

Categorizing Health Behaviors: Exploration of a New Typology

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The Problem

Persuading individuals to change their health behaviors is difficult, and campaigns that have attempted to change health behaviors have failed in many health domains. These domains include adolescent drug use, unhealthy eating, cell phone use while driving, and increasing condom use.

Still, some campaigns have been effective. This is likely because they have capitalized on research finding that different message types work for different types of behaviors and different audiences (i.e., targeted messaging).

Typologies for examining health behaviors (such as Higgins promotion vs. prevention) have not been comprehensive. They have relied on researchers' perceptions of the behaviors, not the population's perceptions.

We sought to build on the *targeted messaging* literature and existing health behavior typologies by considering how participants conceive of health behaviors on a variety of empirically-based categories.

The Solution

A new classification system of health behaviors is needed. By making comprehensive categories that represent how people think of health behaviors, we can systematically study which type of messages are most effective for each category.

A new health behavior classification system would provide a framework under which the effectiveness of different persuasive messages could be tested. By understanding which messages are most effective for a given group of behaviors, future health behavior change campaigns will be more effective.

To accomplish this, we need to determine how people conceptualize health behaviors and changing them. Six variables that are relevant to changing a given health behavior are:

- (1) Effort required to change
- (2) Degree of habit change required
- (3) Short-term consequences to changing
- (4) Long-term consequences to changing
- (5) How fun the target behavior is
- (6) Injunctive norms related to the behavior

The purpose of this research is to examine a host of behaviors using participant ratings on these six variables to create distinct categories of health behaviors. Future research can test the effectiveness of different message types in each category.

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Method

Participants

Six hundred participants were recruited from mTurk, an online "marketplace for work," and were paid .60 cents to complete a survey about health which involved rating 10 health behaviors on 18 attributes. Participants were limited to individuals living in the United States who were 18 years or older.

Participants were disproportionately female (65%) and Caucasian (78%), with 8% Asian, 4% Hispanic, and 3% African American. Nearly half of participants were unemployed (47%), and many had at least a bachelor's degree (44%). Participant age ranged between 18 and 77, with a large portion of participants falling in the 18 to 27 range range (41%).

Measures

Behavior change variables. Three-item scales were used to measure six variables thought to be critical in health behavior change: (1) effort required to change; (2) the extent to which habits would have to change; (3) the positive and negative short-term consequences of changing the behavior; (4) the positive and negative long-term consequences of changing the behavior; (5) how fun engaging in the target behavior would be; and (6) the injunctive norms supporting the target behavior. Participants evaluated each health behavior on these 18 items using a 1 (*strongly disagree*) to 7 (*strongly agree*) scale.

Cronbach's alpha was computed for each scale for each health behavior, and the average alpha for each scale ranged from .64 to .90. For all scales except the short and long-term consequence scales, scale means were computed. For short and long-term consequences, scale scores were computed such that if the behavior had overall positive consequences, the mean would be above 4, and if the behavior had overall negative consequences, the mean would be below 4.

Health Behaviors. A list of 36 health behaviors was devised based on (1) behaviors targeted in past health campaigns, (e.g., hand washing); (2) critical health behaviors identified by the CDC, (e.g., risky sexual behavior); and (3) with the goal of gathering a wide variety of behaviors to assume sufficient variability. A vignette was written about an individual (written as "he" 50% of the time and as "she" 50% of the time) who was considering changing a specific health behavior. Participants were then asked to rate how they think the individual would perceive each of the 18 items when deciding whether or not to change the behavior.

Procedures

Once participants were recruited and consented to participate, they were given a random selection of 10 of the 36 health behaviors, each of which they rated on 18 items. Participants then filled out demographic information.

Analysis

The goal of this research is to create meaningful categories of health behaviors. Therefore, the unit of the analysis is the behaviors themselves. Across participants, average scores for each of the 18 items were computed for each health behavior. Based on these item means, scale means were computed for each of the six scales for each of the 36 behaviors. The total sample size for this analysis was 36 behaviors, and the information for each behavior was based averages from at least 60 participants.

Results

To create groups of health behaviors based on the behavior change variables measured, a hierarchical cluster analysis was conducted using squared Euclidean Distances and Ward's method, which created clusters of behaviors based on minimizing within-cluster variance.

The analysis yielded seven clusters based on the dendrogram and the coefficients in the agglomeration schedule. One factor contained one behavior alone (signing up for organ donation), and that behavior was eliminated from the analysis. The analysis was re-run with 35 behaviors, and yielded six clusters.

The six clusters and their descriptions are listed in Table 1. The behaviors in each cluster are in Table 2. Table 3 displays means of each behavior change variable for each cluster. Table 4 displays results of six ANOVAs testing for significant differences between clusters in the six behavior change variables. Table 5 shows results of post-hoc REGWQ tests for each ANOVA, using an 'X' to signify that the two means represented by the cell were significantly different.

In sum, six clusters of health behaviors were identified. Each of the six behavior change variables contributed to distinguishing these six clusters. While some clusters were similar to one another, each was significantly different on at least one health behavior change variable.

What are the clusters?

Cluster	Cluster name	Description
1	Lifestyle change	High effort to change, moderate negative short-term consequences to change.
2	Unpleasant prevention	Lower effort to change, low habit changing required, low negative short-term consequences to change.
3	Benefiting others	Low long-term positive consequences for oneself.
4	Negative entrenchment	High effort to change, high habit changing required, high negative short-term consequences, behavior is not supported by injunctive norms.
5	Pleasant prevention	Low effort to change, low habit changing required, low positive short-term consequences.
6	Guilty pleasures	Quitting behaviors that are high in fun that are not supported by injunctive norms.

Which target behaviors are in each cluster?

Table 2. Health behaviors that fall on each cluster.

Cluster	Behavior		
1: Lifestyle change	Begin exercise four times per week. Begin a healthy diet. Get more exercise. Quit driving after drinking. Get a vector of stairs rather than elevator.		
2: Unpleasant prevention	Start using condoms. Stop smoking. Begin daily medication. Go to dental biannually. Perform regular breast self screenings. Begin flossing daily. Use daily face cream. Get a medical check-up. Get a STD screening. Stop eating fast food consistently. Cook dinner at home nightly. Begin smoking cigarettes outside only.		
3: Benefiting others	4: Negative entrenchment	5: Pleasant prevention	6: Guilty pleasures
5: Pleasant prevention	6: Guilty pleasures		
Short term conseq.	2: Unpleasant prevention 3: Benefiting others 4: Negative entrenchment 5: Pleasant prevention 6: Guilty pleasures		
Long term conseq.	1: Lifestyle change 2: Unpleasant prevention 3: Benefiting others 4: Negative entrenchment 5: Pleasant prevention 6: Guilty pleasures		
Fun of behavior	1: Lifestyle change 2: Unpleasant prevention 3: Benefiting others 4: Negative entrenchment 5: Pleasant prevention 6: Guilty pleasures		
Injunctive norms	1: Lifestyle change 2: Unpleasant prevention 3: Benefiting others 4: Negative entrenchment 5: Pleasant prevention 6: Guilty pleasures		

Cluster Characteristics

Table 3. Mean and SD for behavior change variables by cluster.

	Cluster					
	1:Lifestyle change	2:Unpleasant prevention	3:Benefiting others	4:Negative entrenchment	5:Pleasant prevention	6:Guilty pleasures
Effort to change	4.84 (.57)	4.19 (.54)	5.1 (.88)	6.08 (.27)	4.38 (.30)	5.32 (.28)
Habituality change	4.69 (.80)	4.17 (.42)	5.16 (.23)	6.23 (.15)	4.52 (.23)	5.35 (.29)
Short term conseq.	3.18 (.22)	3.56 (.13)	3.61 (.28)	1.75 (.55)	4.18 (.20)	2.78 (.17)
Long term conseq.	3.68 (.11)	3.66 (.13)	2.93 (.10)	3.92 (.08)	3.58 (.21)	3.63 (.19)
Fun of target beh.	3.96 (.74)	3.43 (.67)	3.79 (.28)	4.57 (.98)	4.12 (.47)	5.31 (.30)
Injunctive norms	6.16 (.29)	6.15 (.56)	5.06 (.66)	3.12 (.76)	6.36 (.42)	3.13 (.81)

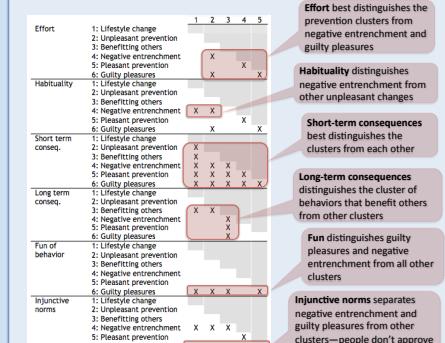
Overall Between-Cluster Differences in Characteristics

Table 4. Results of six separate ANOVAs testing differences in behavior change variables by cluster. All results are significant at $p < .001$.

	F	df (cluster, error)	partial η^2
Effect	10.50*	5, 29	.64
Habituality	11.58*	5, 29	.67
Short term conseq.	62.09*	5, 29	.92
Long-term conseq.	9.30*	5, 29	.62
Fun	10.84*	5, 29	.65
Norms	38.97*	5, 29	.87

Differences in Mean Ratings of Behavior Change Variables

Table 5. Results of post-hoc REGWQ following each ANOVA. Each 'X' identifies means that are significantly different from one another.



Limitations and Future Directions

One limitation of this study was that it is based on data collected online from a disproportionately white female population. Future research should test to see if the same pattern emerges using a different population. Future research should also determine if additional health behaviors would fall into clusters expected.

The next step in this line of research will be to test the effectiveness of different types of persuasive messages across these six categories.