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Routledge

Lindsey, Lisa L. Massi, et al. "Developing effective campaign messages to prevent neural tube defects: a qualitative assessment of women's reactions to advertising concepts." *Journal of health communication* 14.2 (2009): 131-159.

<http://hdl.handle.net/10945/65820>



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Developing Effective Campaign Messages to Prevent Neural Tube Defects: A Qualitative Assessment of Women's Reactions to Advertising Concepts

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The incidence of neural tube defects (NTDs), serious birth defects of the brain and spine that affect approximately 3,000 pregnancies in the United States each year, can be reduced by 50–70% with daily periconceptional consumption of the B vitamin folic acid. Two studies were designed to assess college women's reactions to and perceptions of potential campaign advertising concepts derived from preproduction formative research to increase folic acid consumption through the use of a daily multivitamin. Study one assessed draft advertising concepts in eight focus groups (N=71) composed of college-enrolled women in four cities geographically dispersed across the United States. Based on study one results, the concepts were revised and reassessed in study two with a different sample (eight focus groups:

The authors thank the moderators who assisted with data collection, and AED and Planit, who were involved in creating and revising the advertising concepts tested herein. This project was made possible through a partnership with the CDC Foundation, MOA#12494-0100-05. The findings and conclusions in this report are those of the authors and do not necessarily represent the views of the Centers for Disease Control and Prevention.

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N = 73) of college women in the same four cities. Results indicated that participants generally responded favorably to concepts in each of the two studies, and provided insight into individual concepts to increase their overall appeal and effectiveness. The specific findings and implications of these results are discussed.

Birth defects are a leading cause of infant mortality, pediatric hospitalizations, and medical expenditures in the United States (Callaghan, MacDorman, Rasmussen, Qin, & Lackritz, 2006; Centers for Disease Control and Prevention [CDC], 2007). Neural tube defects (NTDs), debilitating birth defects of the spine (spina bifida) and brain (anencephaly), currently affect over 3,000 pregnancies each year in the United States (CDC, 2004a). Individuals with spina bifida can expect to live full and productive lives, but they often face lifelong challenges, whereas anencephaly is a fatal birth defect. Periconceptional consumption of the B vitamin folic acid reduces the occurrence of NTDs 50–70% (CDC, 1992). Because NTDs occur in the first 21 days of pregnancy—before many women know they are pregnant—and because folic acid is water soluble, women should consume folic acid every day for at least one month *before* they become pregnant (CDC, 1992).

The U.S. Public Health Service and Institute of Medicine (IOM) issued separate recommendations that all women capable of becoming pregnant consume 400 micrograms (μg) of folic acid daily (CDC, 1992; IOM, 1998). Also, the U.S. Food and Drug Administration (FDA) mandated the fortification of cereal grain products (e.g., bread, breakfast cereals, and pasta) with folic acid in an effort to increase women's daily intake (FDA, 1996). Since fortification of the U.S. food supply began in 1998, it has resulted in a 26% reduction in the number of NTD-affected pregnancies (CDC, 2004a); however, with fortification alone few women (only 8%) reach the daily recommended level of 400 μg of folic acid from their diets (Yang et al., 2007). Because numerous studies have shown that periconceptional use of folic acid, alone or in a multivitamin, effectively reduces the risk of birth defects, increasing the use of vitamins containing folic acid remains an important component of NTD prevention (Ahluwalia, Lawrence, & Balluz, 2007; CDC, 1992, 2004a, 2004b). For substantial future reductions in NTDs, effective health communication messages are needed to help increase the number of women consuming 400 μg of folic acid daily through consumption of fortified foods, folate-rich foods, and a daily vitamin containing folic acid.

The current studies were designed as part of a formative research effort to assess college-aged women's reactions to and perceptions of different messages designed to increase multivitamin use. Two studies were conducted to (a) assess draft advertising concepts based on previous preproduction campaign research and (b) revise and test the concepts based on the results of the first study. Key literature that informed the studies is discussed next.

Literature Review

Formative Research in Message Development

A critical step in developing campaign messages is formative research where audience inputs and preferences guide message construction and content (Pfau & Parrott, 1993). Formative research typically is conceptualized as including both preproduction and production research. Preproduction research is useful in

understanding audience members' knowledge, beliefs, attitudes, and abilities about performing a recommended behavior (Mohr, 1995). Production research involves members of the target audience providing feedback on message concepts and content to help guide the formation of messages that will influence the overall target audience to engage in the recommended behavior (Atkin & Freimuth, 2001). Final message development, therefore, should be founded on research-based evidence to maximize the potential for behavior change. A systematic approach informed by theory is the most effective way to design, implement, and evaluate campaigns (Atkin & Freimuth, 2001); thus, the current production research studies were informed by preproduction research and assessed women's attention, understanding, attitude, perceptions of self-efficacy, and behavioral intentions associated with four potential campaign messages.

Important Theoretical Constructs

Just as theory is an important guide to message design (Murray-Johnson & Witte, 2003), theory can guide formative research used to test such messages. Previous research indicated that a target audience first must be exposed, and then attend, to a message if any likelihood of persuasion is to occur (McGuire, 2001). Also, comprehension of a message is necessary, although not sufficient, to confer adherence to a health message recommendation (Maibach & Cotton, 1995). Thus, formative research requires assessment of participants' attention to message features and understanding of a message to evaluate its effectiveness.

Previous theoretical research (e.g., Lindsey, Kopfman, & Prue, in press; Pawlak, Connell, Brown, Meyer, & Yadrick, 2005) around childbearing-aged women's multivitamin-taking behaviors examined the degree to which the theory of reasoned action (e.g., Fishbein & Ajzen, 1975), the theory of planned behavior (1991), and social cognitive theory (Bandura, 1977, 1986) explained women's consumption of multivitamins. For example, Lindsey and colleagues (in press) tested all three theories and found that women's attitudes and self-efficacy (or perceived behavioral control) had the greatest impact on their intentions to consume a multivitamin daily, and their intentions predicted strongly their actual multivitamin consumption. Their findings indicated that messages should focus on influencing these predictors of women's multivitamin consumption. Likewise, these findings suggest that it is essential that formative research assess women's attitudes, perceptions of self-efficacy, and behavioral intentions to determine a message's potential persuasiveness.

Based on the role of formative research in message development, and the theoretical constructs important to the persuasion process (especially those specific to multivitamin behavior), the current studies used these constructs as a guide to message evaluation.

College Women: A Critical Target Audience

The most recent data available indicate that the median age of mothers when they give birth to their first child is 24.9 years of age (Matthews & Hamilton, 2002), putting time of conception of the first birth prior to 24 years of age. Also, the highest rates of unintended pregnancies occur in women ages 18–24 years old (Finer & Henshaw, 2006). For interventions or campaigns to be efficacious in reducing rates of NTDs, women should be targeted prior to the age of 24 years. College-aged

women, specifically, are an appropriate and important target audience for prevention messages about multivitamins because up to 23% of college students experience or are a part of an unplanned pregnancy (Elliot & Brantley, 1997; Wiley, James, Furney, & Jordan-Belver, 1997).

Overall rates for multivitamin consumption are considerably low; specifically, only 24% of women 18–24 years of age are taking a vitamin containing folic acid daily (25–34 year olds are at 36%; 35–45 year olds are at 37%), and only 36% of women who have had any college (including postgraduate experience) report taking a vitamin containing folic acid every day (March of Dimes [MOD], 2005). Given that 78% of pregnancies among 15–19 year olds, and 59% among 20–24 year olds, are unplanned (Henshaw, 1998), the immediate prevention effects of a successful campaign could be significant. In the short term, a young woman might be more likely to take a multivitamin for nonpregnancy-related reasons (e.g., iron, calcium, immunity), and could benefit from folic acid if she has an unplanned pregnancy. In the long term, young women might be more likely to take vitamins containing folic acid once they are ready for pregnancy, protecting their future children.

Preproduction Research on Women, Folic Acid, and Multivitamins

Success in increasing sustained multivitamin use among women of childbearing age has been elusive (Lawrence et al., 2003). Only 33% of U.S. women 18–45 years of age report daily consumption of a vitamin containing folic acid, and these rates have remained consistent since 1995 (CDC, 2005). In 2005, 84% of childbearing-aged women reported they were aware of folic acid, but only 25% knew it prevents birth defects, and even fewer (7%) knew it should be taken before pregnancy (CDC, 2005). As MOD Gallup poll (2005) investigated barriers to daily vitamin use, with the most common barriers identified as “forgetting to take them,” feeling they “don’t need them,” and believing they ate a balanced, healthy diet. A recommendation from a health care provider and poor health were cited as reasons that would encourage women to take a multivitamin daily.

Lindsey, Hamner, and colleagues (2007) conducted preproduction research to further understand younger, childbearing-aged women’s (18–34 years) knowledge, attitudes, beliefs, and behaviors related to general health, diet, folic acid, and multivitamins. This research revealed multiple themes to inform potential advertising concepts about multivitamins, including ideas related to lifestyle issues, the supplemental nature of multivitamins, efficacy concerns, and disinterest in pregnancy-related health topics. Also, as shown in the following sections, women reported specific barriers that prevented them from taking a multivitamin.

Lifestyles. Women perceived their lives to be disorganized, hectic, and without routine, especially those women who did not take a multivitamin daily (Lindsey, Hamner, et al., 2007). They found it difficult to fit multivitamins into their busy schedules, and they had few daily habits with which to link multivitamin use, making it difficult for them to remember to take a daily multivitamin. Therefore, messages that promote the use of multivitamins should be crafted to address women’s busy lives and create perceptions that they can fit multivitamin use into their busy schedules.

Diet Supplement. Women who did not take multivitamins believed that they could get all of their required vitamins and nutrients from food alone, but they acknowledged that they did not eat well enough to do so (Lindsey, Hamner, et al., 2007). Potential messages should indicate that it might be difficult for women to get the vitamins and nutrients they need from food alone, regardless of a healthy diet, and then emphasize the need to supplement their diets with a multivitamin.

Self- and Response-Efficacy. Women identified barriers to taking multivitamins regularly, including the following: (a) cost (e.g., many women believed a month's supply of multivitamins cost at least \$20, and some believed the cost was upward of \$60 per bottle); (b) low tolerance due to pill attributes (e.g., the "horse pill" size made them difficult to swallow); (c) "all-or-nothing" perceptions of healthy behavior (e.g., if a woman was not exercising regularly, there was "no point" in taking a daily vitamin); and (d) lack of immediate, tangible results (e.g., they did not feel different after taking a multivitamin; they wanted a vitamin that resulted in immediate, desirable results they could see and feel). Thus, messages must increase perceptions of efficacy by presenting daily multivitamin use as feasible (e.g., focus on chewable vitamins; change perceived cost of multivitamins) and as an important stand-alone health behavior that provides important benefits (Lindsey, Hamner, et al., 2007).

Pregnancy Outcomes. Younger women (18–24 years of age) were uninterested in issues related to pregnancy and NTD prevention, and they did not want to discuss pregnancy as a possibility (e.g., they denied they would have an unplanned pregnancy; they did not plan to become pregnant until the distant future, if at all). Because they did not consider pregnancy to be "remotely in the realm of possibility," young women said they would ignore a message addressing pregnancy. Additionally, they argued that the best "hook" for them was a promise of beauty-related outcomes. It is important to note that although women desired cosmetic benefits, little to no scientific evidence exists currently that multivitamins can produce these desired effects. Nonetheless, messages that focus on pregnancy-related outcomes might be counterproductive; other tangible benefits might be more effective in influencing college-aged women to take a daily multivitamin (Lindsey, Hamner, et al., 2007).

Summary

In summary, many NTD-affected pregnancies remain preventable with the daily consumption of folic acid prior to conception. Campaign efforts to reduce NTDs should consider their target audiences, incorporating strong research designs that include extensive formative research to construct and test potential messages. The current studies serve to assist such message-development goals.

Study One Method

Participants

A total of eight focus groups ($N=71$) were conducted in four different cities across the United States (East Lansing, Michigan; Gainesville, Florida; Sacramento, California; Washington, DC) such that two focus groups occurred in each location. Participants were English-speaking college women of childbearing age (18–24 years;

$M = 20.44$) with an annual household income of less than \$50,000 who did not take multivitamins. None of the women had ever been pregnant, and all were enrolled at a 2- or 4-year college. Sixty-five percent of participants were White, 11% were Black or African American, 11% were Asian, 7% were Hispanic, and 6% reported their race/ethnicity as "other."

Recruitment. Participants were recruited via telephone or electronic mail (e-mail), and asked screening questions to assess actual age, college enrollment status, household income, and whether or not they took a multivitamin daily. To avoid including women who might have special knowledge of the discussion topics, women who were working or pursuing a degree in health, medical, or marketing fields were omitted from the focus groups. Additionally, women's education levels, race/ethnicity, and whether or not they had ever been pregnant were assessed. Because pregnancy can be an impetus for doctors, especially obstetricians and gynecologists, to inform and educate women about the need for folic acid and other vitamins, recruitment efforts sought to limit the number of participants who had been pregnant.

Procedure

Focus groups were conducted by two trained female moderators. Each moderator conducted a total of four focus groups, two groups in two of the four cities. Focus groups consisted of 7–10 participants, took place in a conference-style room equipped with a one-way observational mirror, and were audiotaped for transcription with the consent of participants. On arrival, participants provided informed consent and were offered refreshments. After an ice-breaking activity, participants were informed that the message concepts under evaluation were drafts without final artwork or language. Participants were told that differing opinions are expected to exist, and to please respond candidly to each question. Each concept was introduced and then assessed separately, and the order of presentation was varied for all eight focus group discussions to avoid order effects. As each concept was introduced, a large (16"×20") color poster of the concept was displayed at the front of the room for the group to view. After revealing the poster, the moderator distributed smaller (8 1/2"×11") color copies to each participant and read each concept aloud before initiating discussion. Each focus group discussion lasted 90 minutes. After being debriefed, women received an honorarium for their participation.

Moderator Guide

The moderator guide was developed to assess the following: (a) women's overall reactions to the draft concepts (e.g., general appeal, feelings, relatability); (b) whether or not the concept would capture their attention (e.g., first words/images women noticed, what text was most important); (c) women's perceptions of the main message being portrayed; (d) whether or not the concepts would motivate participants to use multivitamins or discuss them with others; and (e) what types of changes they would make to the concepts to improve them. Additionally, participants were asked individually to rank order the four concepts in order of preference. Finally, participants provided feedback regarding the source of the message.

Advertising Concepts

The four concepts, created by a professional advertising and marketing agency to have a unique advertising style, were designed to address important issues discovered in the preproduction research phase. Because both studies tested draft advertising concepts, stock photography was used in their creation. A detailed description of each concept follows.

No Excuses. The No Excuses concept (see Appendix A) represented a feminine advertising style that included depictions of vitamins in a makeup case. The aim was to have women associate the importance of taking multivitamins daily (as a means to protect their health) with (a) the time and effort that they spent applying their makeup, and (b) perceptions of beauty without making overt claims about beauty. This concept addressed both self-efficacy issues related to time (“Is your body worth 10 seconds?”) and physical pill attributes (highlighting the availability of chewable multivitamins that allow women to avoid having to swallow large pills) identified in preproduction research (Lindsey, Hamner, et al., 2007). Also, this concept indicated that women need “specific nutrients” every day that might result in outcomes women find desirable (staying healthy, energetic, and focused), and highlighted that these nutrients can be difficult to get from food alone.

Cellular Fulfillment. The Cellular Fulfillment concept (see Appendix B) represented a sensual advertising style that included the bare back of a woman with her face in profile. It identified the importance of multivitamins to women’s health on the cellular level (“A multivitamin can transform your body’s cells into micro-masses of health and vigor”). In response to preproduction research (Lindsey, Hamner, et al., 2007), this concept addressed women’s desire to learn more about vitamins and nutrients, providing information about the function of folic acid (“promotes healthy cell growth & development”).

VitaGo Girl. The VitaGo Girl concept (see Appendix C) presented an animation of a young woman depicted as a superhero with a story about a “multivitamin void” that she is fighting to overcome. This concept tried to overcome the “all or nothing” perception women reported in preproduction research (Lindsey, Hamner, et al., 2007), by arguing that all women (e.g., “healthy eaters and junk food lovers” alike) are affected by the void and need to take a multivitamin daily. It addressed self-efficacy by highlighting the availability of chewable multivitamins. Finally, the concept included the perceived benefits of multivitamins that women reported as desirable in the preproduction research (e.g., “healthier skin, hair, and nails”).

Relationships. The Relationships concept (see Appendix D) used humor by comparing a young woman’s relational commitment to a former boyfriend with her relational commitment to multivitamin use. This concept addressed issues of self-efficacy related to time (“It asks for only 10 seconds of your time each day”) and cost (“It’s much cheaper than the video game you got your ex for his birthday”) identified in preproduction research (Lindsey, Hamner, et al., 2007). Finally, this concept indicated that a multivitamin is “committed” to giving women benefits that they might find desirable (“better health, more energy, and greater well-being”).

Overview of Analyses

The audiotapes were used to transcribe all focus group discussions, and then two separate coding approaches, analyses, and interpretation activities took place. The first step in analysis was to review observer notes, moderator reports, and the transcripts to identify themes and patterns. One author and two research assistants independently conducted the reviews and developed a coding scheme of key words and phrases along with a database of the different thought units (words, phrases, sentences).

Coding Scheme. Conventional content analytic guidelines were used to (a) create precise operational definitions for all categories, (b) train coders in the use of these categories, (c) conduct frequent reliability checks between coders, and (d) remove a unit of analysis if it was unintelligible to the categories. Particular attention was paid to preventing the loss of process elements in the data when coding and analyzing by taking into account both temporal sequencing and group interaction. The goal was to arrive at an analysis that captured the "whole moving picture" of the focus group discussions, rather than analyzing individual segments, and bringing those together in a report.

Reliability. Overall, coders spent approximately 57 hours reviewing and revising the codebook, as well as discussing and resolving any discrepancies. Units were coded individually by the two coders, and Cohen's kappa was used to calculate intercoder reliability as it compensates for agreements by chance (Cohen, 1960). Strong reliability was established from 75% of the data (Cohen's kappa = .90). The coding scheme then was applied to the units using HyperRESEARCH v. 2 software for a final analysis because of its ability to verify and confirm the interpretative findings (Morgan, 1993, 1995; Stewart & Shamdasani, 1990).

Study One Results

Responses to Each Advertising Concept

No Excuses. Overall, No Excuses was ranked the highest among the concepts (see Table 1). Many participants believed that the primary message centered on multivitamins being quick, easy, compact, beneficial, and chewable. Most participants thought this message was important, especially those who described themselves as being "lazy" or "knowing better." The headline "Is your body worth 10 seconds?" stood out as important to women. Because participants described their lives as busy,

Table 1. Concept rankings, study one

Concept	Mean ranking	Mode
No excuses	1.65	1.00
Relationships	1.92	2.00
Cellular fulfillment	3.01	3.00
VitaGo girl	3.36	4.00

Note. Rankings ranged from 1 (most likely to motivate me) to 4 (least likely to motivate me).

framing multivitamins as quick and efficient resonated across all of the groups. It appeared that the 10-second frame, and its relationship to everyday behaviors (i.e., getting ready in the morning), was (a) motivating and (b) forced women to think about the effort they put into "external beauty" compared with their "internal" health:

[No Excuses] would be very effective and something that a lot of women could relate to, like, if you spend some time to make your body look better, the superficial outside of your body, I mean, it takes less time to take a vitamin and make the inside of your body permanently better. (East Lansing)

I think it's good... "is your body worth 10 seconds?" It makes me stop and think about what my health is worth and whether or not I can spend 10 seconds to take a multivitamin. (Sacramento)

Many women liked the pink color of the concept, but some thought the flowers were too childish. Also, some women noted that the connection between makeup and multivitamins was confusing, stating that they might just skip over it in a magazine because it was "just another makeup ad."

Relationships. This concept ranked second among all groups. The majority of women across the eight focus groups made positive comments about its use of humor, and believed the concept was relevant to women like them:

I think most of us probably had a stupid boyfriend, so we found [Relationships] funny. (Sacramento)

I think the reason we all think [Relationships] is so cute is because most girls our age are into being really independent. (Gainesville)

Women noted that the image "really grabs your attention" and would stand out in a magazine because women would wonder, "Who scratched out this picture in my magazine?" Participants noted that this made them want to read the concept more closely. One disadvantage women mentioned was the cost comparison of multivitamins to the cost of a video game. Although participants applauded the idea of providing a cost comparison for multivitamins, many noted that using a video game as an example was not effective when trying to make multivitamins seem affordable. Video games were perceived to be expensive, so it was not a strong contrast to say that multivitamins cost less. Participants suggested using a cost comparison with something more reasonable, and something they tend to purchase more frequently. Nonetheless, women liked the idea of spending some money on themselves to stay healthy:

You have a boyfriend and you break up. You have another boyfriend and you break up. If you think of all the money we spend on boyfriends and you're not spending \$15 on multivitamins for your health. So it's definitely relatable to me. Taking multivitamins is for me, it's not for him, or Mom or Dad. It's for me. (Sacramento)

Another disadvantage was that the Relationships concept seemed to assume that the audience had a previous "relationship" with multivitamins. Some participants pointed out that this might not be the case for most college women, and they cautioned against using this framework:

This ad suggests it's more geared to someone who is already taking multivitamins or has taken vitamins in the past. I don't think that's true of most women our age. It says that boyfriends come and go, but vitamins are there for the long haul. I don't think of it that way. (East Lansing)

Cellular Fulfillment. Participants offered few positive comments about the Cellular Fulfillment concept, and ranked it third among the concepts. Generally, women thought Cellular Fulfillment's attempt to provide "facts" and "evidence" about vitamins (i.e., "Folic acid is important for healthy cell growth and development") was important, and they desired to see more of that in the other concepts. Specifically, participants noted that they wanted to learn more about vitamins, what they do, why they are needed, and how each vitamin and nutrient would benefit women. Also, although a few women argued that talking about benefits at the "cellular level" sounded "vague" and unclear, others liked it because it sounded "science-like":

If I'm going to take a multivitamin, tell me exactly, explicitly what it's going to do. . . . [Cellular Fulfillment] says folic acid helps promote healthy cell growth. I didn't know that. Tell me more. What does that mean. . . . Will it make my nails grow better or my skin look better? (Washington, DC)

I like the folic acid thing [in Cellular Fulfillment] because it actually gives you information. It's telling you if you take folic acid, it promotes healthy cell growth and development. That's my favorite thing about the whole ad, because it's actually giving you information you can use. (Sacramento)

Although participants liked the inclusion of specific information about folic acid, some questioned "Why folic acid?" and not something else. Also, participants said it was "nice" to see an Asian woman in Cellular Fulfillment because many advertisements do not have a lot of diversity. Furthermore, women liked the "roll" on the model's side because it made the model look "real," unlike most thin women in advertisements.

Despite the aforementioned positive attributes of Cellular Fulfillment, it had a number of disadvantages. Most women found the concept confusing. For example, participants agreed that the concept implied a link between multivitamins and sexuality, but they believed it was nonsensical to argue that any vitamin could improve a woman's sex life:

I see more of it as, "If you take vitamins, sexually you will be happier." (Gainesville)

To me, it seems kind of implying sexual stuff. . . . (Washington, DC)

Some participants were offended by the sexual innuendo (e.g., a few participants called it "vulgar"), and most women thought that the imagery was similar to that used in other ads (e.g., it could easily be mistaken for a lotion or body wash advertisement). Furthermore, participants argued that Cellular Fulfillment would make women evaluate themselves negatively, and the concept would not motivate them to take multivitamins:

This looks like every ad you see...I think they could try and be different. (Gainesville)

I feel like this is just another ad that is supposed to make me feel bad about myself. (Washington, DC)

A woman wearing no clothes isn't really going to, like, ... make me take vitamins. (East Lansing)

VitaGo Girl. The majority of participant comments and rankings indicated that VitaGo Girl was the least preferred concept. Reasons for negative comments included the use of a "stereotypical image of women," the concept being "patronizing, insulting to college-age women," and the imagery being "more appropriate for a video game." Participants noted that as adults they found VitaGo Girl too "juvenile" and "cartoonish," believing that this concept might work very well for girls in junior high school, but not on a college campus. To help college women relate to this (or any) concept better, participants suggested using pictures of "real college students" that matched the text.

Although VitaGo Girl was received negatively overall, two aspects of the concept were evaluated favorably: the acknowledgment of participants' busy lifestyles and, similar to the Cellular Fulfillment concept, the inclusion of specific information related to vitamins and their benefits. First, participants appreciated that VitaGo Girl painted a picture of women's college lives that was similar to their own:

How they say, you go from class, to the dining hall, to party late night, ... like a normal girl going from one place to another. (Washington, DC)

Because, it's like, to the dining hall, to class... That's the college life. (Gainesville)

Second, although some women found the information about calcium and vitamin C to be uninformative, most participants expressed a desire for "facts" about multivitamins and thought these phrases were useful but needed clarification:

[VitaGo Girl] says stronger than 1,000 milligrams of calcium. Where do I get 1,000 milligrams of calcium? Is that like a glass of milk or is that like...? I can't make the connection, so, like, it says more powerful than a surge of vitamin C. What's a surge? (Sacramento)

To make me want to do something, you have to give me some facts or put some statistics down there. (East Lansing)

Tagline Rankings

"Taglines," or memorable catch phrases, were tested separately with each group to identify phrases that would appeal to women. Participants ranked nine different taglines. Results indicated that "Multivitamins. Total body makeover," "Multivitamins. Make a commitment to yourself," and "Multivitamins treat you right" were the most preferred taglines (see Table 2).

Evaluation of the Message Source

In response to, "Who do you imagine would be the sponsor of this campaign," women suggested myriad sources including on-campus health clinics, women's non-profit organizations, health retail stores, music television (MTV), multivitamin companies, and physician groups. Participants indicated that they would prefer the source to be a reputable nonprofit organization that did not have a profit motive for marketing the campaign. When exposed to a logo for the CDC, most participants did not recognize it, and a few who did recognize the logo omitted "Prevention" from the organization's name. When asked if the logo might increase the believability or credibility of the message, many participants responded that having the logo did not make a difference (e.g., it would not boost credibility, motivation, interest, etc.) because people would not necessarily know what the logo represented. The women recommended the logo include the full name of the organization so women would know what the logo and "CDC" represented. Generally, participants noted that CDC sponsorship would boost the legitimacy of the concepts and the believability of the information; however, some did not believe that the CDC logo would be necessary to increase the credibility of the concepts.

Study One Discussion

The results of the current message production research provided information about four concepts designed to appeal to young (18–24 years of age) college women and motivate them to take a multivitamin containing folic acid daily. Women responded very positively to both the No Excuses and Relationships concepts. The Cellular

Table 2. Tagline rankings

Tagline	<i>M</i>	Mode
Multivitamins. Total body makeover	3.65	1.0
Multivitamins. Make a commitment to yourself	3.69	2.0
Multivitamins treat you right	4.04	4.0
Multivitamins. Do it for yourself	4.18	5.0
What do multivitamins have to do with your lifestyle – everything	4.99	8.0
Multivitamins. Complete fulfillment	5.58	6.0
Seize your potential. Take a multivitamin	5.95	7.0
Multivitamins. Feel fulfilled	6.16	7.0
Multivitamins. When your life is a whirlwind, it's the least you can do	6.78	9.0

Note. Rankings ranged from 1 (like the tagline best) to 9 (like the tagline least).

Fulfillment and VitaGo Girl concepts were not popular among participants; however, some text segments were identified as important (e.g., the folic acid information in Cellular Fulfillment). These results were consistent with survey research that was conducted concurrently with study one and are reported elsewhere (Lindsey, Boster, Ah Yun, Hamner, & Prue, 2007). Given the findings of the first study and the survey research, the No Excuses and Relationships concepts should be retained, and the Cellular Fulfillment and VitaGo Girl concepts should not be pursued for this audience. As such, further development of No Excuses, Relationships, or some hybrid of the two, should be undertaken with consideration for the specific feedback women provided. It is important to note that, in addition to what women said they liked about the initial concepts, they wanted more information about multivitamins (e.g., more facts, evidence). With regard to the findings related to campaign sponsorship, it is likely that CDC sponsorship would lend credibility, believability, and importance to the campaign; however, it was apparent that the full agency name should be spelled out in each concept so that women would recognize the sponsor. Overall, the findings of study one guided the development and revision of advertising concepts to encourage young women to take a multivitamin daily.

Study Two

A second round of concept development and testing evaluated the effectiveness of four advertising concepts revised based on study one results. In addition to assessing modified versions of the No Excuses and Relationships concepts, two new concepts were created (Morning Routine and Cell Phone). The revision and creation of each concept is detailed subsequently in the method section.

Study Two Method

Participants

Participants were recruited using the same approach as that used in study one. A total of eight focus groups ($N = 73$) were conducted in the same four cities as study one, with two focus groups in each location. Participants were English-speaking college women of childbearing age (18–24 years of age; $M = 20.65$) with an annual household income less than \$50,000 who did not take vitamins. None of the women had ever been pregnant, and all were enrolled at a 2-year or 4-year college. Fifty-two percent of these women were White, 21% were Black or African American, 10% were Asian, 11% were Hispanic, and 7% reported their race/ethnicity as “other.”

Procedure

The procedure used in study two mirrored study one with two exceptions: (a) one moderator conducted all of the focus groups and (b) concept and tagline rankings were not collected. After an icebreaking activity, participants viewed four different message concepts (their presentation was varied to avoid order effects), and answered the same moderator questions described in study one (except for the discussion of taglines and the message source). Participants discussed the concepts for approximately 90 minutes, were debriefed, and then received an honorarium.

Advertising Concepts

Two new concepts and two refined concepts were created by the same advertising agency. Based on the preproduction research (Lindsey, Hamner, et al., 2007), results from the concept testing of study one, and information from additional web-based surveys (see Lindsey, Boster, et al., 2007), the four revised concepts were created using a consistent advertising style, layout, and unifying message features (e.g., the headline). Additionally, the amount of text in each concept was reduced to be more consistent with an advertisement one might see in a magazine.

No Excuses. The revised version of No Excuses (see Appendix E) used the same feminine advertising style to associate women's beauty regimens with the importance of taking care of their health by consuming a daily multivitamin. Visually linking perceptions of beauty with multivitamins addressed one of the most important motivators for this audience without making overt claims (e.g., multivitamins can improve beauty).¹ Other outcomes that women might find desirable were presented, also (i.e., "stay healthy, energetic, & focused"). No Excuses addressed self-efficacy issues related to time ("It takes ten seconds to take a multivitamin"), cost ("A month's supply costs less than a lip gloss"), and physical barriers to taking multivitamins ("Get multivitamins in quick & easy chewables").

Morning Routine. Morning routine (see Appendix F) was designed to be a live-action version of No Excuses, with content focusing on self-efficacy issues of time ("It takes ten seconds to take a multivitamin") and the availability of alternative multivitamin forms ("an easy & chewable addition to your morning routine"). Women's "hectic" lives were acknowledged ("Get the nutrients you need for your busy day"). Also, this concept included the claim "Protect your reproductive health for the future" to address birth defect prevention in a way that was consistent with the preproduction findings (e.g., avoiding pregnancy-specific messages).

Cell Phone. The Cell Phone concept (see Appendix G) included a picture of a woman's hand text messaging someone ("I TOOK MINE 2DAY!") to link the regularity of the behavior with multivitamin use. The concept addressed issues of self-efficacy related to time ("It takes ten seconds to take a multivitamin"), and cost and physical pill attributes ("A single chewable costs less than a text message"). This concept included outcomes that women might find desirable, and linked them to women's hectic lifestyles ("Stay energized & focused when you're on the go") and perceptions of food ("Get the nutrients that are hard to get from food alone").

Relationships. The revised version of Relationships (see Appendix H) used the same imagery as the original concept, but the message was reframed to be consistent with the theme of the four revised concepts ("Is your body worth 10 seconds?"). For example, the lead-in was changed to read "It took 2 months to realize he's a JERK. It takes ten seconds to take a multivitamin." Relationships linked emotional health and multivitamins, incorporated the relational theme, and addressed

¹Although some overt claims were included in the initial concepts (e.g., "healthier skin, hair, and nails"), all concepts were revised for study two to omit such claims. No scientific evidence exists that vitamins will result in such outcomes. Furthermore, promising such benefits when no evidence suggests that multivitamins can deliver on those promises might result in initial behavior change; however, women might stop taking multivitamins soon thereafter when they do not see such results.

self-efficacy issues such as time ("It only asks for 10 seconds of your attention each day") and availability of alternative forms ("Get quick and easy chewable tablets"). Finally, this concept acknowledged an outcome that women might find desirable and linked it with their hectic lifestyles ("Stay energized & focused in the face of stress") and addressed the issue of reproductive health by relating it to relationships ("Protect your reproductive health [for when you do meet Mr. Right]").

Overview of Analyses

The same analysis procedures from study one were used in study two. Again, units were coded individually by the two coders, and Cohen's kappa was used to calculate intercoder reliability (Cohen, 1960). Strong reliability was established from 75% of the data (Cohen's kappa = .90).

Study Two Results

Morning Routine

The Morning Routine concept was the favorite among most groups. Women could relate to the woman portrayed in the concept, and several reported appreciation for using an Asian woman because "you always see Caucasian women in ads." Most women agreed that mornings were filled with routine tasks, and including multivitamins in the routine made sense because forgetfulness was noted as a common barrier:

I might put my vitamins next to my eye shadow, like my makeup. I have vitamins, but I don't take them. If they were right there, next to my makeup, I would remember to take them. (Washington, DC)

It shows you that, like, because you can be, like, chewing the tablet while you're putting on your mascara. Yes, we're definitely multitaskers! (East Lansing)

Most women liked the mention that multivitamins would protect their future reproductive health—this phrase was perceived to be "evidence" providing "reasons" as to why women should take a multivitamin. Participants acknowledged their future reproductive health was important to them, even if they were not thinking about it currently; however, for some women reproductive health was not reason enough to take a multivitamin. Mention of maintaining energy and focus resonated with some women instead.

I like the line, "Protect your reproductive health for the future." Not that I'm trying to have kids anytime soon, but someday, in the future, I would like to be a Mom, and that might gear me more if it helps my kids in the future. (Gainesville)

If they just had more benefits from taking the vitamins every day, just small things, like, you have a percent less of catching a cold, something like that, I could connect with and realize that it really is going to benefit me, . . . because reproductive, I just really don't associate with that, . . . but energize is really good. (Sacramento)

Some participants liked the information related to nutrients they need for their busy day, especially because it acknowledged their busy lifestyles. Also, the imagery in Morning Routine resonated with participants because it showed a part of women's busy lives, how someone could fit multivitamins into her day, and suggested how she might benefit from it.

Like, she is doing it [looking at the vitamin bottle] in the morning and it is going to help her with her busy day, like, that's good. [Multivitamins] help you be more productive throughout the day, and she looks awake and vibrant... If I could look like that every morning... (Gainesville)

As with No Excuses in study one, participants liked that Morning Routine acknowledged that the target audience often pays more attention to the "outside," but that they need to focus on the "inside." Most women liked the green color, indicating it evoked thoughts of health and was eye-catching. Some women made suggestions specific to wording (e.g. "also available in chewables" to avoid advocating chewables only) and graphics (e.g., makeup looked cluttered and mascara wand held like a cigarette).

Relationships

Results for this concept were greatly similar to study one, with most participants finding it humorous. Women liked the use of the handwriting in the concept, responded favorably to the idea of making "a commitment to yourself," and liked the information related to staying energized and focused as well as protecting their reproductive health for the future. Some women who currently were in a long-term relationship did not like this concept (e.g., they perceived it as "mean" or "juvenile"), and several women thought the ad might be about condoms, birth control, or something related more directly to relationships. Overall, participants found this concept to be attention getting and humorous, and the "reasons" for taking multivitamins favorable.

No Excuses

Although No Excuses was ranked highly and liked by most women in study one, the revised version did not test as well in study two. Overall, this version was seen as too feminine, "girlie," and "young" by the majority of participants. At least two to three women in each focus group reported that they were not "into makeup," and several assumed it was for a brand of makeup (mirroring study one findings). On the other hand, some women liked the connection made between multivitamins and one of their current, daily behaviors:

I'm not that much into makeup, I don't think college women spend a lot of time on makeup every day. Makeup isn't that important. (Gainesville)

I like connecting [multivitamins] with putting on makeup, something I do every day so I could remember to take it. (East Lansing)

Women did like the phrase “stay healthy, energetic and focused,” and perceived “costs less than a lip gloss” to be a good cost comparison; nonetheless, some women felt they still needed more specific and compelling reasons:

Maybe instead of saying, “Stay healthy, energetic and focused,” they could give you an example, like, “People who take multivitamins have this much more energy,” or maybe just something a little more specific. (Gainesville)

If you’re going to say, “Take one today and every day,” well why? People are going to be thinking, “why?” (Sacramento)

Despite the few pieces of information women liked, this concept was not received well by participants. Although these results might appear to be in contradiction to findings from the first study, one should note that the appealing points of No Excuses from study one had more to do with the primary message: multivitamins are quick, easy, compact, beneficial, and important. Thus, the appeal was more about multivitamins being “quick and easy” and taking only 10 seconds, themes that resonate throughout all of the study two concepts.

Cell Phone

Few participants liked the Cell Phone concept in its current form, stating that it looked like an advertisement for cell phones, and they would not have stopped to read it in a magazine. In fact, a word used many times to describe the ad was “boring.” Women often noted, however, that it might be much more effective to replace the current image with (a) a woman using the phone (not just a phone in her hand) or (b) a picture of an open purse with a cell phone and multivitamins inside. Although the imagery was not received well, the idea of a daily reminder was viewed by some as an excellent idea, as long as they did not have to pay for it:

There is one thing I do like about it, the daily multivitamin reminder, because I have vitamins, but I never take them because I can’t remember. (Gainesville)

Also, women liked the idea of a cost comparison, but the comparison to a text message was ineffective (e.g., text message costs vary by service provider, some women have free text messaging, etc.). As noted previously, participants liked the information about staying energized and getting nutrients that are hard to get from food alone:

We all need help to have energy, to focus, I like that because I’m looking for that. (Sacramento)

Visiting Vita101.org

The concepts in study two included a mention of a hypothetical website, Vita101.org, to determine whether or not women would be interested in visiting such a site. The reception of the website was mixed; some participants liked the idea of more factual

information about multivitamins, particularly about specific vitamins and their benefits, but others noted they would not go to the website "just for facts." Instead, they argued that tangible items like free samples, free "starter packs," and daily reminders might encourage them to visit Vita101.org:

I would go online and get a reminder with a free vitamin. Yeah, that is a good idea. (Washington, DC)

I like the idea of Vita101.org if I can get free vitamins. (East Lansing)

Study Two Discussion

The results of study two indicated that women responded positively to the Morning Routine and Relationships advertising concepts. Although responses to the Cell Phone concept were not positive, most concerns were related primarily to the image, and feedback focused primarily on how to use more interesting and relevant imagery in the final advertisement. No Excuses, on the other hand, was not popular among participants, a marked difference from study one. This finding is not surprising given that No Excuses' theme of "Is your body worth 10 seconds?" was its strongest attribute (e.g., participants always perceived the makeup to be a bit juvenile). Thus, it is not unexpected that Morning Routine—identical in theme to No Excuses but using women who looked like college students as requested in study one—would be received more positively. Also, the revised version of Relationships (modified to be consistent with the "Is your body worth 10 seconds?" theme) was received well. It is important to highlight that women continued to desire more specific information about multivitamins (e.g., more facts, evidence). One place to accomplish this educational goal would be the website, provided that other opportunities were available that would appeal to college women (e.g., free multivitamin trial packs).

Implications

The current studies demonstrate the value of systematic, iterative research from a communication perspective when designing health messages to influence a defined target audience. These studies provide an exemplar for other researchers interested in using a systematic approach to generate persuasive messages that are informed by rigorous research. The results demonstrate that audience members' knowledge, beliefs, attitudes, and preferences have great utility in informing message content. Within the current multivitamin context, we found that young women want factual information and evidence about the benefits of taking multivitamins (including the importance of folic acid to prevent birth defects, as well as how specific vitamins benefit them); however, they want the information presented in a way that does not insinuate that babies are in their immediate future. This example illustrates the complexity of designing messages that are rich in information, nuanced, and sensitive to audience preferences. Also, health messages need to be conscious of self-efficacy issues, encouraging individuals that they can perform recommended behaviors (e.g., young women want acknowledgment that they are busy, and want to be encouraged that they can easily engage in the behavior of taking a multivitamin daily). Finally, it is

clear that source credibility can bolster the effectiveness of health messages as evidenced by our participants desiring reliable, objective, and credible sources for messages about multivitamins.

In sum, NTDs are significant and important public health problems that need to be addressed. Previous research has suggested that new and creative interventions are needed to effectively reduce the number of NTD-affected pregnancies in the United States (CDC, 2004a, 2004b, 2005). Any interventions that integrate the current findings into their messages have a better chance of impacting women's multivitamin-taking behavior because they are based on strong formative research methods. Effective health promotion strategies and interventions aimed at women of childbearing age are necessary to prevent morbidity and mortality associated with serious birth defects (Ahluwalia et al., 2007). The studies reported here are not only useful for NTD-related interventions, but also provide a formative research model that is valuable across health contexts.

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Appendix A

Vita Multivitamins
Total body makeover

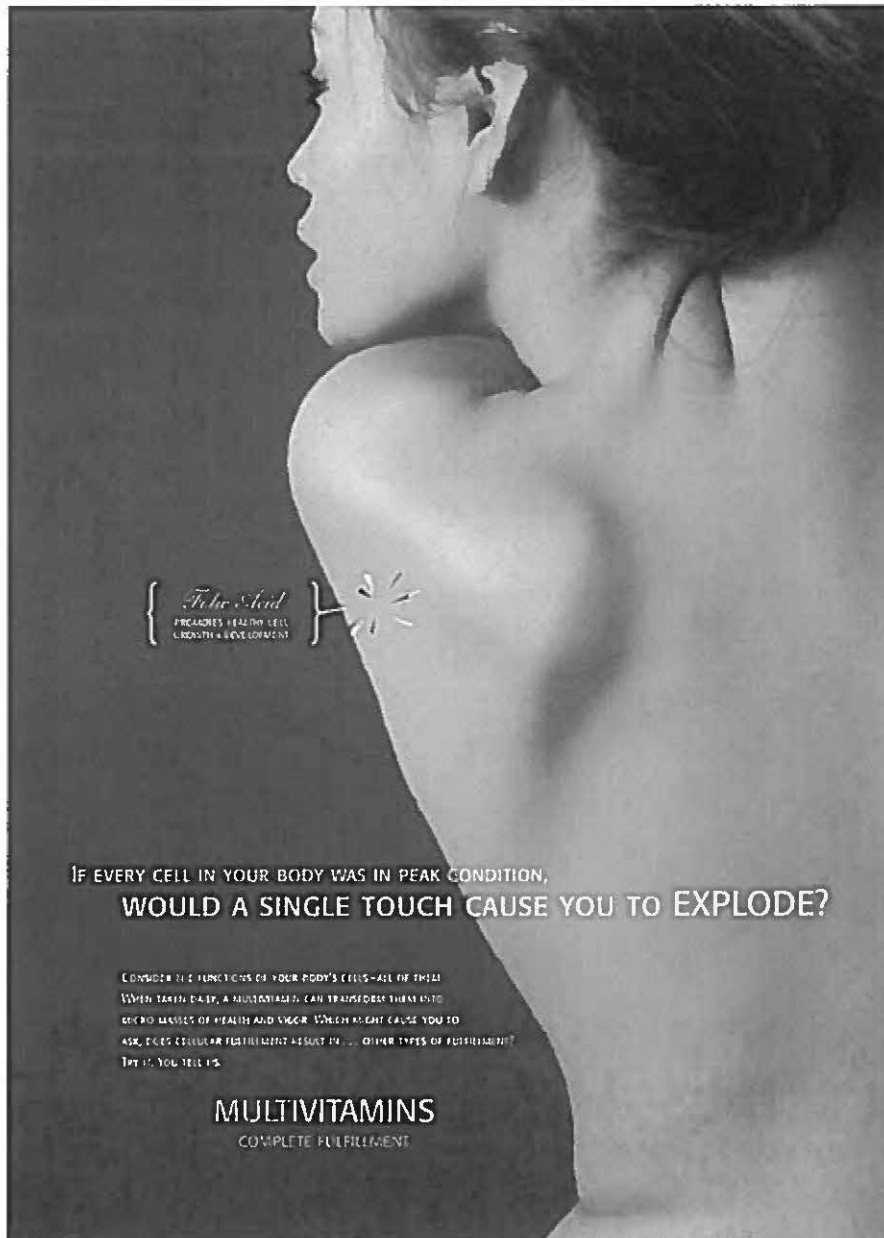
IS YOUR BODY WORTH
10 SECONDS?

It takes ten minutes to put on makeup each day. It takes ten seconds to take a multivitamin. Most women manage one of these tasks—and like most women, you're probably wearing lip gloss right now. You may not realize how crucial those ten seconds can be. Women need specific nutrients every day to stay healthy, energetic, and focused—nutrients that are difficult to get strictly from food. When you're dancing from class to practice to the dining hall to the party to the late-night party to class... you get the picture—a multivitamin might be the healthiest thing you do all day. And the easiest, it even comes in chewable. The next time you check your makeup, take a few extra seconds to protect your health. You owe it to yourself.

Appendix A. No Excuses.

All advertising concepts were evaluated in full color and are reproduced in black and white for publication purpose.

Appendix B



Take Acid
PROMOTES HEALTHY CELL
GROWTH & DEVELOPMENT

IF EVERY CELL IN YOUR BODY WAS IN PEAK CONDITION,
WOULD A SINGLE TOUCH CAUSE YOU TO EXPLODE?

CONSIDER THE FUNCTIONS OF YOUR BODY'S CELLS—ALL OF THEM
WHEN TAKEN CARE, A MULTIVITAMIN CAN TRANSFORM THEM INTO
MICRO-MASSSES OF HEALTH AND VIGOR. WHICH MIGHT CAUSE YOU TO
ASK, DOES CELLULAR FULFILLMENT ASSURE ME... OTHER TYPES OF FULFILLMENT?
TRY IT. YOU TELL US.

MULTIVITAMINS
COMPLETE FULFILLMENT

Appendix B. Cellular Fulfillment.

Appendix C



Appendix C. VitaGo Girl.

Appendix D



breaking up with your boyfriend
- smart
move.

breaking up with
your multivitamin
- Not so
much.

Considering your ex thinks doing laundry is an annual event, your fear of commitment is understandable. But there's no excuse for not making your multivitamin relationship work. It asks for only ten seconds of your time each day and it's much cheaper than the video game you got your ex for his birthday. Plus, a multivitamin is committed to giving you what your body needs for better health, more energy, and greater wellbeing. It's time to be *rare* than friends — and still see other people. (Now how often does *that* happen?)

(multivitamins treat you right.)

Appendix D. Relationships.

Appendix E

• Get multivitamins in quick & easy chewables
• Stay healthy, energetic, & focused
• A month's supply costs less than a lip gloss

IS YOUR BODY WORTH
10 SECONDS?

It takes ten minutes to put on makeup.
It takes ten seconds to take a multivitamin.

When you check your makeup, take the few extra seconds crucial to your health. You owe it to yourself.

Take one today and every day. Visit vita101.org for more information.

MULTIVITAMINS
Total body makeover

Appendix E. No Excuses (Revised).

Appendix F

- * An easy & chewable addition to your morning routine
- * Get the nutrients you need for your busy day
- * Protect your reproductive health for the future

IS YOUR BODY WORTH 10 SECONDS?

It takes time to get ready in the morning.
It takes ten seconds to take a multivitamin.

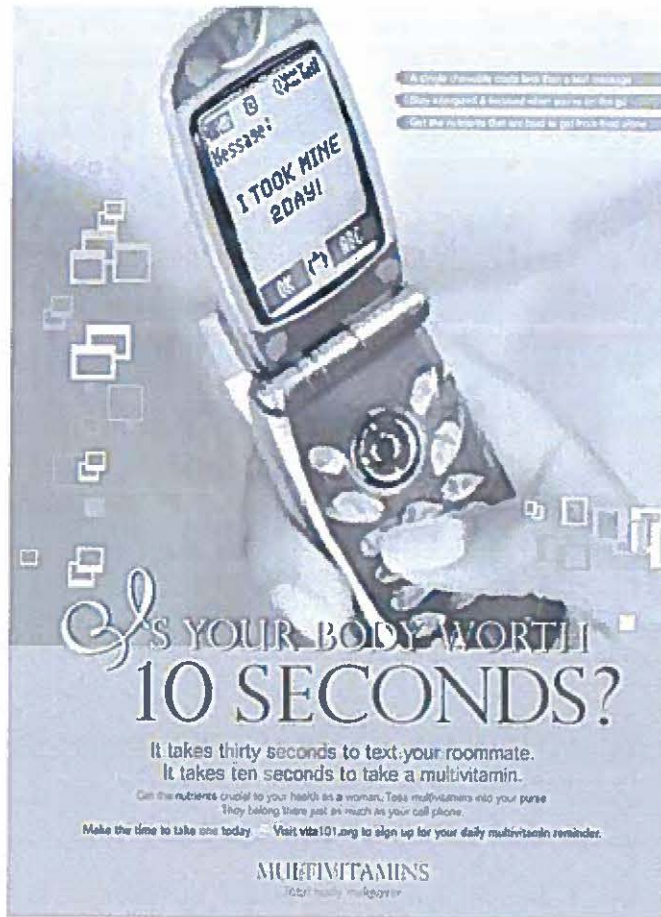
You make time to look good, but do you make time to feel good? You owe it to yourself.

Take a multivitamin today. No excuses. * Log on to vita101.org for your FREE multivitamin starter pack.

MULTIVITAMINS
Total body makeover

Appendix F. Morning Routine.

Appendix G



Appendix G. Cell Phone.

Appendix H

Get quick & easy chewable tablets
Stay energized & focused in the face of stress
Protect your reproductive health (for when you do want the 2 girls)

*It took 2 months to realize he's a JERK.
It takes 10 seconds to take a multivitamin.*

**IS YOUR BODY WORTH
10 SECONDS?**

You love the time to do what's right for your heart. But what about the rest of your body? A multivitamin is committed to giving you the nutrients you need for greater wellbeing—and it only asks for 10 seconds of your attention each day.

Make a commitment to yourself. Take a multivitamin today. Get the facts. Visit vital01.org.

MULTIVITAMINS
Total body makeover

Appendix H. Relationships (Revised).

