original article

Interest in behaviour change interventions: A conceptual model

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The use of the Internet as the (primary) delivery mode for interventions has expanded substantially in the field of public health (Kohl, Crutzen, & De Vries, 2013). Internet-delivered interventions have proved efficacious in changing people's behaviours (Portnoy, Scott-Sheldon, Johnson, & Carey, 2008), but actual participation by the target group is often very low because the target group is not necessarily interested in such interventions (Bennett & Glasgow, 2009; Kohl et al., 2013; Lieberman & Massey, 2008). Meta-interventions, i.e. procedures designed to promote a target group's uptake of an existing intervention (Albarracín, Durantini, Earl, Gunnoe, & Leeper, 2008), are needed to increase the interest of the target population for Internet-delivered interventions and thus their use and potential public health impact. The importance of interest is not limited to Internet-delivered interventions (i.e., the focus of this special issue), but applies to behaviour change interventions in general.

Why is interest of importance?

Interest in using an intervention is different from motivation to change behaviour. Somebody might be *interested* in an Internet-delivered intervention aimed at weight reduction, for example, but not *motivated* to exercise daily. Or conversely: somebody might be *motivated* to quit smoking, but still not be *interested* in using an Internet-delivered intervention to guide him/her through the smoking cessation process. Although there is a long-standing research tradition on motivational determinants of behaviour change (Atkinson, 1957), knowledge on the uptake of interventions is still limited (Glasgow, Lichtenstein, & Marcus, 2003). A research focus on interest as an important determinant for the decision to participate in behaviour change interventions might provide insight in ways to increase intervention uptake. Indeed, in a previous study, arousing interest successfully increased intention to visit a website about Hepatitis A, B and C virus infections and the likelihood of clicking on the link to visit the website (Crutzen, Ruiter, & De Vries, 2014).

Interest is strongly related with emotional engagement (Sun & Rueda, 2012). Arousing interest is a first step in intervention adoption, which might ultimately result in people using an intervention. This is in line with functional approaches to interest suggesting that it is a positive emotion strongly associated with approach motivation (Thoman, Smith, & Silvia, 2011). Interest seems to be especially relevant in an online context, because there is often discontinuous communication (nobody waiting for and judging your response, in contrast to, for example, face-to-face conversations), which increases the likelihood of selectively picking an interesting option (e.g., a website) (Berger & Raghuram, 2013). However, future applications are not limited to websites, but also concern other media. For example, to guide people to the right app in the current "health app overload" (Van Velsen, Beaujean, & Van Gemert-Pijnen, 2013).

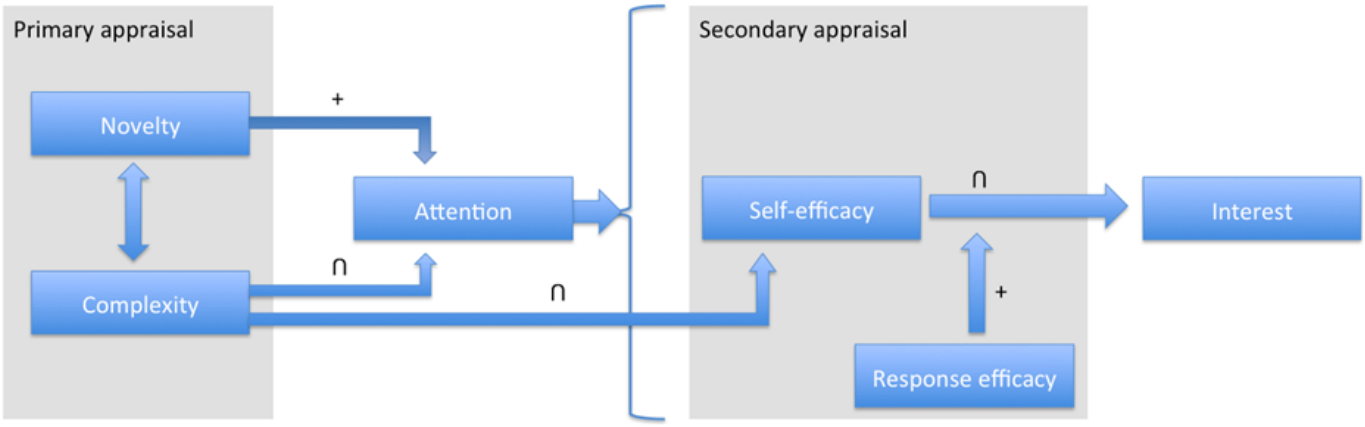

Figure 1. A conceptual model of interest in behaviour change interventions.
Note: A plus sign indicates a positive relationship and an inverted U indicates an inverted u-shaped relationship.

Why is something interesting to people?

Individual differences in interest are the result of variability in subjective appraisals of novelty-complexity and coping potential (Silvia, 2006). Or, as described by Silvia (2008); "Interest stems from events that are new, complex and unfamiliar [novelty-complexity], provided that people feel able to comprehend them and master the challenges they pose [coping potential]." Paul J. Silvia presented his ideas about interest in his thought-provoking book *Exploring the psychology of interest* (Silvia, 2006) and has also conducted experimental studies focused on the underlying appraisal structures (e.g., Turner & Silvia, 2006). Below we elaborate on his ideas to provide more insight into the process from perceiving a stimulus to increased interest. We do this by integrating insights from the structural model of appraisal (Lazarus, 1991) and the coping-appraisal process, as depicted in the Protection Motivation Theory (Rogers, 1983), into a conceptual model of interest in behaviour change interventions (Figure 1). We propose that novelty/complexity should be seen as a primary appraisal and coping potential as a secondary appraisal in the decision making process of intervention uptake.

The primary and secondary appraisal distinction is derived from the structural model of appraisal (Lazarus, 1991) in which the first appraisal concerns whether a stimulus is relevant to a person and the second appraisal whether a person is able to deal with the stimulus. This idea is also reflected in the Protection Motivation Theory in which there is a threat appraisal process to determine the relevance of a health threat and a coping appraisal process to evaluate the effectiveness of actions to avert the threat (Rogers, 1983). The primary appraisal thus concerns the novelty-complexity appraisal, because before people reflect on their ability to deal with the stimulus (i.e., the secondary appraisal being of relevance), it must be clear that the stimulus is unknown (i.e., novelty). If there is no novelty, then it is already clear what to do from previous encounters (and people react without much reflection). Moreover, there should also be a certain amount of complexity, because if the stimulus is so obvious that it is immediately clear what to do (i.e., low complexity) or that it can be taken for granted that it is beyond the capability of people to deal with it (i.e., high complexity), then less attention to the stimulus is needed and the secondary appraisal becomes less relevant. So, in line with Silvia's idea, the combination of novelty and a moderate level of

complexity is optimal. We propose that this combination results in attention to the intervention, and thus in engagement with regard to the secondary appraisal.

The second phase concerns the secondary appraisal of coping potential in which both self-efficacy and response efficacy come into play. If the complexity of a stimulus increases, then self-efficacy decreases. In other words, if something is deemed complex, then the perception of being able to deal with it decreases. However, this does not directly translate into a negative linear relationship between self-efficacy and interest, because of the previously described inverted u-shaped relationship between complexity and attention. Most attention is being paid to stimuli that are moderate in terms of complexity, which is also reflected in the relationship between self-efficacy and interest. Silvia refers to John Dewey (1913) as the first person to argue for nonlinear effects of self-efficacy on interest: "It is not too much to say that a normal person demands a certain amount of difficulty to surmount in order that he may have a full and vivid sense of what he is about, and hence have a lively interest in what he is doing." On top of that, Bandura (1997) suggested that "at least moderate perceived efficacy may be required to generate and sustain interest in an activity, but increases in perceived efficacy above the threshold level do not produce further gains in interest. Indeed, supreme self-assurance may render activities unchallenging and, thus, uninteresting."

We propose that the relationship between self-efficacy and interest is moderated by response efficacy. This idea is substantiated by the assumption that "people form enduring interest in activities in which they view themselves to be efficacious and in which they anticipate positive outcomes" (Lent, Brown, & Hackett, 1994). The latter is closely related to the notion of response efficacy as depicted in the Protection Motivation Theory (Rogers, 1983): the perceived effectiveness of the recommended behaviour in removing or preventing possible harm. When relating this to interest in behaviour change interventions, the recommended behaviour is the uptake of the intervention. Figure 1 combines our ideas about the subjective appraisals related to interest in a conceptual model.

Pointers for future research

The conceptual model is rooted in well-established theories and builds upon previous empirical findings (e.g., Crutzen, Cyr, Larios, Ruiter, & De Vries, 2013; Crutzen et al., 2014; Silvia, Henson, & Templin, 2009; Turner & Silvia, 2006). The key recommendation for future research, however, is to conduct experimental studies focusing on the relationships as depicted in the model in the domain of intervention uptake. As this conceptual model is 'work in progress', we recommend starting with manipulating constructs within the model, using a full factorial design (Peters, De Bruin, & Crutzen, 2013). This enables examining both main and interaction effects and might give more concrete answers to questions such as: To what extent are both novelty and complexity needed to draw attention to the stimulus? And how does response efficacy influence the relationship between self-efficacy and interest?

The conceptual model describes the complete process from perceiving the stimulus to increased interest. An additional question to be answered is how to manipulate stimuli in such a way that it positively affects the novelty-complexity appraisal (see Crutzen et al., 2014). Silvia (2006) proposed a speculative appraisal model of the sources of interest. According to this model, appraisal of novelty-complexity can be increased by, for example, manipulating vividness, surprisingness, or imagery. For example, a previous study demonstrated that JPEG files sizes of screenshots are a good proxy for the complexity of homepages (Tuch, Bargas-Avila, Opwis, & Wilhelm, 2009), which subsequently affects attitude towards the website (Crutzen, De Kruif, & De Vries, 2012). Future systematic manipulations based on this provisional appraisal model are needed to gain

more insight into the ways to positively influence novelty-complexity and coping potential appraisals.

Another issue to explore in future research is the measurement of interest. Previous studies have used self-reports of interest (e.g., Turner & Silvia, 2006) or outcomes that are the result of interest, such as increased intention to visit a website and the likelihood of clicking on the link to visit a website (e.g., Crutzen et al., 2014). The latter is of course an ultimate behavioural outcome demonstrating the relevance of increasing interest, but other measures are needed to provide more insight into the process from perceiving the stimulus to increased interest, as depicted in the conceptual model. For example, there is general agreement on the strong association between eye movements and attention (Rayner, 1998). Moreover, previous research also focused on using neural measures of attention, using measures from electrophysiology and functional neuroimaging (Coull, 1998; Ruiter, Kessels, Jansma, & Brug, 2006; Treue, 2001). It is worthwhile to explore whether such measures can be extended from attention to interest.

Conclusion

A focus on (the underlying process of) ameliorating interest might provide insight in ways to increase intervention uptake. The conceptual model presented in this article could serve a starting point for future experimental studies.

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