

How to tell where 'liking' ends and 'wanting' begins

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Response to Comment

How to tell where 'liking' ends and 'wanting' begins ☆

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ABSTRACT

Food reward is thought to comprise food 'liking' and 'wanting'. The distinction between 'liking' and 'wanting' is generally assumed to give a more detailed view on the regulation of appetite and to provide a better handle on determining what exactly is wrong in case of unhealthy dietary habits (e.g., binge eating). In response to [Finlayson and Dalton \(2011\)](#), I argue however, that after operationally defining 'liking' and 'wanting', one forgot to validate these measures. Such validation requires carefully formulating when and how 'liking' and 'wanting' are uncoupled. In the absence of a priori predictions concerning when and how 'liking' and 'wanting' should dissociate, interpreting any dissociation between supposed measures for 'liking' and 'wanting' as evidence for the independent functioning of 'liking' and 'wanting' processes is moot.

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Introduction

Recently, I concluded that there is little reason to distinguish 'liking' and 'wanting' when studying the role of food reward in human appetite ([Havermans, 2011](#)). To recapitulate, I stated that there is no evidence for neural sensitization and hence any individual difference in seemingly dissociated 'liking' and 'wanting' is unlikely to be the result of incentive sensitization. [Finlayson and Dalton \(2011\)](#) noted that I presented a non-exhaustive review and by doing so I painted a too pessimistic painting of a line of research that "holds a great deal of potential". By highlighting some of the research that I had failed to discuss, they claim to offer a more honest appraisal of "current progress in the assessment of 'liking' vs. 'wanting' food in human appetite". Do [Finlayson and Dalton](#) thus correct a false outlook on the relevance of parsing food reward into 'liking' and 'wanting'? I think not. But that leaves the question why some investigators do find (partly) dissociated 'liking' and 'wanting' in their studies, even under circumstances [Berridge's](#) original conceptual framework (see e.g., [Berridge, 1996](#)) would not predict such a dissociation. I argue that too little thought has been devoted to operationalizing and validating human food 'liking' and 'wanting', and that the operational definitions for 'liking' and 'wanting' are now mistaken for facts.

Validating measures for 'liking' and 'wanting'

[Finlayson and Dalton \(2011\)](#) start their critique by claiming that I apparently fail to understand that 'liking' and 'wanting' are psychological constructs. One cannot just measure psychological constructs, one needs to operationally define these. That is true, but after operationalization one needs to validate these measures. As 'liking' and 'wanting' are concepts derived from [Kent Berridge's](#) earlier animal studies and theorizing (see e.g., [Berridge, 1996, 2009](#)), one would expect that validation would be based on his incentive salience theory. Such theory allows one to predict when and how 'liking' and 'wanting' are likely to diverge and this is necessary to validate operationally defined food 'liking' and 'wanting'. So according to incentive salience theory, when do 'liking' and 'wanting' diverge?

[Berridge \(2009\)](#) recently claimed that the "... important point is that 'liking' and 'wanting' normally go together, but they can be split apart under certain circumstances, especially by certain brain manipulations." Indeed, in the absence of these brain manipulations, there is no reason whatsoever to expect that food deprivation, or flavour preference conditioning procedure, or the development of sensory-specific satiation should reveal any dissociated food 'liking' and 'wanting' (see also [Berridge, 1996](#)). So when one does find such a dissociation, this may mean that (1) 'liking' and 'wanting' systems have uniquely evolved in man to function independently, or that (2) there is something wrong with the purported food 'liking' and 'wanting' measures.

[Berridge \(2009\)](#) has speculated that repeated excessive intake of high calorie, highly palatable, highly rewarding foods, might lead to incentive sensitization; that is, exaggerated 'wanting' for these foods in the absence of a positive shift in food 'liking'. This

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incentive sensitization is the necessary result of underlying neural sensitization, referring to a heightened responsiveness of the dopaminergic mesocorticolimbic circuitry. If chronic excessive intake of certain foods can establish neural sensitization, this would mean that there is such a thing as food addiction. This concept of food addiction would nicely explain binge eating observed in bulimia nervosa patients and in some obese individuals, but Berridge dutifully points out that there is ongoing discussion on whether some foods can indeed be regarded as addictive. He further notes that at this moment “the data is still not entirely clear, and sometimes even a bit contradictory”. I analyzed previously whether there is any empirical evidence yet of such neural sensitization in obese individuals and concluded that there is none (Havermans, 2011). In the absence of neural sensitization, it makes little sense to expect or to hypothesize that food ‘liking’ and ‘wanting’ will dissociate in obese individuals.

Finlayson and Dalton (2011) point out that despite the absence of clear evidence for neural sensitization in obese persons, there are studies that do find indications for dissociated ‘liking’ and ‘wanting’ with monotonous consumption of a given food (see Hetherington, Pirie, & Nabb, 2002; Temple et al., 2009; Zandstra, De Graaf, Mela, & Van Staveren, 2000). Finlayson and Dalton argue that these studies thus indirectly show neural sensitization as the consequence of chronic excessive food intake. This interpretation is doubtful. Firstly, none of the studies cited concerned *excessive* food intake. Secondly, in none of these cited studies was the found pattern of dissociated ‘liking’ and ‘wanting’ explicitly hypothesized beforehand. Still, why do supposed measures of ‘liking’ and ‘wanting’ sometimes dissociate? Given the above discussion, the possibility that these dissociations are a sign of poor construct validity needs to be seriously considered.

Indices of food ‘liking’ and ‘wanting’ under scrutiny

In most studies differentiating between ‘liking’ and ‘wanting’, ‘liking’ is measured by means of a single item rating scale asking the participant to indicate how much s/he likes a given food (see e.g., Havermans, Janssen, Giesen, Roefs, & Jansen, 2009). These explicit ‘liking’ ratings have high face validity, but a very real threat to its accuracy concerns self presentation or social desirability bias. Participants typically know they take part in a study and although they often are unaware of the exact research question and hypothesis, they will realize that the researcher measures things. In most cases, it is fairly obvious what the investigator is trying to measure. For example, in a recent study by Smit et al. (2011), participants (6 normal weight; 5 obese) received three ~500 g test lunches on separate days and under different instructions. Overall, Smit et al. found that the obese participants ate 32% less than did the normal weight participants. The most straightforward explanation for this ‘unexpected’ finding is that the participants knew very well that Smit et al. would measure their intake. Of course they did not want to present themselves as a glutton, especially not the obese participants who are likely to feel (and be) stigmatized as it is (Puhl & Latner, 2007). It is conceivable that for the same reason (i.e., impression management) an obese individual would be hesitant to explicitly state s/he particularly likes chocolate or bacon (even if s/he did), and may be inclined to exaggerate a love for low calorie foods.

What about food ‘wanting’? Simple questions pertaining to how much one wants food suffer from the same shortcomings as the explicit ‘liking’ measure described in the above paragraph. But Finlayson, King, and Blundell (2007a) developed a behavioural task to assess ‘wanting’ for specific food categories (sweet/savoury foods, or high/low fat foods, or a particular combination of taste and fat content). The objective was to develop a ‘wanting’ measure that would be different in methodology from the typical explicit ‘liking’ measure to avoid conceptual overlap (see also Finlayson, King, &

Blundell, 2007b). The ‘wanting’ task is a forced choice task in which the participant receives multiple pairs of food pictures and s/he is instructed to indicate the food s/he most wants to eat now. This renders a relative preference for a food category whereas the explicit ‘liking’ assessment is an absolute measure. It is unclear why Finlayson and colleagues initially thought that relative preference would rather assess food ‘wanting’, but it is obvious that this measure is unlikely to correlate very highly with absolute measures of ‘liking’. Indeed, evaluating a food in the context of another food option allows for hedonic contrast. For example, I like my coffee from the coffee machine at the university department where I work. If, however, one would decide to install a coffee house providing free coffee made from freshly ground beans right next to the coffee machine, I would probably like the coffee from the machine a lot less (see Zellner, Allen, Henley, & Parker, 2006). My choice of coffee (coffee ‘wanting’), however, would still be informed by a hedonic evaluation (coffee ‘liking’). Whether one absolutely or relatively measures an attitude or motivation for a specific stimulus matters a great deal. Absolute measurements of a proposed psychological construct may differ from relative measurements of that same construct (see also Epstein, Temple, Neaderhiser, Erbe, & Leddy, 2007; Houben, Roefs, & Jansen, 2010).

Finlayson and Dalton (2011) rightfully point out that in later research by Finlayson and colleagues, food ‘wanting’ was operationalized by reaction time (RT) of the choices made for each food category with the forced choice methodology. The claim is that this choice RT somehow captures the more implicit nature of the core motivation that is ‘wanting’. RT is measured covertly, outside the awareness of the study participants, which is why Finlayson and colleagues refer to this measure as implicit ‘wanting’ (Finlayson, King, & Blundell, 2008; Finlayson et al., 2007b). But in order to call this task outcome a truly *implicit* measure requires that participants are (1) unaware that their preference is being measured, (2) the participant should not be able to present himself as someone who loves low-fat foods, (3) performance on the task should not be different when having to perform a secondary cognitively demanding task, and (4) performance should be efficient and fast (see De Houwer, 2006). In the forced choice task, the participants are aware that their preference is measured (even though they do not know how), task performance is not independent of the task instruction to state a preference, the task requires intentional processing of the food pictures presented, and RT performance is usually slow (mean RTs of nearly 2000 ms have been reported; see e.g., Finlayson et al., 2008).

The measurement of RT with the forced choice ‘wanting’ task was inspired by work on the Implicit Association Task (IAT; Greenwald, McGhee, & Schwartz, 1998). In a recent publication (Griffioen-Roose, Finlayson, Mars, Blundell, & de Graaf, 2010), RT data were even standardized with a D-RT algorithm (Greenwald, Nosek, & Banaji, 2003) originally designed to treat RT data from the IAT. However, the application of that algorithm is odd given that the core procedure of the IAT is very different from the implicit wanting task. An implicit association measured with the IAT is not inferred from surreptitiously observed response time latencies. The IAT is a task in which participants classify stimuli into categories and they are aware that their RT is measured. The participant is always prompted to respond as fast as possible in accordance with task instructions. The categories are target concepts (e.g., sweet versus savoury) and attributes (e.g., positive versus negative). In the critical trials of the IAT the targets and attributes are combined and assigned to one of two response keys. For instance one response key is used to classify words that denote either a positive attribute (e.g., “pleasant”) or a sweet food (“chocolate”). The other response key then is used to classify words that refer to a negative attribute (e.g., “disgusting”) or a savoury food (e.g., “cheese”). This combination of target and attribute is inverted in

the so called reversed combination trials. For the present example, if one would hypothesize that people have an implicit preference for sweet foods, mean RT should be relatively slow for the reversed combination of sweet/negative and savoury/positive categories (Houben et al., 2010; see Roefs et al., 2011 for an extensive review).

It is clear that the forced choice task developed by Finlayson et al. (2007a) is very different from the IAT. As argued above, a choice in their 'implicit wanting' task is anything but implicit. Further, food choice is presumably slower if the two presented food options are preferred to an equal degree. A participant will take longer to decide when presented with two disliked foods. Longer response times are also expected when the participant has to decide between two highly liked stimuli. There is no reason to assume that the choice itself precludes a hedonic evaluation, and equally problematic, it is uncertain what the response time latency of that choice means. A longer RT means that it was a difficult choice, but the nature of that difficulty remains unclear. In sum, it is not very surprising that the purported implicit 'wanting' measure does not correlate with self-reported explicit 'liking'. Does that mean that one successfully measured food 'liking' versus 'wanting'? Clearly: no.

Another behavioural task that is frequently referred to as a 'wanting' measure concerns the progressive reinforcement ratio task. Epstein, Truesdale, Wojcik, Paluch, and Raynor (2003) found that food deprivation affected the reinforcing value of a snack food, but not the hedonic evaluation of different drinks. They speculated that task performance might reflect dissociated 'wanting' and 'liking' as food deprivation seemed to affect the willingness to work for the food in the task, but not the hedonic evaluation of several drinks. I argued that this interpretation in terms of dissociated food 'wanting' and food 'liking' is somewhat peculiar given that 'wanting' and 'liking' were determined for foods and liquids, respectively. However, Finlayson and Dalton (2011) stated that there are many examples of studies successfully showing the differential effect of food deprivation on food 'liking' and 'wanting'. "In fact, a paper extending and replicating those previous findings (...), but using identical foods for the assessment of 'liking' and 'wanting' was published in this journal in the same year (Raynor & Epstein, 2003)".

There is a good reason why I did not cite the study by Raynor and Epstein (2003) as an example of a dissociation between 'liking' and 'wanting'. Raynor and Epstein did not hypothesize, assess, nor discuss potential dissociations of food 'liking' and 'wanting'. They wanted to know whether food deprivation and/or food restriction promote the relatively reinforcing value of a given food. Raynor and Epstein did not measure the effects of deprivation and restriction on the hedonic evaluation of food. They did measure participants' hedonic evaluation of the foods and drinks used in the experiment, but they did this in a separate screening session before the experimental manipulations. Nonetheless, there are studies in which a dissociation between relative reinforcing value of food and 'liking' for the same food was found, but again this may simply mean that the relative reinforcing value of food is a more sensitive measure for appetitive motivation (see also Havermans, 2011). This motivation expressed for a specific food alternative may well be sensitive to variations in food liking, weight concerns, health status, normative considerations, et cetera. Perhaps this is why Epstein, Carr, Lin, and Fletcher (2011) explicitly state that the relative reinforcing value of food is *not* identical with incentive salience of a food (i.e., food 'wanting').

Conclusion

Finlayson and Dalton (2011) noted in their critique that "... the value of distinguishing between, 'liking' and 'wanting' in human appetite will come from careful study using reliable, transparent

methods with good construct validity". I agree, but considering the absence of both theory and transparent methods with good construct validity, the research into human food 'liking' and 'wanting' has added nothing but conceptual confusion. One more example of such confusion concerns Finlayson and Dalton's discussion of Goal Conflict Theory. According to this theory the subconscious activation of the goal to consume highly palatable food is inhibited by the activation of a dieting goal. The goal to eat palatable food is generally referred to as the hedonic goal of enjoying good food (Papies, Stroebe, & Aarts, 2008). Surely, this goal refers to (expected) food 'liking'. Yet Finlayson and Dalton argue that its activation is consistent with increased food 'wanting'.

The notion that food 'liking' and 'wanting' have different neurophysiological correlates in itself is insufficient reason to seek their behavioural expression. The fact that 'liking' and 'wanting' have different neurophysiological correlates does not at all mean that the two processes are likely to function independently. Indeed, in the absence of any brain abnormalities there is no reason to hypothesize that they do. Interpreting spurious dissociations between ostensible measures of 'liking' and food 'wanting' as evidence for incentive sensitization is a form of ad hoc theorizing. Indeed, as Feest (2005) pointed out, we should be careful not to confuse our operational definitions for facts.

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