Web appendix for "The Role of Social Networks in Influenza Vaccine Attitudes and Intentions Among College Students in the Southeastern United States"

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This web appendix provides additional detail on measures and results presented in the article "The Role of Social Networks in Influenza Vaccine Attitudes and Intentions Among College Students in the Southeastern United States."

1 Survey instrument and measures

We collected social network data using a name generator process that is often used to collect information on survey respondents' contacts. Following a standard approach, we asked respondents to identify up to four individuals with whom they discuss health matters and to describe their relationship with that person. The potential relationships were described as "Parent," "Friend," "Spouse," "Sibling," or "Relative." Our 2009 question battery included a question which asked "Do you think that person supports others getting vaccinated for the H1N1 flu, which is sometimes called 'swine flu'?" [Yes (1)/Maybe (0)/No (-1)]. The procedures were the same in the Fall 2010 sample, but the question on vaccine attitudes was changed to "Do you think that person supports others getting vaccinated for the seasonal flu during this flu season (fall 2010-spring 2011)?" [Yes (1)/Maybe (0)/No (-1)]. We created our *Network support* measure by summing the responses to this question for up to four health discussants named by the respondent. We also created measures of *Spousal support*, *Parental support*, *Friend support*, and *Relative support* by disaggregating *Network support* by type of relationship (we combined siblings and relatives).

We also control for two measures of institutional trust. First, trust in health organizations may influence beliefs about vaccines. We measure trust in the health establishment with a battery of questions that ask "How much do you trust the institutions listed to do the right thing most of the time?" on a seven-point scale from "Distrust fully" (1) to "Trust fully" (7). The institutions listed were: Centers for Disease Control, nurses, hospitals, doctors, pharmaceutical companies, scientists, the public health office in your hometown, and health insurance companies. We measure *Health trust* as the average of these items (Cronbach's alpha: 0.86 in 2009, 0.85 in 2010). In addition, since public health campaigns are often promoted by government agencies, trust in government may affect willingness to be vaccinated. We measure *Government trust* with a question asking "How much of the time do you think you can trust the federal government in Washington to make decisions in a fair way?" Responses were measured on a five-point scale from "Never" (1) to "Very often" (5).

Additionally, we measured several other demographic attributes and attitudes that may influence attitudes towards vaccines. First, *ideology* influence attitudes toward government health policies. We measure it on a seven-point scale from "Very liberal" (1) to "Very conservative" (7). The models reported below also control for *Age* and include indicator variables for respondents who are *Female*, *Black*, *Asian*, *Multiracial*, or *Hispanic*. Finally, while our respondents have similar levels of educational achievement, some may be more inclined to accept evidence of vaccine safety as a result of taking science courses. We control for the number of *Science courses* taken by

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the respondent on a five-point scale ranging from 0 (no college-level science courses) to 4 (four or more).

2   Statistical analysis

Since our dependent variables (*Vaccine safety* and *Vaccine intention*) are ordinal, we use ordered logistic regression models. Ordered logistic models assume the log-odds that the dependent variable takes the category k or less are independent of k. This is known as the "proportional odds" assumption.

3   An alternate measure of network support

The article reports results using a measure of *Network support* that ranges from -4 to 4. These values represent net support or opposition to vaccination among the respondent's health discussants (up to four could be named). One concern is that this measure may be distorted by differences in the size of respondents' discussion networks. Based on the helpful suggestion of a reviewer, we therefore created an alternate measure representing the *proportion* of a respondent's health discussion network supporting or opposing vaccination (ranging from -1 where all network members oppose to 1 where all network members support). We then estimated identical models to those presented in Table 1 of the article. As in the text, the results are reported below in adjusted odds ratio form. Our findings are virtually identical those reported in the article—the proportion of network support for vaccination

reported by a respondent is strongly associated with *Vaccine safety* and *Vaccination intention* in both the 2009 and 2010 data.

Table 1: Ordered logistic regressions of influenza vaccine beliefs and intentions by health discussant type

	Vaccine safety		Vaccination intention	
	2009	2010	2009	2010
Network support (prop.)	4.92*	3.71*	3.38*	2.90*
	[3.32,7.30]	[2.69,5.12]	[2.34,4.89]	[2.12,3.95]
Health trust	1.60*	1.39*	1.53*	1.25*
	[1.21,2.12]	[1.12,1.71]	[1.13,2.09]	[1.00,1.55]
Government trust	1.34	1.49*	1.03	0.98
	[0.96,1.86]	[1.13,1.96]	[0.75,1.42]	[0.74,1.30]
Ideology	1.20*	1.06	0.95	1.14*
	[1.03,1.40]	[0.94,1.20]	[0.82,1.11]	[1.01,1.30]
Age	0.97	1.01	1.01	0.99
	[0.92,1.03]	[0.96,1.05]	[0.95,1.08]	[0.95,1.03]
Male	1.31	1.61*	1.29	1.25
	[0.80,2.16]	[1.08,2.40]	[0.79,2.10]	[0.84,1.86]
Black	0.51*	0.78	1.52	1.10
	[0.31,0.86]	[0.52,1.18]	[0.90,2.56]	[0.73,1.65]
Asian	0.71	1.08	3.84*	3.38*
	[0.37,1.38]	[0.63,1.84]	[1.98,7.45]	[1.94,5.89]
Multiracial	0.84	0.65	0.51	1.49
	[0.37,1.90]	[0.22,1.88]	[0.19,1.33]	[0.53,4.16]
Hispanic	0.60	0.83	1.67	1.46
	[0.28,1.29]	[0.49,1.39]	[0.75,3.71]	[0.87,2.44]
Science courses	0.89	1.18*	1.04	0.97
	[0.73,1.09]	[1.00,1.38]	[0.84,1.28]	[0.82,1.14]
Log-likelihood	-275.59	-428.79	-374.99	-607.82
N	307	525	281	429

This table reports adjusted odds ratios and 95% confidence intervals from the full models estimated in ordered logistic regressions. Cutpoints are omitted. * $p < .05$