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The Politics of HPV Vaccination Advocacy: Effects of Source Expertise on Effectiveness of a Pro-Vaccine Message

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Persistent public resistance to an apparently safe, effective and life-saving public health practice such as HPV vaccination illustrates a significant issue in the communication of behavioral recommendations based on evidence-based scientific data and consensus views of scientific and medical experts. This study examines the influence of source expertise on pro-HPV-vaccine advocacy messaging effectiveness among audiences of differing political ideologies. The findings support prior research indicating greater resistance to HPV vaccination among political conservatives. Subjects who self-identified politically as Centrists and Conservatives were significantly less likely to think deeply about a pro-HPV advocacy message delivered by an expert spokesperson than were politically self-identified Progressives. Conservatives who viewed a pro-HPV vaccination message delivered by a non-expert spokesperson had significantly more positive attitudes toward HPV vaccination than Conservatives who received no advocacy message (the control condition). By contrast, attitudes of Conservatives who viewed a pro-HPV vaccination message delivered by an expert spokesperson were not significantly different from those who received no advocacy message. The findings suggest an over-reliance on expert spokespeople for delivering science-based behavioral recommendations.

The debate over public support for the human papillomavirus (HPV) vaccine crosses the boundaries of science, health and politics. Should it be mandatory for all school girls approaching puberty? For all school children of both genders? Should it be voluntary? Should it be a publicly supported program at all? Instead of being based on objective evaluation of empirical evidence and expert recommendations, people's answers to these questions seem to align along ideologically partisan lines (Kahan et al., 2010).

The logical, rational, utilitarian case for universal vaccination against HPV seems highly persuasive. Approved by the FDA in 2006 for use with females and in 2010 for use with males, the HPV vaccine was expected to reduce deaths due to cervical cancer by 70 percent (Kaufman, 2006), prevent up to 14,000 cases of a wide range of cancers annually, and save thousands of lives (Centers for Disease Control, 2013a). Acceptance and utilization of the vaccine has been far from universal, however. Nationwide, only about a third of adolescent girls are getting the recommended vaccinations, and only about one percent of adolescent boys (Centers for Disease Control, 2013b; Pruitt and Schootman, 2010). In fact, according to the National Immunization Survey of Teens, 2008–2010, the percentage of parents actively choosing to refuse HPV vaccination for their children is increasing (Darden et al., 2013).

With the persistence of low vaccination rates throughout the United States largely attributed to misinformation and active resistance rather than lack of availability (Pruitt and Schootman, 2010), it is clear that finding more effectively persuasive means of communicating the benefits of HPV vaccination would be desirable. This study examines the influence of source expertise on pro-HPV-vaccine advocacy messaging effectiveness among audiences of differing political ideologies.

Literature Review

Communication of Risk

In a complex world filled with constantly changing and newly emerging dangers, the effective communication of risk—and of gaining compliance with and adoption of appropriate behavioral responses to risk—is vital to the safety and well-being of any society. Various reviews of research and best practices regarding risk communications suggest that theory-based communication practices are more likely to be effective than those based solely on intuition, but that even the most thoroughly researched practices should be evaluated (Fischhoff, Brewer & Downs, 2011; Glanz and Bishop, 2004). Despite this evidence, however, many risk-related public health communication initiatives are based on intuition and “common sense” rather than on tested theories, and not systematically evaluated, which hinders the improvement or elimination of programs that are ineffective and prevents the maximization of benefits from those that are effective (Miche and Abraham, 2004; Wilson, 2011). A significant number of interventions even produce what some researchers call “the Boomerang Effect” (Fishbein et al., 2002; Miller et al., 2006; Sylvia, 2006), acting to encourage and increase the very behaviors they are intended to discourage.

Audiences Predisposed Against Science

Complicating the task of communicating research-based information and behavioral recommendations is an often uninformed, uninterested and surprisingly hostile audience. The general public is far from an enthusiastic or actively engaged audience for scientific information, judging by general reading and viewing preferences (Alliance for Audited Media, 2013; Gorman, 2011; Kondolojy, 2012a; Kondolojy, 2012b). A large segment of the population actively resists and argues against science and the recommendations of scientists (Mooney, 2005, 2012; Newport, 2012; Public Religion Research Institute, 2011). Political ideology seems to play a role in attitude toward scientists and scientific information, with people who are politically more conservative less likely to trust scientists as a source of information about public policy issues (Hamilton, 2010).

Scientific data such as morbidity and mortality statistics and peer-reviewed reports about long-term health effects accruing from various causes can be intimidating for many people, even those for whom it may have significant personal relevance (Kahan et al., 2010; Larsson, 2006; Ramanadhan and Viswanath, 2006). Even people who do not actively avoid scientific and health-related information tend to process it in a less-than-fully attentive, rational manner: they use mental shortcuts that can lead to errors in judgment and resulting behaviors that are not of optimal self-interest (Kahan et al., 2010; Gilovitch et al., 2002; Kahneman, 2011). Kahan et al. (2010) suggest that

personality types associated with partisan ideologies and values-structures play a role in which kinds of mental shortcuts are used.

Kahan et al. (2011) suggest that individuals' perceptions of risk and the validity of the facts on which they may be based are influenced by those individuals' cultural predispositions and "shared moral evaluations" (p. 148). In a study of perception of risks associated with HPV vaccination, Kahan et al. (2010) found that subjects with cultural predispositions associated with political and social conservatism perceived much higher risk from HPV vaccination than subjects whose cultural cognitions aligned more with liberal and progressive political and social values. Using survey-administered cultural values scales, Kahan et al. (2010) rated their study participants on their placement on two distinct personality continua: "individualistic vs. communitarian," and "hierarchical vs. egalitarian" (p. 507). The first two of each of these pairs are strongly associated with conservative political and social views, while the latter two are strongly associated with progressive and liberal views. Subjects scoring high on the individualistic and hierarchical scales were more likely to be risk averse and distrusting of science than those scoring high in the egalitarian and communitarian scales, suggesting that those scoring high on the individualistic and hierarchical scales were more prone to biased assimilation—the "tendency of individuals selectively to credit and dismiss information in a manner that confirms their prior beliefs" (p. 504).

Source Credibility and Persuasion

The prevailing view of most persuasion practitioners and communication researchers seems to be that highly credible sources of persuasive messages are more effective than less credible sources, and that expertise is a general cognate for credibility in most situations (Sternthal et al., 1978). This is a fairly well-researched view (see Pornpitakpan, 2004), but it may also be an example of the kind of intuitive assumption warned against by Fischhoff, Brewer & Downs (2011) and Wilson (2011). While many studies find expertise and trustworthiness to be significantly influential in obtaining behavioral compliance, others find different degrees of ascendancy for these qualities, and others have identified conditions in which source credibility—expertise, in particular—can be a liability (Pornpitakpan, 2004; Sternthal et al., 1978).

Tormala, Briñol & Petty (2007) suggest that source credibility—which they describe as a combination of expertise and trustworthiness—can play different roles under different conditions of elaboration. Under conditions of low elaboration, source expertise acts as a heuristic cue, with the greater the expertise the greater the agreement with the expert viewpoint. Under conditions of moderate elaboration, source expertise influences the amount of thought by subjects about the issue under examination, with high credibility sources inspiring more issue-relevant thinking.

Source Expertise and Resistance to Persuasion: Psychological Reactance

A number of researchers have cited Brehm's Theory of Psychological Reactance in describing conditions in which advocacy by an authoritative source high in expertise and credibility can stimulate resistance rather than compliance (e.g., Burgoon et al., 2002; Miller et al., 2006). The theory proposes that psychological reactance occurs in response to perceived threats to freedom, and can lead to responses such as "simply ignoring the

persuasive attempt, derogating the source, and even producing even more of the undesired behaviors as a means of demonstrating choice or restoring attitudinal freedom” (Burgoon et al., 2002, p. 215).

The theory of psychological reactance provides an explanation for the persistent resistance of subjects with firmly held beliefs when faced with attempts by highly credible expert authority figures to present persuasive arguments that threaten those beliefs. This hardening of resistance as a reaction to perceived threats to freedom and individual autonomy is consistent with personality types that lean toward political and social conservatism, which have also been shown to be more likely to oppose vaccination against HPV (Kahan, 2010).

Even the mere anticipation of a potentially persuasive counter-attitudinal argument can lead to greater resistance. Subjects who are forewarned of a forthcoming argument against a current belief or position seem to engage in “anticipatory argumentation” (Petty and Cacioppo, 1977, p. 645) and thereby become even more resistant to persuasion (Petty and Cacioppo, 1977, 1979).

Source Credibility, Attitude Certainty and Counter-Attitudinal Advocacy

In a series of studies, Tormala and colleagues (Tormala & Petty, 2002, 2004; Tormala, Clarkson & Petty, 2006) demonstrated that while resisting a strong counter-attitudinal argument—such as one from a credible source—generally leads to greater attitude certainty, resisting a weak argument—such as from a source low in credibility—can lead to reduced attitude certainty. They speculate that while defending one’s beliefs from a powerful argument can lead to greater confidence in the rightness of those beliefs, successfully defending against a weak argument can leave one wondering whether one’s beliefs would have stood up to a stronger argument (Tormala and Petty, 2004).

Karmarkar and Tormala (2010) present evidence supporting the notion that when low expertise sources express certainty about an issue, they “violate expectancies, stimulate involvement, and promote persuasion” (p. 1033). In other words, the unexpected advocacy of a non-expert spokesperson is likely to gain attention and stimulate elaboration about a persuasive argument in situations in which the words of an expert spokesperson might be lost amid the general cacophony of messages competing for attention.

Source Expertise as a Heuristic Cue and Moderating Factor in Elaboration Likelihood

Much of the recent research on source effects and attitude change has been conducted under conditions of induced elaboration, with subjects instructed to think about and record their thoughts and in some cases their counter-attitudinal arguments (e.g., Clark, Evans & Wegener, 2011; Clark et al., 2012; Lemansky and Lee, 2012; Tormala, Briñol and Petty, 2007; Tormala and Petty, 2002, 2004). This focus on conditions of high elaboration is based at least in part on the assumption that source credibility functions as a fairly simplistic heuristic cue under conditions of low elaboration without a significant influence on critical message consideration. There may also be an underlying assumption that conditions of high elaboration are more conducive or more necessary for significant

attitude change, consistent with a broad understanding of the Elaboration Likelihood Model (Cacioppo and Petty, 1984).

Another approach to examining these issues might be to consider whether and how source credibility influences a subject's level of message elaboration, as well as the resulting influence on attitude change.

Research Questions

Applied to the universe of attitudes and predispositions toward HPV vaccination, the past six-plus years of “expert” sourced advocacy messages have led to (or at least coincided with) increased resistance to the vaccine (Darden et al., 2013).

Prior research has shown that this resistance tends to correlate strongly along lines of political and social conservatism (Kahan et al., 2010). Other research has shown that scientific expertise and scientific information in general seem to generate resistance, which can take the form of actively thoughtful counter-argument, active avoidance of any thought on the matter, and a continuum of varyingly passive-to-active resistance between those two positions (Hamilton, 2010, 2011; Mooney, 2005, 2012; Newport, 2012; Public Religion Research Institute, 2011; Ramanadhan and Viswanath, 2006).

Examination of these prior findings raises the question of whether people who are predisposed to oppose vaccination of pre-adolescent children against HPV infection would be likely to react differently to a pro-vaccination advocacy message from an authoritative expert source—one whose mere appearance might represent forewarning of strong counter-attitudinal arguments (Petty and Cacioppo, 1977, 1979)—than from an obviously non-authoritative, non-expert source. Faced with an authoritative expert, would such anti-vaccination partisans tend to begin marshalling their counter-arguments even before considering the pro-advocacy message, or reject the arguments of the “expert” instantly and heuristically, without significant elaboration on the pro-vaccination advocacy message? Under these kinds of conditions, persuasion would be virtually impossible.

Conversely, when faced with an obviously non-authoritative, non-expert spokesperson, would partisans be more likely to listen to—and rationally process—the arguments of the non-expert, a condition in which at least some possibility of persuasion exists? And following this hypothetical thread to the possibility of practical application for maximum public benefit, would the use of an obviously non-expert spokesperson to present the case for HPV vaccination be a more effective strategy than the use of an expert spokesperson?

For the purposes of operationalization of the current study, these issues can be summarized in the following research questions:

- R1. Will spokesperson expertise have a significant effect on subjects' degree of elaboration on and attitude toward a pro-HPV vaccine advocacy message?

- R2. Will political ideology function as a significant moderating factor to spokesperson expertise in regard to message elaboration and/or attitude toward the object of the message advocacy?

Method

Overview

The current study was constructed as an experiment to test how people's attitudes regarding HPV vaccination are influenced by the perceived expertise of the person delivering a pro-vaccination advocacy message. Using an online survey, the study measured subjects attitude toward HPV vaccination in three randomly assigned conditions: (1) Control: after a basic informational overview of the HPV vaccine; (2) Expert: after the same informational overview plus a pro-vaccine advocacy statement delivered by an expert spokesperson; and (3) Non-Expert: after the same informational overview plus an identical pro-vaccine advocacy statement delivered by a non-expert spokesperson. Subjects in the Expert and Non-Expert conditions were also asked to complete a series of questions designed to measure their degree of elaboration on the advocacy message delivered by the spokesperson in their condition.

A pre-test was administered across all conditions to collect demographic data, which included a political ideology scale that asked subjects to rate themselves politically on a scale of (1) to (5) in which (1) = Strongly Progressive, (2) = Moderately Progressive, (3) = Centrist, (4) = Moderately Conservative, and (5) = Strongly Conservative.

These three variables (spokesperson expertise, message elaboration, and political ideology) comprised the primary effects examined in this study.

Sample: Participants

The experiment's subjects consisted of a demographically diverse sample of 474 adults recruited online through two separate online platforms, the Amazon Mechanical Turk workforce marketplace, and LinkedIn members of a number of interest groups relevant to healthcare and marketing communications.

The overall sample of 474 adults ranged in age from 18 to 82, and included 215 (45.4%) males and 259 (54.6%) females. The average age was 35.1 years, and the average education level was nearly two years of college. Politically, the sample included 88 (18.6%) who identified themselves as Republicans, 195 (41.1%) who self-identified as Independents, 181 (38.2%) who self-identified as Democrats, and 10 (2.1%) who identified themselves as "Other".

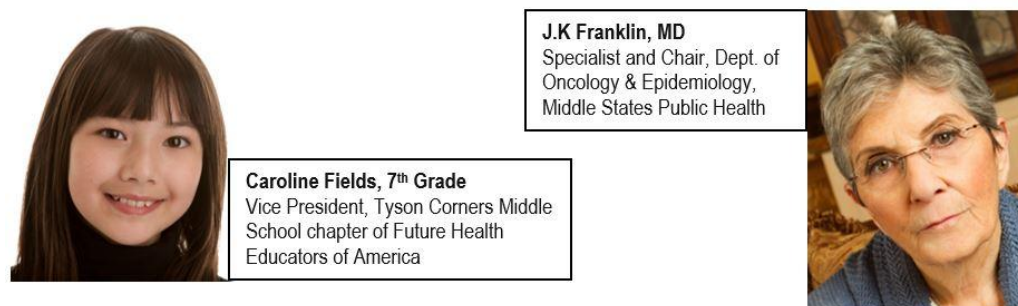
Manipulation: Expert and Non-Expert Message Sources

Based on information from the Centers for Disease Control and a pro-HPV vaccination message developed for a prior study (Kahan et al., 2010), a 281-word advocacy message was developed using language that could reasonably be attributed to either an expert or a

non-expert spokesperson as the message source. This advocacy message was repeated word-for-word as a constant in both message source conditions (See Appendix A).

Participants were randomly assigned to one of three advocacy message conditions. Roughly one-third received a pro-HPV vaccination advocacy message attributed to an authoritative-looking spokesperson identified as a physician; another third received an identical message attributed to a female middle-school student. The identities were entirely fictitious, with spokesperson photos obtained from a professional stock-photo service. (See Figure 1, below.) Participants assigned to the Control condition received no advocacy message and were instructed to skip the spokesperson evaluation (see Manipulation Check, below) and message elaboration questions.

Figure 1. *Images and Identifiers of Expert and Non-Expert Spokespeople*



Manipulation Check

As a manipulation check, the subjects in the two experimental conditions were asked to rate the spokesperson delivering the advocacy message using a seven-point scale on three different attributes: honesty/trustworthiness, likability, and authoritative expertise. There was no significant difference in honesty/trustworthiness between the Expert Spokesperson and Non-Expert Spokesperson, but the intended difference in perception of expertise was confirmed (Expert: $M = 5.54$, $SD = 1.31$; Non-Expert: $M = 3.70$, $SD = 1.66$; $t(312) = 10.92$, $p < .001$ (two-tailed)). The non-expert was rated a bit higher in likability than the expert (Expert: $M = 5.43$, $SD = 1.22$; Non-Expert: $M = 5.73$, $SD = 1.16$; $t(310) = -2.23$, $p < .05$ (two-tailed)).

Measures

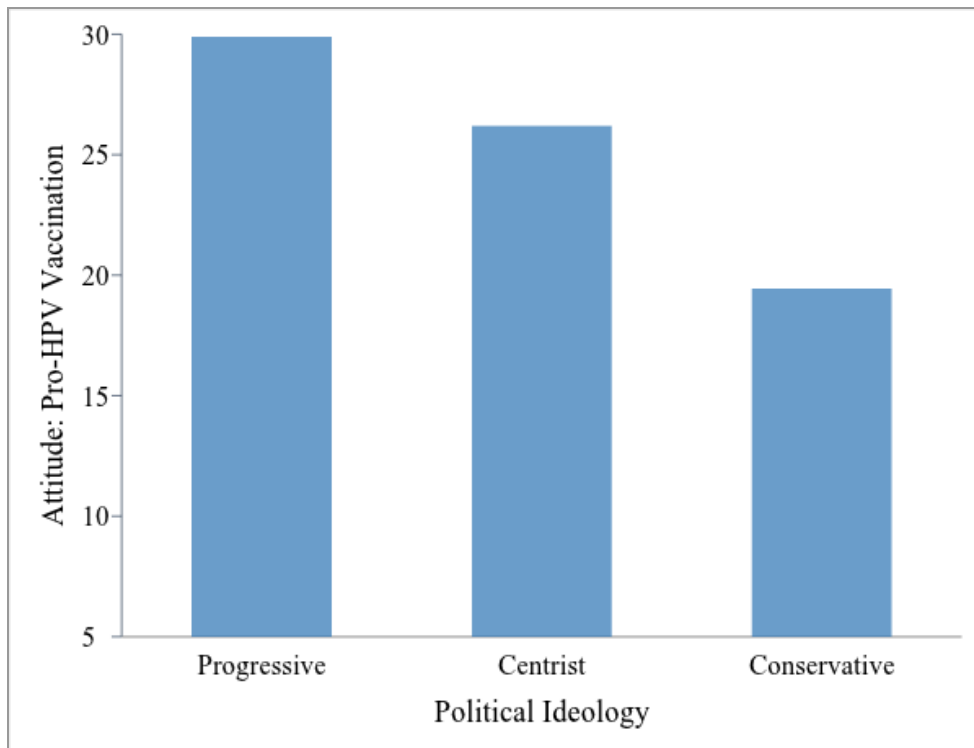
PRE-TEST

The survey pre-test collected information about standard demographic variables such as age, gender, education, political and religious affiliation. Most significant for the purposes of the study was the variable of political ideology, for which subjects were asked to rate themselves on a scale of 1 to 5 along a continuum from Strongly Progressive to Strongly Conservative. For statistical analysis, responses were recoded to combine the Strongly Progressive and Moderately Progressive responses as a single level of a three-level variable, with Centrist responses as a second level, and the Moderately Conservative and Strongly Conservative responses as a third level.

As a check on the predictive validity of these measures of political ideology, both the 5-point scale ($M = 2.74$, $SD = 1.17$) and the 3-point scale ($M = 1.82$, $SD = 0.87$) were compared with scores of attitude toward HPV vaccination ($M = 25.95$, $SD = 11.29$) for subjects in the control condition, and weak but significant relationships were found:

- Political Ideology (3-level variable)/Attitude toward HPV Vaccination: Pearson correlation = $-.215$, $p < .01$, 2-tailed ($F = 3.96$, $df = 2, 157$; $p < .05$; eta squared = 0.49)
- Political Ideology (5-level variable)/Attitude toward HPV Vaccination: Pearson correlation = $-.257$, $p < .01$, 2-tailed ($F = 3.06$, $df = 4, 157$; $p < .05$; eta squared = 0.74)

Figure 2. Means of Attitude toward HPV Vaccination by Political Ideology (Control)



The pattern of attitude toward HPV vaccination by political ideology in this control condition is illustrated in Figure 2, above. Conservatives were more opposed to HPV vaccination than Centrists, and Centrists more opposed than Progressives. As indicated by a one-way analysis of variance, Political Ideology had a significant effect on attitude toward HPV vaccination in this control condition ($F = 14.91$, $df 2, 157$; $p < .001$), accounting for approximately 16% of the variance as indicated by an eta squared value of $.160$. Post hoc Scheffé tests indicated that while Centrists were not significantly different from Progressives ($F = 1.74$, $df 2, 157$; $p = .22$), they were significantly different from Conservatives ($F = 2.92$, $df 2, 157$; $p = .016$), and Conservatives were significantly different from Progressives ($F = 5.46$, $df 2, 157$; $p < .001$). This analysis of variance will be examined in greater detail in the results section, below.

POST-MANIPULATION MEASUREMENTS

Message Elaboration Scale: In addition to the manipulation check on spokesperson expertise noted above, subjects in the Expert and Non-Expert conditions were presented with a series of seven questions to measure their degree of attention and thought given to the actual advocacy message. The sum of the responses to these message elaboration questions was used to create a Message Elaboration Scale (Cronbach's $\alpha = .73$, $M = 34.04$, $SD = 6.55$).

DEPENDENT VARIABLE

Attitude toward HPV vaccination: Subjects in all three conditions of the study (Control, Expert, Non-Expert) answered a series of questions designed to measure their attitudes and behavioral intentions regarding HPV vaccination. A series of seven questions addressed subjects' perceptions about HPV vaccination in terms of like-dislike, good idea-bad idea, risky-safe, and effective-ineffective, using a seven-point Likert-type scale. Questions in which pro-HPV attitudes called for lower scores were reverse coded. The results of these questions were combined into an overall attitude scale (Cronbach's $\alpha = .93$; $M = 20.67$, $SD = 10.48$).

Results

Attitude toward HPV Vaccination as influenced by Spokesperson Expertise across three levels of Political Ideology: Split File Analysis

Because of the significant differences between subjects in the three different levels of the political ideology variable, these levels were examined as different populations, and a one-way analysis of variance was used to analyze the effects of the three levels of the spokesperson variable on attitude toward HPV vaccination for subjects in each of the three political ideology levels separately. Examination of Levene's Test of Equality of Error Variances and plots of residuals indicated that assumptions of homogeneity, normality and linearity were met for all three conditions. Means and standard deviations of HPV vaccination attitude scores by source expertise and political ideology are presented in Table 1, below. A summary of the results of the analysis can be found in Table 2.

Table 1. Means and Standard Deviations for Attitude toward HPV Vaccination by Source Expertise and Political Ideology

Spokesperson Expertise	Political Ideology	n	mean	Standard Deviation
Control	Progressive	77	29.90	9.66
	Centrist	35	26.20	9.01
	Conservative	48	19.44	12.36
Expert	Progressive	80	33.06	7.65
	Centrist	47	26.45	10.40
	Conservative	29	23.97	10.65
Non-Expert	Progressive	80	31.80	9.04
	Centrist	35	28.29	9.76
	Conservative	43	27.00	10.61

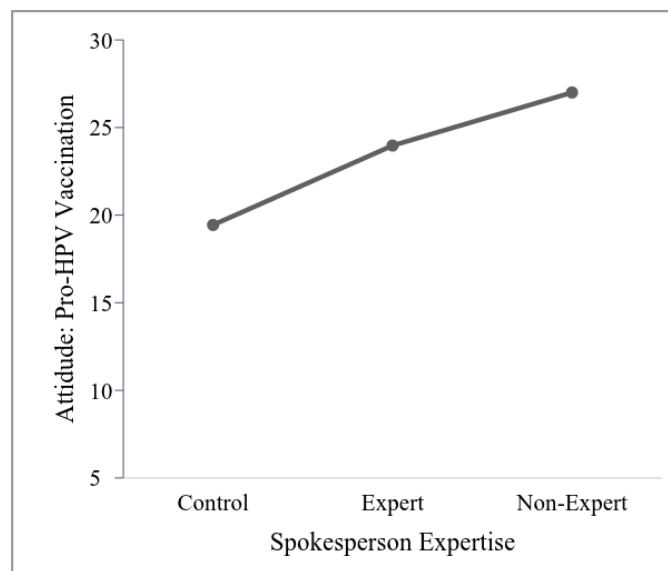
Table 2. Analysis of Variance: Attitude toward HPV Vaccination by Source Expertise and Political Ideology

Source	SS	df	MS	F
Progressive				
Spokesperson Expertise	397.85	2	198.93	2.56
Error	18170.66	234	77.65	
Total	18568.51	236		
Centrist				
Spokesperson Expertise	93.95	2	46.97	0.18
Error	10974.36	114	96.27	
Total	11068.31	116		
Conservative				
Spokesperson Expertise	1317.21	2	198.79	5.11**
Error	15084.78	117	128.93	
Total	16401.99	119		

**p < .01

As can be seen in Table 2, above, spokesperson expertise had a significant effect on attitude toward HPV vaccination with subjects who identify themselves as Conservative in political ideology ($F = 5.11$, $df = 2, 117$; $p < .01$), accounting for 8.0% of the variance in attitude among Conservatives (eta squared = .080). Among Conservatives, post hoc Scheffé tests indicated a significant difference between attitudes of subjects from the control group and attitudes of subjects exposed the pro-vaccination message delivered by the non-expert spokesperson ($F = 3.17$, $df = 2, 117$; $p < .01$).

Figure 3. Means of Attitude toward HPV Vaccination among Conservatives



As shown in Figure 3, above, Conservatives who were exposed to the pro-vaccination advocacy message from the non-expert spokesperson expressed significantly more positive attitudes toward HPV vaccination than those in the control group. Interestingly, while exposure to the same message from the expert spokesperson also produced more positive attitudes than the control condition, this exposure was not statistically significant ($F = 1.70$, $df = 2$, 117 ; $p = .242$).

While the difference between the expert and non-expert conditions does not achieve statistical significance ($p = .268$ as measured by a Helmert contrast), comparison of the attitudes of subjects exposed to each spokesperson condition with attitudes of subjects in the control condition suggests a fairly strong case for the non-expert as the more effective spokesperson when delivering a pro-HPV vaccination message to a conservative audience. This finding provides positive support for the moderating role of political ideology (RQ2), and directional support for the comparative persuasive effectiveness of the Non-Expert spokesperson (RQ1).

Analysis of Message Elaboration by Spokesperson Expertise and Political Ideology

To examine the effects of spokesperson expertise and political ideology on degree of elaboration about the spokesperson-delivered advocacy message, a one-way analysis of variance was used to analyze the data using a split-sample approach. Message elaboration in each of the three levels of the political ideology variable was examined separately for the expert spokesperson condition and for the non-expert spokesperson condition. Tests of homogeneity of variance and plots of residuals indicated that assumptions of homogeneity, normality and linearity were met for both conditions (Levene's Test of Equality of Error Variances: Expert, $F = 1.15$, $df = 2$, 153 ; $p > .05$; Non-Expert, $F = 1.69$, $df = 2$, 155 ; $p > .05$). Means and standard deviations for message elaboration by political ideology and source expertise can be found in Table 3, below. Results of this analysis can be found in Table 4.

Table 3. *Means and Standard Deviations for Message Elaboration by Source Expertise and Political Ideology*

Spokesperson Expertise	Political Ideology	n	mean	Standard Deviation
Expert	Progressive	80	35.30	7.38
	Centrist	47	31.66	5.69
	Conservative	29	33.48	7.19
Non-Expert	Progressive	80	34.31	5.59
	Centrist	35	33.69	7.44
	Conservative	43	34.47	5.57

Table 4. *Analysis of Variance: Elaboration by Source Expertise and Political Ideology*

Source	SS	df	MS	F
Expert Spokesperson				
Political Ideology	397.58	2	198.79	4.20*
Error	7238.60	153	47.31	
Total	7636.17	155		
Non-Expert Spokesperson				
Political Ideology	13.26	2	6.63	0.18
Error	5747.43	155	37.08	
Total	5760.68	157		

*p < .05

As can be seen in Table 4, above, political ideology had a significant effect on message elaboration in the expert spokesperson condition ($F = 4.20$, $df = 2, 153$; $p < .05$; eta squared = .052), but not in the non-expert condition ($F = 0.18$, $df = 2, 155$; $p > .15$; eta squared = .002). A Difference contrast indicated a significant difference between Centrists and Progressives in the Expert condition ($F = 2.88$, $df = 2, 153$; $p < .01$), with Centrists scoring significantly lower on the elaboration scale than Progressives. A Helmert contrast also indicated a significant difference between Progressives and all others ($F = 2.44$, $df = 2, 153$; $p < .05$), with Centrists and Conservatives, taken together, scoring significantly lower than Progressives on the elaboration scale.

These findings suggest that subjects likely to be less supportive of HPV vaccination tend to think less deeply when they encounter a pro-HPV advocacy message delivered by an expert, and they support the notion that a non-expert spokesperson can be a strong alternative to an expert in some circumstances. It can be inferred from these findings that when confronted with an expert spokesperson, self-described Centrists are less likely to pay attention to or think deeply about the spokesperson's message than either Progressives or Conservatives, with a significant gap between Centrists' level of elaboration and that of Progressives. Additionally, these findings indicate that, while people of differing political ideologies react differently in terms of thought processing to messages delivered by an expert spokesperson, there seem to be no significant differences between their levels of attention and elaboration when the spokesperson is not an expert. While the differences are not significantly large, Centrists and Conservatives—groups that tend to oppose HPV vaccination—seem to pay more attention and think more deeply when confronted with a pro-HPV vaccination advocacy message from a non-expert source than from an expert source.

On balance, if the goal is to encourage the greatest number of HPV-vaccination opposers to at least consider changing their position, these findings suggest that choosing a non-expert spokesperson would be at least as effective as choosing an expert spokesperson, and particularly where Centrists are concerned, probably significantly more effective.

Another inference from these results applies to the frequent reliance on expert spokespeople for HPV vaccination advocacy and, by extension, perhaps for communicating science-based behavioral recommendations in general. Since those in

favor of HPV vaccination seem to think more deeply about a pro-vaccination message when it is delivered by an expert than when it is delivered by a non-expert, it may be natural for them to assume that people of all vaccination-predispositions react that way. This may be just the sort of “natural” assumption about risk communication that should be evaluated before being put into widespread, unexamined practice to prevent valuable resources from being invested in efforts that are ineffective or do more harm than good (Fischhoff, Brewer & Downs, 2011; Fishbein et al., 2002; Wilson, 2011).

Discussion

The lack of universal acceptance for—and, in fact, the increasing public resistance to—an apparently safe, effective and life-saving public health practice such as HPV vaccination illustrates a significant issue in the communication of behavioral recommendations based on evidence-based scientific data and consensus views of scientific and medical experts.

A review of the related literature examining this arena suggests that at least some of the efforts to communicate such behavioral recommendations may have suffered from misguided intuitive assumptions and/or lack of sound theoretical foundations (Betsch et al., 2012; Fischhoff, Brewer & Downs, 2011; Fishbein et al., 2002; Glanz and Bishop, 2004; Miche and Abraham, 2004; Wilson, 2011). It also suggests that the recipients of such behavioral recommendations do not present a conveniently monolithic, homogenous and predictably rational or sympathetic audience (Hamilton, 2010, 2011; Mooney, 2005, 2012; Newport, 2012; Public Religion Research Institute, 2011; Ramanadhan and Viswanath, 2006).

While there is value in motivating those already predisposed to comply with pro-vaccination advocacy messages to take positive action, the current research is more concerned with the apparently growing numbers of parents and policymakers who are resisting those messages. The current study provides empirical support for the role of political ideology as an influential factor in attitude toward HPV vaccination, with Centrists and Conservatives significantly less in favor of HPV vaccination than Progressives. This suggests that efforts to address issues of growing resistance to the HPV vaccination might be more productive if they focus on identifying strategies that are more effectively influential with Centrists and Conservatives than with a more generalized population that includes Progressives. The significant differences in attitude toward HPV vaccination found between Centrists and Conservatives also suggest it might be more effective to develop strategies targeting each group separately rather than lumping them together as a single group.

In the current study, significant effects for the influence of spokesperson expertise on message elaboration were found when comparing Progressives to Centrists as well as to the combined population of Centrists and Conservatives in the sample. Centrists as well as Centrists and Conservatives taken together were significantly less likely than Progressives to think deeply about the pro-HPV vaccine advocacy message when it was delivered by a serious-looking authoritative expert. Whether the serious-looking expert suppressed their message elaboration or the young girl stimulated it is impossible to deduce from this research design. However, it is clear that for encouraging attention and thought about a pro-vaccine message among those most likely to harbor predispositions to resist the

behavioral recommendations it carries (by virtue of their political ideology, at least), these findings support the choice of the non-expert young girl rather than the serious-looking authoritative expert as the spokesperson to deliver the message.

Since it can be assumed from the literature (Kahan et al., 2010, for instance) and the current findings that those who are the most active public advocates for HPV vaccination are likely to be Progressives, it is reasonable to suggest that they have been choosing their messaging strategies based on their own sensibilities and intuitions—perhaps leading to an unexamined over-reliance on the scientifically based exhortations of experts who may, in fact, be undermining their own cause (as suggested by Burgoon et al., 2002; Fishbein et al., 2002; Miller et al., 2006; and Wilson, 2011).

In general, the current study suggests that for delivering pro-HPV vaccination advocacy messages to Centrists and Conservatives, a non-expert spokesperson may well be more effectively persuasive than an expert.

Study Limitations and Implications for Future Research

In order to provide a baseline reference for attitude toward HPV vaccination, the control condition featured no spokesperson or advocacy message and therefore there was also no measurement of message elaboration for subjects in the control condition. Without a baseline elaboration measurement, it is impossible to know whether the conditions of spokesperson expertise in this study stimulated or suppressed message elaboration. To address this issue in a future study, a second control condition could be added in which subjects were exposed to the advocacy message without any source attribution, or with the message presented as a newspaper article. Subjects in this second control condition could then be asked to answer the same message elaboration measurement questions as subjects in the spokesperson conditions. Another approach to this issue might include pre-tests using Cacioppo, Petty & Kao's (1984) 18-item "Need for Cognition" scale, which would help inform analysis of the other elaboration measures.

The current study examined political ideology as a moderating factor. Additional moderating factors that seem worthy of examination regarding attitudes toward HPV vaccination in particular but that also may be relevant to a range of other politically charged issues include gender, religious observance, family composition and role, education, geography and attitudes toward other political and social issues.

In addition to supporting the broader and more frequent use of non-expert spokespeople to deliver politically charged health-and-science related advocacy messages, this study suggests a need for further study of the mediating factor of message elaboration in the persuasive effectiveness of such messages as well as the broader use of heuristic cues in those messages. Since the current study was intended to examine effects of source expertise on advocacy message effectiveness, the message was constructed so it could be presented by either an expert or a non-expert spokesperson without appearing to be an unnatural expression from either source. The findings provided support for the persuasive effectiveness of the advocacy message as compared to the control condition, regardless of the expertise of the spokesperson. Future studies might address the relative persuasive power of different messaging strategies and their possible interactions with different

target audiences. As suggested above, a persuasive appeal strong on heuristic cues might be more effective than one full of scientific evidence, particularly for a low-information-seeking audience. Instead of featuring headlines carrying an implication of hard cognitive work ahead, such as “Centers for Disease Control Provide Statistical Evidence of Effectiveness of HPV Vaccination,” low information seekers might be better persuaded by messages requiring less intense attention, such as, “Don’t be the last one on your block to get your child vaccinated.”

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APPENDIX A: Advocacy Messages and Spokesperson Variable

In the experimental conditions, the content of the advocacy message was constant except for the appearance and identification of the spokesperson.

“Expert”

My name is J.K. Franklin. I am a board-certified physician and chair of the department of oncology and epidemiology at the Middle States Public Health Agency. I need to ask for your help.



J.K. Franklin, MD
Specialist and Chair, Dept. of
Oncology & Epidemiology,
Middle States Public Health Agency

Cervical cancer kills up to half a million women throughout the world every year. This year it will kill well over 4,000 women in the United States alone. Scientists believe that virtually all cases of cervical cancer are caused by the human papillomavirus (HPV), which is spread by sexual contact.

A vaccine has been developed that has been shown to be highly effective in preventing most kinds of HPV infections. It can prevent almost three quarters of all deaths from cervical cancer, but only if it is administered before subjects become infected with HPV.

That means they need to be vaccinated before they are likely to become sexually active, because studies show that about half of all sexually active people in this country contract HPV. And once they are exposed to HPV, the vaccine won't work.

For this reason, the World Health Organization and the US National Institutes for Health recommend that all girls be immunized with the HPV vaccine at or before the age of 12 worldwide. If administered universally, this vaccine would save the lives of up to 350,000 women every year.

The Food and Drug Administration has certified the vaccine as safe for use. Because so few girls that age even know what HPV is, it is hard to believe that the vaccination will cause them to become more sexually active or to engage in unsafe sex.

It is therefore clear that universal vaccination of girls against HPV will make a major positive contribution to public health in America. Please join me in advocating for this important health policy in your community.

“Non-Expert”

My name is Caroline Fields. I’m a 7th Grader at the Tyson Corners Middle School, and I am the Vice President of our school chapter of the Future Health Educators of America. I need to ask for your help.



Caroline Fields, 7th Grade
Vice President, Tyson Corners
Middle School chapter of Future
Health Educators of America

Cervical cancer kills up to half a million women throughout the world every year. This year it will kill well over 4,000 women in the United States alone. Scientists believe that virtually all cases of cervical cancer are caused by the human papillomavirus (HPV), which is spread by sexual contact.

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