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Review

Theory-informed design of values clarification methods: A cognitive psychological perspective on patient health-related decision making

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ABSTRACT

Healthcare decisions, particularly those involving weighing benefits and harms that may significantly affect quality and/or length of life, should reflect patients' preferences. To support patients in making choices, patient decision aids and values clarification methods (VCM) in particular have been developed. VCM intend to help patients to determine the aspects of the choices that are important to their selection of a preferred option. Several types of VCM exist. However, they are often designed without clear reference to theory, which makes it difficult for their development to be systematic and internally coherent. Our goal was to provide theory-informed recommendations for the design of VCM. Process theories of decision making specify components of decision processes, thus, identify particular processes that VCM could aim to facilitate. We conducted a review of the MEDLINE and PsycINFO databases and of references to theories included in retrieved papers, to identify process theories of decision making. We selected a theory if (a) it fulfilled criteria for a process theory; (b) provided a coherent description of the whole process of decision making; and (c) empirical evidence supports at least some of its postulates. Four theories met our criteria: Image Theory, Differentiation and Consolidation theory, Parallel Constraint Satisfaction theory, and Fuzzy-trace Theory. Based on these, we propose that VCM should: help optimize mental representations; encourage considering all potentially appropriate options; delay selection of an initially favoured option; facilitate the retrieval of relevant values from memory; facilitate the comparison of options and their attributes; and offer time to decide. In conclusion, our theory-based design recommendations are explicit and transparent, providing an opportunity to test each in a systematic manner.

Introduction

Making decisions about one's healthcare can be challenging for patients. This is especially true when decisions involve tradeoffs between quality of life and length of life (i.e., increasing length at the expense of good quality, or having good quality but decreasing length). These healthcare decisions, ought to reflect patients' preferences (Kassirer, 1994; Sackett, Straus, & Richardson, 2000). To help patients, researchers have developed patient decision aids (PtDAs or simply aids): tools designed to support patient decision making.

Despite the development of aids, there is little evidence suggesting how patients clarify the personal value they associate with different options or features of options, such as how they may trade off pro's and con's within a decision. "Values clarification" describes the process(es) by which patients become clearer about how much they value options and why. Aids may include components to help clarify values, or "values clarification methods" (VCM). In line with the recent International Patient Decision Aids Standards (IPDAS) collaboration update (http://ipdas.ohri.ca/IPDAS-Chapter-D.pdf) we define VCM as methods "to help patients evaluate the desirability of options or attributes of options within a specific decision context, in order to identify which option he/she prefers".

The process of values clarification can be viewed in at least two ways: health-related preferences are seen as pre-existing and only

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in need of being uncovered (Gregory, Lichtenstein, & Slovic, 1993), or as being constructed from basic values at the time decision makers need to determine their preference (Gregory et al., 1993; Payne, Bettman, & Schkade, 1999). In either view, and because consequences are often high-stake, not fully imaginable, and serve conflicting goals (e.g., reducing pain versus minimizing side effects), clarifying values may be challenging (Fischhoff, 1991; O'Rourke & Germino, 1998; Simon, Krawczyk, Bleicher, & Holyoak, 2008).

VCM have the potential to have a substantial impact on resulting preferences. From our perspective, they should aim to facilitate the process of determining what is most important to the patient which will, in turn, increase the likelihood that decisions will be consistent with patients' values. For example, heavy processing burden can result in patients using short cuts which then limit what or how they consider particular aspects/options (Norman & Bobrow, 1975). Thus, if VCM reduces processing burden, patients will have more capacity available to ensure adequate identification and integration of their values.

There is only limited evidence regarding the added value of VCM in aids to facilitate patient decision making. Several types of VCM exist and it is unclear what type is most helpful (Llewellyn-Thomas, 2009). The few randomized controlled trials designed to assess the impact of enriching aids with a VCM suggest they improve the match between values and treatment choice (Dodin, Légaré, Daudelin, Tetroe, & O'Connor, 2001; O'Connor et al., 1999; Rothert et al., 1997). Recent evidence suggests that adding a procedure to clarify values improves patient outcomes but the impact only emerges over time (Feldman-Stewart et al., 2012). At present, many believe that supporting the process of values clarification is beneficial (Elwyn, Stiel, Durand, & Boivin, 2010).

Patient decision aids often have been designed without reference to theory (Bekker, Hewison, & Thornton, 2003; Bowen et al., 2006; Durand, Stiel, Boivin, & Elwyn, 2008) or without a clear rationale on how theory has informed their development (Durand et al., 2008). Rooting VCM design in theory can make explicit the mechanism(s) by which outcomes are achieved, and, therefore inform thinking about method(s) that would be expected to best support clarification. In this manner the active ingredients of interventions can be traced.

In this paper, we aim to provide theory-informed recommendations for the design of VCM that enable patients to become clearer about how much they value options and why. Earlier work started bridging the theory–practice gap in the design of theory-derived aids (Elwyn et al., 2010) by identifying theories that had been reported as informing the design of existing aids, though original authors did not necessarily clarify how. Also, the authors assumed that a conscious deliberation process is essential to values clarification, yet that is under debate (Dijksterhuis, 2004; Wilson, Hodges, & LaFleur, 1995). We were interested in theories that describe processes by which people make new decisions that also include the process of valuation. We selected theories regardless of whether these have been used in designing VCM. There is debate amongst decision scientists about how people make decisions, exemplified by the large number of decision theories "out there" (Bekker, 2010). We identified relatively comprehensive theories that describe decision making processes that VCM could support and have formulated recommendations based on their commonalities.

Process theories of naïve decision making

Process descriptions view decision making as a sequence of mental operations, occurring between the presentation of the decision problem and ultimate choice (Crozier & Ranyard, 1997). Mental operations need not take place in a particular order or in a serial manner but can occur in parallel and iteratively. Importantly, a process perspective holds that individuals' internal representations of the decision problem depend, to some extent, on individuals' pre-existing knowledge, experience, and perspective (Thomas, 1999; Wagenaar, Keren, & Lichtenstein, 1988).

Process theories generally share three main characteristics (Crozier & Ranyard, 1997). First, they view decision processes as extended in time, with a number of stages that occur before a decision is made public or committed to. Second, decision makers are postulated to change their representation of decision problems in order to reach decisions (Brownstein, 2003). The evidence that attributes are re-evaluated before the point of commitment, without new information becoming available, is consistent with changing internal representation as being integral to decision making (Brounstein, Ostrove, & Mills, 1979; Brownstein, 2003; Mann, Janis, & Chaplin, 1969). The mental restructuring stands in contrast to structural theories of decision making, including normative expected utility theories (Fishburn, 1981) and Prospect Theory (Kahneman & Tversky, 1979), which relate decisions to structural characteristics of decision problems and do not suggest re-evaluation of information as part of decision making. Third, a decision maker is viewed as adaptively applying one or more decision 'rules' or strategies to reach decisions. The selection and application of decision strategies can result from conscious consideration of information (Glöckner & Betsch, 2008a) or from automatic processes such as recognition (Dougherty, Gettys, & Ogden, 1999). Decision strategies can consider multiple options at a time, leading to quick, integrated assessments of the attractiveness of options. Other strategies directly compare attributes across options, and include two classes: compensatory and non-compensatory strategies. In *compensatory* decision strategies, information is weighed so that positive attributes can counterbalance negative attributes. In *non-compensatory* decision strategies, information is not weighed but typically thresholds are used to decide if an option remains under consideration. To illustrate the two types of strategies, consider for example a prostate cancer patient, who places a high value on getting rid of the cancer and is choosing between active surveillance and surgery. With a compensatory strategy, surgery, seen to get rid of the cancer but with side effects, is compared to active surveillance, which does not get rid of the cancer but also has no side effects. The desire to eliminate cancer can outweigh not enduring side effects; with a non-compensatory strategy the high value placed on eliminating the cancer can mean that active surveillance is not even being considered.

We searched for theories published in English peer-reviewed journals, indexed in MEDLINE or PsycINFO databases, using broad terms ("decision making theory" OR "decision making model" OR "decision processes") AND ("valuation" OR "values clarification" OR "preference clarification" OR "preference construction" OR "incomplete preference" OR "evaluation"). We further used a snowball technique, inspecting the reference list of those papers. We aimed to select theories that describe decision processes when faced with a new decision (as opposed to "expert" decision making that comes with repeatedly making the same decision), including valuation. Each theory was required to meet the following criteria: it should (a) fit the criteria for process theories as proposed by Crozier and Raynard outlined above; (b) provide a coherent description of the whole process of making a decision, including processes where values clarification is addressed; and (c) be supported by empirical evidence for at least some of its proposed mechanisms.

We identified nine theories of naïve decision making with potential relevance: Image Theory (Beach & Mitchell, 1987); Differentiation and Consolidation theory (Svenson, 2003; Svenson & Jakobsson, 2010); Search for Dominance Structure theory (Montgomery, 1994); Behavioural Decision Framework (Payne,