An Assessment of the Measurement Validity of the Value-Relevant Involvement Scale

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Abstract

Two studies assessed the construct validity of the value-relevant involvement scale (Cho & Boster, 2005), (N = 308 and N = 285). Study 1 assessed the extent to which VRI was related to attitude structure and self-reports of behavior about a topic. Study 2 tested the extent to which VRI can predict reactions to counter-attitudinal messages. The data were consistent with the hypotheses proposing that VRI is associated with the strength of biased processing outcomes including perceiving bias in the source, the belief that the source's supporters have been misled, and arguing about the topic on Facebook.

An Assessment of the Measurement Validity of the Value-Relevant Involvement Scale

The concept of ego-involvement (Sherif & Cantril, 1947), or as it is now more commonly called, value-relevant involvement (VRI; Johnson & Eagly, 1989) has long been a mainstay of research and theorizing about persuasion. Value-relevant involvement is “the psychological state that is created by the activation of attitudes that are linked to important values. Values are presumed to be aspects of the self that are especially important and enduring” (Johnson & Eagly, 1989, p. 290). Despite the importance of this variable to theorizing about persuasion, Cho and Boster (2005) were the first to attempt to construct and validate a self-report measure of VRI as a specific type of involvement, distinguished from other variables and types of involvement.

Their measure offers an improvement on previous measures that offered a single item concerning the importance of the issue (e.g. Bright and Manfreda, 1997; Powell, 1977) or a single item on how involving the issue was to the participants (e.g. Petty & Cacioppo, 1979). Building a measure from a clear definition that distinguishes value-relevant involvement from outcome-relevant involvement and impression-relevant involvement also avoids the conceptual confusion in measures that conflate personal interest and other issues such as social status (e.g. Chebat, Filiatrault, & Perrien, 1990).

A number of theories utilize VRI and similar constructs to predict biased processing outcomes including the social judgment perspective (Sherif, 1979), the self-concept focused version of cognitive dissonance theory (Aronson, 1968), values theory (Rokeach, 1979), functional attitude theory (Katz, 1960), the multiple-motive version of the heuristic-systematic model (Chaiken, Liberman, & Eagly, 1989), and the biased hypothesis-testing model (Pyszczynski & Greenberg, 1987). Although these theories vary in other respects, they generally predict that when information is encountered that contradicts an attitude that is central to one's

self-concept, people engage in motivated information processing with the goal of rejecting that information. There are a variety of means of reaching that processing goal such as rejecting the source. These various means would be associated with heightened levels of VRI, if the measure is valid.

The initial study validity study of Cho and Boster (2005) assessed factorial validity and found that VRI was associated with attitude extremity. Additional research is needed to determine if the VRI measure can predict other variables as predicted by theory. No single study can establish measurement validity. Each validity test merely strengthens the case in favor of validity (Cronbach & Meehl, 1955). Therefore, this study will extend the initial evidence found in the Cho and Boster (2005) paper by testing the proposition that VRI will be associated with self-central attitude structures and behavior. The study will also test the extent to which VRI moderates the relationship between message discrepancy and perceptions of source bias. In addition to assessing the concurrent criterion validity, this study will also include two attempts at assessing the factorial validity via confirmatory factor analysis.

VRI and Attitude Structure

Values, according to Rokeach (1979) are a core part of the self-concept. Therefore, any attitude object in which one has high value-relevant involvement is likely to be closely related to the self-concept. By identifying values as core to one's identity, Cho and Boster (2005) chose items to measure VRI that included phrases in the items such as "central to understanding the kind of person I am" and "reflects who I am" (p. 245). High VRI is an indication that someone considers the position they hold on a topic to be a central part of their identity.

Although Cho and Boster (2005) conceptualized VRI as related to the self-concept, they did not offer any additional evidence of that relationship. In order to assess the extent to which

the self-concept overlaps with particular identities, some researchers have adapted the “inclusion of other in the self” scale (Aron, Aron, & Smollan, 1992) for purposes other than the originally intended relational closeness. The original measure offered a pictorial set of response options for participants to indicate the extent to which their self overlapped with their romantic partner’s self. The measure used pairs of circles that were increasingly overlapping as the numeric value of the scale increased, like a pair of Venn diagrams with an increasingly large shared area.

The measure has been adapted to measure identification with an in-group with the in-group replacing the romantic partner (Coats, Smith, Claypool, & Banner, 2000). Another study replaced the romantic partner’s circle with identifying as an organic food consumer (Bartels & Hoogendam, 2011). The second current study focuses on VRI for a politically charged, public policy position. For this topic, VRI was expected to be positively related to perceiving a political affiliation as core to one’s identity. Rather than measuring the extent to which the participant’s identity overlaps with their romantic partner, the current measure asks them to indicate the extent to which their identity includes their political identification. Therefore, VRI in a political topic was hypothesized to be associated with an “inclusion of other in self” measure that was adapted to focus on one’s political party self-identification (H1).

One of the earliest hypotheses concerning VRI stemmed from the social judgment approach prediction that VRI would be associated with attitude extremity (Sherif, Sherif, & Nebergall, 1965). Cho and Boster (2005) found that VRI was associated with attitude extremity in their validation study across several topics. Both of the studies reported here tested the hypothesis that VRI would again be associated with attitude extremity (H2).

Attitudes that are more strongly associated with the self are likely to be attitudes that are held with greater certainty. Given the motivation people have to see themselves as competent

and intelligent as identified by the self-identity cognitive dissonance theory (Aronson, 1968), attitudes that are a core part of one's identity are likely to be held with greater certainty than those that are not. If an attitude related to the self-concept is weakly held, it would mean that the strength of the self-concept is weakly protected and people with normal self-esteem try to avoid that state (Aronson, 1968). Therefore, it was hypothesized that VRI would be positively associated with attitude certainty (H3).

VRI and Self-Reported Behavior

VRI would be likely to predict the choice to argue with others about a topic on social media. Ethnographic work on Facebook users suggests that arguing for positions in that environment is perceived as risky (Thorson, 2014). Arguing political positions, for example, carries a lot of risk because there are likely people in the diverse network of their Facebook friends who disagree with the user's position. Some users in that study also expressed reluctance to argue on Facebook because that context also carries a greater risk of being misunderstood. Arguing on Facebook is sometimes seen as disaffiliative (Walther, Van Der Heide, Tong, Carr, & Atkin, 2010). Facebook users report a variety of interpersonal goals that both encourage and constrain their likelihood of posting about political issues (Kearney, 2017). Given this context, people may be reluctant to argue with other users on Facebook for fear of seeming unfriendly or even rude. They may feel some degree of motivation to express their opinion but that must be balanced against the fear of becoming less popular.

Yet, clearly some people do choose to take the risk and engage in arguments on Facebook. Jang, Lee, and Park (2014) found that for specific topics, stronger identification with a particular political ideology positively predicted arguing about specific topics associated with that ideology on Facebook. Being ambivalent on those topics reduced Facebook argumentation.

People with unambivalent attitudes and strong ideology would be likely to possess high VRI. Therefore, it was hypothesized that VRI for a given topic is likely to be positively associated with reports of engaging in argumentation on Facebook for that topic (H4).

Perceptions of Bias

Theory and research predict that when an attitude is closely associated with the self-concept, people tend to react to counter-attitudinal messages with biased processing of the message and the source (Eagly, 2007). For example, a study conducted by Teel, Bright, Manfredo, and Brooks (2006) found evidence that on the policy issue of drilling for oil in the Arctic National Wildlife Refuge, people tended to process the information in a biased fashion. Specifically, they rated information that was consistent with their pre-existing attitude as more factual and containing stronger arguments. These relationships were stronger among participants who had rated the issue as “personally important.” Teel et al. explained, “To maintain consistency and thereby avoid this dissonance, we are quick to find fault with and to reject information that goes against what we already believe” (p. 448).

One option for defending the self-concept from messages that critique closely held attitudes is to find fault with the source of the ego-threatening message. Vallone, Ross, and Lepper (1985) identified the hostile media phenomenon such that highly partisan people rate news reports as biased if they concern an issue they consider important. They found that people who had strong opinions viewed news reports as more biased against their “side.” Choi, Yang, and Chang (2009) identified VRI as a key indicator of who is likely to perceive such bias, particularly when encountering a persuasive message from the media that is opposed to one’s position.

People who have high VRI for an issue would be more likely to perceive counter-attitudinal messages as biased rather than change their mind because they are motivated to maintain any attitude position associated with their self-identity. Therefore, this study tested two hypotheses associated with perceived media bias. The first is that for any given topic, VRI would be positively associated with a general perceived media bias for cable news outlets (H5). The second, related hypothesis concerns reactions to a counter-attitudinal message. It was hypothesized that the extent to which a message is perceived as counter-attitudinal would be positively associated with a stronger belief that the source of the message is biased (6a). Furthermore, this relationship was hypothesized to be moderated by VRI such that the relationship would become stronger as VRI increases (6b).

In addition to perceiving counter-attitudinal sources as biased, people may also personally dislike them. Abramowitz and Webster (2016) argued that regarding politics, people have become more hostile to people with different political beliefs over recent decades. They argued that Americans have shown an increasing propensity “to view opposing partisans with growing suspicion and hostility” (p. 14). Choi, Park, and Chang (2011) found that VRI was negatively correlated with a willingness to negotiate with political opponents. People whose stance on a political issue is tied to their core values will have trouble imagining any reasonable person believing otherwise lest they deal with feeling foolish (Aronson, 1968). Dislike of one’s political opponent is consistent with having developed a negative view of that opponent. Therefore, the extent to which a message is perceived as counter-attitudinal was hypothesized to be negatively associated with social attraction to the message source (7a). This relationship was also hypothesized to be moderated by VRI such that the relationship will become stronger as VRI increases (7b).

Another outcome described by Vallone et al.'s (1985) hostile media work is the expectation by the audience that the biased messages produced by the mass media will sway other people who are not as strongly invested in the issue. Someone who encounters a counter-attitudinal message has to deal with the fact that other people had been persuaded by messages similar to the one they encountered. Either one believes that people who disagree with one on an important issue are smarter than oneself or one believes that those people have been misled to believe false information. Therefore, the extent to which a message is perceived as counter-attitudinal was hypothesized to be positively associated with a stronger belief that people who accept the message have been misinformed (8a). Again, this relationship was expected to be moderated by VRI such that the relationship will become stronger as VRI increases (8b)

Summary

According to various theories of ego-defensiveness, people will be strongly motivated to maintain attitudes if those attitudes are tied to their self-concept (Aronson, 1992; Chaiken et al., 1989; Rokeach, 1979; Sherif, 1979). This study's hypotheses were derived from the proposal that VRI offers a valid measure of the extent to which someone's attitudes on a topic are strongly tied to her or his self-concept. Two studies were conducted to assess these hypotheses. The first examined people's perceptions and reports of behaviors concerning one of several varied topics including the extent to which VRI was positively associated with attitude extremity (H2), attitude certainty (H3), arguing on Facebook (H4), and perceived cable news bias (H5).

The second study again tested the extent to which VRI was positively associated with indications of a strong tie to the self-concept such as attitude extremity (H2) and attitude certainty (H3). Additionally, VRI in relation to a political issue was predicted to be tied to the extent to which people included their political identification as a part of their self (H1). The

second study also expanded the growing research on how the Cho and Boster (2005) VRI measure can be used to predict the outcomes of exposure to persuasion attempts (Choi et al., 2009, 2011; Kim, 2016; Lapinski, Zhuang, Koh, & Shi, 2017). In particular, this study tested the prediction that the extent to which a message was perceived to be different from one's own position would be positively related to perceived bias (H6a), positively related to belief that supporters are misled (H8a), and negatively related to social attraction to the message source (H7a). VRI was expected to moderate those relationships such that higher VRI would be associated with stronger relationships between those variables (H6b, H7b, H8b).

Study 1

Method

Participants. Participants ($N = 308$) were recruited by emailing the student body of a medium sized American Midwestern public state university. They were offered a chance to win \$40 in exchange for participation in the online survey. Unfortunately, due to a survey construction error, data were not collected concerning their age and sex. According to the university's website the university-wide student demographics indicate that sex is split 50% male, 50% female with students who are mostly traditional college age. The study received IRB approval.

Procedure. The first page displayed in the online survey was the consent form. Then the participants were randomly assigned to one of four topics (Chicago Cubs baseball team, abortion, increasing the number of refugees the U.S. admits from Syria, or the McDonald's restaurant chain). They were then asked which topic was displayed to ensure they were responding carefully. Any participant who indicated the wrong topic was removed from the

dataset. Then the following measures were displayed that referred to the topic the participants were assigned: Facebook Argument, VRI, cable news bias, attitude certainty, and attitudes.

Measures. All means, standard deviations, and reliability estimates are shown in Table 1. Unless otherwise indicated, measures used 7-point Likert-type response scales ranging from 1-7 and a measure's scores were composed of the average scores across the measure's items.

First was the newly constructed Facebook argument scale, which measured the willingness to argue on the site. It was composed of four items and in addition to the Likert-type scale response options, participants were able to indicate they did not use Facebook. There were 13 non-users who were dropped from analyses concerning this measure. The distribution was strongly positively skewed ($skew = 1.63$, $SE = .14$) and leptokurtic ($kurtosis = 2.33$, $SE = .28$) with the lowest score being the mode, indicating a strong reluctance to argue on Facebook by most participants. The statistics used in this paper, however, are fairly robust to such violations of distribution normality (Norman, 2010). Higher scores indicated a greater propensity to argue about the topic on Facebook. The items for this measure are included in the Appendix.

Next the items for the VRI scale constructed by Cho and Boster (2005) were displayed. The VRI measure contained seven items and was somewhat platykurtic. The measure was scored such that higher scores indicated greater involvement. Some sample items are "Knowing my position on the X is central to understanding the kind of person I am" and "My position on X reflects who I am."

The Gaziano and McGrath (1986) news credibility scale was used to measure perceived media bias with "Cable News channels" indicated as the target media outlet to be evaluated. Six items of the original twelve were used for this study. Six of the items were not used because they

did not apply to some of the chosen topics. Cable news bias was scored such that higher scores indicate greater perceived bias. The distribution was leptokurtic and slightly negatively skewed.

The measure of the participants' self-perceived attitude certainty, the Carpenter and Boster (2013) attitude certainty measure, was displayed next. The five items were scored such that higher scores indicated greater attitude certainty. The measure was somewhat negatively skewed and leptokurtic.

Attitudes toward the topic were measured with four semantic differential items using 7-point response scales anchored at undesirable/desirable, bad/good, dislike/like, and disfavor/favor. For the Cubs topic higher scores indicated greater approval of the Cubs, for Abortion higher scores indicated greater support for continued access to legal abortions, for the refugee topic higher scores indicated greater support for the United States admitting more refugees from Syria, and for the McDonald's topic higher scores indicated more positive evaluations of McDonald's. The distribution of attitudes was somewhat platykurtic.

Attitude extremity was calculated by subtracting the midpoint (4) from each score and taking the absolute value of that score. Higher scores thus indicated greater attitude extremity. The distribution was platykurtic.

Results and Discussion

The proposed 5 factor structure of the measures (VRI, attitudes, attitude certainty, Facebook arguing, and cable news bias) was tested using confirmatory factor analysis (CFA) with the lessR centroid algorithm in Rstatistics (Gerbing, 2014). The fit index is the average absolute standardized error which may be compared to the standardized root mean square residual reported by some CFA programs. The result was an acceptable level of fit such that the

absolute average residual was at an acceptably low .04. None of the indicators cross-loaded with other factors.

It was hypothesized that VRI would be associated with attitude extremity (H2), attitude certainty (H3), Facebook arguing (H4), and perceived Cable News Bias (H5). Examination of the correlation matrix in Table 2 shows that all of the correlations were statistically significant, in the predicted direction, and all above .30. Results are consistent with hypotheses for Study 1.

Although four diverse topics were chosen, it is possible that these relationships would not be found on other topics. Additional research is needed to systematically vary the type of topic to determine if there are boundary conditions or moderators to these relationships.

Additionally, the target of the media bias “cable news” was somewhat vague. Future work might profit from specifying a news outlet that most consider neutral or varying the target of the bias measure to assess the extent to which particular news outlets are perceived as biased.

For a variety of topics, VRI appears to be associated with indications of stronger attitudes and biased attitudes. Study 2 was conducted to assess the extent to which VRI could predict how people will react to a persuasive message.

Study 2

Method

Sample. A sample of 285 participants was collected in the summer and autumn of 2016 from a medium sized American Midwestern public state university. Of these 76 reported being male, 124 reported being female 2 reported being intersexed, and 83 either did not respond or their sex was not recorded due to a recording error in the online survey software¹. The error was caused by the final page containing the link to a separate survey to enter the raffle initially containing the sex and age measures. After those measures were moved to the previous page, age

and sex information was collected. The same issue prevented the ages of 89 participants from being recorded but among the 196 other participants the mean age was 25.58 (*Median* = 21, *SD* = 10.37) and ranged from 18 to 69. Participants were recruited via a participant pool for the university's Communication department in exchange for extra credit ($N = 35$) and by emailing all of the students campus-wide an offer to have a chance to win \$50 in a raffle ($N = 250$).

Procedure. Participants were given a link to the online survey. After agreeing to the informed consent, they were informed that the study concerned how people evaluate short persuasive messages like newspaper editorials. The next page randomly displayed one of two persuasive messages that either supported maintaining funding for state universities in the participants' state or reducing it. Then the measured variables followed. After the survey items, the participants were informed that the messages had been constructed by the researchers and that they did not represent the views of the Communication Department or the University. The survey concluded with either a link to a contact information form for extra credit in their course or a chance to win the raffle.

Materials. In order to create substantial variance in the extent to which the message was attitude discrepant, participants were randomly assigned to read one message that either argued for cutting state university public financial support by 20% or maintaining it. The issue had been much discussed given an ongoing controversy about funding levels of public universities in the state. Layoffs and program eliminations had been announced. The data were collected during the contentious 2016 American presidential election campaign. The argument in favor of budget cuts focused on the need to balance the state budget and suggested that universities could become more efficient by cutting redundant programs. The argument in favor of maintaining levels of state financial support argued that the state needed to support all of its universities so that state

residents would be able to attend a local university regardless of their geographic location. The two messages were of similar length.

Measures. All means, standard deviations, and alpha reliabilities can be found in Table 3. Unless otherwise noted, items used 7-point Likert-type response scales that ranged from 1-7. Measures were formed by averaging the items for the measure.

After message exposure, the first two items asked people to use a 0 to 100 scale such that 0 represented someone who could not be more against cutting state funding for universities and 100 represented someone who could not be more in favor of it. The first item asked them to indicate the position of the article author. The distribution was, unsurprisingly, bimodal. The second item using this scale asked participants to indicate their own position. By asking for participant position after message exposure, whatever persuasive effect of the message can be included in the assessment of message discrepancy. The distribution for the own position attitude item was positively skewed. These two items allowed the calculation of the extent to which the message was counter-attitudinal by calculating a message discrepancy score. The participants' scores were subtracted from the perceived author's scores and the absolute value of that difference was calculated. This measure is labeled message discrepancy and its distribution was somewhat positively skewed ($skew = .86$, $SE = .14$). Attitude extremity was calculated by subtracting 50 from participant attitude positions on the issue and calculating the absolute value. The distribution was somewhat negatively skewed.

Next was the perceived bias scale from Boster, Carpenter, Shulman, Deangelis, Shaw, & Manata (2010) was displayed. It was scored such that higher scores indicate a greater perception that the author presented a biased argument. A sample item is "The article presented a biased position on the issue of cutting state funding for state universities" and another was the reverse

coded “The article presented a fair treatment of the issues regarding cutting state funding for state universities in Illinois.”

Next was the McCroskey and McCain (1974) social attraction scale. It was scored such that higher scores indicated greater social attraction. Following that measure was the newly written measure of supporters of the message being misinformed scale referred to as the misinformed supporters scale. Higher scores indicated greater belief that message supporters were misinformed about the issue. The items can be found in the Appendix. The distribution of scores was somewhat platykurtic.

Then the VRI items from Cho and Boster (2005) were displayed with the target phrase being “reducing state funding for state universities.” VRI approximated the normal distribution in this sample. These measures were followed by the Carpenter and Boster (2013) attitude certainty scale with higher scores indicating greater certainty. The distribution for the scores from that measure was slightly skewed.

Finally, the two general measures of political identity were displayed. First was a measure of political affiliation from Gerber, Huber, Doherty, & Dowling (2012). The scale ranged from -3 to 3 with -3 labeled “strong Republican” and 3 labeled “Strong Democrat.” The 0 was labeled “Independent.” This was followed by the newly created adaptation of the Aron et al. (1992) inclusion of other in self measure. Rather than focusing on a romantic partner, the participants were instructed,

Consider the political identification you just chose, even if it is independent or if you choose not to affiliate with any political party. Look at the pairs of circles in the image above. Imagine the circle on the left is who you are and the circle on the right is your

political identification. Choose which circle best represents the overlap between how you think of yourself and your political identification.

Above these instructions were a series of Venn diagrams showing two circles. The one labeled 1 showed two circles with no overlap whereas the 7 showed two circles with near total of overlap. This is referred to as the strength of political identification measure. The distribution was somewhat platykurtic.

Results

First the results of the CFA to test factor validity will be described. Then induction checks to assess the extent to which the participants accurately identified the author of the message's position will be examined. The primary purpose of this study was to test two sets of hypotheses. First, the hypotheses concerning the extent to which VRI is an indication of the extent to which an attitude on a topic is strongly related to the self-concept were tested. Those tests were done by examining the size and direction of the correlations among the variables found in Table 4. Then the hypotheses were tested concerning the extent to which VRI magnified biased processing of persuasive messages. These hypotheses were tested by first assessing the extent to which message discrepancy was related to the predicted measures that were thought to be associated with biased processing. Finally, moderated multiple regression was used to assess the extent to which VRI moderated those relationship using Aiken and West's (1991) simple slopes method. As per their recommendations, all regressions used standardized variables.

Measurement Model. The proposed 5-factor structure of the multi-item measures was tested using CFA with the lessR centroid algorithm in Rstatistics (Gerbing, 2014). The average absolute standardized error was at an acceptable level for model fit at .05. None of the indicators cross-loaded with other factors. The measurement model was maintained.

Induction Check. Positions both for and against reducing state funding for public universities were used such that half of the participants read a message arguing for reducing funding and half read a message arguing for maintaining levels of funding. To assess the extent to which the participants viewed these messages accurately, their mean scores on the perceived author position measure were compared. Those who viewed a message against cutting funding ($M = 23.92$, $SD = 27.19$) perceived the message to be more against cutting funding than those who viewed a message in favor of it ($M = 74.70$, $SD = 26.05$). The difference was statistically significant $t(282) = 16.07$, $p < .001$, $r = .69$. These results indicate that a substantial amount of variation in message discrepancy would be likely to result given that the two positions were perceived as 50 points apart and both about 25 points from the extremes. These positions leave plenty of room for message discrepancy on both sides of the question.

VRI and the Self-Concept. It was hypothesized that VRI would be positively related to attitude extremity (H2). Examination of Table 4 shows that the relationship was small and the p -value was just larger than standard cutoffs for statistical significance ($p = .053$). The direction but not the size of the relationship is consistent with the hypothesis. It was also hypothesized that VRI would be positively related to strength of political identification (H1). Table 2 shows that the relationship was positive, substantial, and statistically significant. This finding is consistent with the hypothesis. VRI was also hypothesized to be positively related to attitude certainty (H3). Table 4 shows that this relationship was also positive, substantial, and statistically significant. This finding is consistent with the hypothesis.

VRI and Biased Processing. First it was hypothesized that message discrepancy would be positively correlated with perceived source bias (H6a) and misinformed supporters (H8a) but negatively correlated with social attraction (H7a). Examination of the correlation matrix in Table

4 shows that these correlations were all in the expected directions and statistically significant.

Next the moderation by VRI will be examined via moderated multiple regression.

Source bias was regressed onto message discrepancy, VRI, and their product (the interaction term). The multiple correlation was statistically significant, $R^2 = .08$, $F(3, 280) = 8.18$, $p < .001$. The effect of message discrepancy was statistically significant, $b = .38$, $\beta = .26$, $p < .001$, VRI was not, $b = -.02$, $\beta = -.01$, $p = .82$, and the interaction was, $b = .22$, $\beta = .15$, $p = .01$. The simple slopes analysis shown in Table 5 and Figure 1 shows that when VRI was higher (one standard deviation above the mean) the effect of message discrepancy on source bias was substantial. But when VRI was low (one standard deviation below the mean) the effect was much smaller. This finding is consistent with the hypothesis (H6b).

Next, the same pattern was expected for the misinformed supporters variable. The misinformed supporters variable was regressed onto the same set of predictor variables as the previous regression. The multiple correlation was again statistically significant, $R^2 = .10$, $F(3, 278) = 10.52$, $p < .001$. The effect of message discrepancy was again statistically significant, $b = .48$, $\beta = .30$, $p < .001$, VRI was again not, $b = -.08$, $\beta = -.05$, $p = .35$, and the interaction again was, $b = .21$, $\beta = .13$, $p = .02$. The simple slopes analysis show in Table 5 and Figure 1 shows that when VRI was higher (one standard deviation above the mean) the effect of message discrepancy on misinformed supports was substantial but when VRI was low (one standard deviation below the mean) the effect was much smaller. This finding is consistent with the hypothesis (H8b).

Finally, the same pattern was expected for social attraction except that the moderated relationship with message discrepancy was expected to be negative. Social attraction was regressed onto the same set of predictor variables. The multiple correlation was statistically

significant, $R^2 = .09$, $F(3,278) = 8.73$, $p < .001$. The effect of message discrepancy was negative and statistically significant, $b = -.31$, $\beta = -.26$, $p < .001$, VRI was not, $b = .10$, $\beta = .09$, $p = .14$, and the interaction did not reach conventional levels of statistical significance, $b = .14$, $\beta = -.11$, $p = .057$. Although the p-value was not below conventional levels, readers who question such conventions may be interested to know that pattern of results was similar to the previous two moderation hypotheses tests, though the difference in effect sizes was slightly smaller. This finding is inconsistent with the hypothesis (H7b) due to the p-value not reaching the traditional threshold.

Discussion

The second study extended the first study by assessing the proposition that the Cho and Boster (2005) VRI measure can be used as an indication that an attitude is strongly rooted in the self-concept of an individual and thus in need of vigorous defense from opposing messages. VRI was positively correlated with attitude certainty and stronger political identification. These relationships suggest that when people have high VRI, they tend to feel more certain that they will not change their attitude. People who have connected their attitude to their self-concept will be motivated to keep their attitude the same so that their self-concept is not threatened. Given that the topic was a political one, it was also not surprising that VRI for this topic would be related to the extent to which people consider their political identity to be a part of their “self.”

This study offered more convergent validity for the VRI measure. On the other hand, the original Cho and Boster (2005) scale validation for the three involvement measures found that VRI tended to be moderately correlated with attitude extremity. The first study was consistent with that prediction whereas in this second study the relationship between VRI and attitude extremity found here was small, though in the predicted direction. As only a small number of

topics have been examined thus far, it remains a possibility that mere sampling error can explain the variation in effect sizes. Generally, this study is consistent with the construct validity of the VRI scale and with the theoretical connection of this variable with the self-concept.

Study 2 also sought to test the extent to which VRI can predict who is likely to resist a counter-attitudinal message by negatively evaluating the message source. As previously established by the hostile media effect research, highly ego-involved people are likely to decide that the source of a counter-attitudinal message is biased (Choi et al., 2009). This study replicated that finding with a different measure of source bias and thus extended that aspect of the validity test. Additionally, this study went further and found that people may come to believe that anyone who supports counter-attitudinal arguments has been misled or duped. That belief not only offers a comforting explanation for why so many people believe differently, but also bolsters the self-concept because the individual can feel smug for not being as easily misled as those who believe differently. Future research may wish to explore the possibility that people make even more sinister attributions for their political opponents' "incorrect" beliefs.

There were some issues with study 2 that limit generalizability. The study only examined a single topic rather than several, which would be ideal for scale generalizability. The topic of university funding was not only relevant to some of the students' values, the students may also have felt that it was relevant to their personal lives (e.g. outcome-relevant involvement) because the funding being discussed included their own current university. It would be ideal to replicate these findings with a variety of topics that systematically vary the extent to which the topics may be expected to have various combinations of value-relevant and outcome-relevant involvement.

General Discussion

This study sought to validate the proposal that VRI measures the extent to which attitudes will be related strongly to the self-concept. The data were consistent with the prediction that VRI would be associated with indications of an attitude being strongly related to the self-concept and that it could predict who would react to a counter-attitudinal persuasion attempt by rejecting the message source. For researchers interested in ego-defensive phenomena, the data are consistent with using the Cho and Boster (2005) VRI measure for studying ego-defensive attitudes.

Although these studies were not designed to test theory, the data are consistent with Aronson's (1968, 1992) self-concept version of cognitive dissonance. In that model, any threat to one's core identity must be resisted to avoid feeling dissonance and attitudes that are related to the identity will be particularly strong. Such attitudes are connected to one's self-esteem and thus any threat to them arouses a strong desire to resist the threat by concluding that counter-attitudinal messages contain poor evidence and are written by biased sources. As shown here, high VRI was associated with attitudes that were particularly strong and associated with resistant beliefs about the bias of the source. Future work may consider using the VRI measure to predict when the biased processing described by Aronson and other related theories is likely to occur.

Limitations

Both studies had difficulties with age and sex demographic data collection. Although these variables were not associated with any of the hypotheses or theoretically expected to affect any of the processes involved, the difficulties limit the ability of future meta-analysts to assess the impact of the sample type. It may also affect how scholars interpret these results. The sample was also limited by the use of American college students as participants. Although persuasion processes are not generally moderated by student status, it may be that students' attitudes are less well-formed and easier to change. Future work should explore both other age groups and other

cultures to determine if these kinds of processes generalize and if the VRI scale will remain valid.

Future Research

Some research suggests that when people's beliefs are challenged in an online political discussion, they react with verbal aggression (Hutchens, Cicchirillo, & Hmielowski, 2015). It is possible that such verbal aggression is the result of a need to defend attitudes that are tied to the self-concept and VRI may be a useful measure for exploring that phenomenon as well.

Conclusion

This pair of studies offers more evidence that the VRI measure is a valid indicator of attitudes that are tied to the self-concept. Several studies have used the VRI measure (Choi et al., 2009; Choi et al., 2011; Marshall, Reinhart, Feeley, Tutzauer, & Anker, 2008) but this study is the first since the Cho and Boster (2005) paper to attempt to validate it. Hopefully further validation studies will follow with behavioral observation and longitudinal predictive validity tests so that scholars can use this useful measure with greater confidence in its validity.

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Endnote

¹Age and sex are not common moderators of persuasion effects so the loss of that information is unlikely to be an obstacle to accurate interpretation of the results. Using the portion of the sample for which age and sex data were collected, statistical tests were conducted to determine if age or sex had any impact on the measured variables. The vast majority of those tests were not statistically significant and none were substantially large effects.

Table 1

Study 1 Means, Standard Deviations, and Internal Consistency Reliabilities for Measured Variables

	M	SD	α
VRI	3.49	1.62	0.92
Attitude	4.14	1.68	0.96
Attitude Certainty	4.65	1.19	0.92
Attitude Extremity	1.32	1.05	
Facebook Arguing	1.95	1.20	0.92
Cable News Bias	4.46	1.28	0.92

Table 2

Correlation Matrix of Measured Study 1 Variables

	1	2	3	4	5	6
1. VRI		.17	.40	.35	.35	.50
2. Attitude	0.16*		.10	.02	.10	.13
3. Attitude Certainty	0.37*	0.09		.44	.14	.21
4. Attitude Extremity	0.34*	0.02	0.42*		.04	.16
5. Facebook Arguing	0.32*	0.09	0.13*	0.04		.22
6. Cable News Bias	0.46*	0.12*	0.19*	0.15*	0.20*	

* $p < .05$

Note: The lower triangle contains the raw correlations and the upper triangle contains the correlations corrected for measurement error. VRI = value relevant involvement.

Table 3

Study 2 Means, Standard Deviations, and Alpha Reliabilities for Measured Variables

Variable	Mean	SD	Alpha
Author Position	49.31	36.79	
Participant Position	30.16	27.00	
Message Discrepancy	30.84	28.65	
Attitude Extremity	28.71	17.23	
Source Bias	4.78	1.49	0.81
Social Attraction	4.72	1.19	0.83
Misinformed Supporters	3.74	1.62	0.88
Value-Relevant Involvement (VRI)	3.65	1.36	0.86
Attitude Certainty	4.65	1.41	0.89
Political Affiliation	0.41	1.90	
Political Identification	3.77	1.96	

Table 4

Correlation Matrix of Measured Study 2 Variables

	1	2	3	4	5	6	7	8	9	10	11
1. Author Position		0.34	0.6	-0.27	0.20	-0.24	0.27	-0.04	-0.14	0.02	-0.02
2. Participant Position	0.34*		-0.11	-0.63	0.01	0	0.07	-0.05	-0.24	-0.22	-0.04
3. Message Discrepancy	0.60*	-0.11		0.06	0.32	-0.32	0.35	-0.08	0.02	-0.01	0
4. Attitude Extremity	-0.27*	-0.63*	0.06		-0.1	0.14	-0.20	0.13	0.30	0.10	0.09
5. Source Bias	0.18*	0.01	0.29*	-0.09		-0.20	0.27	-0.05	-0.14	-0.01	0.04
6. Social Attraction	-0.22*	0	-0.29*	0.13*	-0.16*		-0.60	0.13	0.19	-0.08	0.16
7. Misinformed Supporters	0.25*	0.07	0.33*	-0.19*	0.23*	-0.51*		-0.09	-0.12	0.12	-0.03
8. VRI	-0.04	-0.05	-0.07	0.12	-0.04	0.11	-0.08		0.46	0.20	0.38
9. Attitude Certainty	-0.13*	-0.23*	0.02	0.28*	-0.12	0.16*	-0.11	0.4*		0.19	0.21
10. Political Affiliation	0.02	-0.22*	-0.01	0.10	-0.01	-0.07	0.11	0.19*	0.18*		0.16
11. Political Identification	-0.02	-0.04	0	0.09	0.04	0.15*	-0.03	0.35*	0.20*	0.16*	

* $p < .05$

Note: The lower triangle contains the raw correlations and the upper triangle contains the correlations corrected for measurement error. VRI = value relevant involvement.

Table 5

Simple Slopes Analysis for +1 and -1 SD of VRI for the Effect of Message Discrepancy on Outcome Variables in Study 2

Level of VRI	Predictor Variable	
	Source Bias	Misinformed Supporters
+1 SD	0.60	0.69
-1 SD	0.16	0.27

Figure 1

Simple Slopes of the Effect of Message Discrepancy on Source Bias as Moderated by VRI

Figure 2

Simple Slopes of the Effect of Message Discrepancy on Misinformed Supports as Moderated by VRI

Appendix

Facebook Argument Measure Items

1. When people make comments on Facebook that are the opposite of my beliefs on X, I feel the need to comment.
2. I have gotten into arguments with people on Facebook about X
3. When someone shares a picture of a quotation about X on Facebook that argues against my position on X I usually comment.
4. I can easily get pulled into a lengthy argument on Facebook about X.

Misinformed Supporters Scale Items

1. The people who agree with this article have likely be misled by politicians.
2. Generally people will only agree with this article if they have not read much accurate information about the issue.
3. It is likely that people only agree with this article if they have been not checked the facts very carefully.
4. People end up agreeing with articles like this because there is so much misinformation being spread around.