



Do interoceptive awareness and interoceptive responsiveness mediate the relationship between body appreciation and intuitive eating in young women?



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ABSTRACT

The extent to which an individual appreciates their own body is recognised as a proximal predictor of intuitive eating, but the mechanisms underlying this relationship are less clearly understood. This study tested whether two partially independent, self-reported facets of interoceptive ability: 'interoceptive awareness' (defined as the ability to detect internal bodily cues) and 'interoceptive responsiveness' (the way in which individuals value and respond to these cues) mediated the relationship between body appreciation and three subscales of intuitive eating: 'unconditional permission to eat'; 'reliance on internal hunger and satiety cues', and 'eating for physical rather than emotional reasons'. Multiple mediation analyses of data from an online survey of Australian college women ($n = 200$) showed that: (1) interoceptive awareness partially mediated the relationship between body appreciation and 'reliance on internal hunger and satiety cues', and (2) interoceptive responsiveness partially mediated the relationship between all three subscales of intuitive eating. Although preliminary, this work lends support to the theoretical framework of the acceptance model of intuitive eating and extends it by suggesting that the different facets of intuitive eating may have distinct underlying mechanisms.

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1. Introduction

In the current worldwide context of rapidly increasing overweight and obesity and its critical role in chronic disease (Hu, 2003), it is important to understand how individual differences act to influence excess food consumption. Although the majority of eating behaviour literature has focused on maladaptive and disordered eating (Cororve Fingeret, Warren & Gleaves, 2006; Stice, 2002), research focus is increasingly turning towards understanding attitudes and behaviours related to adaptive eating styles in the non-clinical population. By investigating the determinants of adaptive eating, we are able to identify constructs that may aid in promoting positive physical and psychological health and well-being in future intervention work, as well as potentially

preventing the development and onset of disordered eating behaviours (cf. Tylka, 2006).

Intuitive eating, broadly defined as eating in response to physiological hunger and satiety as opposed to situational and emotional cues, is known as an adaptive eating style (Tylka, 2006). Previous research has identified three central and interrelated facets of intuitive eating (Tylka, 2006). The first facet is 'unconditional permission to eat'. Individuals who eat unconditionally are those who are willing to eat when physiologically hungry and who place no restrictions on the food they eat. For example, those that eat unconditionally do not categorise food groups as 'accepted' or 'prohibited', and do not base their eating around these categories. The second facet of intuitive eating is 'reliance on internal hunger and satiety cues'. This signifies an individual's trust and acceptance of their own internal hunger cues to determine when and how much to eat. Individuals who do not trust and follow internal hunger cues are found to have less ability to regulate food intake and exhibit emotional eating (Birch, Fisher, & Davison, 2003). The third facet of intuitive eating is 'eating for physical rather than emotional reasons'. This facet reflects a person's tendency to eat

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because they are physiologically hungry rather than in response to adverse emotional states such as anxiety, stress or boredom (Herman & Polivy, 1983), and is associated with lower binge eating and food preoccupations (Tylka & Wilcox, 2006). Higher scores on all three of these intuitive eating facets are associated with an adaptive approach to food (Tribole & Resch, 2003). Research also suggests that non-dieting interventions designed to improve health among people who are overweight by focusing on 'health at every size', and teaching responsiveness to satiety cues, leads to enhanced psychological wellbeing (Bacon, Stern, van Loan & Keim, 2005; Tylka, 2006). Similarly, Tylka and Wilcox (2006) demonstrated that two facets of intuitive eating: 'eating for physical rather than emotional reasons' and 'reliance on internal hunger and satiety cues', positively predicted wellbeing over and above the variance accounted for by eating disorder symptomatology.

A number of studies have investigated predictors of intuitive eating. According to the acceptance model of intuitive eating (Avalos & Tylka, 2006), individuals develop an intuitive eating style when they experience acceptance of their body from others. This, in turn, steers the individual towards low self-objectification and a positive self-orientation, fostering high appreciation of his or her own body. High body appreciation is then thought to result in heightened sensitivity to internal states, including hunger and satiety, which promote an intuitive eating approach to food. Poor body appreciation, on the other hand, will result in bodily cues becoming ignored; hence intuitive eating is less likely to occur (Augustus-Horvath & Tylka, 2011). As such, 'body appreciation', defined as the nonjudgemental acceptance of, and respect for your own body irrespective of perceived flaws (Avalos, Tylka, & Wood-Barcalow, 2005), is considered the proximal predictor of intuitive eating in this model.

In order for body appreciation to translate to intuitive eating, however, the assumption is that the individual must be in tune with their internal states. The emphasis on the ability to attend to internal signals links intuitive eating to the broader concept of 'interoception'; commonly defined as conscious visceral perception, or the "sense of the physiologic condition of the body" (Craig, 2002, pp. 655). Previous research has demonstrated relatively stable individual differences in interoception, such as the ability to detect changes in internal bodily states such as temperature, pain, and hunger (see Craig, 2002; Critchley, Wiens, Rothstein, Ohlman & Dolan, 2004; Herbert et al., 2012; Moisset et al., 2010). This ability to perceive internal physiological signals and cues is a complex process that has been conceptualised in various ways across disciplines using different terms (for a detailed discussion of this, see Mehling et al., 2012). In line with most other studies in the area of eating behaviour to date (e.g. Fassino, Piero, Gramaglia, & Abbate-Daga, 2004; Herbert et al., 2012; Merwin, Zucker, Lacy, & Elliott, 2010), in this study we use 'interoceptive awareness' as a general term meaning the ability to detect and process changes in internal bodily states, or, in other words, "sensitivity for our own visceral bodily reactions" (Herbert et al., 2012, pp. 71). In relation to intuitive eating, a recent study found that individual differences in interoception, as measured by accuracy on a heart-beat perception task, positively predicted two of the facets: 'reliance on internal hunger and satiety cues' and 'eating for physical rather than emotional reasons' in young, healthy females (Herbert, Blechert, Hautzinger, Mattias, & Herbert, 2013). Furthermore, interoceptive awareness measured via this method was found to fully mediate the negative relationship between these facets and body mass

index.¹ No association, however, was found with the intuitive eating facet 'unconditional permission to eat'. Herbert et al. (2013) explain these findings in terms of the extent to which each facet relies on interoceptive abilities; for example, eating for physical reasons and reliance on internal cues depend, by description, on conscious visceral perception, whereas eating unconditionally is more concerned with responses to externally-placed restrictions on food. These findings offer insight into the significance of interoceptive awareness to the prediction of adaptive eating, and speak to the idea that the different facets of intuitive eating may have distinct underlying mechanisms.

Another interesting development comes from additional data suggesting that there may be an additional component of interoception that may act independently of the ability to detect and process bodily signals. In a secondary analysis of data collected in their intuitive eating study, Herbert et al. (2013) investigated how women responded to their own heartbeat by asking them to subjectively rate their cardiac signals as aversive or pleasant. They found that their subjective appraisals were associated with intuitive eating outcomes: specifically, aversive responses negatively predicted the 'eating for physical rather than emotional reasons' facet of intuitive eating, independently of the heart-beat perception accuracy score. No association was found with the other facets, which seems to support the idea that emotional eating behaviours are specifically linked to the avoidance of unpleasant sensations and feelings (Herbert et al., 2013). The authors interpret this finding in light of research that suggests that the non-acceptance of, or aversive response to, bodily signals is associated with disordered eating (e.g. Merwin et al., 2010). Similarly, in the body image literature, Daubenmier (2005) also makes the distinction between the degree of awareness of internal bodily sensations and the way which individuals respond to them, stating that how an individual values or appraises their felt bodily cues may be as important as whether or not they are perceived at all. Daubenmier (2005) found that the ability to respond positively to bodily sensations mediated the relationship between self-objectification (a form of self-consciousness leading to vigilant monitoring of appearance) and disordered eating attitudes in a sample of women. However, no such mediation was found for the awareness of internal sensations alone, again suggesting that distinct processes are at work. Taken together, these findings highlight a potential avenue for further delineating the role of interoception in adaptive eating models. To date, these questions remain relatively unexplored.

In light of the above, the broad aim of the present study was to provide a preliminary investigation into the association between body appreciation, interoception, and intuitive eating. Although support for a positive link between body appreciation and intuitive eating is now fairly robust (cf. Andrew, Tiggerman, & Clark, 2015; Avalos & Tylka, 2006; Tylka, 2006), research into the mechanisms underlying this relationship has received less attention. To reiterate, the acceptance model of intuitive eating proposes that when an individual appreciates their own body, they will naturally pay more attention to internal bodily needs and therefore respect their bodies by eating according to internal cues (Avalos & Tylka, 2006). However, the assumption that the relationship between body appreciation and intuitive eating is mediated by interoceptive abilities is yet to be investigated. This study will test this directly in relation to the three facets of intuitive eating, which are suggested to differ in terms of the interoceptive input required (Herbert et al., 2013). In relation to previous work suggesting there are independent components to interoception, the potential mediating roles of both (1) interoceptive awareness (conceptualised as the ability to detect internal bodily states) and (2) the subjective response to these internal bodily states will be examined. In this study, the latter concept is labelled 'interoceptive responsiveness' in order to

¹ Note that in this study, Herbert et al. (2013) used the term 'interoceptive sensitivity' rather than 'interoceptive awareness'. This is discussed further in the Discussion section.

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