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Ethnic newspapers and low-income Spanish-speaking adults: influence of news consumption and health motivation on cancer prevention behaviors

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ABSTRACT

Objective: Ethnic newspapers have the potential to reach and influence various cultural and ethnic subpopulations traditionally underserved in the United States. The current study sought to explore how ethnic news consumption interacts with health motivation to predict cancer prevention behaviors in a sample of Spanish-speaking adults.

Design: Participants ($N = 100$) completed a survey in Spanish, with items measuring demographics, acculturation, health literacy, health motivation, ethnic newspaper consumption (for two papers: *La Viva* and *La Raza*), and cancer prevention behaviors.

Results: Results indicated consumption of ethnic newspapers correlated positively to acculturation, and cancer screening utilization. In hierarchical regression analyses, the interaction of consumption of an ethnic newspaper (*La Raza*) and health motivation predicted two of the six prevention behaviors assessed: avoidance of fatty foods and screening behavior.

Conclusion: The study provides evidence that consumption of Spanish-language newspapers enhances the likelihood that individuals with high levels of health motivation will engage in healthy behaviors. This finding highlights the utility of utilizing Spanish-language newspapers to reach underserved populations.

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Ethnic newspapers; Spanish-speaking adults; cancer prevention; health motivation; cancer news coverage

An enduring problem for health communication researchers is effectively communicating with culturally diverse or underserved populations to reduce health disparities (Freimuth and Quinn 2004). Lack of effective communication can lead to situations where those most in need are less likely to decipher or have relevant health information (Viswanath 2006). Overcoming this challenge requires the identification and enhancement of communication vehicles capable of reaching these groups.

Recent scholarship on cancer news coverage suggests that ethnic newspapers are promising outlets for the dissemination of cancer control messages (Stryker, Emmons, and

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Viswanath 2007), although research finds these newspapers often fall short of providing health news relevant to specific audiences (Wang and Rodgers 2013). Ethnic newspapers offer information that require lower literacy levels to understand (Stryker, Emmons, and Viswanath 2007), which may make these news outlets more accessible to certain subpopulations, such as Latino(a)/Hispanic (henceforth referred to as Latino) immigrant populations that have lower literacy levels (Dunn-Navarra et al. 2012) and/or lower English language proficiency (Sentell and Braun 2012). More narrowly defined readership provides editors and journalists with opportunities to create stories that address subpopulation-specific health disparities (Viswanath and Lee 2007). Traditionally, health communication researchers look to mainstream media to circulate stories and advertisements promoting healthy behavior, while overlooking ethnic media for high-risk subpopulations (Wilkin and Ball-Rokeach 2006). For example, Latino newspapers could publish more stories about liver, stomach, and cervical cancers – cancer types that disproportionately affect Latino populations (see American Cancer Society 2015).

While ethnic newspapers offer opportunities to address health disparities, there are presently few studies directly examining the relationship between ethnic newspaper consumption and health behaviors. Determining whether reading ethnic newspapers positively influence cancer control behaviors is essential to effective communication about cancer in the media, which is a priority of the current national cancer control research agenda (Hesse 2009). One barrier to effective communication about cancer in the media is that news reporting is a business, which often has competing interests with the desires of researchers and health professionals to have the factual dissemination of scientific findings (Hesse 2009). Ethnic newspapers are often not backed by large corporations, instead run locally and supported by communities and local business advertising (Close et al. 2006; Lin and Song 2006). The community-centered nature of ethnic newspapers seems to make them ideal outlets for public health communication to traditionally underserved and marginalized populations. As noted, however, researchers are still unsure what health behavior effects consumption of these newspapers has on adults.

Cancer news research to date has focused mainly on the content of mainstream newspapers (Freimuth et al. 1984; Jensen et al. 2010; Slater et al. 2008) or ethnic newspapers (Cohen et al. 2008; Hoffman-Goetz and Friedman 2005; Stryker, Emmons, and Viswanath 2007, Stryker et al. 2009). Research has found that Black newspapers had a higher proportion of cancer coverage in health-related stories; those stories focused more on local information, health disparities, and personal behavioral mobilization than general audience newspapers (Cohen et al. 2008). Other research comparing ethnic newspapers more generally with mainstream coverage found similar trends. In the most comprehensive comparative content analysis to date, ethnic newspapers were more likely than mainstream newspapers to cover primary and secondary prevention stories, and focus on awareness and education (Stryker, Emmons, and Viswanath 2007).

There is growing evidence that more cancer prevention coverage in mainstream news could increase knowledge about cancer (Slater et al. 2009; Stryker, Moriarty, and Jensen 2008). Unfortunately, studies identify cancer prevention coverage as being generally inadequate when it appears in mainstream outlets (Slater et al. 2008). Moreover, cancer prevention coverage in mainstream newspapers might perpetuate existing knowledge gaps in the general population (Slater et al. 2009). Past research has shown that attention to health news coverage accounts for increased reader knowledge about some cancer risks,

such as those related to diet and smoking, but not others such as exercise, sun protection, and alcohol abuse (Stryker et al. 2009). Other studies have demonstrated that attention to health news coverage is related to an increase in learning from cancer news (Jensen 2011; Niederdeppe, Frosch, and Hornik 2008). Along with reader attention, health motivation is a potentially important variable in understanding the relationship between news consumption and health behavior (Jensen 2011).

A limitation of the literature on health news consumption is that it focuses primarily on mainstream news coverage, rather than specific, localized information sources (e.g. Spanish-language newspapers) targeting subpopulations. As a result, there is currently no research linking ethnic newspaper consumption with health behaviors. It is surprising that few studies have explored how consumption of ethnic newspapers influences health behaviors or behavioral antecedents – as these information sources are valuable outlets to communication with underserved populations (Stryker, Emmons, and Viswanath 2007). Because ethnic newspapers are more likely to cover stories about prevention and education, they may be primed to help reduce health disparities in these populations. Additionally, Latino adults cite ethnic media as more important to health information seeking activities than mainstream media (Wilkin and Ball-Rokeach 2006).

The current study attempts to explore the relationships between health motivation, newspaper consumption, and cancer control behaviors in a low-income, Spanish-speaking adult population by, first, determining if there is an association between demographic, behavioral, cultural, and psychosocial variables and consumption of ethnic newspapers. The study aims to answer the question: what demographic, behavioral, cultural, and psychosocial variables correlate with the consumption of ethnic newspapers among a cross-sectional sample of low-income Spanish-speaking adults (Research Question 1)?

Additionally, this study attempts to progress the theoretical development of models of news learning. The cognitive mediation model (CMM), for example, posits that motivations underlying news consumption predict media learning (Eveland 2001). Applications of the CMM in a health context have found that context-specific motivations influence knowledge acquisition from cancer news coverage (Jensen 2011). Given the findings of recent research, the present study hypothesizes that the interaction between health motivation and ethnic news consumption will significantly predict health behaviors related to diet, exercise, screening, and smoking. These behaviors were selected because they were identified as receiving more coverage in ethnic than mainstream newspapers (Stryker, Emmons, and Viswanath 2007). Specifically, we predict that – above and beyond demographic, cultural, and skills-based variables – the interaction of health motivation and ethnic news consumption will predict regular fruit and vegetable consumption (Hypothesis 1), avoidance of fatty food (Hypothesis 2), consumption of a high fiber diet (Hypothesis 3), regular weekly exercise (Hypothesis 4), participation in cancer screening (Hypothesis 5), and smoking behavior (Hypothesis 6).

Methods

Participants

Low-income, Spanish-speaking, Latino adults ($N = 100$) participated in the study. The sample was primarily Latina women ($n = 83$), with 15 male participants and 2 participants

who did not identify their gender. The average age of participants was about 35 years old ($M = 34.85$, $SD = 11.48$), and ranged from 18 to 71 years old. A small number of participants reported having more than a high school education ($n = 15$); a similar number graduated high school ($n = 14$) or at least had some high school education ($n = 19$). Other participants completed up to seventh or eighth grade ($n = 10$). Over one-third had a sixth-grade education or less ($n = 37$) and five individuals did not report their education level. Ninety-one participants stated that English was not their native language. Half of the participants self-identified as illegal immigrants ($n = 25$) or permanent residents ($n = 25$), with the remainder of the sample being United States citizens ($n = 19$), naturalized citizens ($n = 7$), or legal immigrants ($n = 6$); 18 participants did not report their citizenship status. Most participants reported their country of origin as Mexico ($n = 89$). The majority reported not having health insurance ($n = 66$). Researchers received approval from a university institutional review board to conduct the current study.

Procedure

Two bilingual university extension employees, who routinely work with low-income Latino populations, assisted in identifying Spanish-speaking adults in Lake County, an impoverished county in the state of Indiana. Individuals selected to complete the study were currently or formerly enrolled in university extension programs. Some adults had never enrolled in the programs. Participants received $25 in cash for completing the study.

Researchers provided a consent form (in Spanish) to individuals, which explained the study. After gaining informed consent, the participants were given a nine-page survey with all items and directions in Spanish. A professional translation service, with certification for medical and legal translation, translated scales from English to Spanish. After receiving the translated measures, a member of the research team fluent in Spanish back-translated the items to ensure accuracy and quality. The university extension employees administered the survey and assisted participants if literacy seemed to be an issue. While survey administrators did not provide an exact count of how many participants needed assistance to navigate the survey, those administrators noted many participants needed help or clarification on some aspect of survey directions or questions. Participants could ask the survey administrator to read any section of the questionnaire, as well as the response options. The only items survey administrators could not assist participants with was the health literacy instrument.

Measures

Demographics

Participant gender (*male* = 0, *female* = 1), education (*some high school or less* = 0, *high school graduate or higher* = 1), age, citizenship (*illegal immigrant/no answer provided* = 0, *naturalized or legal citizen/resident* = 1), and insurance status (*no insurance* = 0, *have insurance* = 1) were measured (Table 1). For insurance, participants reporting 'don't know' were coded as not having insurance. Past research offers support for the decision to dichotomize education into completion of a particular level of formal education (high school), as this often related to health outcomes (Zajacova 2012).

Table 1. Demographics.

Variable	Count
Age (mean)	34.85 years
Gender	
Male	15
Female	83
Education	
Some high school or less	66
High school graduate or more	34
Citizenship	
Illegal immigrant/no response	43
Legal resident	57
Insurance	
No insurance	66
Had insurance	34

Note: Counts and percentages the values are equivalent, as $N = 100$. In cases where the count for a variable is <100, participants opted not to respond.

Ethnic newspaper consumption

Participants reported their readership of 11 ethnic newspapers published in Illinois and Indiana. Informal conversation between the university extension employees and participants during survey administration, as well as observation regarding the availability of ethnic newspapers in community settings, indicated that two papers, *La Raza* (published in Chicago, IL) and *La Viva* (published in Hammond, IN), were the most widely available for the study participants. Participants primarily resided in Gary, Hammond, or East Chicago (IN). For this reason, we retained only consumption for *La Raza* and *La Viva* (as two separate consumption variables). Participants reported *never seeing or hearing of the paper* (=1), *having seen the paper* (=2), *occasionally reading the paper* (=3), or *regularly reading the paper* (=4). Participants reports slightly greater consumption of *La Raza* ($M = 2.35$, $SD = 0.89$) than *La Viva* ($M = 1.85$, $SD = 0.97$).

Health literacy

Health literacy was measured using an abbreviated version of the Spanish Test of Functional Health Literacy in Adults in Spanish (STOFHLA; Parker et al. 1995), which measures individuals' abilities to read and navigate health information. In addition to the original research validating the measure, other researchers have found support for the validity of the measure (see, e.g. Aguirre, Ebrahim, and Shea 2005; Chesser et al. 2014). Extensive research using TOFHLA measures can be found within the health literacy literature as well (see, e.g. Moser et al. 2015; Smith, Brice, and Lee 2012; Yin et al., 2012). This version of the TOFHLA includes reading and numerical skills, weighted to create a 100-point scale. Participants' mean health literacy score was 84.25 ($SD = 12.86$). Most participants were functionally health literate ($n = 91$), with few participants having marginal ($n = 7$) or inadequate ($n = 2$) functional health literacy.

Health motivation

Champion's (1993) health belief model sub-scale measured participant health motivation, or the importance and salience of health beliefs and activities. Researchers interested in health motivation use this measure frequently (see, e.g. Avci 2008; Blue and Valley 2002; Registe and Porterfield 2012; Umeh and Rogan-Gibson 2001), as the measure offers one

of the only validated options to assess the construct (see Champion 1993). The scale consists of seven statements requiring participants to respond on five-point scales (*strongly disagree* = 1 to *strongly agree* = 5). The scale had acceptable reliability (Cronbach's $\alpha = .78$), and participants reported high health motivation scores ($M = 4.18$, $SD = 0.63$).

Acculturation

The Short Acculturation Scale for Hispanics (SASH; Marin, Otero-Sabogal, and Perez-Stable 1987) measures levels of assimilation into the dominant American culture on three dimensions, two of which are relevant to the present study: language (five items; $\alpha = .89$) and media use (three items; $\alpha = .81$). A sample item for the first two dimensions (language and media use), is 'In general, in what language(s) do you think?' Response options for language and media use were *only Spanish* (=1), *more Spanish than English* (=2), *both equally* (=3), *more English than Spanish* (=4), and *only English* (=5). Participant scores indicated low levels of acculturation across scale dimensions (language, $M = 1.47$, $SD = 0.69$; media use, $M = 1.88$, $SD = 0.92$). Acculturation predicts various health behaviors in Latino populations (see Abraido-Lanza, Chao, and Florez 2005) and the SASH measure commonly serves as a measure of acculturation (see, e.g. Ciampa et al. 2013; Sun et al. 2014). We use the variable in the present study to account for the role of acculturation on use of community resources, which could be a factor in predicting health behaviors and utilization of related resources.

Cancer prevention behaviors

Health behaviors were measured using items adapted from the General Health Survey (Nigg et al. 1999). The items offer a nuanced self-report of health behaviors useful for exploring where people are in the process of adopting, changing, or maintaining healthy behaviors (for a recent example, see Friedberg et al. 2014). All measures were single items that placed behaviors on a staged continuum (five response options; smoking had a sixth response option for *never smoked*). An example is 'Do you consistently eat five fruits and vegetables a day?' with response options of 'Yes, I have been for more than six months' (=5), 'Yes, I have been, but for less than six months' (=4), 'No, but I intend to in the next 30 days' (=3), 'No, but I intend to in the next six months' (=2), and 'No, and I do NOT intend to in the next six months' (=1). Given the interest in cancer prevention behaviors, items related to fruit and vegetable consumption ($M = 3.81$, $SD = 1.10$), avoidance of fatty foods ($M = 3.74$, $SD = 1.15$), high fiber diet ($M = 4.02$, $SD = 1.07$), regular exercise ($M = 3.68$, $SD = 1.26$), screening practices ($M = 3.63$, $SD = 1.42$), and smoking ($M = 5.52$, $SD = 1.09$) were included. These behaviors were selected because Stryker, Emmons, and Viswanath (2007) indicated that ethnic newspapers were significantly more likely to report stories on diet, exercise, cancer screening participation, and smoking cessation. Participants generally reported currently being beyond the contemplation stage of engaging in all measured behaviors. The majority of participants ($n = 73$) reported they never smoked.

Results

Due to the less than ideal sample size for traditional regression analysis, the results report traditional significant cutoffs (i.e. $p < .05$), as well as less conservative cutoffs (i.e. $p < .10$).

This practice, while not without potential issues, can offer useful insights (see Schumm et al. 2013). As such, we encourage readers to consider not just the reported significance levels, but also the effect sizes reported to determine the importance of the results for future work.

Research Question 1: correlates of ethnic newspaper consumption

The present study's research question focused on correlates of ethnic newspaper consumption for two Spanish-language papers (*La Viva* and *La Raza*). Table 2 provides a correlation matrix. Results demonstrate that reading one of the ethnic newspapers is associated with reading the other ($r = .52$, $p < .001$), but consumption is not related to any of the demographic variables. Higher acculturation correlated with reading *La Viva* (language, $r = .23$, $p = .023$; media use, $r = .18$, $p = .081$) and *La Raza* (language, $r = .28$, $p = .005$; media use, $r = .33$, $p = .001$). The only cancer prevention behavior correlated with news consumption was cancer screening behavior, with reported reading of *La Viva* ($r = -.17$, $p = .094$). Health motivation showed a significant, positive relationship with all of the cancer prevention behaviors.

Hypotheses 1–4: diet and exercise behaviors

To determine if health motivation interacted with newspaper consumption to predict behavior above and beyond demographic characteristics and direct effects, six hierarchical linear regression analyses were run, one for each of the six cancer prevention and health behavior dependent variables. For all analyses, demographics (age, gender, education, citizenship, and insurance status) were entered in block one, acculturation variables in block two, health literacy in block three (to control for ability to navigate medical information), health motivation in block four, newspaper consumption of *La Viva* and *La Raza* were entered individually in block five, and the interaction terms for health motivation and consumption for the two newspapers were entered in the sixth and final block. Results are presented in Table 2. Variables were centered prior to creating interaction terms.

The first set of analyses examined behaviors related to diet. Regular fruit and vegetable consumption demonstrated significance only at the fourth block (health motivation), $R^2\Delta = .112$, $F(1, 82) = 10.63$, $p = .002$. In the final model with all variables and interaction terms, health motivation was the only significant predictor of fruit and vegetable consumption, but the final block was not significant. Thus, Hypothesis 1 was not supported.

Avoidance of fatty foods was significantly predicted in the final block, $R^2\Delta = .204$, $F(2, 76) = 3.696$, $p = .029$. The only significant predictor in that block was the interaction of health motivation and participant consumption of *La Raza* (see Table 3). Probing that interaction at ±1*SD* of the mean revealed that consumption of *La Raza* was positively related to avoiding fatty foods for those with high health motivation ($b = .83$, $SE = .34$), but the relationship was nonsignificant for those with average health motivation ($b = .27$, $SE = .21$) and low health motivation ($b = -.30$, $SE = .27$). Hypothesis 2 was supported.

The final diet-related behavior of eating a high fiber diet was significant at block one (demographics), $R^2\Delta = .171$, $F(5, 81) = 3.340$, $p = .009$, as well as block four (health motivation, $R^2\Delta = .123$, $F(1, 77) = 14.083$, $p < .001$. Only age, insurance, and health motivation

Table 2. Correlation matrix.

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
1. Read *La Viva*	1.00																	
2. Read *La Raza*	0.52***	1.00																
3. Age	−0.12	−0.10	1.00															
4. Gender	−0.00	0.07	−0.03	1.00														
5. Education	0.13	0.15	0.06	−0.06	1.00													
6. Citizenship	0.14	0.02	0.24*	−0.03	0.15	1.00												
7. Insurance	0.05	0.03	0.13	0.00	0.15	0.41***	1.00											
8. SASH-language	0.23*	0.28**	−0.05	−0.00	0.28**	0.32**	0.20^{+}	1.00										
9. SASH-media use	0.18^{+}	0.33**	−0.07	−0.01	0.36***	0.27**	0.24*	0.68***	1.00									
10. Health literacy	0.14	0.07	0.17	0.19	0.27**	0.14	0.06	0.09	0.04	1.00								
11. Health motivation	0.00	−0.08	0.19^{+}	0.20*	−0.11	0.03	0.09	−0.09	−0.18^{+}	−0.04	1.00							
12. GHS-F-V	−0.02	−0.01	0.06	0.08	0.03	−0.02	−0.03	−0.02	−0.04	0.05	0.33**	1.00						
13. GHS-avoid fat	−0.02	0.01	0.12	0.05	0.05	0.16	0.04	−0.08	0.05	−0.01	0.20*	0.20*	1.00					
14. GHS-hi fiber	−0.03	−0.03	0.28**	0.12	0.11	0.08	0.22*	0.14	0.11	0.22*	0.39***	0.47***	0.29**	1.00				
15. GHS-exercise	0.01	0.14	0.10	0.06	−0.06	0.06	0.00	−0.01	0.05	−0.18^{+}	0.40***	0.43***	0.29**	0.29**	1.00			
16. GHS-screening	−0.17^{+}	−0.03	0.32**	0.32**	0.37***	−0.06	0.02	−0.07	0.01	0.04	0.29**	0.17	0.11	0.20^{+}	0.28**	1.00		
17. GHS-smoking	−0.07	−0.07	0.08	0.08	0.17	−0.06	0.20*	−0.12	−0.18^{+}	0.36***	0.24*	0.02	0.09	0.19^{+}	0.06	0.10	1.00	

$^{+}p < .10$.
$^{*}p < .05$.
$^{**}p < .01$.
$^{***}p < .001$.

Table 3. Hierarchical regression results.

	Regularly Eat Fruits & Vegetables						Avoid Fatty Foods					
	B (SE)	*t*	*p*	Toler.	*sr*	$R^2\Delta$	*B* (SE)	*t*	*p*	Toler.	*sr*	$R^2\Delta$
1. Demographics						.019						.030
Age	.00 (.01)	0.370	.712	.821	.038		.01 (.01)	0.412	.682	.784	.043	
Gender	.05 (.33)	0.137	.891	.789	.014		.10 (.35)	0.296	.768	.866	.031	
Education	.15 (.27)	0.540	.591	.789	.057		.10 (.28)	0.357	.722	.784	.037	
Citizenship	.04 (.29)	0.129	.897	.636	.014		.31 (.31)	0.999	.321	.643	.104	
Insurance	−.22 (.28)	−0.800	.426	.746	−.084		−.14 (.29)	−0.463	.645	.749	−.048	
2. Acculturation						.001						.023
SASH-language	−.05 (.24)	−0.191	.849	.462	−.020		−.25 (.25)	−1.008	.317	.467	−.105	
SASH-media use	.05 (.19)	0.241	.810	.425	.025		.16 (.01)	0.801	.425	.432	.084	
3. Health literacy	.00 (.01)	0.080	.936	.795	.008	.001	−.00 (.01)	−0.009	.993	.787	−.001	.000
4. Health motivation	.64 (.20)	3.185	.002	.782	.334	.112	.27 (.21)	1.273	.207	.796		.036^{+}
5. Ethnic news						.007						.002
Read *La Viva*	−.10 (.15)	−0.646	.520	.594	−.068		−.13 (.17)	−0.782	.437	.520	−.082	
Read *La Raza*	.12 (.18)	0.640	.524	.527	.067		.10 (.20)	0.477	.635	.478	.050	
6. Interactions						.002						.080*
HM × read *La Viva*	.10 (.24)	0.398	.692	.796	.042		−.26 (.26)	−1.005	.318	.767	−.105	
HM × read *La Raza*	.02 (.25)	0.062	.951	.817	.006		.75 (.28)	2.716	.008	.799	.283	
	Eat a high fiber diet						Regular weekly exercise					
	B (SE)	*t*	*p*	Toler.	*sr*	$R^2\Delta$	*B* (SE)	*t*	*p*	Toler.	*sr*	$R^2\Delta$
1. Demographics						.171**						.017
Age	.02 (.01)	2.138	.036	.764	.201		.01 (.01)	0.692	.491	.772	.069	
Gender	.16 (.30)	0.516	.607	.839	.048		−.04 (.37)	−0.111	.912	.862	−.011	
Education	.12 (24)	0.494	.623	.741	.046		.02 (.31)	0.052	.959	.735	.005	
Citizenship	−.41 (.25)	−1.604	.113	.631	−.151		.06 (.32)	0.184	.854	.629	.018	
Insurance	.53 (.24)	2.177	.033	.733	.204		−.10 (.31)	−0.322	.748	.724	−.032	
2. Acculturation						.026						.006
SASH-language	.26 (.21)	1.281	.204	.469	.120		−.15 (.26)	−0.561	.576	.468	−.056	
SASH-media use	.09 (.16)	0.539	.592	.437	.051		.16 (.21)	0.772	.443	.432	.077	
3. Health literacy	.01 (.01)	0.928	.356	.797	.087	.005	−.02 (.01)	−1.670	.099	.797	−.167	.033^{+}
4. Health motivation	.53 (.18)	2.993	.004	.745	.281	.123***	.72 (.22)	3.295	.002	.783	.330	.144***
5. Ethnic news						.010						.025
Read *La Viva*	.13 (.13)	1.033	.305	.616	.097		−.12 (.17)	−0.742	.460	.606	−.074	
Read *La Raza*	−.11 (.16)	−0.712	.479	.556	−.067		.31 (.20)	1.577	.119	.548	.158	
6. Interactions						.021						.023
HM × read *La Viva*	−.11 (.21)	−0.516	.607	.782	−.048		−.32 (.26)	−1.209	.230	.801	−.121	
HM × read *La Raza*	.33 (.22)	1.529	.131	.861	.143		.33 (.28)	1.199	.234	.824	.120	

1. Demographics						.247***						.115+
Age	.05 (.01)	3.567	<.001	.775	.325		−.00 (.01)	−0.216	.829	.800	−.020	
Gender	1.50 (.38)	3.944	<.001	.858	.359		.08 (.31)	0.245	.807	.870	.023	
Education	.09 (.31)	0.292	.771	.789	.027		−.21 (.24)	−0.878	.383	.794	−.083	
Citizenship	−.52 (.33)	−1.574	.120	.638	−.143		−.45 (.27)	−1.679	.097	.634	−.159	
Insurance	.09 (.32)	0.281	.779	.746	.026		.65 (.25)	2.588	.012	.748	.245	
2. Acculturation						.011						.027
SASH-language	−.06 (.27)	−0.225	.822	.470	−.021		−.07 (.22)	−0.324	.746	.465	−.031	
SASH-media use	.19 (.21)	0.882	.380	.444	.080		−.11 (.17)	−0.610	.544	.431	−.058	
3. Health literacy	−.01 (.01)	−0.995	.323	.792	−.091	.010	.04 (.01)	4.021	<.001	.794	.380	.128***
4. Health motivation	.33 (.23)	1.421	.159	.815	.129	.023	.38 (.19)	2.022	.047	.771	.191	.035*
5. Ethnic news						.015						.005
Read *La Viva*	−.19 (.17)	−1.153	.252	.633	−.105		−.10 (.13)	−0.714	.477	.636	−.068	
Read *La Raza*	.03 (.20)	0.155	.877	.555	.014		.03 (.16)	0.208	.836	.581	.020	
6. Interactions						.045+						.001
HM × read *La Viva*	.16 (.28)	0.580	.563	.808	.053		.02 (.21)	0.114	.910	.815	.011	
HM × read *La Raza*	−.46 (.41)	1.988	.050	.798	.181		−.06 (.23)	−0.258	.797	.810	−.024	

Notes: Health motivation and ethnic newspaper consumption variables were centered to control for multicollinearity (see Cohen et al. 2003). Coefficients (*B*), standard errors (*SE*), *t*-values, *p*-values, and semi-partial correlation coefficients (*sr*) are for the final model in which all variables were entered. The $R^2\Delta$ column indicates the amount of variance explained for each block. Abbreviations in the table: SASH = short acculturation scale for Hispanics, Ethnic News = ethnic news consumption, HM = health motivation.

were significant individual correlates in the final model for participant report of having a high fiber diet. Hypothesis 3 was not supported.

For exercise at least three times a week, the regression analysis was significant at the fourth block (health motivations), $R^2\Delta = .144$, $F(1, 79) = 14.271$, $p < .001$. There were no individual significant predictors other than health motivation in the final model. Hypothesis 4 was not supported.

Hypothesis 5: participation in cancer screening

For general screening behavior, the first block (demographics) was significant, $R^2\Delta = .247$, $F(5, 86) = 5.640$, $p < .001$, and the final block (interaction of motivation and consumption) was marginally significant $R^2\Delta = .045$, $F(2, 78) = 2.724$, $p = .072$. Age, gender, and the health motivation by *La Raza* consumption interaction were significant in the final model. Probing that interaction at ±1*SD* of the mean revealed that consumption of *La Raza* was positively related to participation in cancer screening for those with high health motivation, $b = .85$, $SE = .30$, $t = 2.86$, $p = .005$. The relationship was nonsignificant for those with average health motivation ($b = .29$, $SE = .23$) and negative for those with lower health motivation ($b = -.27$, $SE = .37$). Hypothesis 5 was supported.

Hypothesis 6: smoking behavior

The final behavior of interest was smoking cessation. Regression models for smoking behavior were significant at the demographics block, $R^2\Delta = .115$, $F(5, 85) = 2.198$, $p = .062$, the health literacy block, $R^2\Delta = .128$, $F(1, 82) = 14.410$, $p < .001$, and health motivation, $R^2\Delta = .035$, $F(1, 81) = 4.107$, $p = .046$. The interaction of health motivation and ethnic newspaper consumption did not correlate with smoking behavior in the final block of the model. Hypothesis 6 was not supported.

Discussion

The purpose of the present study was to investigate whether there was a relationship between exposure to ethnic newspapers and cancer prevention behaviors. Prior to this study, no studies focused on establishing this basic link that is essential to future research in this area. Results indicate that there is a modest relationship between the constructs and behaviors of interest. Health motivation consistently predicted most cancer prevention behaviors and the interaction of health motivation and cancer news consumption of *La Raza* predicted lower consumption of fatty foods and cancer screening.

Non-behavioral correlates of ethnic newspaper consumption included only the two acculturation-related variables. Modest associations between ethnic newspaper consumption and health behaviors help move forward our understanding of health news among underserved populations. Past research has not identified a direct effect of news consumption or exposure on cancer prevention behaviors (Stryker, Moriarty, and Jensen 2008). Some behaviors did seem to be related to ethnic newspaper consumption and could link to differences in coverage. There was a modest positive association between consumption of *La Raza* and exercise, although the correlation was not significant. The negative association between screening and *La Viva* consumption could be related to less positive

coverage of secondary prevention news stories in that paper, but these current data are unable to fully explore that possibility. Other explanations for the negative association could be there are different demographic or geographic characteristics of the typical readers of the two papers.

Health motivation's moderating role on the effects of ethnic newspaper consumption on certain health behaviors is an encouraging finding that requires further investigation. As noted, the interaction between health motivation and newspaper consumption to predict cancer screening and avoidance of fatty foods is helpful to health communication researchers. These behaviors are closely related to the prevention of breast and colon cancer, which are commonly diagnosed cancer types for Latinos in the United States (American Cancer Society 2015). Because of this, health communication researchers should continue their consideration of how to use ethnic newspapers as an outlet for promoting primary and secondary prevention. Likely, the more difficult task will be simultaneously increasing motivation and attention along with promoting ethnic newspaper exposure and consumption, given that the positive effects of ethnic news consumption were only present in participants with high health motivation.

Focusing on helping journalists report accurate and complex scientific information about cancer, while defaulting to those writers' expertise in crafting news stories that appeal to their readership, seems like a powerful way to promote cancer prevention behaviors in populations served by these specialized news information outlets. Health communication researchers could also provide journalists with strategies to include motivational news story elements, such as anecdotes and exemplars that could improve story quality and health motivation. Future research might focus on the role that ethnic newspaper publishers, editors, and writers feel they have in promoting healthy lifestyles and well-being to their audience. Assuming that these individuals are interested in their audiences' personal health, collaboration between the papers and researches could be very productive.

The results also support the inclusion of health motivation in research related to the CMM in health contexts. The CMM provides a simple theoretical basis for future research on cancer coverage in ethnic newspapers. Considering other tenets of the theory can provide direction for interventions aimed at increasing journalist, editor, publisher, and consumer awareness of how to assist in being a part of efficient communication about cancer control.

Limitations

The current findings are promising, but this study is not without limitations. Our sample included only 100 individuals because of the difficulties associated with recruiting Spanish-speaking, low-income individuals. We did not collect information about where formal education took place or how many years the participants lived in the United States; such information could have offered additional insights. The analyses used (multiple regression) should have larger sample sizes to ensure that the relationships for which there is evidence appear in the data meaningfully and not spuriously. Health behavior specific motivation (e.g. motivation to get screened or eat five fruits and vegetables), rather than the general construct, could also be explored. Another potential construct limitation is this study's measure of consumption using self-reported items that accounted

for general frequency of exposure to two specific papers, which may not fully capture variance of exposure, or exposure to other ethnic and mainstream newspapers. An additional measurement concern is the self-reporting of health behavior performance. Finally, the use of a less stringent cutoff point for statistical results ($p < .10$) means that relationships found may not actually exist. As noted earlier, we urge researchers to consider both the p values and effect sizes when considering the evidence presented in this paper.

Conclusion

This study contributes to an important line of research on public health information. The present study provides evidence that ethnic newspaper consumption is associated with improved self-reported health behaviors for motivated individuals, and amplifies the effect of health motivation on certain health outcomes. Unlike other studies in this area, the sample was composed of low-income participants, whose primary language was not English. This subpopulation would be expected to be the core audience of Spanish-language newspapers. Research with this population is essential, but often difficult to conduct. In general, more research needs to be done to examine what variables and strategies can lead to the most effective communication about cancer in the public sphere (Hesse 2009), particularly with traditionally underserved groups like those in the present study's sample. Focusing on the role of cognitive and affective variables that might moderate and/or mediate the relationship of news consumption and health behavior will benefit a range of health communication researchers and practitioners, and contribute greatly to cancer control initiatives. Ethnic newspapers seem to provide a potential outlet for promoting behavioral change through health communication initiatives, as well as a tool to help reduce health and information disparities in traditionally underserved populations.

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References

Abraido-Lanza, A. F., M. T. Chao, and K. R. Florez. 2005. "Do Healthy Behaviors Decline with Greater Acculturation? Implications for the Latino Mortality Paradox." *Social Science & Medicine* 61: 1243–1255.

Aguirre, A. C., N. Ebrahim, and J. A. Shea. 2005. "Performance of the English and Spanish S-TOFHLA among Publicly Insured Medicaid and Medicare Patients." *Patient Education & Counseling* 56: 332–339.

American Cancer Society. 2015. *Cancer Facts and Figures for Hispanics/Latinos: 2015–2017*. Atlanta, GA: American Cancer Society.

Avci, I. A. 2008. "Factors Associated with Breast Self-Examination Practices and Beliefs in Female Workers at a Muslim Community." *European Journal of Oncology Nursing* 12: 127–133.
Blue, C. L., and J. M. Valley. 2002. "Predictors of Influenza Vaccine: Acceptance among Healthy Adult Workers." *AAOHN Journal: Official Journal of the American Association of Occupational Health Nurses* 50 (5): 227–233.
Champion, V. L. 1993. "Instrument Refinement for Breast Cancer Screening Behaviors." *Nursing Research* 42: 139–143.
Chesser, A. K., N. Keene Woods, J. Wipperman, R. Wilson, and F. Dong. 2014. "Health Literacy Assessment of the STOFHLA: Paper Versus Electronic Administration Continuation Study." *Health Education & Behavior* 41: 19–24.
Ciampa, P. J., R. O. White, E. M. Perrin, H. S. Yin, L. M. Sanders, E. A. Gayle, and R. L. Rothman. 2013. "The Association of Acculturation and Health Literacy, Numeracy and Health-Related Skills in Spanish-Speaking Caregivers of Young Children." *Journal of Immigrant and Minority Health* 15: 492–498.
Close, S., A. Do, J. Ponce de Leon, and E. Schumacher. 2006, August 21. "What's Next for the Ethnic Media? A Pew Research Center Project for Excellence in Journalism Roundtable." http://www.journalism.org/node/1479.
Cohen, E. L., C. A. Caburnay, D. Luke, S. Rodgers, G. T. Cameron, and M. W. Kreuter. 2008. "Cancer Coverage in General-Audience and Black Newspapers." *Health Communication* 23: 423–435.
Cohen, J., P. Cohen, S. G. West, and L. S. Aiken. 2003. *Applied Multiple Regression/Correlation Analysis for the Behavioral Sciences*. 3rd ed. Mahwah, NJ: Erlbaum.
Dunn-Navarra, A.-M., M. S. Stockwell, D. Meyer, and E. Larson. 2012. "Parental Health Literacy, Knowledge and Beliefs Regarding Upper Respiratory Infections (URI) in an Urban Latino Immigrant Population." *Journal of Urban Health* 89: 848–860.
Eveland, W. P., Jr. 2001. "The Cognitive Mediation Model of Learning From the News: Evidence From non-Election, off-Year Election, and Presidential Election Contexts." *Communication Research* 28: 571–601.
Freimuth, V. S., R. H. Greenberg, J. DeWitt, and R. M. Romano. 1984. "Covering Cancer: Newspapers and the Public Interest." *Journal of Communication* 34: 62–73.
Freimuth, V. S., and S. C. Quinn. 2004. "The Contributions of Health Communication to Eliminating Health Disparities." *American Journal of Public Health* 94: 2053–2055.
Friedberg, J. P., M. A. Rodriguez, M. E. Watsula, I. Lin, J. Wylie-Rosett, J. P. Allegrante, S. R. Lipsitz, and S. Natarajan. 2014. "Effectiveness of a Tailored Behavioral Intervention to Improve Hypertension Control: Primary Outcomes of a Randomized Controlled Trial." *Hypertension* 65: 440–446.
Graber, D. A. 1988. *Processing the News: How People Tame the Information Tide*. New York: Longman.
Hesse, B. W. 2009. "Cancer Communication: Status and Future Directions." *Journal of Health Communication* 14: 109–127.
Hoffman-Goetz, L., and D. B. Friedman. 2005. "Disparities in Coverage of Cancer Information in Ethnic Minority and Mainstream Print Media." *Ethnicity & Disease* 15: 332–340.
Jensen, J. D. 2011. "Knowledge Acquisition Following Exposure to Cancer News Articles: A Test of the Cognitive Mediation Model." *Journal of Communication* 61: 514–534.
Jensen, J. D., C. M. Moriarty, R. J. Hurley, and J. E. Stryker. 2010. "Making Sense of Cancer News Coverage Trends: A Comparison of Three Comprehensive Content Analyses." *Journal of Health Communication* 15: 136–151.
Lin, W.-Y., and H. Song. 2006. "Geo-ethnic Storytelling: An Examination of Ethnic Media Content in Contemporary Immigrant Communities." *Journalism* 7: 362–388.
Marin, B. V., R. Otero-Sabogal, and E. J. Perez-Stable. 1987. "Development of a Short Acculturation Scale for Hispanics." *Hispanic Journal of Behavioral Sciences* 9: 183–205.
Moser, D. K., S. Robinson, M. J. Biddle, M. M. Pelter, T. S. Nesbitt, J. Southard, L. Cooper, and K. Dracup. 2015. "Health Literacy Predicts Morbidity and Mortality in Rural Patients with Heart Failure." *Journal of Cardiac Failure* 21: 612–618.
Niederdeppe, J., D. L. Frosch, and R. C. Hornik. 2008. "Cancer News Coverage and Information Seeking." *Journal of Health Communication* 13: 181–199.

Nigg, C. R., P. M. Burbank, C. Padula, R. Dufresne, J. S. Rossi, W. F. Velicer, R. G. Laforge, and J. O. Prochaska. 1999. "Stages of Change Across Ten Health Risk Behaviors for Older Adults." *The Gerontologist* 39: 473–482.

Parker, R., D. Baker, M. Williams, and J. Nurss. 1995. "The Test of Functional Health Literacy in Adults (TOFHLA): A new Instrument for Measuring Patients" Literacy Skills." *Journal of General Internal Medicine* 10: 537–541.

Registe, M., and S. P. Porterfield. 2012. "Health Beliefs of African American Women on Breast Self-Exam." *Journal for Nurse Practitioners* 8: 446–451.

Schumm, W. R., K. K. Pratt, J. L. Hartenstein, B. A. Jenkins, and G. A. Johnson. 2013. "Determining Statistical Significance (Alpha) and Reporting Statistical Trends: Controversies, Issues, and Facts." *Comprehensive Psychology* 2: 10.

Sentell, T., and K. Braun. 2012. "Low Health Literacy, Limited English Proficiency, and Health Status in Asians, Latinos, and Other Racial/Ethnic Groups in California." *Journal of Health Communication* 17 (Suppl 3): 82–99.

Slater, M. D., A. F. Hayes, J. B. Reineke, M. Long, and E. P. Bettinghaus. 2009. "Newspaper Coverage of Cancer Prevention: Multilevel Evidence for Knowledge-gap Effects." *Journal of Communication* 59: 514–533.

Slater, M. D., M. A. Long, E. P. Bettinghaus, and J. B. Reineke. 2008. "News Coverage of Cancer in the U.S.: A National Sample of Newspapers." *Journal of Health Communication* 13: 523–537.

Smith, P. C., J. H. Brice, and J. Lee. 2012. "The Relationship Between Functional Health Literacy and Adherence to Emergency Department Discharge Instructions among Spanish-Speaking Patients." *Journal of the National Medical Association* 104: 521–527.

Stryker, J. E., K. M. Emmons, and K. Viswanath. 2007. "Uncovering Differences Across the Cancer Control Continuum: A Comparison of Ethnic and Mainstream Cancer Newspaper Stories." *Preventive Medicine* 44: 20–25.

Stryker, J. E., J. Fishman, K. M. Emmons, and K. Viswanath. 2009. "Cancer Risk Communication in Mainstream and Ethnic Newspapers." *Preventing Chronic Disease* 6: A23.

Stryker, J. E., C. M. Moriarty, and J. D. Jensen. 2008. "Effects of Newspaper Coverage on Public Knowledge About Modifiable Cancer Risks." *Health Communication* 23: 380–390.

Sun, Y., J. D. Jensen, L. M. Guntzviller, and M. Liu. 2014. "Perceived Message Influence and Hispanic Women: The Disappearance of Self-Other Perceptual Bias." *Hispanic Journal of Behavioral Sciences* 36: 366–382.

Umeh, K., and J. Rogan-Gibson. 2001. "Perceptions of Threat, Benefits, and Barriers in Breast Self-Examination Amongst Young Asymptomatic Women." *British Journal of Health Psychology* 6: 361–372.

Viswanath, K. 2006. "Public Communications and its Role in Reducing and Eliminating Health Disparities." In *Examining the Health Disparities Research Plan of the National Institutes of Health: Unfinished Business*, edited by G. E. Thompson, F. Mitchell, and M. B. Williams, 215–253. Washington, DC: Institute of Medicine.

Viswanath, K., and K. K. Lee. 2007. "Ethnic Media in the United States." In *The new Americans*, edited by M. C. Waters, and R. Ueda, 202–213. Cambridge, MA: Harvard University Press.

Wang, Y., and S. Rodgers. 2013. "Reporting on Health to Ethnic Populations: A Content Analysis of Local Health News in Ethnic Versus Mainstream Newspapers." *Howard Journal of Communications* 24: 257–274.

Wilkin, H. A., and S. J. Ball-Rokeach. 2006. "Reaching at Risk Groups: The Importance of Health Storytelling in Los Angeles Latino Media." *Journalism* 7: 299–320.

Yin, H. S., L. M. Sanders, R. L. Rothman, A. L. Mendelsohn, B. P. Dreyer, R. O. White, J. P. Finkle, S. Prendes, and E. M. Perrin. 2012. "Assessment of Health Literacy and Numeracy Among Spanish-speaking Parents of Young Children: Validation of the Spanish Parental Health Literacy Activities Test (PHLAT Spanish)." *Academic Pediatrics* 12: 68–74. doi:10.1016/j.acap.2011.08.008.

Zajacova, A. 2012. "Health in Working-Aged Americans: Adults with High School Equivalency Diploma are Similar to Dropouts, not High School Graduates." *American Journal of Public Health* 102 (Suppl 2): S284–S290.