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## Speaking of Values: Value-Expressive Communication and Exercise Intentions

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### ABSTRACT

This study introduces the concept of value-expressive communication and examines its relationship with behavioral intent. Value-expressive communication is conceptualized as the verbal output of a value-expressive attitude. Value-expressive communication about exercise is examined in relationship to strength of religious faith, exercise attitudes, communication frequency, and intentions to exercise among a sample of self-identified Christians. The data indicate a significant interaction between value-expressive communication and communication frequency explains significant variance in exercise intentions. Interact to and exercise attitudes is significantly associated with intentions to exercise. Suggestions for using value-expressive communication in health communication research and practice are discussed.

Communication scholars have used the functional approach to attitudes (Katz, 1960) to improve message design (Carpenter, 2012; Hullett, 2004), to model persuasive message processing (Lapinski & Boster, 2001; see Carpenter et al., 2013 for a review of the approach), and to predict social media use (Wang, 2015). The functional approach has been used for functional matching of messages to promote health behaviors including disease screening (Hullett, 2004, 2006), organ donation (Knox et al., 2017), and mental health help-seeking (Kim, 2016). However, the relevance of the functional approach for health communication could be enhanced by examining how attitude functions are expressed through verbal communication. As such, the current study introduces the concept of value-expressive communication, a communicative reflection of a value-expressive attitude. Value-expressive communication (VEC) is conceptualized as the expression of personal values [i.e., relatively enduring beliefs about achieving end states that guide people's lives (Rokeach, 1973)] through verbal communication about an attitude. This study creates and tests a quantitative measure of VEC, provides preliminary evidence for the scale's validity and reliability, and links this variable to behavioral intentions. Specifically, this study examines VEC about exercise, and its relationship to exercise intentions.

Exercise is important and beneficial to health – regardless of size, weight, age, or other characteristics (Bacon, 2010). However, population-specific barriers to exercise exist; for example, Anderson (2011) found that self-identified Christians experience at least one value-based barrier to exercise: tensions that prevent exercise behavior from being reconciled with religious values and beliefs. Although our theory assumes that value expression occurs among all groups of people, this study focused on Christians because: 1) there is a consistent set of values attached to religious faiths making value similarity among people who identify with that religion more likely than it might be in a sample drawn from the

general population (Schwartz & Huismans, 1995); and 2) prior qualitative evidence suggests Christians are likely to express their values related to exercise through verbal communication (Anderson). In this study, we extend Anderson's work to measure value expressiveness and test its association with attitudes and behavioral intentions.

### Value-expressive communication

What we term *value-expressive communication* (VEC) is a conceptual extension of Katz's (1960) value-expressive attitude function from the functional theory of attitudes that follow Rokeach and Schwartz in conceptualizing values as the relatively enduring beliefs about achieving end states that guide people's lives (Rokeach, 1973; Schwartz & Huismans, 1995). Functional theory posits that people hold attitudes for different reasons including defending the self from threats, helping to make sense of the world, affiliating with others, and maximizing positive outcomes (Katz, 1960; Herek, 1987). Attitudes that serve the *value-expressive function* allow individuals to express their personal values and gain satisfaction from the expression of those values (Hullett & Boster, 2001; Smith et al., 1956). Value-expressive attitudes also predict behavioral intentions (Maio & Olson, 1995; Wang, 2015); perhaps because people are inclined to achieve and maintain consistency between their values and their actions (Bardi & Schwartz, 2003; Rokeach) and values underlie value-expressive attitudes.

The term *value-expressiveness* is used here to capture the degree to which individuals' attitudes toward a given object allow them to verbally communicate their personal values to others; highlighting the uniquely communicative nature of the value-expressive function of attitudes. That is, contrary to previous conceptualizations of the value-expressive function that posit value-expressive attitudes need not be publicly expressed (Herek, 1987; Hullett, 2002; Smith et al., 1956), we argue that

a central characteristic of value-expressive attitudes is their public expression by the person who holds them. One way to examine this public expression is through analyzing messages online. Following from seminal research on values (Rokeach, 1973; Schwartz & Huismans, 1995), Shifman (2016) observed that personal values are communicated through online user-generated content, sometimes even incorporating contradictory values within the same message. In fact, Shifman (2019) argues that “values spread and materialize through communication: they are formed through words, movies, and TV shows” (p. 49). Yet Shifman stops short of explicating *how* values are expressed through interpersonal verbal communication.

The emphasis on communication as the public disclosure of value-expressive attitudes distinguishes *value-expressiveness* from earlier work that centered on the *value-relevance* of an attitude (Hullett, 2002). As discussed above, Hullett used value-relevance as an indication of the perceived utility of an attitude to achieve a desired end-state. It is a direct measure of the relationship between a specific value and a specific attitude, rather than a measure of the expression of attitudes that are linked to personal values. Concentrating on the *value-expressiveness* of an attitude rather than value-relevance allows communication behavior to take center stage in considering the relationship between values, attitudes, and behaviors. This is because *value-expressiveness* focuses on the ways that people use their attitudes to communicate to others about their personal values. Concentrating on value-expressiveness moves the study of value-expressive attitudes beyond the realm of establishing the existence and nature of cognitive links between values and attitudes into the realm of exploring how a person uses communication to share a value-expressive attitude.

Value-expressive attitudes could be conveyed through both verbal and nonverbal communications (e.g., in the case of exercise: jogging in one’s neighborhood or wearing athletic clothing). The concept of VEC focuses on verbal, rather than nonverbal, communication of value-expressive attitudes. Yet, we acknowledge that one’s value expressive attitude can also be communicated nonverbally. This is especially important to consider when dealing with value-expressive attitudes toward a behavior, since behavior can nonverbally communicate value-expressive attitudes. Still, VEC remains distinct from exercise behavior, because it need not be related to either the *ways* that a person speaks that about exercise (i.e., VEC). That is, whether a person exercises frequently or infrequently, their communication about exercise may feature their personal values, e.g., “Exercise helps me stay more balanced, which improves my mental health,” or lack such a connection, e.g., “I see my friends at the gym all the time,” or “Thursdays are my leg days.”

Value-expressive communication also shares some conceptual space with additional constructs beyond value-expressive attitudes, such as communication of non-value-expressive attitudes, behavior, and communication frequency. To understand the difference between communication about a basic attitude (i.e., an attitude that does not serve a value-expressive function) and a value-expressive attitude, consider the following illustration. Attitude, for our purpose here, is conceptualized as evaluations of some attitude object (Eagly & Chaiken, 1993). One’s attitude toward exercise may not be linked with personal values, and this would be reflected in one’s communication about exercise with

comments such as: “I like exercise” or “I don’t like exercise.” However, if the attitude is value-expressive (that is, linked with a personal value like self-discipline), then value-expressive communication about that attitude may take a form like, “I like exercise, because it helps me develop self-discipline.” This second example illustrates value-expressive communication because the discourse links the attitude object to a personal value.

### **VEC and communication frequency**

Furthermore, we argue that VEC as a theoretical construct is conceptually distinct from communication frequency. In the current study, we are interested in the nature, or characteristics, of communication about exercise. Thus, we were not concerned with *how often* a person speaks about exercise but *the way in which* they speak about it – specifically whether their communication about exercise featured their personal values. Building on the argument above, we contend that regardless of exercise frequency, a person’s communication frequency about the topic may be high or low, and that communication may or may not be classified as value-expressive. Thus, the level of value-expressiveness should not differ for any combination of exercise frequency and communication frequency.

For example, a person who rarely talks about exercise, whether they exercise frequently or not, may be prompted to do so in response to required participation in a workplace wellness program. Their communication about attitudes toward exercise with respect to the workplace wellness program may emphatically feature their personal values. For example, they may invoke their personal beliefs and values about professionalism or the boundaries between work and personal life in ways that clearly express their negative attitudes toward exercise through value-expressive communication. As another example, a person exercises infrequently, whether they talk about exercise frequently or not, may never include their personal values in such communication.

In conclusion, the concept of VEC deals with one aspect (value-expressiveness) of the *nature of communication* about exercise, irrespective of one’s behavior, communication frequency, or attitudes toward exercise. In other words, VEC is not reliant on a person’s attitude (positive or negative), the frequency of their behavior, or their frequency of communication about the attitude object. Therefore, VEC captures a unique characteristic of communication in ways that these concepts do not, because it focuses on the extent to which personal values appear in a person’s communication about exercise attitudes, when such communication occurs.

In the current study, we not only introduce the concept of VEC, but also present a measure designed to operationalize it. Thus, beyond the conceptual argument presented above, we aim to provide some initial empirical evidence of scale validity. First, following a test of scale reliability, we will use confirmatory factor analysis to determine whether the scale is unidimensional. Next, we will use tests of parallelism to empirically demonstrate the distinction between VEC and communication frequency.<sup>1</sup> In that vein, we propose the following hypotheses:

H1: The measure of VEC will be unidimensional.

H2: The measure of VEC will be parallel to the measure of communication frequency.

### VEC and Christians

Value-expressive communication is relevant to our study sample of self-identified Christians, because previous research has demonstrated that Christian discourse about exercise has links to personal values (Schwartz & Huisman, 1995). Anderson (2011) found that Christian discourse about exercise often evoked instrumental values like discipline or achievement (Schwartz, 1992). For example, some Christians characterized exercise as a way to develop personal and spiritual discipline or as a way to achieve personal goals such as weight loss (Anderson). Participants in that study indicated that their communication about exercise impacted their exercise behavior, but the research design did not allow for a test of the empirical relationship between VEC and exercise behavior. The current study seeks to establish that connection by measuring VEC and exercise behavior in a Christian sample.

Religious beliefs and personal values are closely linked (Schwartz & Huisman, 1995), so it is important to measure both in order to account for their differential effects on exercise attitudes and intentions within a religious sample. *Strength of religious faith* (SRF) is the extent to which a person has integrated, and relies on, his or her religious faith in daily life, regardless of religious affiliation (Lewis et al., 2001; Plante & Boccaccini, 1997). Because VEC expresses personal values that are related to religious beliefs, this study predicts that:

H3: Strength of religious faith will be positively associated with VEC.

The central argument of this study is that VEC will be parallel to, and related to, exercise intentions. This argument is based on previous research that indicates beliefs (Fishbein & Ajzen, 1975), personal values (Bardi & Schwartz, 2003; Rokeach, 1973), value-expressive attitudes (Maio & Olson, 1995), and communication (Dorsey et al., 1999; Noar et al., 2006) are positively related to behavioral intentions. Thus, along with attitudes, VEC should be positively related to exercise intentions, such that:

H4: VEC and attitudes will be positively related to exercise intentions.

H5: VEC and attitudes will each explain unique variance in exercise intentions when controlling for known covariates.

## Method

### Procedure

All study materials<sup>3</sup> were approved by the institutional review board. Participants were recruited through churches and campus ministries in a mid-sized midwestern city. Participants completed an anonymous online survey measuring demographic variables, strength of religious faith, value-expressive

communication, exercise attitudes, and exercise intentions. As an incentive, participants had the option to enter a drawing to receive one of ten 25 USD gift cards to Amazon.com. To maintain participant anonymity, participants wishing to be eligible to receive the incentive used a link to a separate online survey that collected their contact information. Their personal information was never linked to their responses.

### Sample

The sample included  $N = 155$  participants. The average age of participants was 31.79 years ( $SD = 15.69$  years). Because age was positively skewed ( $skew = 1.38$ ,  $SE = .195$ ), we used a less-skewed log transformation of age ( $skew = .914$ ,  $SE = .195$ ) in all analyses. The sample was predominantly female (65.2%) and Caucasian (89%), with 3.9% African Americans, .6% Hispanics, 1.9% Asian, 3.9% Pacific Islander or Native Hawaiian, and .6% multiracial. The sample was primarily Evangelical (58.7%), and was also made up of 20% Mainline Protestant, 7.7% Catholic, 4.5% nondenominational, 3.2% Latter-Day Saints, and 5.2% other. Participants rated themselves as fairly healthy ( $M = 7.27$ ,  $SD = 1.48$ ) on a one-item measure of perceived individual health, with a response range from 1 (very unhealthy) to 10 (very healthy).

### Measurement

All measures were drawn from existing scales with the exception of the value-expressiveness scale which was created for the present study. In order to provide evidence for construct validity, face validity of the items was assessed by examining item content match to construct conceptual definition and confirmatory factor analysis, including tests for parallelism (Hunter & Gerbing, 1982).

### Value-expressive communication

A 5-item, researcher-generated Likert-type scale measured the degree to which participants' communication about exercise, regardless of its frequency, incorporates their personal values. The items are shown in Appendix A. The response scale ranged from 1 (strongly disagree) to 10 (strongly agree). The scale was found to be unidimensional,  $\chi^2(5, 248) = 40.79$ ,  $p < .001$ ; CFI = .95; SRMR = .04; and reliable,  $\alpha = .89$ . Thus, the data were consistent with Hypothesis 1. Participants reported a moderate amount of value-expressive communication about exercise,  $M = 6.09$  ( $SD = 1.96$ ).

### Strength of religious faith

The Santa Clara strength of religious faith questionnaire (SCSRFQ, Plante & Boccaccini, 1997) measured the extent to which a person has integrated, and relies on, his or her faith in daily life. The SCSRFQ consists of 10 items that measure strength of religious faith regardless of denomination. Example items include "My religious faith is important to me" and "My faith impacts many of my decisions." The response scale ranges from 1 (strongly disagree) to 10 (strongly agree). The scale was found to be a unidimensional,  $\chi^2(35, 257) = 208.56$ ,  $p < .001$ ; CFI = .96; SRMR = .02; and reliable,  $\alpha =$

.98. Strength of religious faith was fairly high in this sample,  $M = 8.75$  ( $SD = 1.91$ ).

### Exercise attitudes

Exercise attitudes were measured using a 6-item bipolar adjective scale with a response range from 1 to 10 modeled after Fishbein and Ajzen (1975) recommendations for attitude measurement. CFA indicated that two items failed to fit a unidimensional measurement model; after removing these two items from the scale, it was found to be unidimensional,  $\chi^2(2, 248) = 2.99, p = .22$ ; CFI = .99; SRMR = .01 and reliable,  $\alpha = .89$ . Exercise attitudes were positive,  $M = 7.98$  ( $SD = 1.78$ ).

### Exercise intentions

Exercise intentions were measured with an extended version of Jones et al.'s (2007) 2-item measure of exercise intention. The two items from Jones et al.'s scale are: "I plan to exercise regularly over the next month" and "I plan to exercise at least three times a week over the next month." The two added items assess intention over a shorter time period: "I plan to exercise regularly over the next two weeks" and "I plan to exercise at least three times a week over the next two weeks." The response scale ranged from 1 (strongly disagree) to 10 (strongly agree). The scale was found to be unidimensional,  $\chi^2(2, 155) = 27.04, p < .001$ ; CFI = .97; SRMR = .01 and reliable,  $\alpha = .98$ . Participants had fairly strong intentions to exercise,  $M = 7.43$  ( $SD = 2.93$ ).

### Frequency of communication about exercise

A 3-item, researcher-generated Likert-type scale measured the frequency of participants' communication about exercise. This scale measures how often a person talks about exercise, regardless of the way they talk about it. The measure of frequency of communication about exercise included the stem "how often do you talk about exercise with ..." and then indicated either friends, family, or a significant other (if participants had previously indicated having a significant other). Responses were provided on a 10-point Likert-type scale (1 = very infrequently, 10 = very frequently,  $M = 6.23, SD = 2.29$ ). This scale was reliable ( $\alpha = .84$ ) and unidimensional.

## Results

### Preliminary analyses

#### Test for parallelism

We conducted a test for parallelism between the measures of VEC and communication frequency, in order to provide empirical evidence of the distinction between these concepts

as they were operationalized in this study. The results of this test are presented in Table 1. Our test of parallelism indicates convergent validity between value-expressive communication and communication frequency, thus providing support for Hypothesis 2.

### Determination of covariates

Following the measurement analysis, the data were examined for differences in key dependent variables. We followed Tabachnick and Fidell (1996) recommendations for determining covariates. In order to determine possible covariates for the hypothesis tests, the relationships among the study variables were examined. Table 2 shows the correlation matrix for all study variables and covariates. Age, individual health status, and communication frequency were significantly, and linearly, related to both value-expressive communication and exercise intentions; thus, they were included as covariates for tests where VEC and exercise intentions serve as dependent variables. No other significant covariates were identified.

### Hypothesis tests

$H_3$  stated that strength of religious faith would be positively associated with value-expressive communication (VEC) about exercise. Strength of religious faith was not significantly related to VEC,  $r(155) = .070, p = .384$ . Table 3 shows the results of a hierarchical linear regression using log(age), individual health status, and communication frequency as covariates in Step 1, strength of religious faith as an exogenous variable in Step 2, and VEC as the criterion variable. This test confirmed that strength of religious faith did not explain significant variance in VEC about exercise,  $b = .094, \Delta R^2 = .009, p = .191$ . Thus, the data were not consistent with  $H_3$ .

$H_4$  stated that VEC about exercise and attitudes about exercise would be positively associated with exercise intentions. The data were consistent with this hypothesis; exercise intentions were positively associated with VEC,  $r(155) = .40, p < .001$ , and exercise attitudes,  $r(155) = .563, p < .001$ . Refer to Table 2 for a full correlation matrix.  $H_5$  stated that VEC and exercise attitudes would each explain unique variance in exercise intentions when controlling for known covariates. Table 4 shows the results of a hierarchical linear regression using log(age), individual health status, and communication frequency as covariates in Step 1, VEC and attitudes as exogenous variables in Step 2, and intentions as the criterion variable. VEC was not significantly associated with exercise intentions,  $b = .089, t(153) = 1.288, p = .20$ . Attitude was significantly associated with exercise

Table 1. Test of parallelism between VEC and frequency of communication about exercise.

Correlations						Factor Loadings			
	VEC_1	VEC_2	VEC_3	VEC_4	VEC_5	COM_FREQ_1	COM_FREQ_2	VEC	COM_FREQ
VEC_1								0.78	-0.31
VEC_2	.742**							0.82	-0.03
VEC_3	.479**	.500**						0.54	-0.14
VEC_4	.647**	.655**	.421**					0.85	-0.08
VEC_5	.675**	.714**	.460**	.807**				0.90	0.08
COM_FREQ_1	.375**	.420**	.130*	.292**	.391**			0.06	0.75
COM_FREQ_2	.353**	.311**	.139*	.246**	.335**	.700**		-0.06	0.86
COM_FREQ_3	.446**	.431**	.241**	.378**	.429**	.640**	.595**	0.14	0.80

**Table 2.** Correlations between Study Variables.

	SRF	VEC	ATT	INT	Age	Health Status
Value-Expressive Communication	.07					
Exercise Attitude	-.01	.39**				
Exercise Intention	-.02	.38**	.58**			
Age	.08	.15†	.05	.23**		
Individual Health Status	-.02	.26*	.38*	.30**	-.003	
Communication Frequency	-.07	.44**	.51**	.58**	.09	.24**

\* $p < .01$ , \*\* $p < .001$ , † $p = .05$

**Table 3.** Regression of value-expressive communication on strength of religious faith.

	$\beta$	$t$	$p$	Total $R^2$	$\Delta R^2$
Step 1				.241	.241**
Individual Health Status	.098	1.327	.186		
Age	.111	1.54	.126		
Communication Frequency	.430**	5.807	.000		
Step 2				.249	.009
Strength of Religious Faith	.094	1.315	.191		

intentions,  $b = .337$ ,  $t(153) = 4.703$ ,  $p < .001$ . Thus, the data were not consistent with  $H_5$ . Exercise attitudes were related to exercise intentions whereas VEC about exercise was not related to exercise intentions.

### Post hoc analysis<sup>2</sup>

In order to further consider the potential relationship between VEC and communication frequency, we conducted a *post hoc* test to examine the possibility of communication frequency acting as a moderator in the relationship between VEC and exercise intentions. Thus, in our *post hoc* analysis, we added a VEC x communication frequency interaction term in Step 3 of the model used for Hypothesis tests 4 and 5. The results of this regression test are presented in Table 4. The VEC x communication frequency interaction term explained significant variance in exercise intentions,  $b = -.171$ ,  $t(153) = -2.776$ ,  $p = .006$ .

After decomposing the interaction effect using a simple slope analysis, it appears that communication frequency functions as a moderator in the relationship between VEC and exercise intentions. See Figure 1. Whether VEC about exercise is high or low, less frequent communication produces *greater* intentions to exercise than does frequent communication. However, the effect of communication

**Table 4.** Regression of behavioral intentions on VEC, ATT, and VEC x communication frequency interaction.

	$\beta$	$t$	$p$	Total $R^2$	$\Delta R^2$
Step 1				.393	.393**
Age	.173*	2.70	.008		
Individual Health Status	.033	.519	.604		
Communication Frequency	.539**	8.149	.000		
Step 2				.488	.095**
Value-Expressive Communication	.089	1.288	.200		
Attitudes toward Exercise	.337**	4.703	.000		
Step 3 <sup>†</sup>				.513	.026*
VEC x Communication Frequency	-.171*	-2.776	.006		

\* $p < .05$ , \*\* $p < .001$ , †*Post hoc* test

frequency as a moderator is stronger at higher levels of VEC. That is, at high levels of VEC, those with low communication frequency have *much* greater intention to exercise. The upshot of this interaction effect is that exercise intentions are *weakest* among those with high VEC and high communication frequency.

## Discussion

In this study, the construct of value-expressive communication (VEC; i.e., expressing one's values – relatively enduring beliefs about achieving end states that guide people's lives – through communication about an attitude) was introduced, a measure of VEC was developed, and the relationship between VEC and exercise intentions was tested with a sample of self-identified Christians. Our data were consistent with  $H_1$  and  $H_2$ , in that the measure of VEC was unidimensional, reliable, and parallel to the measure of communication frequency.  $H_3$  proposed that strength of religious faith would explain significant variance in value-expressive communication; our data were not consistent with this hypothesis.

The central theoretical prediction of this study was that VEC about exercise would be related to exercise intentions ( $H_4$ ). Results indicate that VEC was significantly correlated with exercise intentions but did not explain significant variance in exercise intentions after controlling for age, individual health, and frequency of communication about exercise, as well as accounting for the main effect of exercise attitudes. In a *post hoc* test examining the moderating role of communication frequency on the VEC-behavioral intent relationship, we observed that this interaction explained significant variance in exercise intentions. The relationship between VEC and exercise is moderated by communication frequency such that at both high and low levels of VEC, greater communication frequency is associated with weaker behavioral intentions.

In particular, we observed the strongest intentions to exercise among people who were low in VEC and low in frequency of communication. The weakest exercise intentions were observed among participants who frequently communicated in a strongly value-expressive way. Changes in the slope revealed sharp differences in the effects of VEC on behavioral intent for those who communicate most frequently about exercise. In the following, we first address the measure of value-expressive communication developed and used in this study. Next, we explore the relationship between VEC and behavior, with particular attention to the interaction between VEC and communication frequency and its impact on behavioral intentions. Then, we consider potential explanations for observing no relationship between strength of religious faith and VEC. Finally, we explore theoretical and practical applications of this study and note its limitations.

### Measure of value-expressive communication

Hypothesis one and two dealt with the measure of value-expressive communication developed in this study in order to provide some initial evidence for the scale's construct validity. Results demonstrated that the items formed a scale that was

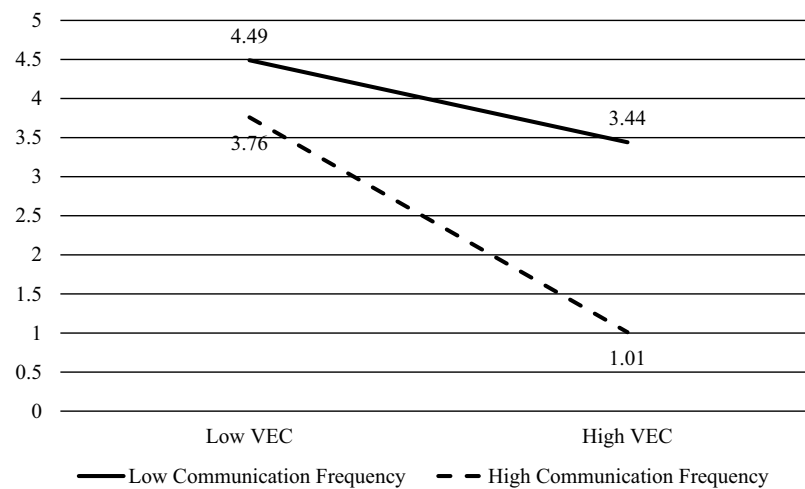


Figure 1. Simple slope analysis of VEC x communication frequency interaction effects on exercise intentions.

unidimensional and reliable. In addition, the scale was found to be parallel to the measure of communication frequency, which provides support for its convergent validity. A strength of the scale is, because it is written in general terms, rather than about a specific issue, it is able to capture value-expressive communication behavior whether frequent or infrequent, whether consistent or inconsistent with one's attitudes, and whether VEC supports or opposes the target behavior. Because of this, the scale can be used across multiple study contexts so that value-expressive communication can be compared across studies dealing with various behaviors and contexts.

The broad nature of the measure is also a limitation of the scale; it means that it does not capture important details about a person's value-expressive communication regarding a particular behavior. Perhaps most importantly, it does not capture the extent to which a person's values, and by extension their value-expressive communication, support or oppose the target behavior. Conceivably, value-expressive communication that establishes a supportive relationship between values and behavior would be associated with stronger behavioral intentions as compared to VEC that establishes a conflict between personal values and the target behavior. However, without knowing the exact relationship between personal values and behavior, it can be difficult to interpret the nature of the relationship between VEC and behavioral intentions, as well as the interaction between VEC and communication frequency.

In terms of improving how we operationalize VEC, we suggest that, rather than modifying the current scale, researchers use additional measures to capture other features of value-expressive communication. First, additional measures could capture the relationship between personal values and the target behavior. Perhaps something as simple as "My personal values support engaging in \_\_\_\_\_ (target activity)" or "My values are not consistent with \_\_\_\_\_ (target behavior)." This would capture the relationship between values and behavior. Second, to pinpoint *which* values the participant is referencing, a study must also include a measure of personal values as they relate to the target behavior. By adding such measures, in addition to measures of communication frequency, researchers

can develop a clearer picture of the relationship between VEC and behavior. This understanding could be used to guide message development in behavior change interventions to either strengthen or reframe the connection between personal values and behavior in order to improve behavioral outcomes.

### **Value-expressive communication and communication frequency**

A central theoretical argument in this article is that our communication about a given topic reflects the personal values we hold and their relationship to that topic. In this study, our results indicate that when people communicate about exercise value-expressively (whether weakly or strongly) frequent communication is associated with weaker exercise intentions, as compared to infrequent communication. This distinction is most pronounced for those whose communication about exercise is strongly value-expressive and very frequent. This finding might be partially explained by an aspect of our original theoretical argument about VEC. We posited that VEC could be associated with behavior, in part, because people are motivated to maintain consistency between their thoughts or personal values and their behavior. And when their communication reflects those personal values (i.e., when it is value-expressive), it follows that they would strive for consistency between that communication and their behavior.

In this study, we observed that participants with the lowest exercise intentions were those who had highly VEC and communicated frequently. This could represent some inconsistency between communication and behavior. However, it could also reflect consistency if those participants' VEC emphasized the clash between their personal values and exercise. The more strongly their values clash with exercise, and the more frequently they communicate that, the less likely they are to engage in that behavior (exercise). Still, based on the current measure of VEC, it is not possible to determine whether participants' personal values supported or opposed exercise based on the measurement in this study. However, given that people are motivated to achieve consistency between their thoughts,

communication, and behavior, we suggest that participants' personal values – and by extension their VEC – likely clash with exercise, thereby motivating participants to have weaker intentions to exercise. To parse out these details, we recommend future researchers include measures of personal values and the extent to which they align with the target behavior; researchers should also measure communication frequency.

### **Strength of religious faith and value-expressive communication**

In this study, which included a sample of self-identified Christians, we did not observe a significant relationship between strength of religious faith and VEC ( $H_3$ ). These findings stand in contrast to previous qualitative research that suggested VEC about exercise occurred with this population (Anderson, 2011). However, this finding may indicate that VEC is not limited to, or more prevalent in, religious populations than in non-religious or mixed populations. In other words, religious belief is not necessary for VEC to occur. Another explanation may come from the topic of the study. It may be that there is not a significant relationship between one's religious beliefs and the way that *exercise* is discussed. Perhaps a relationship between VEC and target behaviors only becomes significant for those with strong religious or political affiliations when observed within particular contexts or around certain issues – especially those that are taboo, stigmatized, or highly politicized. These approaches should acknowledge the likelihood that the relationship between VEC and behaviors is likely reciprocal over time and establishing causal order necessitates longitudinal data.

### **Practical implications**

With complex public health issues that are also taboo or stigmatized, such as childhood vaccinations or wearing face coverings to protect against the spread of COVID-19, understanding VEC about those issues could yield important insights about *how* these issues are being represented and understood. Indeed, understanding *how* to discuss the topic – whether considering public messaging or interpersonal conversations – becomes central to efforts to impact health behaviors. For example, VEC may be particularly prominent in discourse about complex health issues that occurs on communication platforms where user-generated content dominates (such as social media), because of its focus on the personal expression of values through communication. Additionally, VEC highlights relevance and power of *interpersonal* communication about health behaviors to health education efforts. For example, health practitioners using VEC could provide better guidance for audiences hoping to see behavioral change among themselves and/or their loved ones, e.g., how to have productive conversations about challenging health topics.

The concept of VEC could bolster future studies that examine how health allies, advocates, and activists use VEC to express their perspectives and persuade audiences. For example, Miller and Lellis (2016) demonstrated that advocacy messages from the fossil fuel industry clearly conveyed specific values. But it is not clear the extent to which those messages

were value-expressive, the motivations for including values, or the impact of those messages. Efforts to engage citizens in deliberation and dialogue (Kuehl et al., 2020) could also consider what prompts VEC about complex public health issues, and how it can be harnessed to generate sustainable approaches to addressing complex public health issues.

### **Theoretical implications**

In addition to practical implications, the results of this study point to many theoretical implications and directions for future research. Because the interaction between VEC about exercise and frequency of communication is related to exercise intentions, future research should investigate the VEC construct further, focusing on the predictors, characteristics, and effects of VEC with designs that allow for causal claims and find new models for accounting for communication frequency. Other potential *predictors* of VEC about health behaviors or other topics could be examined. For example, how might personal goals, demographic characteristics, or the nature of the relationship between communicators predict the extent to which a person engages in VEC about health behaviors? Identifying predictors of VEC would allow for more targeted message design to facilitate health behavior change.

Research could also examine the *effects* of value-expressive communication about health on individuals and their relationships. Studies concentrating on the audience could document how the audience interprets and responds to VEC as a way for understanding communication campaign effects. One avenue for exploring the audience perspective on VEC was modeled by Miller and Lellis (2016), who demonstrated that audience members readily identified the values present in advocacy messages from the fossil fuel industry. In the current study, participants were asked to self-report their levels of VEC. This requires conscious awareness of value-expressive content in one's communication. Finally, studies could determine how VEC affects relationships; for example, does it affect relational satisfaction or closeness? Studies could use a framework like relational dialectics theory (Baxter, 2011) in conjunction with VEC to understand how values are communication in conversations and how relational partners respond to and/or resolve the expression of conflicting values.

If researchers continue to observe a link between VEC and health behaviors, then future studies may focus on communication behavior – in addition to attitudes – as independent and dependent variables of interest (see Parks & Kim, 2018 for an example of this approach). Practically, this could shift the emphasis of health communication interventions away from intrapsychic, psychological variables toward interpersonal communication variables. As we gain a better understanding of the link between VEC and behavior, this will also prompt research into other forms of communication that impact health behaviors. For example, Anderson et al. (2020) found that memorable conversations following campaign exposure prompted conversational partners to volunteer for living kidney donation. Like Anderson et al., the findings from this study support the inclusion of communication as a central component of the process by which cognitions impact health behaviors.



## Limitations

As discussed above, the measure of VEC was unidimensional and had strong internal consistency, but it was also intentionally designed to be ambiguous with respect to personal values that may be operating in one's VEC. This was done in order to increase the ease with which the questionnaire could be administered, and responses could be given. However, it also decreased the specificity of the scale and the inferences available from its scores. Additional evidence for scale validity is necessary if it is to be used in additional research. Future research could consider some form of multi-trait multi-method validation of the VEC scale and could also supplement the VEC scale with open-ended responses about participant VEC, in order to understand which values are operating in VEC. This study does not allow for causal claims about the relationships described here; future studies could use longitudinal and experimental designs to bolster causal claims about the relationship between VEC and behaviors. Studies could also measure participant values and value-expressive attitudes, observe relationships between those and self-reported VEC, and also prompt participants to provide examples of VEC about the topic of interest and which values they are expressing through those messages.

## Conclusion

In conclusion, this study introduced the construct of VEC. Using a new unidimensional and reliable scale, the data indicate that the interaction between VEC and communication frequency explains significant variance in exercise intentions. For practitioners, VEC offers a tool for understanding, and possibly shaping, public and interpersonal discourses about complex health issues. For researchers, the concept of VEC illustrates how behaviors are impacted by not only communication frequency, but also by its *characteristics*. We suggest that scholars conduct future research to accurately identify predictors, characteristics, and effects of VEC. VEC offers myriad opportunities for researchers and practitioners to consider and capitalize on the role of values in communication about health.

## Notes

1. As value-expressive attitudes and communication of non-value-expressive attitudes were not measured in this study, tests of parallelism between those measures and VEC cannot be conducted.
2. The authors would like to acknowledge an anonymous reviewer for their review comments which prompted the inclusion of communication frequency in the analysis. Its relationship with other study variables was not predicted in the original study hypotheses.
3. An additional goal of this study was to test for the effects of value-matched messages on the study outcomes. Thus, the study variables were measured at two time points: prior to message exposure and after message exposure. Participants completed the second survey 18.96 days ( $SD = 10.89$  days) after completing the first survey. No differences emerged between those who completed only the Time 1 survey and those who completed both surveys. We also found that experimental condition had no significant effects on study variables. This was tested first through separate

regressions with value-expressive communication, exercise attitudes, and exercise intentions as outcome variables, and including age and individual health as covariates in step 1, then message condition as predictors in step 2. Secondly, we used experimental conditions as covariates in the analysis reported in the current paper; producing a model with age, individual health, and experimental conditions as covariates in step 1, then VEC and attitudes in step 2, and exercise intentions as the outcome variable. In this model, too, the experimental conditions were non-significant predictors. Thus, they were not included in the analyses presented in this article, which deal only with Time 2 data.

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## Appendix A

Measure of Value-Expressiveness

### Value-Expressiveness

*All questions used a 1 to 10 response scale (1 = strongly disagree, 10 = strongly agree).*

- (1) What I say about exercise is based on my personal values.
- (2) My personal values come through in the way I talk about exercise.
- (3) The things I say about exercise have nothing to do with my personal values. [recode]
- (4) When I talk about exercise, in a way I'm also talking about my personal values.
- (5) The way I talk about exercise shows people my personal values.