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Internet-Based Tailored Health Communications: Application and Future Directions

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Introduction

In the previous edition of Interface, I detailed the historical events that provided the foundation for the development of Internet-based tailored forms of health communication. As a refresher, a tailored communication has been defined as an individualized form of communication intended to reach one specific person that is based on information about characteristics that are unique to that person [1] [2]. Information presented via tailored communication, designed to focus directly on an individual’s unique needs, has been found to be more effective than other methods of information presentation in the promotion of a variety of healthy behaviors [3].

Following is a presentation of empirical research demonstrating the effectiveness of the tailoring approach with an introduction to current application and speculation on future directions and the role of the tailoring approach in Internet-based health communication.

Empirical Evidence Supporting Tailored Communication

In my previous article, I detailed that Petty and Cacioppo’s Elaboration Likelihood Model (ELM) specifies that individuals process information more thoughtfully (i.e., more actively and elaborately) if they perceive it to be personally relevant and that the efficacy of message persuasion, in terms of endurance, depends on the likelihood and extent of this elaboration. The rationale for utilizing an Internet-based tailored communication is founded in the idea that elaboration is more likely when a message is seen as personally relevant and that increased elaboration leads to an enhanced likelihood of adoption and utilization of the tailored message. This rationale has been succinctly detailed in a five-part logic sequence by Kreuter, Strecher and Glassman [4]. First,
superfluous and unnecessary information is eliminated in tailored communications, thus allowing
for a more focused communication. Second, given that the information that is utilized in tailored
communications is based on an individual assessment of the message recipient, the resulting
communication is, therefore, deemed more personally relevant to the learner. Third, individuals
attend more fully to material that they deem personally relevant. Fourth, when information is
attended to, it is more likely to have a lasting impact (i.e., be remembered better) than is non-
attended to information. Fifth, when the tailored information that addresses needs specific to the
particular individual are attended to, the individual becomes and stays motivated, gains new skills,
and is more likely to enact and keep the desired behavioral change.

To determine whether such an ELM-based explanation of the effects of tailoring is valid, Kreuter
and colleagues conducted a study among 198 overweight men and women who were randomly
assigned to receive one of three different types of printed weight-loss information: (a) materials
that were computer-generated and tailored to the individual, (b) standard preprinted materials
from the American Heart Association (AHA), or, (c) computer generated materials containing the
same content as the AHA materials (but formatted to look identical to the tailored materials) [5].
Follow-up surveys administered both immediately after participants received one of the three
different weight-loss materials, and again one month later, looked for differences in the ways
participants processed the weight-loss materials. Examined within the study were people’s
elaborations in the form of cognitive responses (i.e., thoughts and ideas listed by study
participants immediately after receiving and reading their weight-loss materials). Such a method is
commonly used to identify thoughts and ideas generated by different types of messages [6] [7].

The findings of the Kreuter, et al. study showed that, when compared to participants in either of
the two non-tailored groups, those who received the tailored weight-loss materials listed
significantly more (a) positive thoughts about the study materials, (b) thoughts reflecting a
personal connection to the materials, (c) thoughts indicating that a self-assessment took place,
and (d) intentions to make behavioral changes [8]. These findings suggest that, by tailoring health
information to the unique needs of each individual, the likelihood that the recipient will thoughtfully
consider the health message can be significantly improved and can stimulate important pre-
behavioral changes such as self-assessment and behavioral intention.

As the Kreuter, et al. study indicated, this kind of information processing is, in fact, related to
behavioral change [9]. According to the ELM, when cognitive responses are specific and
behavioral implications are straightforward (i.e., there are few intervening events), a relationship
between cognitive and behavioral responses is found [10]. Data from the Kreuter, et al. study
support this as well [11]. In the study, both the intention to attempt behavioral recommendations
and the number of tailored recommendations actually attempted was significantly correlated.
Furthermore, among participants in the tailored message group, those who indicated a more
favorable attitude toward the weight-loss materials were significantly more likely to adopt
behavioral changes than those who did not. These findings suggest that certain cognitions (or
cognitive / affective reactions) may be important mediating factors in the relationship between
tailored communication and behavioral outcomes.
Summarizing this theoretical rationale, tailored communication eliminates information that is not pertinent to the individual recipient. What remains is only information that the individual has identified as being important. As such, tailored messages are able to address the specific concerns, interests, and needs of a single person. As detailed within the ELM, a person is more likely to attend to the tailored information and thoughtfully consider it because it is viewed as more personally relevant. When the individual’s attention is captured and elaboration begins, health messages are more likely to influence the person’s awareness, knowledge, attitudes, beliefs or behaviors [12].

The tailoring approach has been found to be effective in promoting behavioral change within a variety of areas such as smoking cessation [13], weight loss [14], educational achievement [15] and the adoption of healthy eating behaviors [16]. Some of the most influential research on computer-based information tailoring, however, has been focused on encouraging the adoption of healthy eating behaviors. While attentional focus, as detailed above, has been found to be a pertinent factor in the adoption of healthy eating behaviors this is, however, only one aspect that is likely to be influential in creating a change in healthy eating behavior.

Additional Mediating Factors and Determinants of Health-Related Behavior

The successful adoption of a healthy eating behavior may be mediated by influential factors that fall into three broad categories: physiological factors related to experiences with food, environmental factors operating outside of the individual, and cognitive and motivational factors related to the way individuals handle health information that they come into contact with.

Physiological and Environmental Factors

Physiological examination of healthy eating behaviors has revealed that infants appear to be born with an extremely limited set of propensities toward the adoption of a healthy diet [17]. In fact, a preference for foods that are sweet and a negative response toward sour and bitter tastes are the only known innate predispositions that we are born with. Researchers in this area have, therefore, concluded that rather than rely on this limited guide to establish healthy eating behaviors, individuals instead learn food acceptance patterns that are often based on the consequences of eating certain foods [18]. As such, environmental factors (i.e., factors acting outside of the individual) also play a strong mediating role in the adoption of food choice behaviors [19]. Such factors include the availability of food (e.g., physical, economic, and preparation requirements), cultural norms and practices, and the influence of family and educational programs.

Cognitive and Motivational Factors

As individuals become older, cognitive and motivational processes exert greater influence over our food choice behavior [20]. These include the influence of motivation and values (e.g., desired consequences of food choice behavior), personal beliefs (e.g., expected consequences,
acceptability, and self-efficacy) and knowledge. In addition to the aforementioned mediating personal beliefs, the perceived control that an individual feels that they have over their health (i.e., their locus of control) is also a potentially influential factor in the adoption of food choice behaviors.

An individual's locus of control (LOC) is expressed as tendencies to be either “external” or “internal” in their perceptions of the primary source of influence across life events [21]. For example, to attribute success on a recently taken test to hard work and persistence would be consistent with an internal locus of control, whereas attribution of the test grade to good fortune or the influence of others (e.g., the instructor) would constitute an external locus of control.

According to Rotter, the chances of any given behavior occurring is a function of the expectation that the behavior will elicit a reward and of the value that this reward has for the individual [22]. Rotter’s concept of locus of control predicts that internals and externals will differ in the behaviors they engage in because they have different expectations of reward. Rotter found strong support for the hypothesis that individuals who have a strong belief that they can control their own destinies (i.e., hold an internal locus of control) are more likely to be aware of environmental factors that may influence future behavior, place greater value on skill or achievement reinforcement, take steps to improve environmental conditions and be resistive to conformity and other subtle attempts to influence their behavior [23]. Externality, on the other hand, is associated with the concept of ‘learned helplessness’ and is derived from a low expectation of reward and feeling no control in obtaining reward.

Rotter’s model has been very successful as a generalized locus of control scale predicting variables such as depression, but falls short in specific locus of control domains such as academic, interpersonal and socio-political LOC [24]. As a measure of locus of control specific to the health domain, The Multidimensional Health Locus of Control (MHLC) scale has emerged [25] [26].

The MHLC, in use since the mid-1970’s, has been widely cited in the literature and has been used in over 1,000 studies [27] including examination of the functional outcomes of individuals with chronic pain [28], body image in breast cancer survivors [29], the influence of having a parent who is an alcoholic [30] and improvements in physical functioning of patients in a return-to-work program [31].

Internals, who perceive that they retain power over health related rewards, are prone to obtain proper nutrition, exercise, rest, stress reduction and to adopt prevention/enhancement strategies to maintain/improve the state of their health. Externals, who believe that chance, or the medical industry (i.e., powerful others) control their health, are liable to exhibit behaviors that are less action oriented (more reaction oriented) and appropriate responses to their current state of their health may not occur. Individuals with an internal health locus of control tend to adopt strategies to maintain or improve the state of their health (i.e., abstaining from smoking or drinking and getting exercise) [32] and have a significant advantage over externals in their mental and physical health [33].
A considerable amount of research has linked internal locus of control to a variety of positive health beliefs and behaviors. Internal locus of control has been associated with knowledge about disease [34], effective use of birth control [35], adherence to a medical regimen [36], ability to stop smoking [37], ability to lose weight [38] and getting preventive inoculations [39].

The influence of an individual’s locus of control is the single area within the research on tailored communication where such personality factors of the individual learner have been examined [40]. In a study of 198 overweight individuals, Holt and colleagues examined differences in responses to tailored and non-tailored weight loss materials. Locus of control was found to significantly interact with tailoring condition in that those with an external locus of control were more likely to respond to the health education materials with counter-arguments rather than accept the information as pertaining to their life and accepting behavioral change recommendations. This finding is in line with previous research that suggests that individuals with an internal locus of control tend to respond better than externals to programs involving self-change [41] [42] [43] [44].

In addition to personal efficacy and control beliefs, changes in the way individuals process information is likely an influential mediating factor in the adoption of successful food choice behaviors. For example, research has found the development of advanced rehearsal strategies and increases in rehearsal activity to be associated with increases in information recall in children [45] [46]. As we grow and develop, however, strategy use becomes more elaborate. Organizational strategies such as categorization and grouping of related pieces of information as well as the use of imagery techniques are more often seen in adults and are generally much more effective methods of maintaining and learning information than is the simple repetition of rehearsal [47]. In that we are better able to manipulate and incorporate health related information that we encounter, we are likely to make not only better informed, but also more complex food choice decisions.

**Future Directions for Internet-Based Tailored Health Communication**

While the evidence in support of tailored communication is promising, research has demonstrated that the overall effectiveness of the tailoring approach might be limited [48]. For example, in some studies aimed at detailing the effectiveness of the tailoring approach, only about half of the participants indicated that the study materials that they received applied to them specifically [49] [50]. It has been suggested that limitations found in such an approach might be the result of not including potentially relevant and influential characteristics such as contextual, cultural, or personality factors [51] [52]. While work detailing personality factors that might enhance the tailoring approach has begun, a full understanding of many personality and cultural influences on the acceptance of tailored forms of communication remains lacking.

One such dimension upon which identification and use might bolster the effectiveness of tailored Internet communications is within the distinction between a collectivist and an individualist value orientation. The identification of such a culturally-based value orientation has proven useful in a variety of areas including career counseling [53] and Internet shopping [54]. Though diverse in
their investigative focus, such studies consistently highlight the influence of an individual’s cultural values and beliefs on the subsequent acceptance of information. Research funded by the Berglund Foundation is currently underway to extend existing research on the effectiveness of tailored communication techniques by investigating the role that cultural value orientation and other personality factors (i.e., locus of control, self-efficacy, resiliency, etc.) might play in the acceptance and utilization of such messaging.

As more is learned about the factors involved in the effective construction and individual interpretation of tailored health communications, we can move beyond the ‘one size fits all’ approach that has historically dominated the transmission of health information. With the continued development and adoption of Internet technologies, a true individualization of health information is within reach.

ENDNOTES


[9] Ibid.


[20] Ibid.


[22] Ibid.

[23] Ibid.


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