspective to this field (Roeser & Zelazo, 2012). Increasingly, developmental psychologists are turning to mindfulness intervention as a means of improving higher-order cognition including executive function (Diamond & Lee, 2011; Diamond, 2012), self-regulated attention (Napoli, Krech, & Holley, 2005), and effortful control (Zelazo & Lyons, 2012). While attention has focused on how mindfulness practices may promote higher cognitive functions, more systematic research is needed on when and how children develop the capacities of awareness that underlie mindfulness practice. The goal of the current study was to examine children's developing awareness of their own breathing and thinking, with awareness defined both as a general understanding of how these processes work as well as the ability to monitor their own breathing and thinking as they were happening.

The most commonly used definition of mindfulness is Kabat-Zinn's (2003) description as “the awareness that emerges through paying attention on purpose, in the present moment, and non-judgmentally to the unfolding experience” (p. 145). Mindfulness thus requires an awareness of stream of consciousness involving the observation and acceptance sensations, feelings, images, and thoughts as they come to mind. Because mindfulness involves a higher order conscious awareness of being aware, it is considered to be distinctly metacognitive and include metacognitive knowledge, metacognitive experiences, and metacognitive strategies (Jankowski & Holas, 2014).

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Metacognition is often broadly conceptualized in terms not so different from mindfulness (“thinking about thinking”), but research has predominantly focused on knowledge and strategies of cognitive performance and/or theory-like causal-explanatory knowledge, termed Theory of Mind. In contrast, mindfulness is traditionally considered to be a disciplined *introspective* metacognitive way of knowing, which leads to the development of a broad, foundational kind of inner, practical understanding. The classic four foundations of mindfulness begin with bodily awareness, extend to feelings, then thoughts, and finally a wider understanding of impermanence, all contributing to improvements in physical, psychological, and social well-being (Grossman, 2010). In other words, mindfulness is part of a kind of practical, “inner” way-of-knowing that is designed to positively transform a person’s whole way of being in the world.

There has been some research on the development of children’s introspective capacities (for reviews, see Eisbach, 2013; Papaleontiou-Louca & Thoma, 2014). In general, this research indicates that preschool children are capable of introspection in isolated cases, such as when deliberately engaged in mental imagery, but awareness of the ongoing spontaneous stream of thought appears to be a later achievement. In this regard, Estes (1998) proposed that the development of the capacity to introspect is a complex multi-leveled achievement, which depends on introspected content, the contextual support, as well as individual differences in introspective disposition. Such an account is consistent with the contemplative view of mindfulness as a long-developing capacity that requires disciplined practice and guidance, and proceeds from sensory/bodily awareness to more complex, subtle understanding (Grossman, 2010).

The present investigation of children’s introspective capacity was distinctly framed with regard to contemplative practices. As Grossman (2010) points out, mindfulness practices most often begin with the observation of breathing, as it provides a kind of gateway fuller understanding. In this regard, respiration has a number of unique properties that serve this purpose, including being available to the senses, being essential to life, functioning under both conscious and unconscious control, and being linked to emotions and behavioral activities (Grossman, 2010).

Though breath awareness is a core mindfulness practice, like knowledge of children’s awareness of their own mental experiences, there is a dearth of research on when children develop the ability to monitor their own breathing. Studies of children’s developing understanding of breathing have typically focused on objective knowledge as part of understanding of life and death processes, e.g., that living things breathe and dead things do not (Slaughter, Jaakola, & Carey, 1999; Bering & Bjorklund, 2004; Harris & Giménez, 2005). There have been no examinations of how children’s objective knowledge of breathing as a process might relate to their developing ability to monitor their own breathing as it is happening.

1.1. Links between developing awareness of stream of thinking & of breathing

Apart from the mindfulness framework, John Flavell and colleagues (Flavell, Green, & Flavell, 1993; Flavell, Green, & Flavell, 2000) conducted pioneering research on children’s awareness of what they referred to as the “stream of consciousness.” Despite young children’s capacities to infer discrete mental states (theory-of-mind), they found them to be remarkably oblivious to the ongoing stream of thought. In one study, 5-year-olds reported having no thoughts during a short quiet period while 8-year-olds reported having thoughts. Children in this study, however, had been told to try not to think about anything for 30 seconds and were then asked if they had indeed been thinking. It is therefore possible that younger children were simply more unwilling to admit a perceived wrongdoing. In a second study probing this issue, children were given intense scaffolding, told to sit in “the thinking chair” and prompted to “imagine” specific scenarios. In this case, 5-year-olds were able to report having thoughts during the 30-s period but were still largely unable to report on the content of their thinking.

This finding is consistent with Buddhist psychology that without special attention, we are normally unaware of the unintentional flow of our thoughts, and that “thoughts” are especially subtle phenomena to attend to, as compared to more concrete sensations such as images or feelings (Grossman, 2010). From this standpoint, as described above, attention to the natural flow of breathing is considered to be more accessible because of its salient sensory qualities, evident in its flow through the nostrils and movement of the abdomen. Additionally, attending to “easy” internal processes such as breathing may allow children to gain access to more complex internal processes such as thinking. We test this hypothesis in the current study.

In sum, there is no empirical study of children’s developing understanding and awareness of the ongoing flow of breath or their ability to monitor this flow, capabilities necessary for mindfulness practice. There is, moreover, no research that examines this capacity along with children’s developing awareness of the natural, unintentional stream of thought. We hypothesized that breath awareness would be a comparatively earlier development because breathing is more concretely sensory than thinking. We also investigated when children have a more general, objective understanding of how these internal processes work. We were interested in knowing how children’s developing objective knowledge about breathing and thinking may be related to their developing subjective capacity to experience these phenomena.

2. Methods

2.1. Participants

Children were recruited from laboratory preschools and elementary schools run by local universities and from one local after-school program. 68 children were tested (27 girls), 24 4-year-olds (8 girls), 24 6-year-olds (10 girls), and 20 8-year-olds

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