

# How to Attract Interest in Health Materials: Lessons from Psychological Studies

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## Abstract

**Objective:** Health materials need to target individuals who resist or are not interested in health behaviors. Attracting the interest of this audience is a crucial aspect of materials' design. The present study aimed to review the findings of psychological studies on causes of interest and to discuss the applicability of these studies to the design of health materials. **Methods:** We used the backward and forward snowball method for our literature review. We identified 10 relevant publications as initial sources for snowballing through a systematic search of EBSCOhost (searching PsycINFO, PsycARTICLES, ERIC, CINAHL and MEDLINE). Through backward and forward snowballing from these sources, 76 relevant publications were identified. **Results:** We identified properties and variables relevant to attracting interest and grouped them into four tactics: surprise; question; visualization; emotional appeal. **Conclusion:** Lessons from psychology gained in the present study may guide future studies and practices for attracting interest in health materials. The four tactics can be used to make health materials more interesting, as an example showed in the present study.

## Keywords

Health Material, Health Education, Attention, Interest, Comprehension, Memory

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## 1. Introduction

Health materials help individuals to understand and engage in the management of their health conditions. Written or audiovisual health materials are designed and disseminated to individuals by health professionals. These health materials convey important health education messages such as recommendations for cancer screenings, vaccinations, healthy diet, and physical activity. The primary challenge in designing health materials is to preferentially target individuals who

resist or are not interested in health behaviors [1]. McGuire's communication and persuasion matrix indicate that attracting attention and interest of this audience is the first step toward promotion of health behaviors [2] [3] [4]. Furthermore, studies indicate that when audiences are interested in the given information, their learning, comprehension, and recall are enhanced [5] [6]. Therefore, attracting the interest of the audience is crucial in the design of health materials.

Numerous studies in psychology have sought to determine which stimulus properties attract interest. Sharing of these findings with researchers and practitioners in health education will contribute to better design of health materials. The present study aimed to review the psychological literature on causes of interest, and to discuss the applicability of those findings to the study and practice of designing of health materials.

## 2. Methods

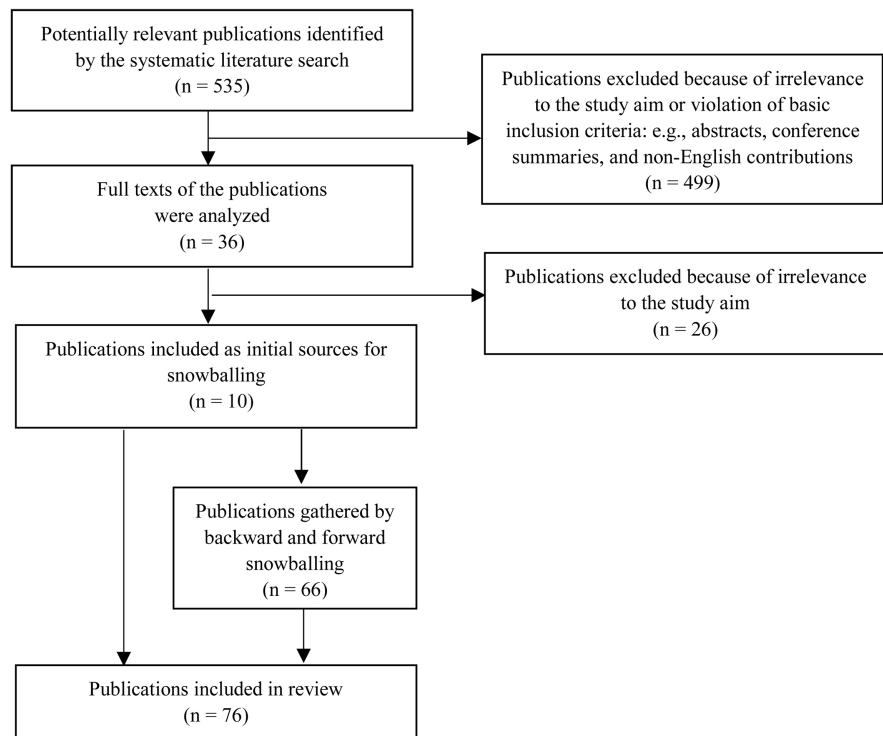
We adopted the backward and forward snowball method proposed by Greenhalgh *et al.* [7] [8] [9] because search terms such as "interest" generated a large volume of results. To identify initial sources for the snowballing, we conducted a systematic search of EBSCOhost (searching PsycINFO, PsycARTICLES, ERIC, CINAHL and MEDLINE) to identify relevant review articles and books published in English between January 1990 and 2017. The search terms were: attention OR interest OR curiosity OR liking. We excluded irrelevant results by selecting subjects. The search yielded 535 publications. After title and abstract analysis, we excluded 499 publications because of irrelevance to the aim of the present study. We analyzed the full text of the remaining 36 publications; in this process, 26 publications were excluded, and 10 publications were included as initial sources. From these sources, we gathered relevant publications by backward reference snowballing and forward citation snowballing using the Web of Science. As a result, we identified 76 relevant publications and subsequently reviewed them (Figure 1).

## 3. Results

As Table 1 shows, we identified 15 message variables. According to McGuire's communication and persuasion matrix indicate [2] [3] [4], the message variables are the independent variables, and the output variables are the dependent variables that respond to the message variables. As McGuire [2] has mentioned, some of the message variables influenced multiple output variables (e.g., questions attract interest and improve memory). We integrated similar message variables and grouped them into four categories: surprise; question; visualization; emotional appeal.

### 3.1. Surprise

Berlyn [10] [11] [12] was one of the first researchers to investigate environment-based causes of interest. According to him, interest is a function of collative



**Figure 1.** Analysis of the identified contributions.

variables, which he defined as structural properties of stimulus patterns, such as familiar-novel and expected-surprising [12]. The underlying characteristic of these properties is that they create conflict [10] [11] [12]. Similarly, other scholars have proposed that information conflict [13], incongruity [14] [15] [16], and structural anomaly [17] attract interest.

Hidi [18] reviewed these evidences and proposed message variables such as unexpectedness [19], surprise [20] [21] and novelty [22] attract interest. Lowenstein [23] argued similarly that interest is aroused when the given information violates one's expectations or is incongruous with one's existing ideas, because these situations interfere with the natural tendency to try to make sense of the world. This construct encompasses properties such as novelty and surprise [23]. Wade *et al.* [24] and Silvia [25] conducted empirical studies to test these message variables, and concluded that they attract interest.

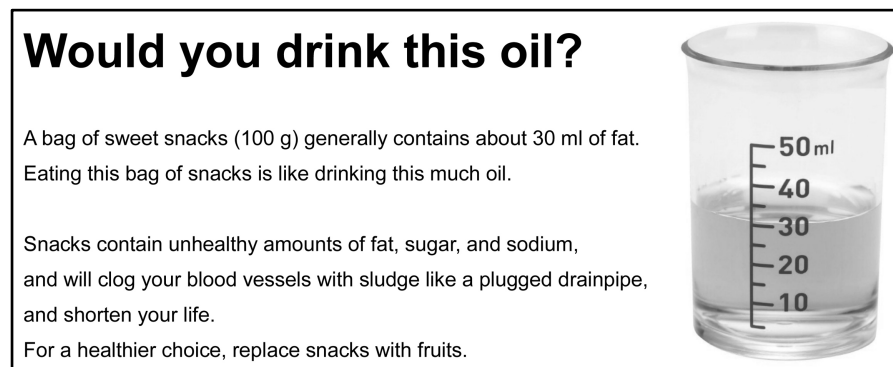
The public advertisement presented by a partnership between the health and community organizations in Australia, "Rethink Sugary Drink", is an example of using a tactic of surprise, within which fat comes out from a can when a man drinks a sugary drink [26]. Health professionals are advised to convey unexpected and surprising messages in health materials to attract interest of audiences. For an example, see **Figure 2** (to be discussed later).

### 3.2. Question

As is generally accepted, mystery is a powerful inducer of interest that does not need personal relevance, but brings its own relevance in the form of a need for

**Table 1.** Message variables, categories, output variables and key references.

Categories	Message variables	Output variables	Key references
Surprise	Conflict	Interest/liking	Berlyn, 1960, 1974; Nunnally & Lemond, 1973
	Incongruity	Interest/liking	Hunt, 1963, 1965; Mandler, 1982
	Structural anomaly	Interest/liking	Lepper, 1988
	Surprise	Interest/liking	Hidi & Baird, 1986; Iran-Nejad, 1987
	Unexpectedness	Interest/liking	Schank, 1979; Wade <i>et al.</i> , 1999
	Novelty	Interest/liking	Anderson <i>et al.</i> , 1987; Wade <i>et al.</i> , 1999; Silvia, 2005
	Mystery	Interest/liking	Cialdini, 2005; Kruglanski & Webster, 1996
Question	Information gap	Interest/liking	Loewenstein, 1994
	Question	Interest/liking	Berlyn, 1960; Loewenstein, 1994
		Recall	Slamecka & Graf, 1978; Pressley <i>et al.</i> , 1987; Mulligan & Lozito, 2004
	Imagery	Interest/liking	Wade <i>et al.</i> , 1999;
Visualization	Imagery	Comprehension	Clark and Paivio, 1991
		Recall	Clark and Paivio, 1991
	Vivid detail	Interest/liking	Schraw <i>et al.</i> , 1995
	Concreteness	Recall	Wharton, 1980; Sadoski <i>et al.</i> , 1993; Sadoski <i>et al.</i> , 2000
	Pictures	Attention	Delp & Jones, 1996;
		Comprehension	Michielutte <i>et al.</i> , 1992; Austin <i>et al.</i> , 1995; Morrow <i>et al.</i> , 1998; Mansoor & Dowse, 2003
		Recall	Patel <i>et al.</i> , 1990; Delp & Jones, 1996; Sojourner & Wogalter; 1998
Emotional appeal	Emotional arousing	Decision making	Roter <i>et al.</i> , 1987; Delp & Jones, 1996; Whatley <i>et al.</i> , 2002
		Comprehension	Mio, 1996; Gentner & Markman, 1997
		Attention	Yiend, 2010; Carretié, 2014.
		Interest/liking	Schank, 1979; Kintsch, 1980
		Recall	Sadoski & Quast, 1990; Schmolck <i>et al.</i> , 2000; Hamann, 2001; Buchanan & Adolphs, 2002



**Figure 2.** Application example, using surprise, question, visualization and emotional appeal.

closure [27] [28]. The power of mystery as an inducer of interest is informed by Loewenstein and Litman’s conceptions of interest. According to Loewenstein [23], interest is a form of cognitively induced deprivation. This deprivation arises when individuals perceive a gap in their knowledge or a gap between what they know and what they want to know [23]. This state motivates a desire to know. According to Litman, the desire stimulates acquisition of new information [29], which brings an eventual experience of pleasure from closing the information gap [30]. Accordingly, the posing of questions confronts the recipient directly with an information gap, and can be the most straightforward inducer of interest [10] [23].

Additionally, recipients remember information better when they must generate possible answers to a question; such findings have been labeled as a “generation effect” [31]. For example, pairs of antonyms in which some information is concealed and must be generated by the reader (e.g., fast—s\_\_\_) are better recalled than are pairs in which all information is presented (e.g., fast—slow) [32].

Health professionals are advised to present riddles or questions in health materials to allow audiences to process the information actively. For example, a headline with a question such as “99% vs 15%—do you know what the numbers mean?” will attract interest more than a simple headline such as “Obtain breast cancer screening regularly”.

### 3.3. Visualization

Studies indicate that when written health materials are presented with pictures, they attract more attention [33] as well as facilitate comprehension [34] [35] [36] [37] and aid recall [33] [38] [39] and decision-making [40] [41] [42] (see Houts *et al.* [43] for a review). A simple graphic of the USDA Myplate Nutrition Guideline [44] is a good example of visualization. The graphical guideline improved respondents’ recall and food choices compared with a previous complex graphic [45].

This effect can be explained by dual coding theory [46], which assumes that both verbal and nonverbal (e.g., visualized) mental encoding of information

yields additive increases in comprehension and retention. Dual coding is prompted by concrete language even without pictorial cues [47] [48]. Studies indicate that concrete words stimulate greater generation of imagery [49] [50] and that concrete descriptions with vivid details are more interesting [24] [51], more comprehensible [52] [53] [54], and more memorable [55] [56] [57] than is abstract text.

Sadoski [54] suggests that important but abstract messages should be fleshed out with connected concrete examples. Metaphors can be used to express an abstract concept in a concrete form. For example, to explain atherosclerosis simply, health professionals can describe it as “like a kitchen drain pipe becoming gradually plugged with cooking grease and sludge”. Metaphors also make an argument easier to comprehend [58] [59] and are consequently more persuasive than literal messages [60].

### 3.4. Emotional Appeal

Schank [19] suggested that life themes such as danger and death are “absolute interests”, *i.e.*, they elicit individuals’ interest almost universally. Kintsch [61] referred to them as “emotional interests.” Studies indicate that both negative and positive emotional arousal information elicits selective attentional priority over non-emotional information [62] [63].

Studies also indicate that strength of emotional arousal is correlated with recall rates [55] [64] [65] [66]. This finding has been documented with a variety of stimuli, including words, sentences and pictures [67] [68] [69]. Neuroimaging studies have demonstrated that amygdala activation plays a fundamental role in consolidating memory for emotional information [70] [71] when an individual processes threat-related as well as reward-related information [72] [73] [74].

The public advertisement “Make Health Last”, created by the Canadian Heart and Stroke Foundation [75], is an example of emotional appeal by contrast between costs of not performing health behaviors and benefits of performing them.

## 4. Discussion

The present study showed properties relevant to attracting interest as well as enhancing comprehension and memory. The properties can be instantiated with four tactics: surprise, question, visualization, and emotional appeal. Although we cannot deny the possibility that relevant publications were missed in the present review, the “snowball” method we used is powerful for identifying high-quality sources in obscure locations [7]. Although the present study is an exploratory review of literatures to examine properties relevant to attracting interest in health materials, it has implications, as follows. Studies and practices of designing health materials so far have focused on lowering the barriers to health information for those with low literacy skills [76]-[83]. To our knowledge, the properties and variables revealed in the present study have not received sufficient attention in studies of designing health materials to attract the interest of

audiences. Future studies may assess the extent to which the variables that emerged in the present study affect audiences' interest as well as comprehension and memory. It may also be useful to examine the effect of combining these variables in the design of health materials (e.g., **Figure 2**) on audiences' intention to perform health behaviors.

**Figure 2** shows an example of using the four tactics introduced in the present study. When health materials try to inform about health risks of indulging in too many confectionary snacks, a mediocre message such as, "Replace snacks with fruits" may not successfully attract the interest of target audiences. The headline in **Figure 2**, "Would you drink this oil?" uses a question. Sentences like the following offer a surprise: "A bag of sweet snacks (100 g) generally contains about 30 ml of fat". A picture of a measuring cup with oil visualizes this surprising message. A metaphor of a plugged drainpipe visualizes the abstract idea of atherosclerosis. A sentence like the following is intended to appeal to the audience's emotions: "Snacks contain unhealthy amounts of fat, sugar, and sodium, and will clog your blood vessels with sludge like a plugged drainpipe, and shorten your life". Thus, the tactics showed in the present study can make health materials more interesting.

Health education and promotion begin with attracting the interest of audiences [2] [3] [4]. If health materials are successful in this, they will be able to promote health more effectively. Studies in psychology may guide the future studies and practices in health education to attract interest in health materials.

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