

Mandates and Recommendations for Public Health Materials to Improve Health Literacy

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HEALTH LITERACY is defined as the “degree to which individuals have the capacity to obtain, process, and understand basic health information and services needed to make appropriate health decisions” (Healthy People 2010, 2000) and refers to all forms of health promotion communication (CDC, 2005). More than 90 million people in the United States are estimated to have low health literacy (Kirsch, Jungeblut, Jenkins & Kolstad, 1993), and even people with high overall literacy may not understand critical health information if time constraints or stress interfere with their attention or comprehension skills.

The consequences of low health literacy are widespread and costly. For example, low health literacy is a stronger predictor of poor health than age, income, employment status, education level, and race (AMA, 1999). Low health literacy is also associated with increased risk of hospitalization, poor treatment compliance, and adverse health outcomes (AHRQ, 2004). Overall, the adverse outcomes associated with low health literacy have a financial impact in the U.S. of \$30-\$73 billion annually in lost revenue and productivity (Center on an Aging Society, 1999).

Because of the high personal and economic costs of low health literacy, the public health field has placed a priority on the development of consumer-centered educational materials that closely reflect the needs, skills, and abilities of the target audience. Theory can be used to develop appropriate materials, but the types of theories used in public health to generate products and information have been limited. Behavior change theories are the most commonly used because they provide a model of how new knowledge can prompt attitude and behavior change. Despite their potential value to the field of public health, however, cognitive development theories, drawn from the fields of psychology and education, have not been systematically explored for their potential contribution. But cognitive development theories provide a robust complement to behavior change theories with recommendations on

RESEARCH OBJECTIVES

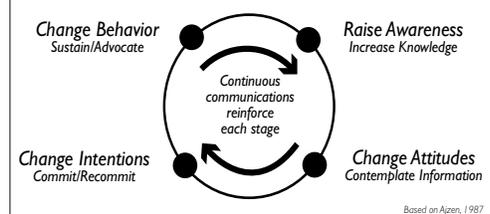
This research provides a systematic examination of the linkage between two bodies of theory – behavior change theories and cognitive development theories from the fields of psychology and education – to inform the creation of public health materials for low literacy populations.

how to make knowledge optimally accessible to a variety of audiences. To that end, this brief explores the links between behavior change theories and cognitive development theories to inform the development of public health materials for low literacy populations. Combining the tenets of these theories suggests practical recommendations for how health communication materials that are likely to have impact with low literacy audiences can be designed.

Behavior Change Theories

Research suggests that increasing knowledge and positive attitudes can lead to behavior change (Ajzen, 1987; Ajzen & Fishbein, 1980). Indeed, this is the key tenet of the Theory of Reasoned Action (TRA), which posits that exposure to persuasive information causes changes in knowledge, with cascading changes in attitudes, intentions, and finally, behavior (Figure 1). TRA is commonly used in public health interventions, and has a broad evidence base on its contribution to effective programs in variety of health

FIGURE 1: Theory of Reasoned Action



promotion and prevention areas (Fishbein & Yzer, 2003; Sutton, 1998). However, behavior change theories such as TRA are silent on two key questions: How do different people obtain information from the environment? How can persuasive information be made optimally accessible in order to start this cascade of knowledge, attitude and behavior change? Cognitive development theories provide valuable insights to these questions.

While the empirical connections between knowledge, attitudes and behaviors may help practitioners in their work, these connections are limited because there is little systematically known about how different people process health information to build knowledge. Cognitive development theories can fill that gap, because they are frequently used in the fields of education and psychology to explain, predict, and improve how people obtain and process information from the environment. More specifically, the basis of using theories of cognitive development to examine the creation of public health information is rooted in the notion that people with low literacy may have fewer and often fundamentally different cognitive skills than a high literacy population.

Cognitive Development Theories

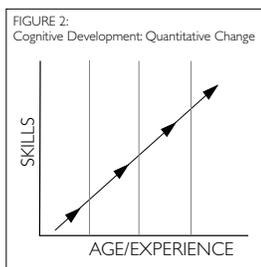
There are two classes of cognitive development theories: quantitative and qualitative.

A quantitative conceptualization of cognitive development

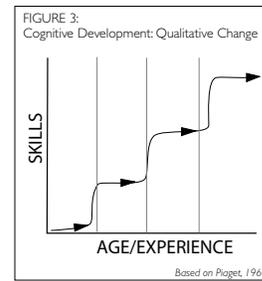
Quantitative cognitive development theories, such as informational processing theory, assume that a person's information processing skills, such as the acquisition of new vocabulary, increases in reading speed, or improvements in reading comprehension (Ashcraft, 1994), build from one another in a linear, upward trajectory over the course of development (Figure 2). Literacy increases in turn as information processing skills improve in speed, depth, and breadth.

There is evidence that adults acquire literacy skills in this manner. For example, a study on vocabulary acquisition showed that vocabulary knowledge played a larger role in success than working memory, suggesting that a previous database of vocabulary provides a basis for future success with new vocabulary tasks (Long & Shaw, 2000).

Because experience can improve performance on cognitive tasks, multiple exposures to a new concept will aid comprehension and mastery, as will connecting a new concept to a more familiar concept through analogy and comparison. Decreasing the information processing demands needed to read public health materials will help people comprehend the information.



A qualitative conceptualization of cognitive development



Piagetian cognitive development theories are qualitative in nature and conceptualize sudden stage-like jumps in ability with intervening longer homogenous periods. A qualitative conceptualization of cognitive development resembles jagged steps (Figure 3) and at each step, “thinking” is fundamentally different than “thinking” at the previous step. These stages, though often tied to chronological age, may actually be more reflective of educational and life experience (Piaget, 1963).

An example with particular relevance to the field of public health relates to the development of abstract thinking, particularly the two stages that people pass through in the development of abstract thought: concrete operations and formal operations.

Concrete operations is characterized by the ability to perform mental operations successfully, as long as there is a concrete reference – for instance, mapping out the route to a treatment room in a hospital by looking at a map. Over time, physical development and experience combine to help people achieve formal operations.

In formal operations, a person has mastered abstract thinking, with the ability to perform mental operations on abstract concepts, without direct experience or tangible referents. Formal operations encompasses the ability to think through outcome and consequences while making decisions, to weigh hypotheses and test them mentally with available evidence, and to manipulate ideas about intangible concepts.

Piaget (1963) suggests that formal operations is achieved by early adolescence. However, abstract skills are not ubiquitous in the adult population. More recent educational research has found that up to 40 percent of college freshmen are either in transition between concrete and formal operations, or lacking formal skills entirely (Anderson, 2003). Sutherland (1999) found that half of all adults in the U.S. population function at a concrete operational level.

Theory-based Public Health Materials

Taken together, behavior change and cognitive development theories suggest three complementary mandates for the development of accessible health communication materials:

- Provide persuasive information that can change attitudes, intentions and behaviors in turn.
- Provide that information at a level that is accessible to consumers in terms of literacy skills like reading comprehension and vocabulary.
- Provide information in concrete ways that do not overly tax abstract thinking skills.

These mandates lead to five recommendations for the development of health communication materials for low literacy audiences.

Decrease information processing demands in written material

Health communication materials should be written with low vocabulary and reading levels to allow people to focus on the information rather than the effort involved in processing the information. Currently, the literature suggests that information written at a 6th grade level will be accessible to most Americans. Write the material in short sentences in the active voice, using words with fewer than three syllables, and simple grammar. Making the material look easy to read is as important as the actual reading level. Use larger fonts and liberal amounts of white space and graphics to make the reader comfortable with the content. Illustration can provide essential information in non-verbal ways.

Scaffold learning through analogy and comparison

People are able to learn familiar content more easily than new content, so use analogy to compare a novel health concept to something more tangible and familiar. For example, explain that a neurotransmitter works like a lock and key. Multiple exposures to the same information will help ensure mastery of that information, so repeat key content in slightly different ways.

Decrease demands for abstract thinking

Complex scientific or medical information can be difficult to explain in concrete terms, so consider providing physical referents to ground your explanation. This could include a greater reliance on illustration or analogy. Another option is to provide tangible, visual examples of what you are explaining, like a medical device to demonstrate its functionality during consent procedures, or an anatomic model to illustrate the location of organs.

Do not make people do things in their heads

Short term memory has a finite capacity, and some people struggle with auditory processing of information. When providing information interpersonally, present it verbally and visually. Worksheets that lay out options will allow individuals to visually see pros and cons. Written information, graphs or charts can help people with lower literacy skills to compare and contrast information.

Provide short and long term consequences and benefits when encouraging behavior change

Well-developed abstract thinking skills are associated with a mature understanding of cause and effect and future-oriented thinking. Long-term benefits and consequences may resonate and motivate behavior change in some people, while short-term consequences are more effective with others, particularly teens (Reister & Linton, 1998).

Conclusion

Behavior change theories posit that information acquisition is a necessary precursor for behavior change, while cognitive development theories describe methods to present information that will allow low literacy populations to access and internalize that information. Taken together, these theories suggest a set of recommendations to guide public health professionals in creation of health communication materials that are accessible to all people in need of accurate, scientific information upon which to base their decision-making.

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