



## Healthcare and Health Promotion

## Information scanning and vaccine safety concerns among African American, Mexican American, and non-Hispanic White women



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## ABSTRACT

**Objective:** A significant number of parents delay or refuse vaccinating their children. Incidental exposure to vaccine information (i.e., scanned information) may be an important contributor to anti-vaccine sentiment. This study examines the association between scanned information, trust in health information sources and vaccine safety concerns among African American, Mexican American, and non-Hispanic White women.

**Methods:** Women (N = 761) in Los Angeles County were sampled via random digit dial and surveyed regarding use of and trust in health information resources and vaccine safety concerns.

**Results:** Analyses indicate that the sources of information associated with vaccine safety concerns varied by ethnicity. Each ethnic group exhibited different patterns of association between trust in health information resources and vaccine safety concerns.

**Conclusions:** Information scanning is associated with beliefs about vaccine safety, which may lead parents to refuse or delay vaccinating their children. These relationships vary by ethnicity.

**Practice implications:** These findings help inform practitioners and policy makers about communication factors that influence vaccine safety concerns. Knowing these sources of information will equip practitioners to better identify women who may have been exposed to anti-vaccine messages and counter these beliefs with effective, vaccine-promoting messages via the most relevant information sources.

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## 1. Introduction

The recent 2014–2015 measles outbreak in the U.S. illustrates the public health impact of an under-vaccinated population [1]. The number of parents who do not adhere to the CDC immunization schedule by intentionally delaying vaccination or refusing to vaccinate their children altogether has been rising [2–4] in recent years, with estimates placing the percentage of parents refusing at least 1 vaccine for their children at 11.5% [5] and delaying vaccination at 21.5% [3]. The considerable news coverage of the 2014–2015 measles outbreak and the corresponding debates over

vaccination underscore the range of sources through which individuals learn about vaccines. These days, healthcare providers encounter patients whose vaccine beliefs are informed by a wide variety of health information sources, including personal discussion and news reports [6,7]. Increasingly, practitioners are seeking to develop educational and counseling strategies to promote childhood vaccinations. It is thus important to understand how the sources of health information that individuals use affect their vaccine beliefs and behavior [8,9].

There are two key ways that different health information sources may expose individuals to vaccine information: information seeking and through information scanning [10–12]. Vaccine information seeking is the process by which parents deliberately obtain vaccine-related information using means such as asking questions about vaccines to health care providers, friends and family, and looking up vaccine-related information online, in books, and in magazines. It is well-established that the sources

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from which parents seek vaccine information play a key role in the formation of vaccine-related beliefs, ultimately influencing subsequent vaccination behavior [3,13–16]. Parents who use the Internet to obtain information about vaccines, for example, have been found to be more likely to hold anti-vaccine beliefs [13,14] and to delay vaccine administration [3], as were parents who used the library and other types of media [3] and parents who used interpersonal sources (e.g. friends) [13].

While less well-characterized, information scanning may have a significant impact on population-level health outcomes [10,11] that is even greater than information seeking [17]. Information scanning is “information acquisition that occurs within routine patterns of exposure to mediated and interpersonal sources” [12, pp. 154]. These sources also include the Internet, television, print media, friends, family, and healthcare providers, but in this case vaccine information is encountered in a more passive and less deliberate way. For example, an individual watching the local news might incidentally encounter vaccine information when the news features a story about the recent measles outbreak. The vaccine information acquired by watching the news program is scanned information. Thus, while some parents actively seek out information about vaccines, a considerable amount of vaccine information is also encountered and absorbed in a more passive way over the course of more general use of information sources.

It is plausible that scanned information encountered through routine use of information sources impacts vaccine decisions. Individuals encounter a great deal of incidental health information in the course of their general communication patterns [18,19]. In fact, scanned health information is encountered at greater rates than sought information [17,20,21]. Thus, because more individuals are exposed to scanned health information, it likely has a greater impact on population-level health outcomes [10,11]. Scanned information may also prompt additional information seeking [21] that reinforces favorable or unfavorable vaccine attitudes—a pro-vaccination news story encountered while watching TV, for instance, could prompt a parent to ask a pediatrician for more information. Similarly, an anti-vaccination story heard on the radio while driving to work could prompt a parent to search online for anti-vaccine websites when he or she arrives in the office. Additionally, because scanned information is encountered through typical daily patterns of media use, not during active seeking, it may be particularly influential in the formation of initial vaccine attitudes [17]. For example, a young woman may incidentally encounter anti-vaccine information through the media and subsequently form anti-vaccine beliefs long before she has any children.

Lee et al. [22] note that the pathways through which scanned information impacts behavior are not well studied, but research related to information processing and social cognition in persuasion illuminates potential mechanisms through which this effect may occur. The cognitive mediation model [23] theorizes the relationship between exposure to health information in the news and knowledge acquisition and behavioral outcomes [24,25]. In this model, elaboration is a key process through which exposure to information results in behavior. More specifically, elaboration is a process that “relates the incoming information to existing knowledge and images and attaches connotative and associative meanings. Information is linked mnemonically to similar information, placed in an organizational structure, and responses are rehearsed” [26, pp. 19]. Additionally the communication mediation model [27,28] proposes the broad construct of reasoning as a similar pathway mediating the relationship between information exposure and subsequent action.

Lee and colleagues [22] build on these models and test specific pathways through which exposure to scanned health-related information may affect behavior. They find evidence that reflective

integration, a process that includes both elaboration as well as interpersonal discussion about a topic, is a key mediator linking exposure to scanned information and behavioral outcomes. Thus, over the course of everyday patterns of communication, individuals may encounter information related to childhood vaccination. These individuals may then elaborate upon and integrate this information, increasing the likelihood that this information will be retained and ultimately acted upon.

Given this potential for health information scanning to impact childhood vaccination behaviors, the primary aim of this study was to investigate how these “routine patterns” [12, pp. 154] of communication impact vaccine safety concerns (a key factor in vaccine hesitancy) by examining how the general use of different sources of health information is associated with vaccine safety concerns. We also examined the relationship between trust in different interpersonal sources of health information and vaccine safety concerns. Trust is included as a critical factor in how interpersonal sources of health information may influence health behavior [29–31]. In general, people trust sources of health information to which they are routinely exposed [32], including less credible vaccine information sources such as friends and family members [33]. In particular, parents who feel concerned about vaccine safety have been shown to be more likely to trust information from these less scientifically rigorous sources [34–36]. A lack of trust in healthcare providers is one of the factors that may lead parents to reject vaccination protocols despite the healthcare provider's recommendation.

A secondary aim of this study was to investigate the relationships between vaccine safety concerns, information scanning, and trust in interpersonal sources of information among three ethnic groups—African American, Mexican American and non-Hispanic White. Vaccination rates are known to vary by ethnicity [5]. The sources of vaccine-related information that parents trust similarly varies [33]. More broadly, it has been shown that preferred sources of health information vary across ethnicity [37,38]. However, the extent to which these different information sources contribute to varying levels of vaccine safety concerns among members of different ethnic groups has not been well characterized. Because different sources of information may contain very different messages about vaccination, it is important to understand what sources of information are associated with vaccine safety concerns among members of different ethnic groups so that vaccine promotion efforts can be better targeted. Ultimately, understanding the specific sources of health information trusted by parents of different ethnic groups will provide a clearer understanding of how vaccine safety concerns are formed, and will facilitate the development of targeted educational messages that healthcare providers and practitioners can use to combat specific pieces of misinformation.

## 2. Methods

### 2.1. Study design

We conducted a secondary data analysis using baseline data from a study on cervical cancer education and communication. A random digit dial (RDD) procedure was used to recruit African American, Mexican American and non-Hispanic White female participants as part of a larger study examining women's health in Los Angeles County. Inclusion criteria were that participants be between 25 and 45 years old and speak English. 761 women completed the measures reported here. All participants provided oral informed consent. The research protocol was approved by the university Institutional Review Board. All interviewing was conducted in English by California Survey Research Services, Inc. Up to six call attempts were made to contact sampled numbers.

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