Social Marketing: Developing a Tailored Message for a Physical Activity Program

By: D. R. Black, Carolyn L. Blue, K. Kosmoski, and D. C. Coster

Black, D.R., Blue, C.L., Kosmoski, K., & Coster, D.C. (2000). Social marketing: Developing a tailored message for a physical activity program. *American Journal of Health Behavior, 24(5)*, 323 - 337.

Abstract:

Objective: To apply social marketing principles to identify message components for development of a campaign, to recruit participants, and/or to tailor a physical activity program to blue-collar employees.
Method: An author-developed, 74-item questionnaire with established validity and reliability was administered to a census of 529 employees, and 468 participants responded (response rate = 88.5%).
Results: Descriptive and multivariate statistics were applied to identify significant social marketing variables to compose the "marketing mix" and demographic variables to identify distinct segments of the sample.
Conclusions: Different variables that compose the marketing mix should be emphasized to target specific segments and design appropriately appealing messages.

Article:

According to Physical Activity and Health: A Report of the Surgeon General [1] engaging in physical activity on most, if not all, days of the week reduces the risk of developing and dying from the leading cause of death in the United States, coronary heart disease. The Surgeon General's Report[1] also indicated that physical activity improves health by reducing the risk of developing diabetes, high blood pressure, colon cancer, and feelings of anxiety and depression; promotes psychological well-being; controls weight; builds and maintains healthy bones, muscles, and joints; and increases strength and flexibility of older adults to move about without falling. Approximately 250,000 premature deaths annually in the United States can be attributed to limited physical activity, which is greater than the number of deaths occurring annually from smoking.[2]

Despite health sequela, over 60% of adults do not engage in regular, sustained physical activity (most if not all days of the week) to promote fitness (vs specific health outcomes), and an additional 25% of adults are not active at all.[1] Physical activity can be defined as bodily movements that require use of Skeletal muscles and substantially increase energy expenditure.[1] The challenge for the nation is to reduce the population prevalence of inactivity.[3] A second challenge is to encourage individuals to incorporate physical activity into their lifestyles so it becomes routine.[4]

Increasing the appeal of physical activity is likely to enhance interest and intention to enroll in structured and unstructured physical activity programs,[5] Increasing personal appeal to engage in physical activity and designing programs that are attractive may be ameliorated by strategies based on social marketing (SM) principles. Kotler and Levy[6] promulgated 30 years ago the application of business marketing principles to promote social change. Social marketing has been defined as "the application of commercial marketing technologies to the analysis, planning, execution, and evaluation of programs designed to influence the voluntary behavior of target audiences in order to improve their personal welfare and that of their society."[7] Social marketing may include the following activities: (a) detailed research to learn about the market and the probable effectiveness of different strategies, (b) product (ie, idea) development to meet the needs of the consumer, (c) incentives that encourage the "purchase" of the product (ie, behavior adoption), and (d) use of methods to facilitate product purchase.[8]

Quantitative tracking or consumer surveys are often advocated as a preproduction and prepromotion step and can be used to support implementation of social change initiatives seeking to bring about changes in individual

behavior or policies.[9] Consumer surveys predicated on SM principles focus on 4 basic marketing decision variables known as the marketing mix or the four Ps: Product, Promotion, Price, and Place.[7] Product decisions pertain to the design of an item or idea and its desirability to the target audience. Promotion includes strategies and tactics for communicating with the target audience about the product (ie, program) and encouraging participation. Price refers to the various costs (ie, barriers) that a person must accept in order to participate in the program. Place pertains to the channels of distribution for delivering the product, idea, or program to the consumer (ie, participant).

Another key element of SM principles is audience segmentation. Audience segmentation is the process of dividing a population into homogeneous subgroups ("target audiences") to better describe and understand their current behaviors in order to develop messages and to tailor programs to the specific needs of a particular subgroup.[8] The audience can be segmented according to a nested hierarchy.[10] The descending hierarchy might begin by first identifying a segment of a larger community (eg, focusing on a university/college campus within a city) and then by segmenting into an even smaller community (eg, concentrating on faculty or staff vs students in a university/college). A final step might be to segment the smaller community further (eg, dividing staff at a university/college according to. gender or other demographic characteristics).

TABLE 1
Population Marketing Strategy Factor Analysis of Social Marketing Variables

Variable	Median	Mode	Factor Loading	Comm-unality	Eigen Value	Percent Variance	α*
Positive Core Product—Expectancy							
Makes me feel better	4.0	4.0	*.874*	*.764*	*4.182*	*59.750*	*.884*
Gives me more energy	4.0	4.0	*.837*	*.701*			
Adds muscle tone	4.0	4.0	*.815*	*.664*			
Improves my health	4.0	5.0	*.802*	*.643*			
Controls my weight	4.0	4.0	.745	.555			
Helps me to relax	4.0	4.0	.725	.526			
Will get more work done	3.0	4.0	.574	.329			
Positive Core Product—Value							
Makes me feel better	4.0	4.0	*.856*	*.733*	*4.356*	*62.229*	*.897*
Gives me more energy	4.0	4.0	*.856*	*.733*			
Improves my health	4.0	5.0	*.849*	*.721*			
Controls my weight	4.0	4.0	.773	.597			
Adds muscle tone	4.0	4.0	.758	.575			
Helps me to relax	4.0	4.0	.752	.566			
Will get more work done	4.0	4.0	.658	.433			
Negative Core Product—Expectancy							
Unenjoyable	5.0	5.0	*.876*	*.767*	*2.091*	*69.703*	*.781*
Awful	5.0	4.0	*.861*	*.741*			
Unhealthy	6.0	7.0	.762	.581			
Positive Tangible Product—Expectancy							
Easy if fun	4.0	4.0	*.805*	*.648*	*3.780*	*53.999*	*.857*
Easy if convenient	4.0	4.0	*.792*	*.627*			
Easy with a reminder	3.0	3.0	.735	.540			
Easy if it didn't cost	4.0	5.0	.714	.510			
Easy if time	4.0	4.0	.707	.500			
Easy if with someone	4.0	4.0	.695	.483			
Easy if nice weather	4.0	4.0	.687	.472			
Positive Tangible Product—Value							
Is convenient	2.0	2.0	*.849*	*.721*	*4.041*	*57.734*	*.876*
Is fun	2.0	2.0	*.837*	*.701*			
Having time	2.0	2.0	*.781*	*.610*			
If it didn't cost money	2.0	1.0	.764	.584			
If with someone	2.0	2.0	.709	.503			
If the weather was nice	2.0	2.0	.685	.469			
If I had a reminder	3.0	3.0	.673	.453			
Negative Tangible Product—Expectancy							
Large work demands	2.0	1.0	*.812*	*.659*	*2.676*	*53.522*	*.779*
After a long work day	2.0	1.0	*.800*	*.640*			
When chores to do	2.0	1.0	.764	.584			
When in a bad condition	1.0	1.0	.639	.408			
When I get up early	2.0	1.0	.621	.386			
Negative Tangible Product—Value							
Without a trainer	3.0	3.0	*.879*	*.773*	*4.376*	*62.518*	*.899*
Without company	3.0	3.0	*.855*	*.731*			
When I lack skills	2.0	3.0	*.804*	*.646*			
No athletic meetings	2.0	3.0	*.802*	*.643*			
In bad weather	2.0	3.0	.764	.584			
Poor facilities	2.0	1.0	.712	.507			
Feeling depressed	2.0	3.0	.701	.491			

(Table 1 - continued)

TABLE 1 (Continued)
Population Marketing Strategy Factor Analysis of Social Marketing Variables

Variable	Median	Mode	Factor Loading	Comm-unality	Eigen Value	Percent Variance	α*
			Price—Psychological				
Physical activity confidence	6.0	5.0					
			Price—Monetary				
Costs money	4.0	5.0					
			Price—Opportunity				
Feeling tired	3.0	3.0	.761	.579	2.452	49.042	.738
Interferes with family	3.0	3.0	.738	.545			
Too time-consuming	3.0	3.0	.704	.496			
Sore muscles	4.0	4.0	.670	.449			
Hurt or make me sick	3.0	3.0	.617	.381			
			Promotion Communication Themes				
Good	6.0	6.0	*.856*	*.733*	*4.019*	*66.977*	*.901*
Useful	6.0	6.0	*.852*	*.726*			
Valuable	6.0	6.0	*.848*	*.719*			
Helpful	6.0	6.0	*.812*	*.659*			
Pleasant	5.0	5.0	*.797*	*.635*			
Interesting	5.0	4.0	.741	.549			
			Place Personal—Believability				
Family	4.0	4.0	*.891*	*.794*	*2.116*	*70.545*	*.789*
Spouse	4.0	4.0	*.869*	*.755*			
Doctor/nurse	4.0	4.0	*.753*	*.750*			
			Place Personal—Influentiality				
Coworker	3.0	3.0	*.913*	*.834*	*2.682*	*72.055*	*.868*
Friend	3.0	3.0	*.890*	*.792*			
Boss	3.0	3.0	*.864*	*.746*			
Doctor/nurse	4.0	4.0	.714	.510			

Note. Medians and modes are based on social marketing variables with reference to "moderate or vigorous physical activity that is done for at least 20 minutes each time for at least 3 days a week." Positive Core Product—Expectancy 1=very unlikely, 2=unlikely, 3=unsure, 4=likely, and 5=very likely. Positive Core Product—Value 1=very bad, 2=somewhat bad, 3=neither, 4=somewhat good, and 5=very good. Negative Core Product—Expectancy 1=extremely not, 2=not very, 3=slightly not, 4=neutral, 5=slightly, 6=very, and 7=extremely. Positive Tangible Product—Expectancy 1=very difficult, 2=somewhat difficult, 3=unsure, 4=somewhat easy, and 5=very easy. Positive Tangible Product—Value 1=absolutely does not affect me, 2=does not affect me, 3=unsure, 4=affects me a little, and 5=affects me a lot. Negative Tangible Product—Expectancy 1=no, I would not exercise, 2=unsure, and 3=yes, I would exercise. Negative Tangible Product—Value 1=no, I would not exercise, 2=unsure, and 3=yes, I would exercise. Price 1=very likely, 2=likely, 3=unsure, 4=unlikely, and 5=very unlikely. Promotion Communication Themes 1=extremely not, 2=not very, 3=slightly not, 4=neutral, 5=slightly, 6=very, and 7=extremely. Place Personal 1=definitely should not, 2=should not, 3=unsure, 4=should, and 5=definitely should. Influentiality 1=not at all, 2=not very much, 3=unsure, 4=quite a bit, and 5=very much.

***Standardized Cronbach alpha coefficient.**

Table 1 ***Population Marketing Strategy Factor Analysis of Social Marketing Variables (continued)***

An objective of audience segmentation is to identify people most at risk who are the least likely to engage in health-promoting/enhancing behaviors (eg, physical activity) and to encourage enrollment in a program (either structured and unstructured) designed to increase physical activity and to improve health. Focus on people who would benefit most is prudent because there are insufficient resources to focus on everyone. Identifying the target population and those who are most at risk also requires knowledge of epidemiological statistics. For example, according to Physical Activity and Health: A Report of the Surgeon General,[1] physical activity levels for the nation have not changed in the past 2 decades despite the number of negative health and psychological consequences of inactivity. Specific subgroups seem to be more at risk due to inactivity than do other populations. For example, as income and education decrease, so does activity.[1, 11] Further examination of epidemiological statistics shows that blue-collar workers with the lowest income are less likely than white-collar workers to enroll in structured activity programs,[12, 13] and blue-collar workers exercise less than the total population.[1] Recent evidence shows that blue-collar workers in a university setting seem to exercise much less than blue-collar workers in other worksites.[14] Therefore, focusing on blue-collar workers employed in a university setting who are at greatest risk because of the vast percentage of those who are physically inactive is an exigent priority.

Social marketing principles have been successfully applied to health promotion programs.[15-18] In recent years, SM principles have been used to address health problems, such as abuse of alcohol, tobacco, and other drugs; unsafe sex; and cancer. [19-27] Computer and hand literature searches have not yielded studies that explicitly consider the application of SM principles to identify message components that might be used to

develop a campaign, enhance recruitment, and/or design or modify physical activity programs for university populations.

The purpose of this initial planning formative research study was to "fill the gap" in the application of SM principles in the physical activity research literature. The study was specifically designed to identify preproduction and prepromotion message components for campaign development and/or to ameliorate recruitment and design of a physical activity program for blue-collar workers employed at university setting who are at a higher risk than other workers. Marketing-mix decision variables (four Ps) were examined to develop appealing recruitment messages and programs to increase physical activity.

METHOD

Subjects

A census of blue-collar workers (n = 529) at a large university in the Midwest were identified as eligible participants for the study. There were 468 respondents. (Power calculations were computed for multivariate analyses with a maximum of 15 independent variables and 1 dependent variable. The power for the sample size was adequate to detect a significant relationship when the effect size was 1.0, beta was 0, and alpha was .01.) The response rate was 88.5%, and respondents were mostly male (75.1%) and predominantly white (94.5%). The majority of the workers were married (65.6%) and over the age of 40 (61.2%). Only 33% (n=155) of the workers reported exercising for 20 minutes, 3 or more times per week. The distribution of workers according to various job classifications was as follows: 97.8% were employed full time; 96.1% worked 40 or more hours per week; and 53% worked the day shift. Their modal education level was "high school graduate" and completion of trade or technical school.

According to the 1990 Standard Occupational Classification System developed by the US Bureau of the Census (http://www.census.gov), blue-collar workers are defined as skilled or unskilled manual laborers who work for an hourly wage. Based on the number of valid responses pertaining to job title, the skilled laborers (n=135, 37.4%) were mostly electricians, carpenters, electronics installers and repairers, and plumbers. Unskilled laborers (n=226, 62.6%) were custodians, grounds maintenance workers, mail clerks, heavy equipment operators, pest control technicians, work crew drivers, toolroom keepers, warehouse laborers, and window-covering maintenance workers.

Procedure

Questionnaire Development and Content. Systematic and formal procedures were used to establish the psychometric properties of the questionnaire. Content domain parameters were defined by interviewing a sample of blue-collar employees (n=21) from the worksite population. These employees responded to a "free-response" format pertaining to variables used to measure SM constructs. Modal responses were converted into Likert-type scale questions where a "neutral" midpoint separated 2 positive and 2 negative responses. Three experts in physical activity and SM reviewed the items for content validity, and items were excluded or included following their collective feedback. Content validity was verified by construct validity. This verification was confirmed by factor analyses and acceptable Cronbach alphas (Table 1). The result of the grouping of items by experts was in complete agreement with the construct-validity analyses. The items according to these results were correctly grouped under the appropriate SM construct, or P.

Readability, reading-grade level, and response bias were assessed. The same group of workers (n=21) reviewed the questionnaire and made comments about incomprehensible words and statements. The Flesch-Kincaid reading-grade level was 9.8. The Strahan and Gerbasi[28] shortened version of the Marlow-Crowne Social Desirability Index measured response bias. The correlations (-.001 to .04) between the Social Desirability Index and each of the variables based on SM constructs and the physical activity questions were all nonsignificant, which suggests that social desirability did not bias subjects' responses.

The questionnaire contained 74 items. The items were broken down into the following categories: (a) demographic (n= 8), (b) Godin Leisure Activity Questionnaire (n=3), and (c) questions based on SM principles

(n=63). The demographic questions related to gender, ethnicity, marital status, and job classification were measured on a nominal scale. Education level was measured on an ordinal scale, and age and leisure activities per week were assessed on a ratio/interval scale. SM variables were measured on an ordinal scale. The ratings of SM items can be found in the Note of Table 1.

The Godin Leisure Activity Questionnaire[29] was pilot tested and validated with employees (n=31) from the same setting. The Godin Leisure Activity Questionnaire consists of 3 items to assess time per week a person engages in strenuous, moderate, and mild physical activity that lasts 15 minutes a day over a usual 7-day period. A total energy expenditure score was the sum of the reported strenuous, moderate, and mild activities weighted by their respective metabolic equivalent of 9, 5, and 3, respectively. The Godin total score was analyzed as a continuous variable.

Psychometrics for the Godin Leisure Activity Questionnaire have been reported previously by Godin and Shephard.[29] and Godin, Jobin, and Bouillon.[30] Two-week test-retest reliability for total physical activity was .74; concurrent validity for total activity was .38 for VO^2 max, 43 for percent body fat, and .54 for muscular endurance. Predictive validity was established for the current study by correlating scores on the Godin Leisure Activity Questionnaire[29] with body mass index (BMI= weight (kg)/[height (m)]^2) and the step test. The Godin questionnaire was negatively correlated with both BMI and the step test (r=-.47 and -.58, respectively). These results indicate that as scores increased for physical activity, subjects weighed less, and their step test scores were lower (suggesting they were more physically fit). Construct validity and test-retest reliability for the step test seem to be acceptable, but the psychometrics are limited because of small sample sizes, testing of men only, and dated assessments.[31, 32]

Recruitment. After approval from the Committee on the Use of Human Subjects, workers were recruited through contacts with their department heads. Their supervisors arranged for data to be collected during 3 mandatory department policy and United Way meetings. These 3 meetings were held at times convenient for the day, evening, and night workers.

Questionnaire Administration. Investigators gave a 20-minute explanation of the study purpose, assurance of confidentiality, and of the voluntary nature of participation. Packets also were distributed that contained a cover letter and the questionnaires to be completed. Participants completed the questionnaires in a classroom setting at the end of the meeting. Subjects were informed by the researchers about the benefits and any potential risks, and were given the opportunity to ask questions. The participants were informed that participation in the study was totally voluntary, participation decisions would not affect job security or job status, anonymity would be maintained, and implied consent to participate was given when the questionnaire was returned. A cover letter with this same information as well as the name, address, and telephone number of the investigator accompanied the questionnaire. Employees completed questionnaire during working hours. The questionnaire could be returned to the investigator by using a free courier or by depositing it in a box at the testing site.

SM Constructs

Product. All definitions for SM constructs were adapted from Hammond[33] and Rothman, Teresa, Kay, and Morningstar.[34] Product was divided into 2 subgroups, core and tangible. Core product is defined as the value (how important) and expectancy (how likely to occur) of the consumer's anticipated effects and whether the consumer believes the effects of engaging in physical activity will be either positive (desirable) or negative (undesirable). The tangible product is the physical good or service received (physical activity program or personal trainer); it can be positive or negative and can be classified under either value or expectancy.

Price. Price can be classified as monetary, opportunity, or psychological costs. Monetary costs refer to the dollar amount of participating in a physical activity program; opportunity costs as the contrary behaviors of engaging in a physical activity program; and psychological costs as the emotions and attitudes contrary to engaging in a physical activity program.

Promotion. Incentives and communication themes are classification categories for promotion. Incentives are the rewards for enrolling or engaging in a physical activity program. Communication themes refer to the mass communication themes utilized to make consumers aware of a physical activity program.

Place. Place is divided into 2 categories, personal media and nonpersonal media. Personal (human) and nonpersonal media (nonhuman) are the believable and influential media where the consumer can learn about enrolling or engaging in a physical activity program.

Analytic Plan

Initial Analyses. The Statistical Package for the Social Sciences[35] was used for the primary analysis reported in this study. The effects of missing data on the response variable were assessed. Means were compared with medians as a preliminary way to detect skewness. Summary statistics, including measures of skewness and kurtosis that are provided by SPSS,[35] were used to formally evaluate normality. Scatterplots were used to detect "outliers." Regressing the activity score on the SM response variables assessed the influence of outliers on the Godin Leisure Activity questionnaire results. Standardized regression coefficients for the total sample were compared with results for the subset of cases [greater than or equal to] the 80th percentile on the activity score. Chi-squared and t-tests were computed to detect differences in demographic variables for main group and subset analyses.

TABLE 2
Marketing Mix Backward Elimination Regression Analysis for Social Marketing Variables Predicting Leisure Physical Activity for the Total Sample and Segments

Variable	Standardized Regression Coefficients (β) Total	Men	Women	↑ High Sch	↓ High Sch
Initial Model					
Positive Core Product	.01	-.01	.20	.15	-.06
Negative Core Product	.04	.06	-.13	.11	.02
Positive Tangible Product	-.04	-.02	-.15	.07	-.03
Negative Tangible Product	.25**	.23**	.13	.27**	.23**
Price—Psychological	.25**	.33**	.11	.15**	.38**
Price—Monetary	.02	.03	.03	-.13	.03
Promotion Communication Themes	.08	.09	.24*	.08	.08
Place Personal	.11*	.02	.11	-.02	.14*
Gender	.11*				
Education	.10*				
Age	-.09				
Marital Status	.07				
Job Skill	-.03				
Race	-.01				
Final Model					
Positive Core Product				.16*	
Negative Core Product					
Positive Tangible Product					
Negative Tangible Product	.27**	.24**	.22*	.28**	.22**
Price—Psychological	.26**	.34**		.16*	.39**
Price—Monetary					
Promotion Communication Themes		.13*	.25*		
Place Personal	.11**				.15*
Education	.10*				
Gender	.09*				

Note. The constructs entered into the regression equations were the factors unique to the total sample and each of the 4 segments (ie, men, women, greater than high school education, and high school or less education). R^2=.29, .31, .19, .22, and .33 for the final models for the total sample (n=468), men (n=344), women (n=109), high school or less education (n=234), and greater than high school education (n=224), respectively.

*p < .05. **p < .01.

SM Variable Selection. The first step used descriptive statistics to ascertain the relative importance of a SM variable listed under a given P. Any median or mode generally above the scale midpoint indicated that the item was important because these values were associated with positive responses to the item. The second step was to compute listwise factor analyses plus standardized Cronbach alpha coefficients separately for each construct of P. The purposes of these analyses were to ascertain the relative importance of a variable within that factor and to confirm that items were appropriately categorized under a given construct of P (eg, expectancy and/or value; Table 1). The third step was confirmation of grouping variables under a given construct of P, which was based on the following criteria: (a) factor loading [greater than or equal to]0.40, (b) eigenvalue [greater than or equal

to] 1.00, (c) communality [greater than or equal to]0.60, (d) percent variance explained [greater than or equal to]50%, and (e) a Cronbach alpha of [greater than or equal to]0.70.

Marketing Mix. The fourth step was to ascertain the efficacy of the marketing mix (the collective contribution of the 4 Ps) by computing a series of backward elimination multiple regression analyses for each construct of P. Each multiple regression backward elimination analysis was conducted by regressing physical activity on to all demographic variables and variables within a single construct of P. Each construct of P included those variables that met the factor analysis criteria specified above, except for price psychological and price monetary where there was a single variable and factor analysis was inappropriate. In these two instances, these variables were included in the analyses. The P variables under a given construct were combined rather than assessed separately to eliminate collinearity. Multiple regression backward elimination analysis was selected for the following reasons: (a) to identify the most parsimonious model for each construct of P significantly associated with physical activity scores, (b) to identify those constructs of P that contributed to the marketing mix, and (c) to identify empirically total sample demographic characteristics that might be used for audience segmentation and more specific targeting (see the bottom portion of Table 2 "Final Model").

Target-audience Marketing Strategy. The final step was to target a specific segment of the population. This was determined by examining the significant demographic variables identified in the regression analyses described above. These significant demographic variables were used to compute separate factor analyses for total sample segments (ie, men vs women and the 2 educational levels). Separate factor analysis results for a segment for each construct of P were compared. These comparisons were done by ranking factor loadings. Kendall's coefficient of concordance[36] was used to ascertain whether the order of the factor loadings between 2 segments was independent. A segment of the population was targeted when the null hypothesis was accepted, which meant that the order of the factor loadings was independent. Although a null hypothesis conclusion cannot prove independence of 2 population segments, such findings do suggest that the 2 population segments place different emphasis on the P variables. Hence, it was deemed prudent to tailor a marketing message specifically to each segment. If the factor loadings were independent, the 4 steps under the Analytic Plan listed above were repeated to identify the constructs of P and to reduce the number of variables of P under a construct to the smallest number. The objective of these subsidiary analyses was to ascertain if a program for the total sample would be appropriate for the segments or whether tailoring would be preferred (Table 3).

RESULTS

Initial Analyses

Missing Data. Only for a small percentage (n=23, 4.91%) of the cases were there missing values. The number of missing values for these cases divided by the total number of values for the entire sample was minusule ([less than or equal to].01%). Plotting of missing values showed randomness. Summary results and probability levels changed infinitesimally when analyses were recomputed to ascertain if it was appropriate to substitute means for missing values. Therefore, means were substituted for missing values for response variables only (not demographic variables), and all subjects with missing data were included in the final analyses.

Normality. There was one exception in which the data violated assumptions of normality. The energy expenditure measure was skewed to the right. Visual inspection of expected and detrended normal probability plots indicated that deviation from the expected regression line was minimal even though 16% of the subjects reported that they did not engage in leisure physical activity at all (zero scores). Transformation of data was not done because zero was a legitimate response, and skewness did not appreciably affect regression results. Therefore, the data were analyzed in their original form.

Outliers. The only outlier in the data set that was identified was the energy expenditure score for the leisure activity measure. Casewise plots of standardized residuals were examined for residuals that exceeded 3 standard deviations. Five (1.07%) cases exceeded this limit. Regression analyses indicated that this departure from normality did not influence the pattern of the standardized regression coefficients. Consequently, outliers were not removed from the analyses.

TABLE 3
Items Retained in Each Social Marketing Construct

Social Marketing Concept	Item Retained	T	M	W	↑HS	↓HS
Positive Core Product						
Expectancy	Will make me feel better				X	
	Will give me more energy				X	
	Will tone my muscles				X	
Value	Will make me feel better				X	
	Will give me more energy				X	
	Will improve my health				X	
	Will help me to relax				X	
Negative Core Product	Exercising is unenjoyable					
	Exercising is awful					
Positive Tangible Product						
Expectancy	Easy if fun					
	Easy if convenient					
	Easy if it did not cost money					
	Easy if I had a reminder					
Value	Easy if fun					
	Easy if convenient					
	Easy if I had time					
	Easy if it did not cost money					
Negative Tangible Product						
Expectancy	Not with large work demands	X	X	X		X
	Not after a long work day	X		X	X	
Value	Not without a trainer	X	X	X	X	X
	Not without company				X	X
	Not when I lack skills			X	X	
	Not when the weather is bad					X
	Not when there are no athletic meetings			X	X	
Price						
Psychological	Confidence	X	X		X	X
Monetary	Costs money					
Promotion Communication Themes						
	Exercise is good		X	X		
	Exercise is valuable		X	X		
	Exercise is useful		X			
	Exercise is pleasant		X	X		
	Exercise is helpful		X			
	Exercise is interesting			X		
Place Personal						
Believability	Family	X				
	Spouse					X
	Doctor/nurse					
Influentiality	Coworker	X				X
	Friend	X				X
	Boss					

Note. Audience segmentation and marketing mix are designated by T=Total sample, M=Men, W= Women, ↑HS= More than a high school education, ↓HS = High school or less education.

Table 3 Items Retained in Each Social Marketing Construct.

Main Analyses

Variable Selection. Table 1 shows items listed under each P that met all the analytic criteria specified in the 3 steps under SM Variable Selection. The items italicized in the table are the items deemed to be of greatest importance.

Product

Positive Core. The items of greatest importance for positive core product --expectancy (ie, how likely that a desirable outcome will occur) were physical activity "makes me feel better," "gives me more energy," "adds muscle tone," and "improves my health." Items of greatest importance for positive core product --value (how important a desirable effect is) were physical activity "makes me feel better," "gives me more energy," and "improves my health."

Negative Core. The 2 items of greatest importance for negative core product -- Expectancy (ie, how likely an undesirable outcome will occur) were physical activity is "unenjoyable" and "awful."

Positive Tangible. The items of greatest importance for positive tangible product -- expectancy (ie, how likely that a desirable good or service will occur) were physical activity would be easy if it was "fun" and "convenient." The items of greatest importance for positive tangible product -- value (ie, how important a desirable good or service is) were physical activity needs to be "convenient," "fun," and "time" set aside for physical activity.

Negative Tangible. The items of importance pertaining to negative tangible product -- expectancy (ie, how likely that an undesirable good or service will occur) were attempting to engage in physical activity after "large work demands" and "after a long work day." The items of greatest importance for negative tangible product -- value (how important an undesirable good or service is) were the undesirability of engaging in physical activity "without a trainer," "without company," "when lacking skills," and "when no other athletic meetings" were scheduled.

Price

Psychological. The variable pertaining to psychological costs (emotions and attitudes contrary to engaging in physical activity) included having "confidence" in one's ability to carry out physical activity. (This variable was retained in the multiple regression analyses because it was a single item variable and, therefore, was included to represent the construct of psychological cost.)

Monetary. The item for monetary costs (dollar amount of participating in program) was engaging in physical activity "costs money." (This variable also was retained in the multiple regression analyses because, again, it was a single item variable and was included to represent the construct of monetary cost.)

Opportunity. No items related to opportunity costs (contrary behaviors of engaging in physical activity) met the criteria for inclusion and, therefore, these costs were dropped from further analyses.

Promotion

Communication Themes. The 5 items of greatest importance for promotion communication themes (mass communication themes used to make consumers aware of a program) for encouraging physical activity were the key words "good," "useful," "valuable," "helpful," and "pleasant."

Place

Personal. The items of greatest importance for place personal - believability (ie, believable human medium where consumers can learn about a program) and place personal -- influentiality (ie, influential human medium where consumers can learn about a program) were "family," "spouse," and "doctor/nurse" and "co-worker," "friend," and "boss," respectively.

Marketing Mix and Target Audience Marketing Strategy

Table 2 presents the marketing mix for the social marketing variables. The top part of the Table is devoted to initial model analyses that identify the potential social marketing variables of importance and the significant audience segments. The bottom part of the Table is devoted to final model analyses and identifies the explicit social marketing variables to emphasize in combination for the total population and each of the respective segments, in this case, gender and education.

Kendall's coefficient of concordance[36] was computed after separate factor analyses were conducted for each of the 4 audience segments. Those social marketing factor rankings for men and women not in concordance (not significant) were positive core product -- value, positive tangible product -- expectancy, negative tangible product -- value, and promotion communication themes. Those social marketing factor rankings for more than high school and high school or less education not in concordance (non significant) were positive tangible product -- expectancy, negative tangible product -- expectancy, and promotion communication themes.

Table 3 presents a summary of the marketing-mix variables to emphasize in a SM campaign, and to use for designing and implementing a program. Based on calculation of percentage agreement (and results of the nonparametric binomial test[36]), it can be seen that the variables to emphasize in a promotion message or a program design differ if the intent was to target the total population or a given segment. In fact, there is only a 25.0% agreement between the total and men (p=.927) and the total and women (p= .855), a 23.1% (p=.954) agreement between total and more than a high school education, and a 44.4% (p=.500) agreement between total and a high school education or less. A comparison of segments shows an agreement of 45.4% (p= .500) between men and women and 22.2% (p=.985) agreement between those with more than a high school education and those with a high school education or less.

DISCUSSION

Efforts to identify message components to enhance physical activity among blue-collar university employees need to be theoretically based and systematically evaluated in accordance with the tenets of theory.[37] This initial planning formative research study used social marketing principles to identify message components that ultimately can be used to develop a campaign, recruit participants, and/or design or modify physical activity programs for blue-collar, university employees. One of the keys to enhancing physical activity is to identify the unique motivating factors that underlie physical activity behaviors of the total sample, but more prudently, a particular segment of the audience. Systematic analysis-based message-component identification is an exigent priority in order to increase physical activity because both prior research[38] and the present study indicate that only 33% of blue-collar employees engage in physical activity outside of work, but at minimum levels (ie, [greater than or equal to]1 time per week).

A beneficial feature of a systematic analytic plan such as the one used in this study is its replicability and the parsimony of results. The procedures used make it clear which Ps, parts of the P, and variables under a particular part of the P to emphasize in developing a message. The analytic plan also helps to determine empirically (rather than philosophically, intuitively, or pragmatically) the segments of the populations. Hence, efforts can be devoted to the appropriate marketing mix for the total sample or for a particular segment (depending on objectives or resources). The Ps to emphasize (according to the results) in order to target the total sample are the 3 Ps (product, price, and place). For women, 2 Ps need to be emphasized (product and promotion). For men, 3 Ps need to be emphasized (product, price, and promotion). For those with a high school education or less, 3 Ps need to be the focus (product, price, and place). For those with greater than high school education, concentration needs to be on 2 Ps (product and price).

Further parsimony occurs due to the analysis plan when it is desirable to focus on which actual parts of the P to emphasize. For the total sample, it would be prudent to concentrate on negative tangible product expectancy and value, price psychological, and place personal. What can be omitted are positive core and positive tangible product expectancy and value, negative core product, price monetary, and promotion communication themes.

For men, the focus is the same as the total population on negative tangible product expectancy and value and price psychological, but it switches, however, to emphasis on promotion communication themes. What not to emphasize for men is the same as the total sample, except for place personal. For women, the focus is on negative tangible product expectancy and value and many of the promotion themes. What to omit for women is the same for both the total sample and men in regard to positive core product expectancy and value, negative core product, and positive tangible product expectancy and value. Women and men differ in that price psychological would not be emphasized for women.

For those with more than a high school education, the focus is on positive core product expectancy and value, negative tangible product expectancy and value, and price psychological. What is omitted is negative core product, positive tangible product expectancy and value, all the promotion communication themes, price monetary, and place personal. For those with a high school education or less, the focus is on negative tangible product expectancy and value, price psychological, and place personal. What is omitted is positive core product

expectancy and value, positive tangible product expectancy and value, negative core product, price monetary, and all the promotion communication themes.

These findings suggest that messages for the total population would be different from those developed for the segments, even though there is some overlap in the variables identified for the total population and segments. For example, if the intent were to target the total population, the message should emphasize physical activity even when there are large work demands, a long workday, or no trainer available. Also important is building confidence to be physically active. In addition, the total population believes their family, but is influenced by coworkers and friends to engage in physical activity.

For men, messages should emphasize exercising despite large work demands, availability of a trainer, and all of the positive features of activity (ie, good, valuable, useful, pleasant, and helpful). For women, the emphasis should be the same as for men on availability of a trainer, the positive features of activity, skill acquisition, and interesting activities.

For those with more than a high school education, the emphasis should be on physical activity increasing their energy level, making them feel better, toning their muscles, improving health, and helping them to relax. Emphasis too should be on incorporating physical activity into their schedules after a long day, identifying sites with trainers, coordinating schedules with an exercise partner, and building confidence to engage in physical activity independent of perceived skill deficits, and group exercise or athletic events. For those with a high school education or less, emphasis should be on physical activity even when there are large work demands, no trainer available, absence of company, bad weather, and no structured athletic opportunities. This segment tends to believe their spouse about the importance of physical activity, but they are influenced to increase their physical activity by their coworkers and friends.

In addition to the benefit of the variables being reduced and the model being more parsimonious, the analytic plan produced some unique findings. Because this population of university workers' education level was higher than blue-collar workers in other worksite settings nationally, the expectation was that the physical activity level of blue-collar workers in university settings would have been higher too. However, the present population's physical activity level was lower than expected based on the recent Surgeon General's report.[1] Also, it was anticipated ecologically that because these workers were in a highly educated, "protected" environment where recreational facilities were readily available and accessible, their activity level would exceed that of workers in other worksites nationally. The "reduced" activity level noted in this population may be due to geographic idiosyncrasies in that people in the Midwest engage in less physical activity than do those elsewhere in the nation (http://www.cdc.gov/nccdphp/phyactiv.htm).

Another surprising finding was that only more educated blue-collar workers were likely to engage in physical activity for health reasons. For the majority of subjects, this would not be a compelling reason. Such positive communication themes as physical activity's being good, valuable, or pleasant also may be important to include in a message. Research shows messages that arouse positive emotions result in more positive feelings toward the behavior and greater intent to comply with the message.[39, 40] Promotion of positive messages is important to overcome the realities of fatigue after a long workday and physically demanding jobs. However, it was surprising that no segment of this population indicated that if physical activity were fun, it would be easier to engage in. In addition, the data suggest that physical activity programs applied in this setting should strive to boost the participant's confidence about the participant's ability to engage in regular physical activity. Considering people important to the target audience may enhance cogency of the message.

It is important to note possible limitations of the findings. Self-reports of physical activity may be subject to error due to memory and recall bias. Responses to leisure physical activity levels may have been influenced by the workers' perceptions of their occupational physical activity levels. However, there are no data, objective or otherwise, to indicate that the self-assessments provided were invalid. Observed measures of physical activity were not used due to sample size and limited resources.

There are several priorities for future research regarding social marketing and blue-collar workers. One consideration would be to focus on positive tangible product, negative core product, and price opportunity to ascertain whether variables under these constructs have relevance to physical activity because none of these variables was significant in this study. Another consideration is to further explore product expectancy and product value variables because research has not addressed the importance of expectancy and value as they relate to the worth of each as viewed by the consumer. The same is true for believability and influentiality of place variables and which the consumer emphasizes. In general, future research needs to address the physical activity behaviors and attitudes of blue-collar workers because there is a dearth of research in this area.

In conclusion, this initial planning formative study serves as a first initiative to develop messages for campaigns, recruitment, and development or modification of physical activity programs for blue-collar university workers. The data specifically suggest that messages should consider the marketing mix and be designed for the specific target audience/segment. In general, positive messages that focus on increasing energy, incorporating activity into busy schedules after a long workday, using the services of a trainer, and selecting a program that builds confidence and makes an individual feel good may help motivate workers to engage in physical activity.

REFERENCES

1. U.S. Department of Health and Human Services. Physical Activity and Health: A Report of the Surgeon General. Atlanta, GA: U.S. Department of Health and Human Services, Centers for Disease Control and Prevention, National Center for Chronic Disease Prevention and Health Promotion 1996:3-207.
2. Pate R, Pratt M, Blair S, Haskell WL, Macera CA, et al. Physical activity and public health: a recommendation from the CDC and ACSM. JAMA 1995;273:402-407.
3. Booth M, Bauman A, Oldenburg B, Owen N, Magnus P. Effects of a national mass-media campaign on physical activity participation. Health Promotion International 1992;7:241-247.
4. Brunner R. Considering factors that affect exercise adherence. Medicine, Exercise, Nutrition, and Health 1994;3:293-295.
5. Babrow A, Black DR, Tiffany ST. Beliefs, attitudes, intentions, and a smoking cessation program: a planned behavior analysis of campaign development. Health Communication 1990;2:145-163.
6. Kotler P, Levy S. Broadening the concepts of marketing. Journal of Marketing 1969;33:10-15.
7. Andreasen R. Marketing Social Change: Changing Behavior to Promote Health, Social Development, and the Environment. San Francisco, CA: Jossey-Bass 1995:1-33.
8. Kotler P, Andreasen A. Strategic Marketing for Nonprofit Organizations. Upper Saddle River, NJ: Prentice Hall 1996.
9. Siegel M, Doner L. Marketing Public Health: Strategies to Promote Social Change. Gaithersburg, MD: Aspen 1998:473-474.
10. Slater M. Theory and method in health audience segmentation. J Health Commun 1996;1:267-283.
11. Stephens T, Caspersen C. The demography of physical activity. In Bouchard C, Shephard R, Stephens T, (Eds), Physical Activity, Fitness, and Health: International Proceedings and Consensus Statement. Champaign, IL: Human Kinetics 1994:204-213.
12. Gale J, Eckhoff W, Mogel S, Rodnick J. Factors related to adherence to an exercise program for healthy adults. Med Sci Sports Exerc 1984; 16:544-549.
13. Heaney C, Inghsh P. Are employees who are at risk for cardiovascular disease joining worksite fitness centers? J Occup Environ Med 1995;37:718-724.
14. Heirich M, Foote A, Erfurt JC, Konopka B. Work-site physical fitness programs: comparing the impact of different program designs on cardiovascular risk. J Occup Med 1993;35:510-517.
15. Farquhar JW, Fortmann SP, Maccoby N, Haskell, WL, Williams PT, et al. The Stanford five-city project: design and methods. Am J Epidemiol 1985;122:323-334.
16. Lefebvre R, Lasater T, Carleton R, Peterson G. Theory and delivery of health programming in the community: the Pawtucket Heart Health Program. Prey Med 1987;16:80-95.
17. Maccoby N, Solomon J. Heart disease prevention: community studies. In Rice R, Paisley W, (Eds), Public Communication Campaigns. 2nd ed. Beverly Hills, CA: Sage 1981:105-125.

18. Mittlemark MB, Luepker RV, Jacobs DR, Bracht NF, Carlaw RW, et al. Community-wide prevention of cardiovascular disease: education strategies for the Minnesota Heart Health Project. Prey Med 1986;15:1-17.
19. Black DR, Babrow AS. Identification of campaign recruitment strategies for a stepped smoking cessation intervention for a college campus. Health Educ Q 1991;18:235-247.
20. Black DR, Coster DC. Interest in a Stepped Approach Model (SAM): identification of recruitment strategies for university alcohol programs. Health Educ Q 1996;23:98-114.
21. Black DR, Loftus E, Chatterjee R, Tiffany S, Babrow AS. Smoking cessation interventions for university students: recruitment and program design considerations based on social marketing theory. Prey Med 1993;22:388-399.
22. Black DR, Smith MA. Reducing alcohol consumption among university students: recruitment and program design strategies based on Social Marketing Theory. Health Educ Res 1994;9:375-384.
23. Fine S. Social Marketing: Promoting the Causes of Public and Nonprofit Agencies. Boston, MA: Allyn & Bacon 1990.
24. Gries J, Black DR, Coster DC. Recruitment to a university alcohol program: evaluation of Social Marketing Theory and Stepped Approach Model. Prey Med 1995;24:348-356.
25. Kotler P, Roberto E. Social Marketing Strategies: Strategies for Changing Public Behavior. New York, NY: Free Press 1990.
26. Potter JD, Graves KL, Finnegan JR, Mullis RM, Baxter JS et al. The cancer and diet intervention to reduce nutrition-related risk of cancer. Health Educ Res 1990;5:489-503.
27. Solomon J. A social marketing perspective on communication campaigns. In Rice R, Aiken C, (Eds), Public Communication Campaigns. 2nd ed. Newbury Park, CA: Sage 1989:87-104.
28. Strahan R, Gerbasi K. Short, homogeneous versions of the Marlow-Crowne Social Desirability Scale. J Clin Psychol 1972;28:191-193.
29. Godin G, Shephard R. A simple method to assess exercise behavior in the community. Can J Appl Sport Sci 1985;10:141-146.
30. Godin G, Jobin J, Bouillon J. Assessment of leisure time exercise behavior by self-report: a concurrent validity study. Can J Public Health 1986;77:359-362.
31. Kasch F, Phillips W, Ross W, Carter J, Boyer J. A comparison of maximal oxygen uptake by treadmill and step-test procedures, J Appl Physiol 1965;21:1387-1388.
32. Nagel F, Balke B, Naughton J. Gradational step tests for assessing work capacity. J Appl Physiol 1965;20:745-748.
33. Hammond S. Health advertising: the credibility of organizational resources. In McLaughlin M, (Ed), Communication Yearbook. New Brunswick, NJ: Transaction-International Communication 1987; 10:613-628.
34. Rothman J, Teresa J, Kay T, Morningstar G. Marketing Human Service Innovations. Beverly Hills, CA: Sage 1983.
35. SPSS User's Guide; 2nd ed. Chicago, IL: SPSS Inc 1986.
36. Siegel S, Castellan NJ. Nonparametric Statistics for the Behavioral Sciences. 2nd ed. San Francisco, CA: McGraw-Hill 1988:262-272.
37. Glanz K, Lewis FM, Rimer BK. (Eds). Health Behavior and Health Education: Theory, Research, and Practice. San Francisco: Jossey-Bass 1977:20-21.
38. Niknian M, Linnan L, Lasater T, Carleton R. Use of population-based data to assess risk factor profiles of blue and white collar workers. J Occup Med 1991;33:29-36.
39. Batra R. Affective advertising: role, processes, and measurement. In Peterson W, Hower W, Wilson WR, (Eds), The Role of Affect in Consumer Behavior: Emerging Theories and Applications. Lexington, MA: Lexington Books 1986:53-87.
40. Thorson E, Friestad M. The effects of emotion on episodic memory for television commercials. In Cafferata P, Tybout A, (Eds), Cognitive and Affective Responses to Advertising. Lexington, MA: Lexington Books 1989:305-326.