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THE INFLUENCE OF DIFFERENT TYPES OF CUES-TO-ACTION ON VACCINATION BEHAVIOR: AN EXPLORATORY STUDY

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Vaccination of a population before an epidemic spreads is critical. Yet trends suggest that vaccination rates are remarkably low due to a public that ignores or views with suspicion vaccination recommendations. However, pharmaceutical companies may attempt to drive demand by lobbying for mandated vaccination. In an exploratory study, an experimental design is used to determine if firms benefit from such efforts. Consumer responses to different cues-to-action, or stimuli that arouse individuals to engage in a desired behavior, are examined. Results suggest that responses to different cues-to-action vary. Implications are discussed for businesses that may consider seeking mandates to increase demand.

New diseases are developing at a record rate, many with the potential to become epidemic. Although considerable research has been devoted to understanding the most effective biological makeup of vaccines (Gay and Richie 2007) and optimizing vaccination production and distribution (Hodge and O’Connell 2006), little research has been devoted to the issue of how marketing strategies can be developed to successfully persuade a populace to become vaccinated. This research examines the effects of different types of influence strategies that firms may incorporate into their marketing efforts to encourage vaccination.

Trends suggest that vaccination rates in the face of epidemic diseases are remarkably low, even when legislation is passed to increase compliance (Neustadt and Fineberg 1983). In early 2008, the Centers for Disease Control and Prevention (2008) stated extremely low vaccination rates across different types of infectious diseases. Only 2.1 percent of adults are vaccinated against tetanus-diphtheria-whooping cough, and only 1.9 percent of people over 60 years old are immunized against shingles, indicating that individuals may be “leaving themselves needlessly vulnerable to significant illness, long-term suffering and even death” (Spiesel 2008). Among the medical community, there is consensus that the public generally ignores or views with suspicion governmental recommendations to get vaccinated (Colgrove 2006). Yet health care and pharmaceutical companies are among the leading organizations seeking government mandates as part of their overall marketing strategies. The increasing power and scope of legislative lobbying provides evidence of the growing involvement of private firms in government (Levine 2008). The series of actual events that inspired this research offers a compelling example.

A vaccine to prevent the human papillomavirus (HPV), a sexually transmitted disease that can cause cervical cancer, was approved by the Food and Drug Administration in February 2006. The initial target market for the vaccine consisted of young women ages 9-26. After a great deal of lobbying by the vaccine’s manufacturer, Merck, the governor of Texas signed an Executive Order on February 2, 2007, requiring all girls entering the sixth grade to be vaccinated against HPV. The governor argued that the vaccine’s ability to prevent the sexually transmitted disease and possible cervical cancer should override the individual’s right to decide whether or not to get the vaccine. He compared his action to other vaccine mandates that have been enacted to prevent the spread of serious childhood diseases. After a considerably negative reaction from Texas citizens, the

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state legislature later blocked the governor’s mandate. The state of Virginia, however, did approve a mandate of the vaccination for young girls and, at the time of this study, more than a dozen states were considering similar proposals. Seventeen states decided to fund public informational campaigns about the HPV virus and vaccination.

Merck coupled its lobbying efforts with an extensive traditional multimedia marketing campaign (Edwards 2007). However, less than 25 percent of the initial target population—far below the desired 90 percent—had received the full regime of three doses of the vaccine as of late 2008, even as HPV reached epidemic proportions (Springen 2008; Stobbe 2008). An epidemic is defined as the occurrence of cases of an illness in a population in excess of what is normally expected (Centers for Disease Control and Prevention 2003). Over 50 percent of sexually active women have been infected with HPV (Winer et al. 2002).

There has been a call for research to determine the mechanisms that can increase vaccination compliance rates (Janz, Champion, and Strecher 2002). Indeed, the well-publicized events described above prompted us to ask, “Why should or would a pharmaceutical firm seek government mandates as part of a comprehensive strategy to market a vaccine?” In this paper, we draw on theory in health behavior and marketing to examine how various “cues-to-action,” tools available to firms and policymakers for managing public health behaviors, may affect an individual’s willingness to become vaccinated. A cue-to-action is a stimulus or trigger that prompts an individual to initiate some behavior (Burns 1992; Rosenstock 1966). In a health context, cues-to-action exist in many forms, from a single, fleeting bodily event, such as a sneeze, which may prompt a person to take measures to prevent a cold from developing, to large-scale, marketer-controlled events, such as a multichannel marketing campaign to encourage mammograms (Janz, Champion, and Strecher 2002). Although cues-to-action have been examined in the forms of pure information and advertisements (Bowman, Heilman, and Seetharaman 2004; McCaul, Johnson, and Rothman 2002), there is limited understanding of how other marketer-influenced cues-to-action, such as government mandates shaped by lobbyists, may influence consumer health behavior.

Specifically, the purpose of this exploratory study is to isolate and compare the effects of single cues-to-action in different categories on an individual’s willingness to seek a particular vaccination—in this case, the vaccination for HPV. We view this research as an important step toward a better understanding of how government mandates and other persuasion tools are perceived by customers and whether or not advantages exist in using one type of cue-to-action over another in a company’s vaccination campaign.

In studying the influence of these cues, we contribute to the literature in several ways. First, although considerable prior research has examined the various dimensions and dynamics of health behavior, little attention has been given to determining the differential effects of cues-to-action across cue categories. In fact, we have been unable to identify any studies that have examined the effects of different broadly targeted, marketer-initiated cues in isolation. Our focus brings cues-to-action to the forefront of theoretical and practical discussion on persuasion. Second, by exploring how different cues-to-action influence willingness to receive a vaccine, we add to existing knowledge of vaccination behavior, an understudied area that intersects the fields of marketing and public health. Third, we examine company-controllable cues-to-action that may be used in isolation or combined with other persuasive tools to create an overall marketing strategy. The government mandate is perhaps the least examined type of cue-to-action in the marketing literature. Yet with a wide range of companies becoming more involved in lobbying, attention is warranted to determine if government mandates in fact offer a substantial and positive change in demand. We provide businesses considering the use of mandates as a marketing tool with implications and questions to consider before adopting this strategic approach.

CONCEPTUAL PERSPECTIVES

In this research, we focus on a particular preventive health behavior, receiving an HPV vaccine. An individual’s health behavior may include observable actions, as well as measurable mental events and feeling states, such as beliefs, expectations, motives, values, perceptions, and personality traits that relate to health maintenance, restoration, and improvement (Gochman 1982). Specifically, preventive health behavior includes any action undertaken by a person who believes him- or herself to be healthy for the purpose of preventing or detecting illness while in an asymptomatic state (Kasl and Cobb 1966).

Our conceptual framework consists of fundamental constructs found in dominant theories applied to preventive health behavior such as the health belief model (Rosenstock 1974) and protection motivation theory (Floyd, Prentice-Dunn, and Rogers 2000). The body of research on preventive health behaviors is extensive, and an exhaustive literature review is beyond the scope of this project. That said, several key variables have emerged from the varied theoretical per-
spectives. Along with cues-to-action, the primary exogenous modifiers of health beliefs and behaviors, and willingness to obtain a vaccination, which is our dependent variable, we examine perceived susceptibility, a highly germane construct that appears in most theories of health behavior (Connor and Norman 1995). For our exploratory work focusing on the differential effects of the various cues, it is appropriate to limit our conceptual framework to these key elements, which are discussed in turn below.

Cues-to-Action

Cues-to-action have been referred to as “a classic but understudied variable” (McCaul, Johnson, and Rothman 2002, p. 624) in health behavior studies. Previous cue-to-action research has examined the effects of media messages, such as the effect of ads on proper pharmaceutical product usage (Bowman, Helman, and Seetharaman 2004); or interpersonal interaction, such as the effect of counseling to encourage safer sex practices (Matson 1999); and of educational reminders, such as phone calls and postcards to encourage health-screening behaviors such as obtaining a mammogram (Taplin et al. 1994). However, researchers generally have not compared a mixed group of cues-to-action in different categories, or comprehensively examined the government mandate as a driver of health behavior.

Rothschild’s conceptual work (1999) presents three classes of strategic tools for influencing public health and social issue behaviors. These three types of influence tools, which Rothschild labels education, marketing, and law, are analogous to types of cues-to-action. We classify the types of cues in our study according to this framework because it provides a solid theoretical basis for comparing the effects of government mandates, or law-based cues, with the effects of the other cue types. We will now discuss the three types of cues in turn.

Education Cues

According to Rothschild, education refers to “messages of any type that attempt to inform and/or influence a target to behave voluntarily in a particular manner but do not provide, on their own, direct and/or immediate reward or punishment” (1999, p. 25). Education may be used to create awareness about the rewards and benefits of compliance, but according to Rothschild, “cannot deliver them, even though the resultant knowledge may have value for long-run behavior in the pursuit of benefits” (1999, p. 25). Education cues drive internal cognition, further search for information, and depending upon the nature of the information, may be viewed favorably if perceived as emanating from a neutral or independent source (Blackwell, Minardi, and Engel 2006). Education cues can differ in format. For example, an education cue can take the form of a public service announcement (Reichert, Heckler, and Jackson 2001) or the form of a survey (Gollwitzer 1999).

A survey is a type of education cue that may influence consumers by spurring internal cognitive processing. Surveys used by companies are a relatively nonintrusive way to transmit information or place the respondent in a situation that evokes thoughts about a topic. A rich stream of research suggests that the act of taking a survey actually can produce specific behavior related to the topic of the survey (Feldman and Lynch 1988; Godin, Sheeran, and Conner 2008). Fitzsimons and Morwitz (1996) suggest that survey questions increase the salience of thoughts regarding a topic and, thus, influence the consumer. Even in relatively innocuous contexts such as bank patronage, respondents who were asked about their attitudes about a bank (versus those who were not asked) increased their bank activity as long as several months after the survey was conducted (Dholakia and Morwitz 2002). We suggest that questions on a survey regarding intimate topics, such as sexually transmitted diseases and vaccination, stimulate concrete, contextualized thinking, which has been shown to enhance the probability of a respondent taking the action asked about within a survey (Gollwitzer 1999).

Marketing Cues

In Rothschild’s (1999) framework, marketing refers to the use of persuasion to motivate a target’s voluntary participation in a desired exchange activity. Thus, the term marketing as used here and by Rothschild (1999) is not to be confused with marketing as a function, philosophy, or discipline. Instead, this marketing label specifically refers to the use of incentives, offered in a favorable environment in which choices among products or services are made available, benefits are outlined, and concerns are addressed (Rothschild 1999). Both marketing and education promote uncoerced, voluntary behavior. However, marketing provides explicit choices and paybacks and presents them directly to the target; education suggests choices and paybacks, but requires the target to initiate the search for them (Rothschild 1999).

The marketing and consumer behavior literatures suggest that marketing cues may be viewed with suspicion—consumers are known to distrust business-controlled,
external sources of information, such as advertising, that clearly have a stake in the outcome of an exchange (Calfee and Ringold 1994). In contrast, the limited research on direct-to-consumer advertising (DTCA) of pharmaceutical products, the specific marketing cues most relevant to the present study, suggests that consumer attitudes toward this type of advertising are generally positive (Deshpande et al. 2004).

The small but growing body of research on the effectiveness of DTCA of pharmaceutical products, which has been permitted in the United States only since 1997 (Wosinka 2005), has garnered mixed results. Research to date indicates that the positive effects of DTCA may include better knowledge of the benefits of compliance, reinforced compliance among those consumers already in compliance (Bowman, Heilman, and Seetharaman 2004), and increased number of doctor visits (Wosinka 2005). Some negative effects were linked to raised expectations, or interpretations of DTCA that a user could be “cured” and stop taking the drug (Bowman, Heilman, and Seetharaman 2004). Further, multiple studies have concluded that DTCA does not necessarily persuade consumers to ask their doctors for a specific drug (Bowman, Heilman, and Seetharaman 2004; Joseph et al. 2005).

Law Cues

Laws involve coercion to achieve compliance that may be required if target individuals are not motivated to act voluntarily. This notion of law is based on authority (Lindblom 1977), which consists of commands backed by “specific penalties that threaten to disadvantage noncompliance” (Rothschild 1999, p. 25). Law is conceptualized as a structural solution (Wiener and Doescher 1991) or a political act that mandates individual behavior.

Among the cue types, law-based cues-to-action have received the least attention in the literature. However, there is evidence that pharmaceutical companies may seek government mandates as means to make demand for a vaccination more certain; uncertain demand is “one of the biggest risks facing vaccine manufacturers” (Batson and Bekier 2001, p. 107). For public health and safety behaviors, such as motorcycle helmet usage (Sass and Zimmerman 2000) and organ donation (Johnson and Goldstein 2003), government mandates have been shown to increase rates of compliance (Sass and Zimmerman 2000). But whether such laws can raise vaccination program participation above rates necessary to prevent or stem an epidemic is an open question, one that is especially relevant given the increasing evidence of some consumers’ refusal to participate in vaccination programs (Meszaros et al. 1996). For example, a Maryland judge had to order more than 2,000 parents to bring their school-age children to the courthouse for state-required vaccination for chicken pox and hepatitis B or face up to 10 days in jail (Barakat 2007).

In summary, there are a number of extant theories, studies, and anecdotes related to the cues-to-action and their effects on health behavior, but the topic remains wholly understudied from a systematic, empirical perspective. Although the evidence from these somewhat disparate streams of literature does not yet cohere, it does provide us with motivation and direction for the present study.

Willingness to Obtain a Vaccination

Several factors led to our choice of willingness to obtain a vaccination as our dependent variable in this research. First, in general theories of health behavior, cues-to-action provide stimuli that promote an individual’s desire to make a health change. In other words, a cue-to-action is something that helps move someone from a state of wanting to make a health change to actually making the change. A dictionary-based definition of willing is “ready to act” (http://dictionary.reference.com/browse/willingness). Therefore, cues-to-action (should) increase an individual’s readiness to act, or level of willingness.

Second, vaccination researchers seem to agree that “the success of any vaccination program depends upon the willingness of members of the general public to undergo vaccination” (Micco, Gurmankin, and Armstrong 2004, p. 451). A search of the EBSCO and MEDLINE databases revealed over 900 preventive health studies that focus on targets’ willingness, likelihood, or intention to engage in a particular behavior as the primary outcome variable of interest. Thirty-three of these articles dating from 1995 to the present examine willingness in the context of vaccination behavior.

Third, in this exploratory research, as in many previous studies of this nature, it proved more reasonable for us to examine individuals’ willingness to engage in a behavior (i.e., receive a vaccine) than to attempt to measure the behavior. Further, a focus on willingness goes straight toward assessing the more proximate effects of the cues—that is, conation. At this exploratory stage, it is appropriate to consider willingness because readiness to act does not always lead to action. Other subsequent or intervening conditions and variables may influence actual behavior. Thus, we use willingness to obtain the vaccine as the dependent variable.
Perceived Susceptibility

Although a variety of factors have been thought to predicate readiness to act, one of the most widely studied predictive variables in health behavior research is an individual's perceived susceptibility or vulnerability to a given illness or condition. Perceived susceptibility is defined as an individual's perception of the risk of contracting a health condition (Janz, Champion, and Strecher 2002), and the individual's perceived vulnerability to negative consequences from an acute health threat (Gerend et al. 2004). Within the several value-expectancy (i.e., cost-benefit) theories of health behavior, such as the health belief model (Rosenstock 1974) and protection motivation theory (Floyd, Prentice-Dunn, and Rogers 2000), this construct has been repeatedly modeled, tested, and supported as an important antecedent to health behaviors. Various studies have suggested that only a minority of the variance in perceived susceptibility is related to scientific evidence from epidemiological models (Gerend et al. 2004). Instead, much of the variance in perceived susceptibility is related to how the threat is presented (i.e., via the type of cue-to-action) or in the individual's psychological makeup (Gerend et al. 2004; Janz, Champion, and Strecher 2002). Perceived susceptibility has been found to be influenced by psychological factors (i.e., cognitive heuristics), such as perceived similarity to a person with a disease and perceived prevalence of the disease, whose effects were shown to exist beyond respondents' medical risk factors (see Gerend et al. 2004 for a review).

The health belief model (Rosenstock 1974) suggests that for those who exhibit high-risk behaviors, perceived susceptibility is necessary before commitment to behavioral change can occur (Janz, Champion, and Strecher 2002). Weinstein (1987) determined that people are reluctant to acknowledge personal susceptibility to harm even when they are aware of the risk faced by others; overcoming this reluctance is a major barrier to getting people to take a desired action (Janz, Champion, and Strecher 2002). Indeed, we find it especially important to examine perceived susceptibility in this study of HPV vaccine behavior in young women due to a plethora of findings that adolescent and young women tend to greatly underestimate their perceived susceptibility to sexually transmitted infections (Ethier et al. 2003; Lopez and McMahan 2007).

RESEARCH QUESTIONS

Considering Rothschild's (1999) conceptual framework for managing public health behaviors, education cues-to-action for vaccination may be most effective when an individual is merely uninformed about reasons to engage in a desired behavior. The presented health information will drive an internal search and activate relevant cognitive processes. Marketing may be most useful when an individual's motivation is inconsistent with program goals or insufficient to drive participation in the exchange. Persuasive messages or incentives are needed to provide additional impetus and improve the individual's perceived payback for compliance (Rothschild 1999). Law-based appeals may be fitting when the target population or segment is unmotivated to behave in the prescribed manner. According to Rothschild (1999), laws will be needed when the interests of the target cannot be surpassed with additional rewards through exchange, when rewarding is inconsistent with societal or program goals, or when the rights of the target are believed to be less of a factor than societal benefits.

Rothschild (1999) suggests that this framework can be used to create segments. However, whether for academic or managerial purposes, creating, measuring, and accessing such segments a priori would be inherently difficult in a population of any significant size. (The dearth of empirical research on Rothschild's theory may, in part, be due to these challenges.) The corollary to this is that with an undifferentiated target population (i.e., a mass audience), we would expect that the various types of cues would produce differential effects to the extent that Rothschild's implied segments are represented. Rothschild's theory also allows for, but does not expand upon, the fact that people are often unwilling to comply with strong persuasion attempts, particularly of the law or marketing types. Yet, essentially, Rothschild's conceptual ideas about the appropriate application of education, marketing, and law influence strategies remain empirically untested. Thus,

Research Question 1: Do different types of cues-to-action (education, marketing, law) have different effects on willingness to obtain a vaccination?

Although dominant theories of health behavior such as the health belief model (Rosenstock 1974), often conceptualize cues-to-action as a direct antecedent to perceived susceptibility, this relationship is underresearched, and the way in which different cues-to-action may influence perceived susceptibility is not well understood. A cue-to-action may affect an individual's perception by providing direct or indirect information about a disease's severity, such as its symptoms, how it is spread, and the medical or social consequences associated with its contraction (Gerend et al. 2004). Cues-to-action may include content regarding the
characteristics of the vulnerable population and whether the disease has reached epidemic status, thus causing a person to internally assess his or her similarity to someone with the disease, and in turn, to estimate his or her perceived susceptibility. It is expected that this informational content of a persuasive message, once cognitively processed, has strong potential to influence an individual’s health perceptions, attitudes, and beliefs. However, Gerend et al. (2004) conceptualized a composite cognitive heuristics factor as influencing susceptibility and found that this combined measure did not produce significant effects. This lack of significance may have been due to the fact that the construct mixed distinct elements of influence, or different types of cues-to-action, and did not examine their individual differential effects.

Importantly, the type of cue (education, marketing, law), and its relative level of persuasion, behavioral restriction, or coercion may actually serve to signal an individual regarding his or her chances of contracting a disease. We may expect people to associate a higher level of behavioral restriction, such as a law, with a higher level of perceived susceptibility. Historically, law-based cues-to-action such as government-sponsored vaccination programs or vaccination legislation are enacted in order to stem the spread of only highly severe or contagious diseases that have reached or have the potential to reach epidemic status. We do believe that above and beyond message content, the cue types themselves hold the potential to affect perceptions of a disease’s threat. Holding message content constant, there may be differential effects of different cue types on perceived susceptibility. Thus,

Research Question 2: Do different types of cues-to-action (education, marketing, law) have different effects on perceived susceptibility to a disease?

Perceived susceptibility to disease has been highlighted as a key driver of whether or not a person seeks preventive health care (Becker et al. 1977; Kasl and Cobb 1966; Rosenstock 1966). Results from a variety of empirical studies show that perceived susceptibility is a strong predictor of whether a person reduces or ceases high-risk behaviors such as smoking or having unprotected sex with multiple partners, as well as a predictor of whether an individual engages in screening behaviors such as getting a mammogram (Janz and Becker 1984).

In the vaccination context, studies indicate that perceived susceptibility is a key variable for distinguishing vaccination program participants from nonparticipants (Aho 1979; Cummings et al. 1979; Rundall and Wheeler 1979). In a recent meta-analysis of associations between risk perception variables and vaccination behavior, Brewer, Chapman, and Gibbons (2007) found strong, positive associations between perceived susceptibility and vaccination likelihood. However, other evidence from the preventive health care domain suggests that the relationship between perceived susceptibility and health behavior may not be robust. There are several relevant studies in areas of high-risk, sexually oriented behavior in which this relationship has not been significant (Lollis et al. 1995; Mahoney, Thombs, and Ford 1995). Further, as this relationship has not been tested in the specific context of this study, we believe that it is practical to make such an inquiry. Thus,

Research Question 3: Does perceived susceptibility to a disease positively affect willingness to obtain a vaccination?

As mentioned above, cues-to-action have been modeled often as a direct influence on perceived susceptibility (or threat) and a subsequent indirect influence on willingness to engage in a desired health behavior. Rosenstock’s (1974) health belief model includes these relationships, but empirical validation of this complete set of effects remains scarce. Cues-to-action have also been modeled and successfully tested as a direct influence on willingness/likelihood/intention (Oliver and Berger 1978) rather than an indirect influence via perceived susceptibility. If it is true that cues-to-action directly influence both perceived susceptibility and willingness to obtain a vaccination and perceived susceptibility directly influences willingness to obtain a vaccination, then it is reasonable to question whether perceived susceptibility acts as a partial mediator of the effects of cues-to-action on willingness to obtain a vaccination. Thus,

Research Question 4: Does perceived susceptibility to a disease partially mediate the relationship between cues-to-action and willingness to obtain a vaccination?

Figure 1 contains a model of the relationships under inquiry in this study. In the next section, we describe two experiments designed to empirically explore these research questions.

METHODOLOGY

Pilot Study

The overall goal of the pilot study was to explore the effects of two different cues-to-action that extend from an
observed marketplace phenomenon—the introduction and marketing of Merck’s HPV vaccine to young women. An experimental design was determined most appropriate for isolating the effects of different types of cues-to-action on women’s willingness to become vaccinated. Of particular interest was whether or not exposure to a law-based cue, such as the HPV vaccine mandate pursued by Merck in the state of Texas, would produce differential effects beyond those resulting from a presentation of basic facts about the vaccine with no mention of a law. In addition, the pilot study was designed to test the experimental procedures and establish that it is possible to produce a significant effect on willingness to obtain a vaccine with exposure to a single cue-to-action.

Procedure

A one-factor, two-level, vignette-based (i.e., scenario-based), between-subjects experiment was developed to test the effects of two types of cues-to-action—a law-based cue and an education cue—on willingness to obtain an HPV vaccination. The education cue was chosen for comparison with the law-based cue in the pilot study because these two cues types are most different from each other (Rothschild 1999). In vignette studies, the experimental conditions (herein the cue types) should be highlighted (Burstin, Doughtie, and Raphaeli 1980) and crafted to be as different from each other as possible (Kerlinger 1973).

Following a convention in marketing in which the majority (70 percent) of experimental vignettes are author developed (Wason, Polonsky, and Hyman 2002), we worked closely with a coauthor with 20 years’ experience in the medical field to develop each scenario. The key facts of the HPV vaccination relevant to consumers were identified, and the wording for the law cue was developed based on the language used to describe pending legislation in Texas regarding the vaccination. The vignettes were rotated among the coauthors for refinement and, in addition, were shown to six other business faculty colleagues for comments. Once complete, the scenarios were deployed in a pretest to confirm the appropriateness of the wording and presentation.

The vignette developed for the education cue (straight facts) contained basic information about HPV and was designed to educate participants about the potential of the virus to cause cervical cancer, as well as the vaccine’s cost, side effects, and effectiveness. This information was presented in a straightforward manner. The vignette developed for the law-based cue (indirect mandate) created a situation in which the participants (college-aged women) learned that their own state required by law that all girls entering the sixth grade receive the HPV vaccination. The indirect mandate scenario also contained the same basic information about the HPV vaccine included in the straight facts scenario. The mandate condition was indirect in that the law described was applicable to sixth-grade girls, not college-aged women, just as in the Texas case. Practical considerations for conducting the research allowed us to access only those members of the initial target market for the vaccine who had reached the age of majority. Thus, although there are many possible manifestations of each cue type, we worked to create an accurate representation of what was occurring in the marketplace relevant to the available respondents with treatment conditions that corresponded well to the observed application of the marketing strategies Merck was using at the time. Because of the dearth of empirical data on the effects of government mandates, it was worthwhile to examine whether a group of women who simply read facts about a vaccine would react differently than those who also knew about a law requiring a
related group to be vaccinated. Would the potential force of the mandate on the sixth graders “spill over” to a related group of young women? (See Appendix A for the pilot study scenarios.)

Prior to data collection for the pilot study, we conducted a pretest with 22 students attending a small southeastern university. This pretest confirmed the appropriateness of the wording of survey items and other materials and determined that respondents did not feel uncomfortable with the subject matter.

Sample

The participants in the pilot study included 111 females between the ages of 18 and 30 who attended a medium-sized midwestern university. This sampling frame was chosen because it reflected those members of the initial, overall target market for the HPV vaccine who had reached the age of majority. The sample was 97 percent white. The mean age was 20.6 years (standard deviation [SD] = 1.42). Based on the rule of thumb used in experimental designs of this type, our aim for the design was to have at least 30 respondents per cell. Participants were randomly assigned to one of three groups: the “straight facts” condition (N_{education} = 39), the “indirect mandate” condition (N_{law} = 39), or the control group (N_{control} = 33).

Members of the control group were told that we were interested in people’s attitudes toward vaccinations. They were asked to rate their willingness to receive several types of vaccines, including HPV, and were not exposed to an experimental vignette. The questions about the other vaccines were included as filler for the purpose of limiting potential bias and demand effects. Participants in the treatment groups read one of the two vignettes and completed a series of scales measures. Participation in the study was strictly voluntary; the students who participated were incentivized with extra credit points and offered a full debriefing on the purpose of the study upon completion and return of the questionnaire.

Measures

The survey measures were adapted from previous preventive health management research, with a special effort to use items found in extant vaccination research. Single-item measures were used for attributes, as suggested by Bergkvist and Rossiter (2007), when the concept measured was concrete, or easily imagined, such as the attitude measures used in their study.

Willingness to Obtain the Vaccination. Respondents were asked to rate their willingness to obtain the HPV vaccination on a scale ranging from “definitely unwilling” to “definitely willing” (-5 to +5). Single-item measures of willingness are used widely in studies of vaccination behavior (Miccio, Gurmockin, and Armstrong 2004; Silk et al. 2005).

Prior Knowledge. We controlled for prior knowledge by asking each respondent, “How much do you know about the HPV vaccination?” (1–7 scale, anchor by “nothing” and “a lot”). Vaccination research utilizing similar single-item measures of knowledge include the Silk et al. (2005) study, which found that those respondents with higher perceived prior knowledge of a vaccine were more likely to express willingness to receive the vaccine.

Manipulation Checks

Manipulation checks confirmed that the experimental manipulation of the two cue types was successful. Participants were asked to identify a vignette as either an education cue (“information about a vaccine”) or a law-based cue (“information about a vaccine and a related vaccination law”), and did so correctly 96 percent of the time. To further test the differences between each condition, participants were asked to rate the degree to which each cue type attempted to be “coercive” and “forceful” (1–7 scales; higher scores reflect more coercive and more forceful). The results indicated significant differences between the law and education cues on both characteristics, with perceptions that the law cue-to-action was the more coercive (Mean_{education} = 2.76, Mean_{law} = 4.38; t = 4.75, p < 0.001) and the more forceful (Mean_{education} = 2.80, Mean_{law} = 4.71; t = 6.58, p < 0.001). The manipulation checks gave us confidence that not only were the different types of cues-to-action properly interpreted but also that the perceptions of the relative degree of attempted force and coercion attributable to each cue type (as theorized by Rothschild 1999) differed as expected.

Pilot Study Results

We used general linear model (GLM) univariate analysis in the pilot study. This data analytic technique allowed us to test the model using both continuous variables (willingness to obtain the vaccine and prior knowledge) and a categorical factor (with two categories—a law cue-to-action versus an education cue-to-action).

We examined whether willingness to obtain the HPV vaccine varied across the law and education cues. Although the
participants exposed to the law cue were slightly more willing to receive the HPV vaccination, the difference between the effects produced by the two cues was not statistically significant (M_{education} = 2.61, M_{law} = 3.03; F = 0.23, nonsignificant [ns]). Thus, knowledge that the vaccine is mandated for a related group, provided in addition to the basic facts about the vaccine, did not produce more willingness than did the straightforward presentation of the information alone. However, both the law and education cues produced greater willingness to become vaccinated than that found in the control group (Mean_{control} = 1.75; t_{law} = 3.65, p < 0.01; t_{education} = 1.85, p < 0.05).

Discussion

The law cue in the pilot study presented a mandate that did not directly affect the women in the study. The force of the mandate on the younger market (sixth-grade girls) did not produce any spillover effects (i.e., signaling the importance of the HPV vaccine) to a different age segment not subject to the law. This finding suggests that a law affecting one segment of a target population may have no more or less influence on another segment of the target population than information delivered in a straightforward, factual manner. Generalizing these results back to the actions taken by Merck, the pharmaceutical company could perhaps have achieved the same degree of consumer willingness to obtain the vaccine among targeted women with a public educational campaign presenting facts as they could have with the mandate. A related point is that the potential risks and costs associated with the legislative mandate efforts likely outweigh those associated with an educational campaign approach. Further, across these two types of strategies, different types of resources are deployed in different directions. Pursuing the mandate involves lobbyists and legal teams and focuses on legislators; creating and implementing an educational campaign involves doctors and health clinics and focuses on consumers. An additional concern is that the attempt to mandate a vaccine may result in resistance to such strong-arm persuasion and create new negative attitudes toward a brand or a company that are difficult to change.

The results of the pilot study raised several questions. Would a law directly affecting a target group be a stronger cue-to-action than an indirect mandate and thus produce a significantly different level of willingness than would other types of cues? Would a traditional marketing cue, such as a company advertisement, be a more effective and less risky use of a company’s budget, while still achieving the societal benefits of a high vaccination rate? To address these questions, we followed the cue-to-action framework of education, marketing, and law in the main study, but modified the experimental manipulations such that the different properties of the cue types (i.e., levels of coercion and behavioral restriction, source effects) were maximized.

Main Study

Procedure

In the main study, a one-factor, three-level, vignette-based, between-subjects experiment was developed to test the effects of three different types of cues-to-action on the perceived susceptibility of contracting cervical cancer and willingness to obtain an HPV vaccination. Every effort was made to construct conditions to best reflect the inherent differences in the cue-to-action types.

The education cue-to-action consisted of just a survey about women’s health issues, including cervical cancer. As mentioned earlier, there is a substantial body of research that suggests that the simple act of responding to survey questions can activate an individual’s thoughts and attitudes about a topic, and this acts as a source of influence (Morwitz and Fitzsimons 2004; Williams, Block, and Fitzsimons 2006). Consistent with Rothschild’s framework, an education cue can take on a wide variety of forms with the core intent to “persuade a target to behave voluntarily” without punishment or reward (1999, p. 25). Moreover, an education cue is in part self-driven. Given the volume of surveys that corporations produce and the place of a survey as the “mainstay of marketing research” (Wyner 2007, p. 6), understanding the implications of this particular type of education cue relative to law and marketing cues is important. Not only has the act of taking a survey been shown to make a topic more salient to a consumer, but the sheer frequency in which surveys are used as a device to collect consumer behavior information makes the survey form of an education cue even more pertinent to understand relative to other cues-to-action. In fact, the leading pharmaceutical company producing the focal vaccination of this study actively uses consumer surveys as part of its marketing efforts. Thus, we considered the “survey-only” condition to be the best way of constructing an education-type cue with a minimal amount of presented information and overt persuasiveness that would still have the capability to trigger relevant health beliefs and behavioral intentions.
In order to further strengthen the manipulations in the main study, the law-based cue (direct mandate) was changed to reflect a hypothetical situation in which the respondents themselves (i.e., college-aged women) are subject to a government mandate for the HPV vaccine. Thus, the respondents may more directly sense the full authority of the law and its restriction of their freedoms. The marketing cue (ad) presented participants with an advertisement for a specific brand of the HPV vaccination. The ad cue differed from the other cues in that it contained photographs (as in the real advertisements for the vaccine that were running at the time). The black-and-white photos within the ad are an important part of the cue. This follows Burstin, Doughtie, and Raphael’s (1980) guidance that manipulations should not be subtle and Kerlinger’s (1973) advice that differences among experimental conditions should be as different as possible. All vignettes contained virtually identical information about the vaccine. Wording was kept consistent across the conditions so as to highlight the differences between the types of cues and ensure that the different types, rather than any different content, would be driving any differential response. (See Appendix B for scenarios used in the main study.)

Sample

One hundred thirty female students between the ages of 18 and 30, who attended a medium-sized southern university, participated in the study. The sample was 73 percent Caucasian, 10 percent Hispanic, 5 percent African American, 3 percent Asian American, 1 percent American Indian, with the remaining respondents describing their race as a combination of ethnicities. The mean age was 22.5 years (SD = 2.53).

As in the pilot study, the aim for the design was to have 30 respondents per cell. Participants were randomly assigned to the control group (N_control = 32) or one of the three conditions: “survey only” (N_survey = 33), “direct mandate” (N_mandate = 33), or “ad” (N_advertising = 28). As in the pilot study, members of the control group were asked only to rate their willingness to receive several different types of vaccines, including the HPV vaccine, and were not exposed to an experimental vignette. For the “survey-only” condition, each participant completed a series of scaled measures regarding health-related topics, including cervical cancer. In the “direct mandate” and “ad” conditions, participants read a scenario first, and then completed the same series of scaled measures as in the survey-only condition. As in the pilot study, the volunteer participants were incentivized with extra credit points for their involvement and were offered a full debriefing on the purpose of the study upon completion and return of the questionnaire.

Measures

As in the pilot study, the survey measures were adapted from previous preventive health management research, with a special effort to use items found in prior vaccination research. The measures for willingness to obtain the vaccination and prior knowledge were the same as those used in the pilot study.

Perceived Susceptibility. Three items were adapted from Gerend et al. (2004) to reflect the respondent’s perceived susceptibility of contracting cervical cancer. The items included ratings of how susceptible the woman felt to getting cervical cancer in her lifetime, what she believed the chance to be of developing cervical cancer in her lifetime, and what she believed were her chances of developing cervical cancer in her lifetime as compared to other women (1–7, higher scores reflecting greater susceptibility). Cronbach’s alpha for the resulting composite was 0.77.

Skepticism. Skepticism was added to the main study as a covariate via the item: “The HPV vaccination is not likely to be as effective as people say it is” (1–7, higher scores reflecting greater skepticism). This skepticism measure was adapted from Ferguson and Gallagher’s (2007) study on message framing in the vaccination context. The measure was included after consideration of the relative newness of the vaccine and the prevalence of news reports at the time which questioned whether or not the leading HPV vaccine on the market was as effective as the company and scientists stated.

Manipulation Checks

As in the pilot study, manipulation checks were conducted, and they confirmed that the experimental manipulation of the cue types was successful. Participants were able to distinguish correctly among the cues 95 percent of the time. To further test the differences between each condition, participants were asked to rate the degree to which each cue type attempted to be “coercive” and “forceful” (1–7 scales, higher scores reflect more coercive and more forceful). The results indicated significant differences among all three cue types on both characteristics, with perceptions that the law cue-to-action (direct mandate) was the most coercive.
Research Question 3 involved the effect of perceived susceptibility on willingness to obtain a vaccine. Our results show that perceived susceptibility is a significant and positive predictor of willingness ($F = 7.80, p < 0.01$; power = 0.80).

A four-step process (Baron and Kenny 1986) was used to test Research Question 4: whether perceived susceptibility partially mediates the effects of cues-to-action on willingness to become vaccinated. In each case, we controlled for the effects of the woman's prior knowledge of the HPV vaccination and her skepticism that the vaccination would actually be effective. We used the GLM procedure that offers a conservative test in that it avoids the practice of analyzing contrast pairs one by one without controlling for the effects of other variables in a model.

The first step ensures that the mediator in the model, perceived susceptibility, has a significant relationship on willingness to obtain the HPV vaccination. The test results for Research Question 3 showed that this relationship is significant and positive. The second step is to assess the effect of the antecedent predictor, cues-to-action, on willingness to obtain the HPV vaccination. In testing for Research Question 1, we found that the education cue produced a significantly higher level of willingness than either the law or marketing cue. The third step is to determine if the antecedent predictor, cues-to-action, is a significant predictor of perceived susceptibility. The results of tests for Research Question 2 illustrate that perceived susceptibility does significantly differ across cues, and thus this relationship also holds. Recall that the education cue produced a higher level of perceived susceptibility than the marketing cue.

The fourth step is to examine the influence of the mediator and the antecedent predictor on the dependent variable. If susceptibility partially mediates the relationship between cues-to-action and willingness, then cues-to-action and susceptibility should be significant in the model. We found this to be the case, suggesting partial mediation ($F_{cues} = 3.86, p < 0.05$, power = 0.71; $F_{wn} = 4.75, p < 0.05$, power = 0.69). These results suggest that cues-to-action influence willingness to obtain the HPV vaccination both directly as well as through a woman’s feeling of perceived susceptibility to cervical cancer. Table 1 lists the means for susceptibility and willingness across the main study conditions.

**Discussion**

In the main study, the education cue produced significantly higher willingness to obtain the HPV vaccination than did the law and marketing cues, and the education cue alone

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**Main Study Results**

We used GLM-univariate analysis to explore the research questions in the main study. GLM allows for the testing of both continuous and categorical variables and can be used effectively with unbalanced cell sizes. Cell sizes in this study are similar, but not identical.

To answer Research Question 1, we determined whether willingness to obtain the vaccination varied by the type of cue-to-action. Controlling for prior knowledge and skepticism, we found that the education cue (survey only) produced the highest level of willingness ($M_{education} = 3.09, M_{law} = 1.71, M_{marketing} = 1.33; F = 5.40, p < 0.01$; power = 0.83), significantly higher than both the law cue (direct mandate) and the marketing cue (ad) ($t = 2.95, p < 0.01$; $t = 2.66, p < 0.01$). The law and marketing cues did not result in levels of willingness significantly different from each other. Further, when compared to the control group’s level of willingness to obtain the vaccine ($M_{control} = 1.79$), only the group in the “survey-only” condition indicated a significantly higher level of willingness ($t = 3.10, p < 0.01$). The marketing and law cues did not produce a significantly different level of willingness than that found in the control group.

Although skepticism about the effectiveness of the vaccination was a control variable in our study and not a primary variable of interest, we did note a main effect of this variable. As may be expected, higher levels of skepticism were associated with lower levels of willingness to obtain the vaccination ($F = 48.28, p < 0.01$).

Next, to answer Research Question 2, we examined whether the different types of cues would have different effects on perceived susceptibility. We found that the education cue (survey only) produced the highest level of perceived susceptibility ($M_{education} = 4.41, M_{marketing} = 3.76, M_{law} = 4.06, F = 3.69, p < 0.05$; power = 0.77), but paired contrasts revealed that it was significantly different from only that produced by the marketing cue ($t = 2.71, p < 0.01$).
produced higher willingness than that found in the control group, who received no cue exposure. The education cue also produced significantly higher perceived susceptibility than the marketing cue. Perceived susceptibility was a significant driver of willingness to obtain the HPV vaccine, and this construct was also found to partially mediate the relationship between the effects of cues-to-action on willingness.

What might explain the similar nonsignificant effects of the marketing and law cues on willingness to obtain the vaccination? The ostensibly higher levels of persuasion and coercion in both the marketing and law cues-to-action did not gain more potential compliance with the desired vaccination behavior than did the act of simply taking a survey as in the education cue-to-action. When considered in light of the anecdotal evidence cited earlier, these results seem to indicate the presence of considerable resistance to such strongly persuasive influence attempts, particularly when the target behavior is of high personal relevance (i.e., a non-reversible health procedure such as receiving a vaccination). The result for the ad condition may also reflect a strong distrust of advertisements in general, an attitude that has been robust in the general U.S. population for many decades (Calfee and Ringold 1994). The result for the direct mandate condition has important implications for pharmaceutical and other types of companies that might seek government involvement in creating demand for their products. We are left to consider whether it is always worth the risk for a company to promote legislation of a product.

Respondents were exposed to only a single cue-to-action, and thus to find significant effects on willingness from any of the cues is encouraging. The highest level of willingness was produced in the group who received the education (survey only) cue-to-action. The simple act of asking questions about willingness or intention has been suggested to increase related beliefs and attitude accessibility (Fitzsimons and Morwitz 1996; Morwitz and Fitzsimons 2004). Accordingly, we suggest that the survey-only condition generates internal cues that may lead to near-automatic consideration of the issues, which is driven by the internal reflection of the consumer. Ultimately, this cue may be far more effective than persuasive mass-market messages generated by marketers or the full-blown authority of government legislation.

One path to creating willingness in a target market clearly leads through perceived susceptibility. Firms may choose to craft influential messages with the express purpose of enhancing personal risk perceptions in order to raise the effectiveness of their overall health programs. Again, the education cue produced more perceived susceptibility than did the marketing cue, which implies that getting people to internally process or elaborate on the message (Petty, Cacioppo, and Schumann 1983), in other words helping people make up their own minds, may be a more effective form of influence on preventive health behaviors than strongly persuasive marketer-driven tactics.

**GENERAL DISCUSSION AND IMPLICATIONS**

This research presents an exploration of how different cues-to-action used by companies may shape consumer behavior. The findings suggest that the least coercive type of cue-to-action may produce a greater positive effect than other types of cues-to-action. One explanation for the effectiveness of the survey-only version of the education cue-to-action is that the cue may be increasing the likelihood of message elaboration, or the extent to which respondents think carefully about the information/questions presented and integrate the information with existing knowledge (e.g., Petty, Cacioppo, and Schumann 1983). It is possible that because the survey-only version of the education cue did not have an external stimulus such as the presentation of an ad or description of a law, that self-referencing, or internal cognitive processing of “information previously stored in memory in order to give the new information
meaning” (Debevec, Spotts, and Kernan 1987, p. 417), was induced. Without the external stimulus (e.g., an ad or news of a law), we may have eliminated the opportunity for the respondents to take a shortcut and apply a heuristic response based on preconceived biases toward the external stimulus. For example, a person may have a heuristic response to an ad and immediately associate the ad with an attempt to persuade.

Prior research has demonstrated that self-referencing increases the processing of information (Burnkrant and Unnava 1989) and enhances learning (Debevec, Spotts, and Kernan 1987). Thus, the central processing that may occur with the survey-only version of the education cue-to-action may result in more enduring pathways through the respondent's internal processing of personally relevant information about the disease (e.g., family members/friends who have had cancer), the vaccination (e.g., beliefs that the vaccination will help), and behaviors (e.g., sexual activity). This suggests that companies producing health-related products and services may want to reconsider expenditures on traditional persuasive advertising in light of the potential positive influence of a more educational campaign that enhances the consumer’s own thought process.

The two types of law cues-to-action tested—a law directly affecting the respondents and a law directed at the respondents’ junior peers—did not persuade the respondents to become more willing to receive the HPV vaccination as compared to the other less coercive and forceful attempts. Law cues attempt to restrict individual freedom, and may trigger resistance (Abramson and Pickering 2002). Laws do not always result in compliance, and when initiated by companies may create negative reactions. For companies attempting to motivate consumers and create positive brand associations, the results suggest that law-based cue-to-action should be carefully considered and compared to other approaches that may be more influential, yet less risky, in creating the desired behavior.

In this study, movement toward the desired behavior was achieved with only one exposure to the survey-only version of the education cue-to-action. This influence technique pursued the central processing route to attitude change. The ad cue-to-action may be less effective and possibly less efficient because repeated exposure is required. This is seen in the marketplace where even after two years of a massive advertising campaign the pharmaceutical company producing the HPV vaccination continues to have less than 25 percent coverage in its initial target market (Stobbe 2008). However, a primary goal of ads, particularly for pharmaceuticals, is to build awareness and brand-name recognition. Thus, more individually directed techniques (classically personal selling and targeted sales promotions) may be required to move the target along the hierarchy of effects to the desired action.

Ultimately, education cues such as surveys that induce thoughtful processing of relevant information may prove more effective in achieving desired results and perhaps more efficient in producing cost savings because the education cues-to-action have the potential to move targeted groups toward compliance with a desired behavior in less time. Such techniques may prove highly beneficial, albeit effortful, for those organizations in the public health arena whose primary objective involves developing solutions for successfully managing epidemics. Marketing managers should seek creative ways to involve consumers in self-reflection and questioning about the use of health products and services and the possible ramifications of not using such products and services. The power of a non-company-influenced cue-to-action (the education survey cue) suggests that the payoffs for companies may come from enabling the consumer to independently think about risks and health dangers specific to the individual.

The cue-to-action framework has applications beyond the pharmaceutical context. In some industries, these cues are used to attempt to discourage consumers or groups of consumers from using particular products/services. For example, dozens of states have regulations to prevent individuals under age 18 from using indoor tanning facilities. The music and film industries have been involved with legislation to discourage use of music and film that have been copied without permission. On the other hand, industries may use law-based cues in an attempt to encourage the use of particular products/services. For example, some states have mandated insurance coverage of colorectal cancer screening, the production of childproof gas cans, and the ownership of defibrillators in public places such as gyms. Whether laws are created to encourage or discourage the use of a product/service, the costs and benefits of the law-based cue should be weighed against alternative means of persuasion.

LIMITATIONS AND FUTURE RESEARCH

The findings of this research are presented given the common caveats of scenario-based experiments. Previous studies have effectively used vignettes in experimental designs to examine vaccination behavior (Chapman et al. 2001; Hershey et al. 1994). However, several limitations to using scenarios exist. First, only hypothetical options are
considered with scenarios. We did not measure whether women who were willing to obtain the HPV vaccination indeed did so, or if those women who said that they were not willing eventually did become vaccinated. Moreover, our particular vignettes were all presented in black-and-white and on paper. In the actual market, HPV vaccination information may be presented in glossy magazine ads, in a pamphlet in a doctor’s office, or through a news report on television about legislation mandating the vaccination. Further, as there may be more vividness inherent in certain cues such as advertisements, further examination of the effects of a cue’s relative vividness may be warranted. In spite of these limitations, scenario-based studies can be used successfully (Sierra and Hyman 2006).

Because this research investigates a relatively underresearched phenomenon—the use of government mandates as cues-to-action for preventive health behaviors—it was considered appropriate to first consider the effects of various types of cues in isolation. This also served to maximize the internal validity of the studies; however, the extent of the generalizability of the results to other contexts and populations is not known. Further, there are various ways to express or present influence within each cue type, with potentially varying effects. Within-type comparisons may be a next step for future research.

A further limitation is our somewhat small sample size in both studies. Moreover, the samples for both studies in this analysis were predominantly white. Although no differences in vaccination coverage have been found among races in other vaccination studies (Centers for Disease Control and Prevention 2008), we do not know if differences might exist in the way in which people of different races respond to cues-to-action.

Our research isolated the differential effects of single cues-to-action and found that the education cue resulted in the highest levels of perceived susceptibility and willingness to obtain a vaccination. This finding suggests that the act of simply asking a respondent health-related questions needs further exploration to determine the type and number of questions that are most efficacious in generating the desired response. Future research is needed to examine how the firm can best connect its brand with the survey instrument, and if that diminishes any positive effects gained from the use of the survey-only version of the education cue-to-action. Much research is required in these areas to determine the most effective design of the survey-only education cue and the ethical implications of such efforts.

Rising lobbying expenditures suggest that businesses may be attempting to shape public policy as part of marketing strategy. Yet our findings support the notion that a company’s mandate marketing activities are, at best, utilized as a “complement to, rather than substitute for, traditional strategies” (Krapel 1982, p. 82). For every organizational objective, there may exist some optimal mix of the education, marketing, and law techniques that, when applied in an integrated fashion, will result in the desired outcome (Rothschild 1999). Factors likely to influence this optimal mix include level of motivation among target groups, accessibility of such groups, demographics, and size of the market(s). Although common segmentation tasks such as demographic profiling may not be problematic, measuring key individual difference variables such as level of motivation may present formidable challenges. Whether an optimal mix can be approximated a priori—that is, prior to a campaign launch, or even in retrospect—is a question that deserves future study.

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APPENDIX A
Pilot Study—Scenarios

Education (Straight Facts) Cue

There is a vaccination that prevents some types of human papillomavirus (HPV), a virus that can cause cervical cancer.

The vaccination is approximately 70 percent effective against precancerous lesions. Three booster shots of the vaccination are required over a six-month period. Commonly reported side effects of the vaccine include pain, swelling, redness at the injection site, fever, nausea, and dizziness. The vaccination costs approximately $360 for the three-shot regime.

The vaccination is most effective when received by females ages 9-26.

Law (Indirect Mandate) Cue

Your state has recently passed legislation requiring that girls entering the sixth grade receive a vaccination that prevents some types of human papillomavirus (HPV), a virus that can cause cervical cancer.

The vaccination is approximately 70 percent effective against precancerous lesions. Three booster shots of the vaccination are required over a six-month period. Commonly reported side effects of the vaccine include pain, swelling, redness at the injection site, fever, nausea, and dizziness. The vaccination costs approximately $360 for the three-shot regime.

Approximately 20 states have said that they are very likely to consider similar legislation as your state in making the vaccination a requirement for girls entering the sixth grade. The vaccination is most effective when received by females ages 9-26.

APPENDIX B
Main Study—Scenarios

Law (Direct Mandate) Cue

The state where you live has recently passed legislation requiring that you receive a vaccination that prevents some types of human papillomavirus (HPV), a virus that can cause cervical cancer. Under this legislation, all women entering college would be required to be vaccinated. You would have to be vaccinated before registering for the next semester at any university receiving any state or federal funding.

The vaccination is approximately 70 percent effective against precancerous lesions. Three booster shots of the vaccination are required over a six-month period. Commonly reported side effects of the vaccine include pain, swelling, redness at the injection site, fever, nausea, and dizziness. The vaccination costs approximately $360 for the three-shot regimen.

Approximately 20 states have said that they are very likely to consider similar legislation as your state in making the vaccination a requirement. The vaccination is most effective when received by females ages 9-26.