

# Individual Differences in Three Aspects of Evaluation: The Motives to Have, Learn, and Express Attitudes

Mengran Xu<sup>1</sup>, Richard E. Petty<sup>2</sup>, Nicholas Wright<sup>3</sup>, and Pablo Briñol<sup>4</sup>

<sup>1</sup> School of Management, Fudan University

<sup>2</sup> Department of Psychology, Ohio State University

<sup>3</sup> United States Special Operations Command, MacDill Air Force Base, Florida, United States

<sup>4</sup> Department of Psychology, Autonomous University of Madrid

We report seven studies that introduce and validate two unique aspects of evaluation that supplement the original Need to Evaluate (NE) scale (Jarvis & Petty, 1996). Whereas the original scale focused on the tendency to have attitudes, the two new scales focus on the tendencies to learn and express attitudes. Although the new scales are correlated with the original scale and each other, each new scale is shown to be related in a unique way to other relevant scales, and most importantly, to predict different outcomes. Study 1 develops the new learning and expressing aspects of evaluation. Study 2 establishes the factor structure of these new dimensions and distinguishes them from the having aspect identified in the original NE scale. Study 3 demonstrates the convergent and discriminant validity of the two new NE scales in relation to relevant existing individual differences. Study 4 shows that the new NE-learning and expressing scales can predict people's preference for different roles in an impending group discussion. Study 5 shows that the NE-expressing scale predicts attitudes in a paradigm where people generate persuasive arguments and Study 6 shows that the NE-learning scale predicts attitudes in response to an external message using evaluative language. Finally, Study 7 shows that the original NE scale predicts above and beyond the two new scales in accounting for people's tendencies to have and possess attitudes toward various social and political issues.

Keywords: need to evaluate, having, learning, expressing, individual differences

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Evaluation is an important and essential part of everyday life. During the process of evaluation, people assess the positive and/or negative qualities of objects or issues and this typically results in people forming an attitude about it (Fazio, 1995; Jarvis & Petty, 1996). This process can be highly consequential because the attitudes people hold are crucial for guiding their attention, emotional expressions, judgments, and behaviors (see Maio et al., 2019). Despite the fact that it is very common for people to engage in evaluation and hold attitudes, the likelihood and extent to which people do so varies as a function of (a) situational factors, (b) variables associated with the object, and (c) individual differences. Of most relevance to the current research is the latter. That is, the likelihood of engaging in evaluation and possessing attitudes has been shown to vary as a function

of a person's Need to Evaluate (NE), which is a stable trait across situations, objects, and time (Jarvis & Petty, 1996).

The original NE scale was shown to be useful in predicting the extent to which people generate evaluative thoughts and hold attitudes (vs. have no opinion) across a wide variety of topics (see Petty & Jarvis, 1996 for a review). Subsequent studies have shown that those high versus low in their NE are more likely to have attitudes that are highly accessible (Albarracín et al., 2004) and show less susceptibility to question framing effects in opinion surveys (Druckman & Nelson, 2003). Higher NE individuals also demonstrate stronger affective priming effects (Hermans et al., 2001) and are more likely to act on the attitudes they hold (Bizer et al., 2004; Federico & Schneider, 2007), among other things. In short, the original NE scale captures not only the increased likelihood of having an attitude on various issues, but also individuals' propensity to engage in evaluation when they do not already have an opinion, and to act in accord with possessed attitudes (Tormala & Petty, 2001).

The original 16-item NE scale has proven useful in a variety of contexts with scale items that mainly capture the extent to which people report engaging in evaluation (with four items such as "I pay a lot of attention to whether things are good or bad") and especially the extent to which they report holding attitudes (with 12

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Mengran Xu  <https://orcid.org/0000-0002-9998-0103>

Richard E. Petty  <https://orcid.org/0000-0002-2870-8575>

Pablo Briñol  <https://orcid.org/0000-0002-0327-5865>

Correspondence concerning this article should be addressed to Mengran Xu, School of Management, Fudan University, 670 Guoshun Road, Shanghai, 200433, China. Email: [xumengran@fudan.edu.cn](mailto:xumengran@fudan.edu.cn)

items similar to “I have many more opinions than the average person.”) The aim of the current work is to examine two additional aspects of evaluation that do not appear to be represented by the initial NE scale. These new aspects relate to interpersonal or social motives relevant to evaluation whereas the original scale was more focused on intrapersonal factors. Because of its nonsocial focus, the original scale did not highlight two features of evaluation that are particularly important in the contemporary world dominated by social media. Specifically, some scholars have divided social media users into those who are avid seekers of the opinions of others versus those who are avid sharers of their own views (Berger, 2014; Murray, 1991), and these categorizations are consequential. For example, with respect to the world’s most popular social media app, Facebook, research shows that those who use the platform passively (e.g., absorbing and learning about one’s friends’ activities) show reductions in affective well-being compared to those who use it actively (e.g., posting one’s own photos and expressing one’s views; e.g., Verduyn et al., 2015). These two different types of engagement with social media form an important part of interpersonal communication and as explained shortly, also have been studied in some classic social psychological work.

In brief, we argue that although engaging in evaluation and holding opinions are important aspects of evaluation that are tapped well by the original NE scale, seeking or leaning the evaluations of others versus sharing or expressing one’s own views are potentially unique, but important, additional aspects of evaluation that are not captured well by the original scale. Thus, in the current set of studies we develop measures of these learning and expressing motives with respect to evaluation. Furthermore, we distinguish these tendencies from what is captured by the original NE scale, and demonstrate their utility in predicting important evaluation-relevant phenomena. To introduce these two unique aspects of evaluation, we first review some empirical evidence supporting the importance of the learning and expressing dimensions in both classic and contemporary research.

Historically, attitudes have been a critical concept in social psychology (Allport, 1935) because of their important impact on various aspects of people’s daily lives (Fazio, 1990). The notion that evaluation dominates human judgment was featured prominently in the classic work by Osgood et al. (1957) where evaluation, potency, and activity accounted for the meaning of adjectives. From seemingly trivial decisions such as whether to have chocolate ice-cream for dessert to more consequential ones such as who should be the U.S. president, evaluations play an important role (e.g., Fishbein & Ajzen, 1975). Thus, understanding the various aspects of evaluation is potentially important.

The possibility that the motive not only to have attitudes, as tapped by the original NE scale, but also that the motives to learn and express attitudes could be two additional features of evaluation is strongly suggested in prior work. For example, in the 1950s, the themes of learning about other’s opinions and expressing one’s own attitudes were raised by Leon Festinger. First, according to Festinger’s (1954) social comparison theory, humans are motivated to assess their own opinions and abilities. Festinger suggested that one way to do this is by comparing one’s own attitudes to those of others. Through the process of learning about other people’s opinions, people can become better informed about the validity of the evaluations they already hold. That is, Festinger argued that people have the motivation to seek others’ evaluations

because learning others’ opinions can serve as a basis to inform and make judgments about one’s own evaluations. The notion that there could be individual differences in the motive to learn others’ opinions, however, has not yet been examined.

Subsequently, in his cognitive dissonance theory, Festinger (1957) raised the idea that people can be motivated to express their evaluations. For example, in an early study on belief disconfirmation, Festinger et al. (1956) found that when an important belief about the impending end of the world failed to be validated, adherents of this belief did not abandon the views they held, but rather began to engage in even greater expression of their opinions to others. Again, however, the possibility of individual differences in the motive to express one’s opinions has not been examined previously. In brief, one can see in Festinger’s two classic theories both the need to learn about the opinions of others (to validate one’s existing view) and the need to express one’s own views to others (to justify one’s existing view).<sup>1</sup>

In addition to the learning/expressing distinction in Festinger’s classic social psychological theories, these themes have also emerged in early interpersonal communication work on transmission versus reception sets (e.g., see Zajonc, 1960). In this research, the core assumption is people can adopt one of two mindsets with respect to information (i.e., to transmit it vs. receive it). A transmission set occurs when the task requires that people communicate their own cognitions to others (i.e., express one’s own views). A reception set occurs when the task requires that people receive information from others (i.e., learn others’ views). When people are placed in a transmission mindset, they are expected to be motivated to develop a holistic and unambiguous concept of the attitude object, resulting in a desire to receive primarily one-sided information (Cohen, 1961). In contrast, in a reception mindset, people are presumably motivated to get the full story and are less tied to receiving one-sided information.

As additional evidence of the importance of the learning versus expressing distinction with respect to evaluation, consider classic research on how role-playing affects persuasion (Janis & King, 1954). In this paradigm, the amount of attitude change that results for those generating arguments (i.e., often playing a role to convince others) versus receiving arguments is compared (Greenwald & Albert, 1968). People who are assigned to generate the arguments and present them to others are involved in expressing evaluations. In contrast, those who are assigned to receive the arguments generated by others are involved in learning others’ evaluations. As noted earlier, these distinctions are highly relevant in the current social media environment (see Kross & Chandhok, 2020). There are also parallels in other domains. For example,

<sup>1</sup> In this article, we use the term “need” as it was intended to be understood in the development of the original Need to Evaluate scale (Jarvis & Petty, 1996) but also other scales in widespread use in social/personality psychology such as the Need for Cognition scale (Cacioppo & Petty, 1982), the Personal Need for Structure scale (Neuberg & Newsom, 1993), the Need for Closure scale (Webster & Kruglanski, 1994), the Need to Belong scale (Baumeister & Leary, 1995), and others. That is, the use of the term “need” makes no presumption of any biological basis for the individual difference, though it may certainly be the case that one is present. As in the original NE paper, we only presume that the underlying nature of the need to evaluate (or have closure, etc.) assessed with these scales will be similar to what McClelland et al. (1989) referred to as a self-attributed motive (i.e., a motive based in the self-concept and typically assessed through self-report).

within marketing, researchers have investigated the difference between the behaviors of posting evaluations (i.e., communicating one's product or personal experiences to others) versus lurking (i.e., taking in the posts of others but not posting oneself; e.g., Schlosser, 2005). In the domain of advice, researchers have compared the impact of giving advice to others versus receiving it on one's own subsequent relevant behavior (e.g., Eskreis-Winkler et al., 2018).

In short, it appears that themes relevant to the learning and the expressing of opinions have been around for a long time and are also very evident in contemporary research. Yet, prior research has treated motivations to learn and express attitudes as stemming primarily from situational or contextual inductions and has not considered individual differences, the goal of the current work. Before turning to our scale development, a question that might occur to readers is what more general motives might be served by a need to express versus learn about others' opinions? And, how might individual differences in the tendencies to express and learn attitudes arise in the first place?

### Linked Motives and Origins

What more general motives might differences in the learning and expression of evaluations serve? We speculate that these two aspects of evaluation could map onto two more general human motives that have featured prominently in the literature on social motivation: epistemic and power motives (Echterhoff et al., 2009; Douglas et al., 2017; Fiske, 2007; McClelland & Burnham, 2008). Epistemic motives refer to people's pursuit of meaning and the need to achieve a valid and reliable understanding of the world. The greater the understanding, the greater the feeling of security and control. Therefore, epistemic motives are associated with people's desire for information seeking and knowledge gathering (Katz, 1960). Because obtaining the opinions of others is a way to learn about the world as well as validate one's own views, the motive to learn others' evaluations is plausibly related to more general epistemic motives. Need for power, on the other hand, concerns individuals' desires to be influential and have impact. This could manifest itself in attempts to gain influence over others (McClelland, 1961). One way to influence others is through self-presentation (Leary & Allen, 2011). People with a high need for power maintain a public image that connotes that they are dominant, powerful, and of high-status (Fodor, 2009). Because expressing one's own view is a method of potentially influencing and having an impact on other people, this motive is plausibly related to a more general motive to gain power.

Because the learning aspect of evaluation presumably taps into people's desire to gain a better understanding of the world around them, it should show stronger relationships with individual difference variables linked to epistemic motives such as the need for cognition (Cacioppo & Petty, 1982) than does the expressing aspect of evaluation. Conversely, because the expressing aspect of evaluation presumably taps into people's motivations to engage in self-presentation and to exert dominance in social contexts, it should show stronger relationships with individual difference variables linked to the need for power such as the desirability of control (Burger & Cooper, 1979), than does the learning aspect of evaluation.

Despite having these speculations in mind, we are not claiming that links to other general motives are not also reasonable. It is

even possible that the opposite of our speculations could hold. For example, a motive to learn the opinions of others could link to the power motive because achieving a better understanding of the world could be viewed a way to gain power. Similarly, a motive to express one's own opinions could link to epistemic motives in that expressing one's views and obtaining feedback on them could help a person understand the world better. In short, although various links between our postulated learning and expressing motives and various more basic human motivations can be hypothesized, investigating these linkages is beyond the scope of the current article. Nonetheless, in Study 3 we will provide some initial evidence relevant to our speculations in order to better understand the nature of the motives to learn and express evaluations.

Although the proposed learning and expression motives are plausibly linked to more general epistemic and power motives, as just noted, how might these more particular motives arise in the first place? One possibility is that individual differences in these two motives reflect personal competencies that have developed over time. For instance, if some people have selected to engage in expressing strong evaluations during social interactions more regularly than others, then it is possible that this constant practice leads to an increased level of skill in the corresponding behaviors. This increased competency might in turn positively reinforce the individuals to be more motivated to engage in the behaviors in the future. Alternatively, rather than stemming from competencies, differences in these motives could have developed based on individuals' different reinforcement histories. For example, some people might come to be high in their motive to express evaluations because as children, they were often rewarded by their parents for expressing their views. Others might come to be high in the motive to learn evaluations because over time they have seen how valuable it is to know what others think. Of course, both learning and expressing opinions are likely to be functional or rewarding for everyone on different occasions, but different life experiences and competencies can still lead one motive to become more prevalent than the other.

### Importance of Different Evaluation Motives

The goal of the current research is to investigate the hypothesis that not only are some people more likely to have more evaluations than others as captured by the original NE scale, but so too are some people more motivated to learn about evaluations and express their own evaluations than are other people. This is an important issue to address for several reasons. First, it is a basic research question as to whether or not there are individual differences in the more interpersonal motives to learn and express attitudes that are distinguishable from the relatively intrapersonal motive to have attitudes. Importantly, if learning and expressing motives exist and can be measured, then individual differences in these motives could differentially moderate well-established phenomena with respect to attitudes and persuasion. As just one example, consider again the role-playing paradigm of persuasion mentioned earlier. In one study, Janis and King (1954) found evidence that people who actively participated in expressing their own persuasive arguments on an issue showed more favorable attitudes toward the issue than those who passively received arguments from others. In the active generation condition, the task demand is for people to express their opinions on issues.

Therefore, it is reasonable to expect that for people relatively high in the motivation to express their attitudes, this argument generation task would be more compatible with their evaluative goal, and thus be easier than for people lower in this motive. Because people are more likely to rely on thoughts associated with ease of generation rather than difficulty (Schwarz et al., 1991; Tormala et al., 2002), those higher in the motive to express evaluations could show a stronger role-playing persuasion effect than those lower in this motive. As we explain shortly, other phenomena would be more likely to be moderated by individual differences in the motivation to learn (rather than express) evaluations.

### Construction of the Learning and Expressing Scales

So far, we have argued that the possible existence of individual differences in the learning and expressing aspects of evaluation remain uninvestigated by researchers. We have also argued that identification of these individual differences has the potential to contribute to the field both theoretically and practically, especially by serving as moderators of when both established and new attitudinal effects will emerge. Thus, the primary goal of the current series of studies is to develop new scales to tap into the learning and expressing aspects of evaluation and to demonstrate their utility over and above each other and the already established NE scale.

As noted, examination of the items in the original NE scale (Jarvis & Petty, 1996) indicated that it included mostly items related to engaging in evaluation and especially having attitudes, but no items related to learning or expressing attitudes. Yet, these latter two aspects of evaluation have been identified as important in both past and current research. Therefore, in the current series of studies, modifications were made to the original NE scale items to allow for the study of other potentially important aspects of evaluation that were not captured in the original scale. In particular, as explained, we aimed to capture individual differences in the motives to learn the opinions of other people and to express one's own evaluations to others. We expected that individual differences in the motive to learn attitudes would be distinguishable from the motive to express attitudes and that both could be distinguished from the motive to have attitudes. On the other hand, it could be that all of these aspects of evaluation are so strongly associated with each other that they cannot be distinguished.

Of course, we did not expect these aspects of evaluation to be completely independent of each other as a general concern with evaluation is common to all. These aspects of evaluation could also be related to each other because they constitute a causal sequence. One possibility is that a person might first be motivated to learn the opinions of others, then form and have an opinion, and then express it. However, this is not the only causal sequence possible. For example, a person low in self-awareness might form an opinion only after first expressing some viewpoint by the process of self-perception (Bem, 1972) and only then seek others' opinions for validation (Festinger, 1954). Our goal is not to specify one causal sequence among the motives, as many are possible, but rather to distinguish these aspects of evaluation from each other and show their predictive utility.

### Overview

The primary goal of Study 1 was to develop scales to assess the two aspects of evaluation just described that were not represented in the original NE scale (i.e., the motives to learn and express

evaluations). Then, in Study 2, with the structure of the new NE-expressing and NE-learning scales established, we constructed a parallel version focused on the having aspect of evaluation. This new scale (NE-having) was composed of items designed to map onto the aspect of evaluation captured in the original NE scale. Furthermore, Study 2 aimed to examine whether these three aspects of evaluation were distinguishable from each other. In Study 3, we compared the two new aspects of evaluation (expressing and learning) to other individual difference inventories to establish convergent and discriminant validity. After demonstrating that the scales assessing the motives to express and learn evaluations were different from each other and the scale assessing the motive to have evaluations, in Study 4, we examined the predictive validity of the two new dimensions in the context of an impending group discussion and showed their predictive utility beyond the original NE scale. In Studies 5 and 6, we examined the unique predictive abilities of the expressing and learning scales in both self-generation and traditional persuasion contexts. Finally, Study 7, examined the unique predictive validity of the original NE scale compared with the new learning and expressing scales when predicting people's tendencies to have evaluations toward social and political issues, a paradigm used in the original NE research (Jarvis & Petty, 1996).

### Study 1: Measuring the Expressing and Learning Aspects of Evaluation

As just reviewed, two potentially distinct aspects of evaluation—expressing and learning—have received conceptual support in the literature, but were not examined in research on the original NE scale which focused on having evaluations. In order to determine if these two aspects could be measured and distinguished from each other empirically, in Study 1 we aimed to develop reliable scales for measuring the expressing and learning aspects of evaluation. Specifically, two initial 16-item scales that were designed to tap into expressing or learning were factor analyzed to yield a smaller, more coherent set. The items used in these scales paralleled those found in the original NE scale, but the wordings were modified to focus on learning or expressing rather than having evaluations. These scales were included in four separate data collections that were combined prior to analysis.

### Method

#### Participants

Data were collated across four separate time periods. Participants in all data collections were undergraduate students at a large Midwestern University who participated for partial credit in an introductory psychology course. A total of 772 students (459 women, 313 men) participated.<sup>2</sup> Data from 13 participants with response times of > 250 ms on over 10% of the items were excluded.<sup>3</sup> Removing these individuals

<sup>2</sup> At each time period, data were collected from 100–445 participants. For Data Collection 3, another study that is reported in the current article as Study 6 was attached at the end of the scale measures. There were no gender effects in any studies, and thus our results are generalizable across gender.

<sup>3</sup> These same exclusion criteria are used in all of the scale development studies for which response time was available (i.e., Studies 1 and 3). Nonetheless, in all studies, the results are substantially the same as when all participants are included.

Table 1  
The 16-Item Scales for the Exploratory Factor Analysis in Study 1

Scales	Process	Item
1	Expressing	<b>1. I express my opinions about everything. [1]</b>
	Expressing	<b>2. I refer to avoid expressing extreme positions. (R) [2]</b>
	Expressing	<b>3. It is very important to me to share strong opinions. [3]</b>
	Expressing	<b>4. I want others to know exactly what is good and bad about everything. [4]</b>
	Expressing	5. I often prefer to remain silent about complex issues. (R)
	Expressing	<b>6. If something does not affect me, I do not usually tell others if it is good or bad. (R) [5]</b>
	Expressing	<b>7. I enjoy expressing strong liking and disliking for new things. [6]</b>
	Expressing	8. There are many things for which I do not share my preference. (R)
	Expressing	9. It bothers me to share neutral opinions.
	Expressing	<b>10. I like to express strong opinions even when I am not personally involved. [7]</b>
	Expressing	<b>11. I share many more opinions than the average person. [8]</b>
	Expressing	12. I would rather express a strong opinion than no opinion at all.
	Expressing	13. I pay a lot of attention to whether I say things are good or bad.
	Expressing	<b>14. I only share strong opinions when I have to. (R) [9]</b>
	Expressing	<b>15. I like to tell others about my decisions that new things are really good or really bad. [10]</b>
	2	Learning
Learning		<b>2. I prefer to avoid learning about others' extreme positions. (R) [2]</b>
Learning		<b>3. It is very important to me to hear about strong opinions. [3]</b>
Learning		<b>4. I want others to tell me exactly what is good and bad about everything. [4]</b>
Learning		5. I often prefer not to hear others' opinions about complex issues. (R)
Learning		<b>6. If something does not affect me, I am not usually interested if others say it is good or bad. (R) [5]</b>
Learning		<b>7. I enjoy learning if others strongly like and dislike new things. [6]</b>
Learning		8. There are many things for which I do not care about others' preferences. (R)
Learning		9. It bothers me to hear about neutral opinions.
Learning		<b>10. I like to learn about others' strong opinions even when I am not personally involved. [7]</b>
Learning		<b>11. I enjoy learning about others' opinions more than the average person. [8]</b>
Learning		12. I would rather hear about a strong opinion than no opinion at all.
Learning		13. I pay a lot of attention to whether people say things are good or bad.
Learning		<b>14. I only listen to strong opinions when I have to. (R) [9]</b>
Learning		<b>15. I like to hear about others' decisions that new things are really good or really bad. [10]</b>
Learning		16. I am pretty much indifferent to learning about many important issues. (R)

Note. Bolded items represent the 10-item scales used in Study 2. (R) represents reverse-coded items. The numbers in the brackets refer to the new item numbers in the 10-item scales.

from the analyses left a final sample size of 759 (445 women, 304 men).

## Procedure

For all four data collections, once participants arrived at the lab, they were asked to complete a series of personality questionnaires presented via MediaLab software (Jarvis, 2006). The presentation order of the items intending to assess expressing and learning motivations (16 items on each) was counterbalanced within data collections. Also, scale items were always presented in the same order (for the order they appear in the scales, see Table 1). Participants responded to each item using 5-point scales with response options ranging from 1 = extremely unlike me to 5 = extremely like me. At the end of each data collection, participants provided demographic information to allow for an adequate description of the sample. Before being dismissed, participants were thoroughly debriefed and thanked for their time.

Procedural similarities in the data collections through the point of measuring the constructs of interest and sampling from the same population allowed for combining the data. A twofold cross validation method was used for the combined analysis. That is, the combined data were randomized and split into two portions, a training sample (Sample A,  $N = 379$ ) and a validation sample (Sample B,  $N = 380$ ). These sample sizes met Cattell's (1978) minimum sample size (not less than 250) and participants-to-item (not less than 3:1) criteria for performing factor analysis.<sup>4</sup> Scale

reliability and exploratory factor analyses were performed on Sample A to identify items that produced internally consistent expressing and learning scales that measured distinct constructs. Confirmatory factor analyses were then performed on Sample B using the appropriate scales to demonstrate the validity of the models uncovered in the exploratory analyses.

## Results and Discussion

The factor analysis of the expressing and learning items was guided by best practices for exploratory factor analysis (Costello & Osborne, 2005). The scale reliability and factor analyses were performed using IMB SPSS Version 21 and structural equation

<sup>4</sup> MacCallum et al. (1999) suggested an alternative way to calculate sample size based on considerations such as the level of communality of the factors, the number of factors, and the number of items per factor (i.e., the level of overdetermination of factors). In Studies 1 and 2, the communalities in our sample are in the low to medium range (all below .67). In addition, we have 10–16 indicators per factor and a rather small number of factors (two to three), indicating a relatively high degree of overdetermination. Based on the recommendation of MacCallum et al. (1999), any sample between 200–300 participants would be deemed reasonable. Therefore, by this standard, the sample sizes we used in Study 1 (379 participants in Sample A, 380 participants in Sample B) and Study 2 (403 participants) should be sufficient to achieve reliable results for our factor analyses.

modeling was performed using AMOS Version 21 and SAS University Edition. All eigenvalues were calculated using the reduced correlation matrix using syntax from [Fabrigar and Wegener \(2011\)](#). The quantitative item and scale criteria were those used in the development of the original NE scale: (a) an item-total correlation of greater than .30, (b) an average interitem correlation of greater than .20, (c) an overall mean greater than 2 and less than 4 on the 5-point scale, and (d) a standard deviation of at least 1.

### Exploratory Factor Analysis

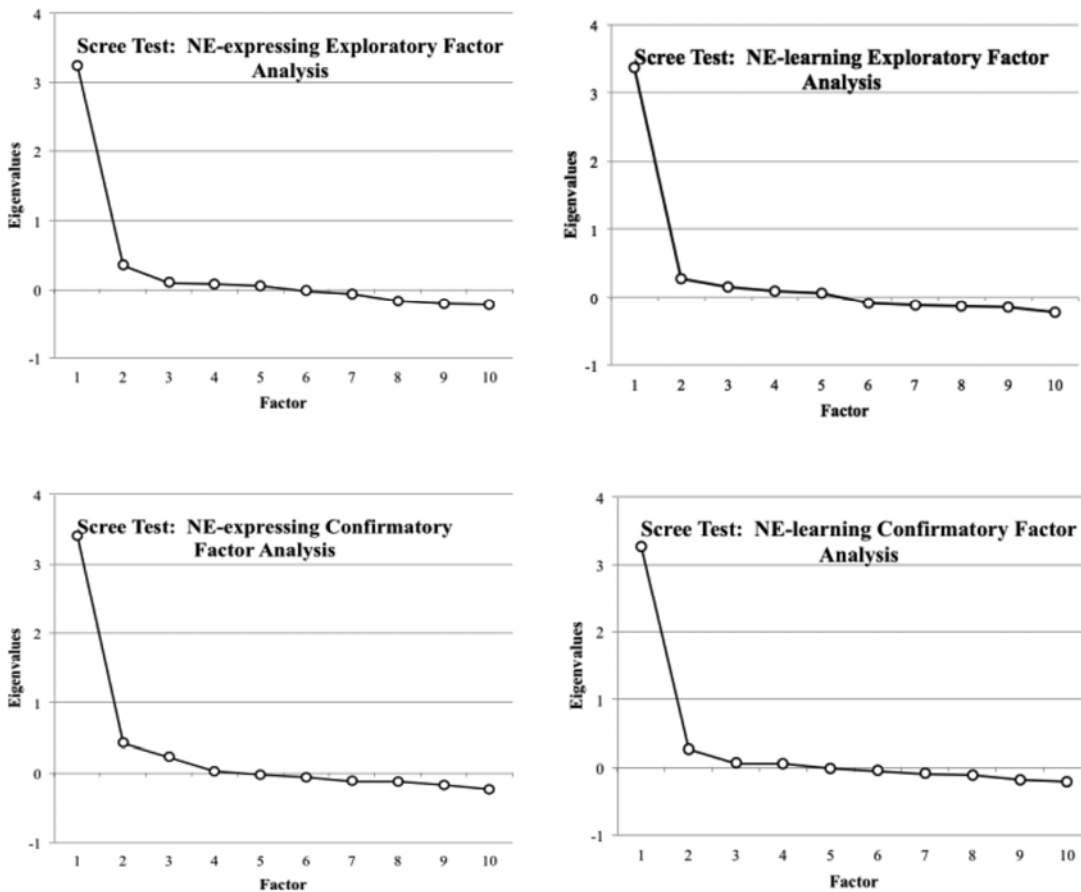
**Selecting Items for the Scales.** The exploratory factor analyses used data from Sample A. An iterative approach was used for reducing the 16-item expressing and learning scales to a smaller number. In each iteration, the scales were subjected to scale reliability and factor analyses to identify the single item in each scale with the grossest violation of the established criteria. This approach is preferred over the removal of multiple items at the same time as the removal of one item influences the internal consistency as well as the factor loadings of the scales' remaining

items. The value of this approach increases as the scales near their final solutions.

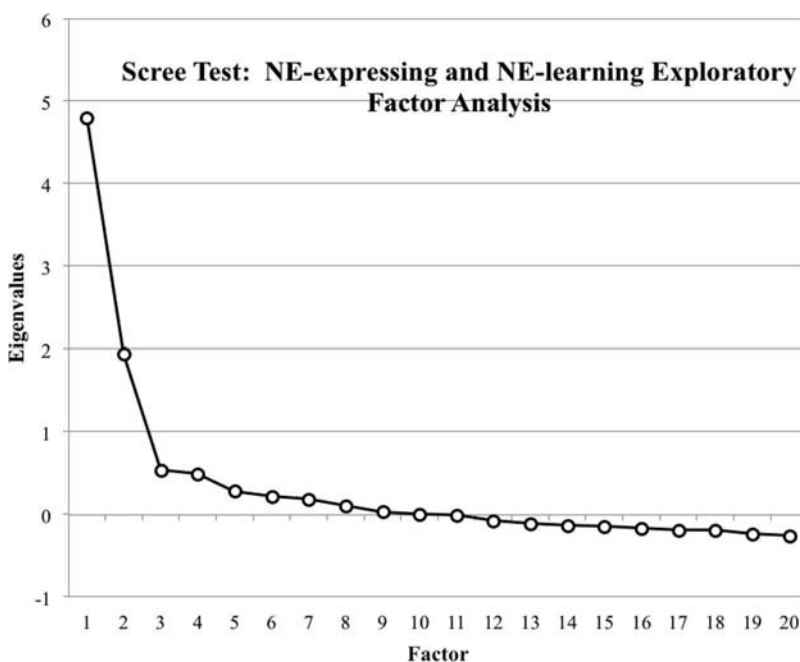
Items 5, 8, 9, 12, 13, and 16 (see Scale 1, [Table 1](#)) were discarded from the expressing scale for their lack of consistency and fit with the model. This left seven standard and three reverse-scored items to represent the expressing psychological construct. That is, the expressing scale was reduced to 10 items ([Scale 1, Table 1](#), bolded items) that met all of the item criteria. This set of items also met all of the scale criteria, having good internal reliability (Cronbach's alpha = .825) and fair model fit (RMSEA = .076) for the one factor solution (loading absolute values range from .451 to .726). This single factor accounted for 32.6% of the total scale variance. A scree test (top left panel, [Figure 1](#)) depicts a single clear factor above the break in the data line supporting this assessment. We will refer to these 10 items as the NE-expressing scale to indicate that the items used in its development were modifications of the original NE scale items to tap the expressing aspect of evaluation.

**Figure 1**

*Top Panels: Scree Tests for the Exploratory Factor Analysis of the 10-Item Expressing Scale (Left Panel) and Learning Scale (Right Panel) Depicting One Distinct Factor Above the Break in the Dataline. Bottom Panels: Scree Tests for the Confirmatory Factor Analysis of the 10-Item Expressing Scale (Left Panel) and the 10-Item Learning Scale (Right Panel) Depicting a Single Distinct Factor Above the Break in the Data Line*



**Figure 2**  
*Scree Test for the Exploratory Factor Analysis of the 10 Item NE-expressing and NE-learning Scales Depicting Two Distinct Factors Above the Break in the Dataline*



The comparable six items (Items 5, 8, 9, 12, 13, and 16; see Scale 2, Table 1) were discarded from the learning scale for their lack of consistency and fit with the model. This left seven standard and three reverse-scored items to represent the learning psychological construct. That is, the learning scale was also reduced to 10 items (Scale 2, Table 1, bolded items) that subjectively met all of the item criteria.<sup>5</sup> This set of 10 items also met all of the scale criteria having good internal reliability (Cronbach's alpha = .830) and fair model fit (RMSEA = .066) for the one factor solution (loading absolute values ranged from .378 to .725). This single factor accounted for 34.0% of the total scale variance. A scree test (top right panel, Figure 1) depicts a single clear factor above the break in the data line supporting this assessment. We will refer to these 10 items as the NE-learning scale.

**Distinguishing the Scales.** The items from the two 10-item scales were then combined into one data set on which we conducted an exploratory factor analysis to determine if these two internally consistent scales would load on two separate factors or only one. A scree test was used to identify the number of latent variables indirectly observed by the items in the two scales. Examination of the graph of the eigenvalues presented in the scree plot (see Figure 2) showed there were two potential factors above the break in the data line. The factor analysis for the two-factor solution indicated that all the items loaded on their respective factors above the threshold criterion (loading absolute values ranged from .463 to .735 for the expressing factor and from .351 to .721 for the learning factor) and no items violated the crossloading criterion (crossloading absolute values ranged from .001 to .111 for the expressing factor and from .002 to .110 for the learning factor; for all factor loadings, please see Table S1 in the online supplement materials). The learning

factor accounted for 23.9% of the total scale variance and 71.2% of the total common variance. The expressing factor accounted for 9.7% of the total scale variance and 28.8% of the total common variance. The two-factor model accounted for a total of 33.6% of the total scale variance. The expressing and learning factors were moderately and positively correlated ( $r = .406$ ). Overall, the NE-expressing and NE-learning scales were internally consistent and appeared to measure constructs that are distinguishable. Confirmatory analysis was then undertaken to assess these statements using the data from Sample B.

### Confirmatory Factor Analysis

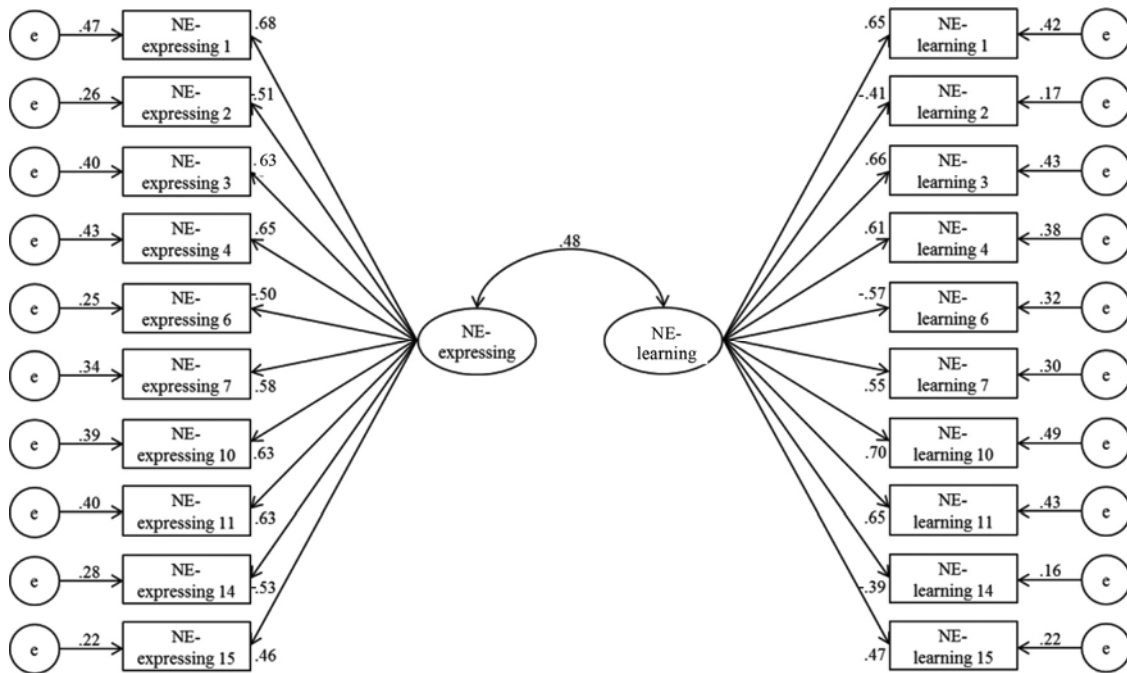
The confirmatory analysis used data from Sample B. First, the 10-item NE-expressing scale identified in the exploratory analysis met all of the item criteria when factor analyzed. The items also subjectively met all of the scale criteria having good internal reliability (Cronbach's alpha = .835) and acceptable model fit (RMSEA = .084) for the one factor solution (loading absolute values ranged from .470 to .688).<sup>6</sup> This single factor accounted for 34.2% of the total scale variance. A scree test (bottom left panel, Figure 1) revealed a single clear factor above the break in the data line supporting this assessment. These results for the confirmatory analysis were consistent with those found in the exploratory analysis.

The 10-item NE-learning scale identified in the exploratory analysis also met all the item criteria when subjected to a

<sup>5</sup> The standard deviation for item 15 was less than one but was very close to 0.997.

<sup>6</sup> Although this exceeded our criteria, RMSEA  $\leq .1$  is considered as moderate or acceptable fit.

**Figure 3**  
Structural Equation Model Testing the Viability of the A Priori Two-factor Model



confirmatory factor analysis.<sup>7</sup> Furthermore, the items met all of the scale criteria in having good internal reliability (Cronbach's alpha = .824) and good model fit (RMSEA = .047) for the one factor solution (loading absolute values ranged from .397 to .697). This single factor accounted for 33.1% of the total scale variance. In addition, a scree test (bottom right panel, Figure 1) showed a single clear factor above the break in the data line supporting this assessment. Again, the results for the confirmatory factor analysis were consistent with those found in the exploratory analysis.

Structural equation modeling was then used to confirm the viability of the a priori model (see Figure 3). The model specified that a large amount of the shared variance in the NE-expressing items derived from a single latent construct as well as a large amount of the shared variance in the NE-learning items derived from a single latent construct. More importantly, the model also indicated that these two constructs were distinct from one another but with some covariation. This a priori model met all of the scale criteria demonstrating strong factor loadings for all of the items on their respective constructs (loading absolute values ranged from .464 to .684 for the expressing factor and from .395 to .698 for the learning factor; see Table 2) and fair fit (RMSEA = .063).<sup>8</sup> Compared with the one-factor structure solution ( $X^2 = 886.84$ ,  $df = 168$ ), the two-factor solution ( $X^2 = 426.29$ ,  $df = 169$ ) showed significant improvement in model fit,  $p < .001$ . Additionally, the two factors showed moderate covariation ( $\sigma = .482$ ).

In sum, the two aspects of evaluation—expressing and learning—were identified and distinguished, and 10-item scales that measured each aspect were created. Overall, these scales demonstrated good internal consistency and had single factor structures that showed they were distinguishable from each other. In Study 2, we examine these two scales in the context of a scale that taps into what we presumed was measured by the original NE scale, the motive to have attitudes.

### Study 2: Relationship Between the Two New Scales and the Original NE Scale

The overall goal of Study 2 was to examine the relationship between the two new aspects of evaluation identified in Study 1 (learning and expressing) along with the having aspect that is presumably assessed by the original NE scale. The learning aspect of evaluation captures the desire to be informed about others' views, the having aspect focuses on the desire to possess attitudes, and the expressing aspect focuses on the desire to share one's evaluations with others. In Study 2, we constructed 10 new scale items that closely followed the wording of the learning and expressing items developed in Study 1 with the aim of more comparably tapping into the motive to have attitudes. Furthermore, in order to examine the convergence between our new NE-having scale and the original NE scale, we also aimed to demonstrate empirically

<sup>7</sup> Although, the standard deviation for item 15 was less than one, it is close at 0.969.

<sup>8</sup> To reduce concern about acquiescence bias influencing the results, we imposed a three-factor structure solution with the following constraints. One factor was imposed on the 10 items measuring the motive to express evaluations and a second factor was imposed on the 10 items measuring the motive to learn evaluations. A third acquiescence methodological factor was imposed on all items (see Billiet & Matsuo, 2012; Price et al., 2015). For all expressing and learning items, all statements were permitted to load on their respective expressing and learning factors freely. For the acquiescence factor, all items were forced to load with a positive, unstandardized value of 1. The acquiescence factor was not permitted to correlate with the expressing and the learning factors, ensuring the expressing and learning factors were not confounded with acquiescence. This new model showed comparable model fit when compared with the model reported in the text (new model: RMSEA = .063; see Table S2 in the online supplement materials for details).



**Table 2**  
*SEM Standardized Regression Weights*

Expressing scale		Learning scale	
Item	Factor loading	Item	Factor loading
1	0.684	1	0.649
2	-0.511	2	-0.414
3	0.628	3	0.657
4	0.654	4	0.613
6	-0.501	6	-0.570
7	0.580	7	0.548
10	0.626	10	0.698
11	0.631	11	0.654
14	-0.529	14	-0.395
15	0.464	15	0.467

that these two methods of assessing the motive to have evaluations show good empirical overlap with each other. As foreshadowed in the Introduction, the expressing and learning aspects of evaluation were expected to be distinct from the having aspect, captured either by the original NE scale or our new 10 item NE-having scale.

To accomplish these aims, an exploratory factor analysis was first conducted on the three 10-item NE-learning, expressing, and having scales to examine whether these three aspects of evaluation formed distinct factors. Then, the original NE scale items were included in the factor analysis along with the three sets of newly developed scale items to examine whether the original NE scale items primarily overlapped with any of the three new scales. We predicted that the items from the NE-having, learning, and expressing scale would load on three separate factors and that the NE-having scale would be most highly correlated with the original NE scale and load on the same factor.

## Method

### Participants

Four-hundred and three Mechanical Turk workers who accepted the human intelligence task (HIT; 151 women, 251 men, one unidentified) participated in this study in exchange for a payment of \$.70. This sample size meets *Cattell's (1978)* minimum sample size (not less than 250) and participants-to-item (not less than 3:1) criteria for performing factor analysis (see also Footnote 4).

### Procedure

Participants completed all of the measures (described shortly) presented using Qualtrics (Provo, UT). They were then asked to provide their demographic information.

### NE Aspects Scales

Three potential aspects of evaluation were investigated using the learning and expressing items developed in Study 1 along with 10 parallel items to assess the motive to have evaluations. That is, in order to construct an NE-having scale to compare with the newly developed NE-learning and expressing scales, we used items that mirrored the wording of those scales. However, in the NE-having scale, the items focused on having and holding attitudes instead of learning or expressing them. The items from the three scales were shown to participants in three presentation

blocks. The presentation orders of the blocks and items within the blocks were randomized. Participants responded to all items using 5-point scales with response options ranging from 1 = extremely unlike me to 5 = extremely like me. The items comprising each of the three aspects of evaluation are explained further next.

**Learning.** The motive to learn attitudes is one of the two aspects of evaluation the original NE scale did not explicitly assess. The 10 learning items in the present study were developed in Study 1 and address the varying degree to which people like to learn about others' opinions on a variety of things (e.g., "It is very important to me to hear about strong opinions"). All items are presented in [Table 1](#).

**Expressing.** The motive to express attitudes is the second aspect of evaluation that the original NE scale did not assess. The 10 expressing items, also developed in Study 1, address the varying degree to which people like to express their opinions on a variety of things (e.g., "I express my opinions about everything"). All items are presented in [Table 1](#).

**Having.** The motive to have attitudes is the aspect of evaluation explicitly tapped by the original NE scale. We constructed 10 having items that addressed the varying degree to which people like to have and hold opinions on a variety of things (e.g., "I own more opinions than the average person"). These 10 items were all new but were designed to map conceptually onto the construct captured by the original NE scale (having attitudes) in a manner that was equivalent and more comparable to the newly developed expressing and learning scale items. All items can be found in [Table S3](#) in the online supplement materials.

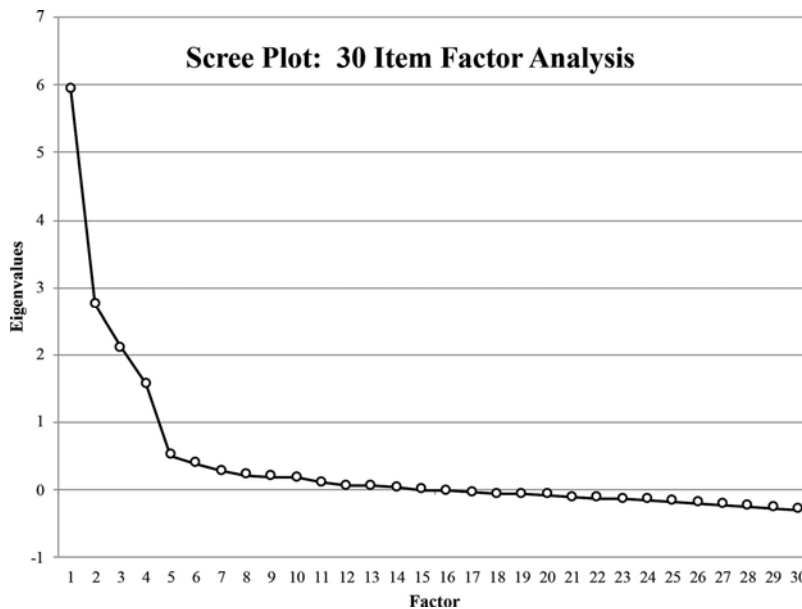
## Results and Discussion

The analyses of the various scale items were guided by best practices for exploratory factor analysis (*Costello & Osborne, 2005*) and were performed using IBM SPSS Version 26. The maximum likelihood factor extraction method is used for all the factor analyses and RMSEA was used as the fit index (RMSEA < .05 is good; < .08 is fair; > .10 is poor). Oblique rotations (direct oblimin) were used for all analyses involving two or more factors. All eigenvalues were calculated using the reduced correlation matrix using syntax from *Fabrigar and Wegener (2011)*. The item factor loading and crossloading cutoffs were set at greater than and less than |.30| respectively.

The first factor analysis examined the 30 items from the NE-having, learning, and expressing scales. A scree test was used to identify the number of latent variables present in the aspect assessment. There were four potential factors above the break in the data line shown in the scree plot. The eigenvalues are presented in [Figure 4](#). The first factor accounted for 22.2% of the total scale variance. The second strongest factor accounted for 11.1% of the total variance. The third factor accounted for 9.0% of the total variance, and the fourth factor accounted for 7.3% of the total variance. Given that we initially would expect three separate aspects of evaluation would emerge, factor analyses for the three-factor solution are presented in the text. The four-factor solution is reported in [Table S5](#) in the online supplement materials.<sup>9</sup>

<sup>9</sup> As shown by the factor loading table for the four-factor solution in the [online supplement materials](#), the first three factors in the four-factor solution showed very similar loadings with those reported in the text for the three-factor solution. The fourth factor consisted of reverse scored items across all three aspects of evaluation.

**Figure 4**  
*Scree Plot for the 30-Item Exploratory Factor Analysis Depicting Four Distinct Factors Above the Break in the Data Line*



The three-factor solution produced fair fit (RMSEA = .071) for the data (see Table S4 in the online supplement materials). The variable-to-factor ratio for both factors was greater than 6:1, meeting Cattell's (1978) criteria. The first factor was represented primarily by having items (i.e., eight out of 10 items; loading absolute values ranged from .311 to .742). The second factor was represented primarily by learning items (i.e., nine out of 10 items; loading absolute values range from .384 to .632). The third factor consisted primarily of expressing items (i.e., seven items; loading absolute values range from .495 to .716). Overall, five items did not load on any factor (all are reverse-scored items) and none crossloaded. Factors 1 and 2 (having and learning) showed no correlation with each other ( $r = -.01$ ). Factors 1 and 3 (having and expressing) showed a small positive correlation ( $r = .16$ ) as did Factors 2 and 3 ( $r = .18$ ). These suggested that the identified three factors showed only small overlap with each other. This three-factor solution provides new information that is of theoretical interest. Consistent with our theorizing about the different aspects of evaluation, this factor solution provides evidence that the new expressing items and the new learning items each loaded on factors that were separate from the having items. Also, consistent with the findings of Study 1, the new expressing and learning items loaded on separate factors.<sup>10</sup>

To test our assumption that the new having items would overlap most strongly with the items on the original NE scale, we had the participants in this study complete the original NE scale after responding to the NE-learning, expressing, and having scales along with some other measures (on attitude functions) that will be discussed subsequently in the General Discussion. First, simple correlations among the scales were conducted. The original 16-item NE scale showed the strongest positive correlation ( $r = .68$ ) with the composite of the 10 having items (with negatively worded items reverse-coded when calculating the composite score). The

original NE scale also showed moderate and positive correlations with the composite of all expressing items ( $r = .56$ ) as well as the composite of all learning items ( $r = .28$ ).

Then, to further examine the relationships among the scales, we conducted an exploratory factor analysis using not only the 30 new items capturing the learning, having, and expressing aspects of evaluation, but also the 16-item original NE scale. From the scree plot of all 46 items, four factors emerged and the items from the original NE scale loaded on the same factor as the new having items. Learning items and expressing items loaded on two separate factors, with the fourth factor consisting of reverse-scored items. These results further support our suggestion that the having aspect of evaluation

<sup>10</sup> In order to verify the exploratory factor analysis results, we conducted confirmatory factor analyses using the independently collected data for NE-expressing, learning, and having that were available in Study 6. When constraining these data to the three-factor structure we obtained from the exploratory factor analyses, the result from the confirmatory factor analysis indicated reasonable model fit (RMSEA=.097). To control for possible acquiescence bias, we also conducted a confirmatory factor analysis with a four-factor structure. One factor was imposed on the 10 items measuring the motive to express evaluations, a second factor was imposed on the 10 items measuring the motive to learn evaluations, a third factor was imposed on the 10 items measuring the motive to have evaluations, and a fourth acquiescence methodological factor was imposed on all items (see Billiet & Matsuo, 2012; Price et al., 2015). For all expressing, learning, and having items, all statements were permitted to load on their respective expressing, learning, and having factors freely. For the acquiescence factor, all items were forced to load with a positive, unstandardized value of 1. The acquiescence factor was not permitted to correlate with the expressing, learning, and having factors, ensuring the expressing, learning, and having factors were not confounded with acquiescence. This new model showed good model fit and improvement from the three-factor structure when not controlling for acquiescence without changing the structure of the three factors of interest (RMSEA = .056). The factor loadings from the confirmatory factor analyses can be found in Tables S6 and S7 in the online supplement materials.

was dominant in the original NE scale (see Table S8 in the online supplement materials for more detail on this factor analysis).

In short, the results from these factor analyses further support the distinction of the two newly developed NE-expressing and learning scales from each other as well as from the having aspect of evaluation that is captured by the original NE scale. In sum, the three-factor solution obtained provides three points of interest: (a) the new NE-expressing and NE-learning scale items are distinguishable from the having items, (b) the NE-expressing and NE-learning items are also distinct from each other, and (c) the new NE-learning scale items load on the same factor as the original NE scale items. These features were also apparent in the four-factor solution.

### Study 3: Scale Relations—Convergent and Discriminant Validity

Having developed two new scales to assess NE-learning and expressing, we turn to the question raised in the introduction regarding what core motives these dimensions might be related to, and the question of the convergent and discriminant validity of these scales. The original work on the Need to Evaluate scale showed that it had low positive correlations with scales assessing the need for cognition, desire for control, and affect intensity. Given that the having aspect of evaluation has already been examined with respect to various other measures, in the current study we focused on the two new aspects of evaluation (learning and expressing). Nevertheless, we also included the original NE scale in order to compare it with the two new scales. Our primary goal for this study, before turning to the predictive validity of the new scales, was to show that the two novel aspects of NE relate to relevant other constructs in theoretically sensible ways without being redundant. Thus, some of the scales included in Study 3 were ones for which clear predictions could be made, but others were included for exploratory purposes.

In introducing the new learning and expressing motives to evaluate, we alluded to possible links to more fundamental epistemic and power motives (Echterhoff et al., 2009; Douglas et al., 2017; McClelland, 1961). Based on our speculations, we predicted that compared to NE-expressing, NE-learning would show greater correlation with scales related to epistemic motives such as being positively correlated with the need for cognition and negatively correlated with the need for closure. However, we also predicted that NE-expressing would show greater correlation with scales related to the need for power such as being positively correlated with the desirability of control and self-monitoring, but negatively correlated with the need to belong. We include brief discussions of other obtained relationships, but detailed reporting is reserved for the online supplement materials. Study 3 was comprised of two similar data collections. Both data collections included the original NE scale (a proxy for NE-learning), NE-expressing, NE-learning, and the need for cognition scale (Cacioppo & Petty, 1982). As explained further below, the two data collections (i.e., Studies 3a and 3b) included different batteries of other scales.

## Method

### Participants

All participants were undergraduate students sampled from the same population as Study 1. Students participated for partial credit

in an introductory psychology course. One-hundred and two students (58 women, 44 men) participated in Study 3a. Data from five participants with response times of > 250 ms on over 10% of the items were excluded, as in the prior studies. Removing these individuals from the analysis left a final sample size for Study 3a of 97 participants (57 women, 40 men). Seventy-four students (51 women, 23 men) participated in Study 3b. No data were excluded from this study because no participants met the exclusion criteria used previously. Data from Studies 3a and 3b were combined ( $N = 171$ ; 108 women, 63 men) for assessing scales included in both studies. Of course, comparisons that included scales unique to one study did not use combined data. The sample size for Study 3a had .8 power to detect a correlation of .25. The sample size for Study 3b had .8 power to detect a correlation of .30. The combined sample had .8 power to detect a correlation of .20.

### Procedure

Once participants arrived at the lab and gave consent to participate, they were instructed to complete a series of personality questionnaires presented via MediaLab (Jarvis, 2006). The presentation order of the NE-expressing and NE-learning scales was counterbalanced within studies and scale items were always presented in the same order. The presentation order of the original 16-item NE scale (Jarvis & Petty, 1996) and the 18-item need for cognition scale (Cacioppo et al., 1984) were randomized within each data collection. Participants responded to each item using 5-point scales with response options ranging from 1 = extremely unlike me to 5 = extremely like me.

Study 3a included the 100-item Big Five Aspect scale (10 items from each of the 10 aspects; DeYoung et al., 2007), the 24-item Assessment and Locomotion scales (12 items each; Kruglanski et al., 2000), the 15-item brief version of the Need for Closure scale (NFC; Roets, & Van Hiel, 2011; Webster & Kruglanski, 1994); and the 15-item Self-Monitoring scale (Snyder, 1974).<sup>11</sup> Study 3b included the 20-item Desirability of Control scale (Burger & Cooper, 1979), the 10-item Need to Belong scale (Baumeister & Leary, 1995) and the 20-item UCLA Loneliness scale (Russell et al., 1980).<sup>12</sup> The presentation order of these additional personality measures was randomized within each study. At the end of each study, participants were asked to provide demographic information to allow for an adequate description of the sample. Procedural similarities in the two studies and sampling from the same population allowed combining the data when appropriate. Next, we describe scales for which we had hypotheses.

**Need to Evaluate.** As explained previously, the original NE scale (Jarvis & Petty, 1996) measures individual differences in the likelihood and extent of holding attitudes and can be considered a proxy for NE-learning.

**Need to Evaluate—Learning.** The NE-learning scale developed in Studies 1 and 2 is intended to measure individual differences in the motivation to learn about others' attitudes. A relationship between the original NE and NE-learning is expected as learning about attitudes is one method of forming and holding one's own views.

<sup>11</sup> All participants in Study 3a were participants from the first of the four periods of data collection of Study 1.

<sup>12</sup> All participants in Study 3b were participants from the second of the four periods of data collection of Study 1.

**Need to Evaluate–Expressing.** The NE-expressing scale developed in Studies 1 and 2 is intended to measure individual differences in the motivation to express one's own attitudes. A relationship between the original NE and NE-expressing is expected as forming or holding evaluative associations is often an antecedent to expressing them.

**Need for Cognition.** The Need for Cognition (NCog) scale (Cacioppo et al., 1984) measures individual differences in the likelihood of engaging in and enjoying effortful thought (see Petty et al., 2009, for a review). Prior research has already shown that NCog is moderately related to NE ( $r = .35$ ; Jarvis & Petty, 1996), but the relationships of NCog with NE-expressing and NE-learning are unknown. Because NE-learning and high levels of thinking (NCog) likely share a common epistemic motivation (seeking knowledge), they are expected to be more highly correlated than NCog and NE-expressing.

### Study 3a Scales

**Need for Closure.** Need for Closure (NFC) refers to a desire to reach an answer even if that answer is not the correct or best one (Webster & Kruglanski, 1994). The 15-item version of the scale (Roets & Van Hiel, 2011) measures five aspects of NFC. For people who score higher on the NFC, they might jump to conclusion too hastily or become close-minded after reaching a final conclusion. Therefore, overall NFC is inversely related to epistemic motives. Thus, we hypothesized that NFC would negatively correlate with NE-learning.

**Self-Monitoring.** Self-monitoring refers to the extent to which individuals consciously employ impression management strategies in social interactions (Snyder, 1974). People who score higher on the self-monitoring scale are motivated to monitor their self-presentations and expressive behavior depending on the situation in order to increase their leadership outlook. Given that NE-expressing is proposed to be linked to the need for power and desire to cast influence over others, we hypothesized that self-monitoring would positively correlate with NE-expressing.

### Study 3b Scales

**Desirability of Control.** Desirability of control measures individual differences in the people's general desire for control over the events in their lives (Burger & Cooper, 1979). Because desire for control is related to a desire for power, we expected NE-expressing to be positively related to this scale.

**Need to Belong.** Need to belong refers to people's drive to form and maintain lasting and positive interpersonal relationships (Baumeister & Leary, 1995). This should be negatively related to people's desire to pursue power over others during social interactions. Therefore, we expected that need to belong to be negatively related to NE-expressing.

## Results and Discussion

In presenting the results, we focus on the correlations for which predictions were made. Nonetheless, a full list of scale correlations obtained is presented in Table 3. The relationships among the original NE scale and the two new NE scales (i.e., expressing and learning) are reported in the top panel of the table. Next, the relationships among the two new NE scales and the other personality measures are

reported. The reporting of these assessments is organized by the nature of the relationships (uncorrelated, common correlations, unique correlations) and is used to identify the characteristics associated with NE-expressing and NE-learning.

### NE Scales Relationship

As shown in the top portion of Table 3, the correlations between the original NE scale and the two new scales were positive as expected. The original scale correlated more highly with NE-expressing ( $r = .726, p < .001$ ) than with NE-learning ( $r = .443, p < .001$ ). This difference was significant,  $z = 4.89, p < .001$ . The correlation between the NE-expressing and the NE-learning scales was also moderate and positive ( $r = .436, p < .001$ ). The fact that NE-expressing is more highly correlated with the original NE scale than is NE-learning is consistent with the factor structure found in Studies 1 and 2. The strong link between the motive to have and express evaluations may suggest that a core reason to form and hold evaluations is to express them. However, the correlation between the original NE scale and NE-learning supports the idea that evaluative associations are formed through multiple processes one of which is learning the views of others.

### NE-Learning and Scales Related to Epistemic Motivation

Consistent with our prediction, the correlation between NE-learning and NCog was positive and significant,  $r = .34, p < .001$ . Furthermore, the strength of the relationship between NE-learning and NCog tended to be greater than between NE-expressing and NCog ( $r = .19, p = .01$ ),  $z = 1.93, p = .053$ . In addition, overall NFC showed a significant negative correlation with the motive to learn attitudes ( $r = -.230, p = .023$ ), but was not related to NE-expressing. Thus, NE-learning showed a stronger relationship to epistemic motives than did NE-expressing, consistent with our speculation that those high in NE-learning are more motivated to seek knowledge and understand their environment.

### NE-Expressing and Scales Related to Power Motivation

Consistent with our prediction, the correlation between NE-expressing and the desirability of control was positive and significant ( $r = .46, p < .001$ ). Furthermore, the strength of the relationship between NE-expressing and control ( $r = .462, p < .001$ ) was greater than between NE-learning and control ( $r = .07, ns$ ),  $z = 3.305, p < .001$ . In addition, NE-expressing was significantly positively correlated with self-monitoring ( $r = .25, p = .02$ ) and negatively associated with the need to belong ( $r = -.24, p = .04$ ). In contrast, NE-learning was not significantly related to either of these scales. Overall, NE-expressing tended to be more highly related to both self-monitoring,  $z = 1.80, p = .07$ , and the need to belong,  $z = -3.25, p = .001$ , than was NE-learning. The overall pattern of these correlations suggests that NE-expressing is more strongly related to the power motive than is NE-learning, consistent with the view that those high in NE-expressing are more motivated to influence and dominate their social environments.

## Discussion

Examining the correlations of the two new scales with other scales provided evidence for the suggested links to other scales related to more general epistemic and power motives. That is, NE-

**Table 3**  
Correlation Table for Scales Included in Studies 3a and 3b

	NE	NE-expressing	NE-learning
NE (Jarvis & Petty, 1996)	1	.73*	.443*
NE-expressing (current paper)	.73*	1	.436*
NE-learning (current paper)	.443*	.436*	1
Uncorrelated scales			
Scales	NE	NE-expressing	NE-learning
Assessment (3a, Kruglanski et al., 2000)	.06	-.003	.03
Locomotion (3a, Kruglanski et al., 2000)	.14	.09	.15
Agreeableness: Comparison (3a, DeYoung et al., 2007)	-.01	-.06	.10
Conscientiousness: Industriousness (3a, DeYoung et al., 2007)	-.05	.08	-.04
Extraversion: Enthusiasm (3a, DeYoung et al., 2007)	.11	.10	.12
NFC: Order (3a, Webster & Kruglanski, 1994)	.01	-.003	-.14
NFC: Predictability (3a, Webster & Kruglanski, 1994)	.01	-.08	-.14
NFC: Decisiveness (3a, Webster & Kruglanski, 1994)	.002	.05	-.14
NFC: Ambiguity (3a, Webster & Kruglanski, 1994)	.02	-.09	-.08
SM: Other directedness (3a, Snyder, 1974)	.01	.09	-.08
Loneliness (3b, Russell et al., 1980)	-.02	-.02	.04
Common scale correlations			
Extraversion: Assertiveness (3a, DeYoung et al., 2007)	.38 <sub>a</sub> *	.39 <sub>a</sub> *	.22 <sub>b</sub> *
Openness (3a, DeYoung et al., 2007)	.34 <sub>a</sub> *	.23 <sub>b</sub> *	.23 <sub>ab</sub> *
SM: Acting (3a, Snyder, 1974)	.27 <sub>a</sub> *	.32 <sub>a</sub> *	.22 <sub>a</sub> *
Need for cognition (NCog; 3a & 3b, Cacioppo & Petty, 1982)	.31 <sub>a</sub> *	.19 <sub>b</sub> *	.34 <sub>a</sub> *
Unique NE-expressing scale correlations			
Self-monitoring (SM; 3a, Snyder, 1974)	.14 <sub>a</sub>	.25 <sub>b</sub> *	.03 <sub>a</sub>
Need to belong (3b, Baumeister & Leary, 1995)	-.12 <sub>ab</sub>	-.24 <sub>a</sub> *	.10 <sub>b</sub>
Unique NE-learning scale correlations			
Openness: Intellect (3a, DeYoung et al., 2007)	.17 <sub>a</sub>	.16 <sub>a</sub>	.30 <sub>a</sub> *
Need for Closure (NFC; 3a, Webster & Kruglanski, 1994)	-.04 <sub>a</sub>	-.05 <sub>a</sub>	-.23 <sub>b</sub> *
Conscientiousness: Orderliness (3a, DeYoung et al., 2007)	-.08 <sub>ab</sub>	-.03 <sub>a</sub>	-.22 <sub>b</sub> *
Neuroticism: Withdrawal (3a, DeYoung et al., 2007)	-.07 <sub>a</sub>	-.10 <sub>a</sub>	-.22 <sub>a</sub> *
Neuroticism: Volatility (3a, DeYoung et al., 2007)	.19 <sub>a</sub>	.09 <sub>a</sub>	-.22 <sub>b</sub> *
Scales correlated with two NE-scales			
Agreeableness: Politeness (3a, DeYoung et al., 2007)	-.35 <sub>a</sub> *	-.34 <sub>a</sub> *	-.10 <sub>b</sub>
SM: Extraversion (3a, Snyder, 1974)	.23 <sub>a</sub> *	.29 <sub>a</sub> *	.03 <sub>b</sub>
Desirability of control (3b, Burger & Cooper, 1979)	.41 <sub>a</sub> *	.46 <sub>a</sub> *	.07 <sub>b</sub>
NFC: Closed minded (3a, Webster & Kruglanski, 1994)	-.20 <sub>a</sub> *	-.05 <sub>b</sub>	-.35 <sub>a</sub> *

Note. Starting from the common scale correlations section, within each row, the subscripts indicate whether the pairwise comparison of correlations were the same or different from each other. Common letter subscript on correlations suggested that the correlations are not different from each other ( $p > .10$ ) and different letter subscripts suggested that the correlations could be different from each other ( $p < .10$ ). All tests of correlation differences were performed using Fisher's  $r$ -to- $z$  transformation and then testing the difference between two dependent correlations with one variable in common.

\*Correlation is significant at the .05 level (2-tailed).

\*\*Correlation is significant at the .01 level (2-tailed).

learning most strongly related to other scales linked to information and knowledge seeking (e.g., positively to need for cognition and negatively to need for closure) whereas NE-expressing most strongly related to other scales linked to seeking influence and control (positively with desirability of control and self-monitoring and negatively with need to belong). The fact that the NE-learning and NE-expressing scales related in sensible ways to scales tied to the expected motives provided some evidence for convergent validity and the fact that these scales did not relate to scales linked to the contrasting motive provided some evidence for discriminant validity. Furthermore, neither of the two new scales correlated

with any other scale at a level greater than .4 to .5. Therefore, the two new scales do not appear to be redundant with other existing and theoretically relevant scales.

Having provided some evidence for linkages between our new scales and some relevant prior constructs, Studies 4–7 were designed to examine the predictive abilities of the two new scales along with the having aspect of evaluation. That is, these studies address the critical issue of whether these scales are useful in uniquely predicting consequential outcomes. Each of the next studies assessed both NE-expressing and NE-learning. To assess the having aspect of evaluation, the studies either

included the original 16-item NE scale or the new 10-item NE-having scale.<sup>13</sup>

#### Study 4: Preference for Differential Role Positions in an Impending Group Discussion

Because the original NE scale had already been shown to have predictive validity, the primary goal of Study 4 was to provide an initial demonstration of the predictive validity of the two novel NE scales—learning and expressing. That is, we aimed to provide evidence that the NE-expressing and learning scales predict people's preference for actions that are linked to the underlying constructs assessed by the scales over actions that are not. To examine this, participants read descriptions of different possible roles they could take on in an upcoming group discussion session in which they were presumably going to be involved. Participants were asked to rank order the possible roles to which they could be assigned and then complete the NE-learning and expressing scales. Participants also completed the original NE scale. An initial regression model was used to analyze the differential predictive abilities of the two new scales in terms of people's preference for the different roles. We then also aimed to show that these new scales predicted relevant choices above and beyond the original NE scale.

We reasoned that people who are higher on NE-expressing would show greater preference for positions in a group interaction in which they could express their opinions to the group. In contrast, people who are higher on NE-learning would show greater preference for positions in which they would learn others' opinions. In addition, people who are higher on the NE-expressing scale should show greater preference for expressor role positions relative to the learner role positions. Those who are higher on the NE-learning scale should show greater preference for learner roles relative to expressor roles. In any given real-world group task, people often have the option of taking on different roles. Our study examines which roles people who vary in NE-learning versus expressing prefer. Furthermore, we expected that that NE-expressing and NE-learning scales would predict role choices better than the original NE scale since the latter represents the having aspect of evaluation.

## Method

### Participants

One-hundred and 18 undergraduates (74 women and 44 men;  $M_{\text{age}} = 18.99$ ,  $SD_{\text{age}} = 1.62$ ) from a large midwestern university participated in partial fulfillment of an introductory psychology course requirement. The target sample size was estimated where the Type I error was set at 5% and power was 80%. Assuming a small to medium effect size ( $f^2 = .08$ ; Cohen, 1988) for a single regression coefficient, we used G\*Power to conduct the power analysis and approximately 101 participants were needed (Faul et al., 2009). By conducting the study from the start to the end of the academic term, we anticipated we would reach at least this number. Each participant completed the role selection task. NE-expressing, NE-learning, and NE-having (as assessed with the original NE scale) were measured.

## Procedure

All participants were recruited through the introductory psychology Research Experience Program website at a large midwestern university. Upon arrival, participants were asked to follow instructions presented via MediaLab software (Jarvis, 2006). Participants were told that they would be involved in a group discussion on various topics and that the main goal of the discussion was to reach a consensus opinion on each of the topics. However, before the actual discussion took place, the participants would need to indicate what kind of roles they would prefer to take in that discussion. The cover story for the role choice task was that this would allow the researchers to assign different roles to the participants based on their preferences. Participants were then exposed to a list of six different roles, all essential in the group discussion, along with a brief description of the responsibilities for each role. After reading about the roles, participants rank-ordered them in terms of their interest. After that, participants completed the two new NE scales (learning and expressing) along with the original NE scale.

### Role Position Preferences

Participants were asked to rank order the six different role positions to indicate the role they would want to take the most to the role they would want to take the least. The six different roles were: discussion group leader, innovator, secretary/recorder, resource investigator, procedural technician, and video technician. Discussion group leader and innovator were described to make clear that they involved sharing one's opinions with others. Secretary/recorder and resource investigator were described to make clear that they involved obtaining the opinions of others. Procedural technician and video technician did not explicitly match either learning or expressing goals. The detailed description of each role position can be found in the [online supplement materials](#).

The roles were presented in a different random order for each participant. For the dependent measure, the rank for each role position was recalculated such that larger values indicated higher preference for that particular role (e.g., a rank of 1 became a preference score of 6). Then the preference score for each of the three different role categories (i.e., expressor, learner, and neutral) was calculated by taking the average preference score of the two role positions within each role category.

### Need to Evaluate Scales

Participants responded to items of NE-expressing and NE-learning scales as well as the original NE scale (to assess NE-having). The order in which they responded to these scales was randomized. The correlation between the NE-learning and NE-expressing

<sup>13</sup> Studies 3 and 4 were conducted before the development of the NE-having items. Therefore, the original NE scale was measured in these two studies to capture the having aspect of evaluation. Studies 5 and 7 were conducted after the development of the NE-having items, so the 10 NE-having items were used. Additionally, in Study 7, one goal was to establish empirically that the original NE and the NE-having scales were interchangeable in the underlying construct they tap into and that the NE-having scale could thus be viewed as a short-version of the original NE scale. Therefore, both the original NE scale and the NE-having scale were included in Study 7. Study 6 did not include either the NE-having or the original NE scale.

scales was .24 ( $p = .01$ ). The correlation between the NE-expressing scale and the original NE scale was .66 ( $p < .01$ ) and the correlation between the NE-learning scale and the original NE scale was .40 ( $p < .01$ ). This comports with the data patterns obtained in the earlier studies. The two new NE scales and the original NE scale were standardized and treated as continuous variables in our analysis.

## Results

### Predicting People's Preference for Expressor Role Positions

Data were first submitted to a stepwise hierarchical multiple regression with preference for expressor roles as the dependent variable. Both the standardized NE-expressing and NE-learning scores were entered in the first step and the interaction between the two terms was entered in the second step. There was a significant effect of NE-expressing on participants' preference for the expressor role positions,  $B = .58$ ,  $t(115) = 4.53$ ,  $p < .01$ , 95% CI [.32, .83]. The higher the participants' NE-expressing scores were, the more they wanted to be in an expressor role position. However, there was no significant effect of NE-learning on participants' preference for expressor role positions ( $p > .12$ ). In addition, the two-way interaction between NE-expressing and NE-learning was not significant ( $p > .77$ ).

We also performed a multiple regression analyzing people's preference for expressor role positions as a function of the NE-expressing and learning scales as well as the original NE scale. NE-expressing remained the only significant predictor of participants' preference for expressor role positions,  $B = .47$ ,  $t(114) = 2.86$ ,  $p = .005$ , 95% CI [.14, .79]. There was also a trending negative effect of NE-learning on participants' preference for expressor role positions in this analysis,  $B = -.25$ ,  $t(114) = -1.82$ ,  $p = .07$ . The higher the score on motivation to learn others' opinions, the higher the tendency was to avoid expressor role positions. The original NE scale was not a significant predictor ( $p > .29$ ) above and beyond the expressing and learning scales.

### Predicting People's Preference for Learner Role Positions

We conducted the same stepwise hierarchical multiple regression model with participants' preference for the learner role categories as the dependent variable. There was a significant effect of NE-learning on participants' preference for learner positions,  $B = .22$ ,  $t(115) = 2.27$ ,  $p = .03$ , 95% CI [.03, .40]. The higher the participants' NE-learning scores were, the more they wanted to be in learner roles. In addition, there was a significant negative relationship between NE-expressing and preference for learner roles,  $B = -.21$ ,  $t(115) = -2.22$ ,  $p = .03$ , 95% CI [-.40, -.02]. The higher the participants' NE-expressing scores were, the less they wanted to be in a learner role. Because ranking one set of roles higher also meant ranking other roles lower, this inverse correlation between NE-expressing and the ranking of learner roles could in part represent this dependency in the data. Additionally, the two-way interaction between NE-expressing and NE-learning was not a significant predictor of people's preference for the learner role positions ( $p > .46$ ).

We also performed a multiple regression analyzing people's preference for learner role positions as a function of the NE-

expressing and learning scales as well as the original NE scale. In this analysis, NE-learning was the only significant predictor for participants' preference for learner role positions,  $B = .21$ ,  $t(114) = 2.02$ ,  $p = .046$ , 95% CI [.004, .41]. There was a trending negative effect of NE-expressing on participants' preference for learner role positions,  $B = -.24$ ,  $t(114) = -1.93$ ,  $p = .06$ . The original NE scale was not a significant predictor ( $p = .74$ ) after controlling for the NE-expressing and learning scales.

### Predicting People's Preference for Neutral Role Positions

People's preference for neutral roles was also examined. When only NE-expressing and learning were in the model, there was a significant effect of NE-expressing on the preference for neutral roles,  $B = -.37$ ,  $t(115) = 3.08$ ,  $p = .003$ , 95% CI [-.60, -.13], indicating that the higher the NE-expressing score, the less highly they rated taking a neutral role. However, this effect disappears when the original NE scale is entered into the model ( $ps > .13$ ).<sup>14</sup>

## Discussion

Supporting the predictive validity of the two new scales, people who varied in their NE-expressing and NE-learning scores demonstrated differential preference for different role categories in an impending group discussion. Specifically, people who were higher on NE-expressing demonstrated a higher preference for the expressor role positions and a lower preference for the learner role positions. On the other hand, people who were higher on NE-learning demonstrated a preference for learner role positions and a tendency to avoid expressor role positions. Importantly, this study demonstrated that the two new NE scales had predictive power over and above the original NE scale in an interpersonal context (i.e., when it concerned people's preference for expressor and learner role positions in a group interaction). This study provides the first evidence that the two new NE scales are differentially predictive of people's choices. Although not tested here, one might expect that these choices are likely to be translated into better performance and satisfaction associated with actually assuming the preferred role. This study did not include any roles where it would be particularly beneficial merely to have opinions. If such roles were included, we would hypothesize that the original NE scale would be the best predictor above and beyond NE-learning and NE-expressing.

### Study 5: NE-Expressing Moderates the Self-Generation Persuasion Effect

Having established the predictive validity of the new NE-learning and expressing scales, the primary goal of Study 5 was to demonstrate the unique predictive validity of the NE-expressing scale in a situation that was not as obviously tied to the nature of the construct as was the case in Study 4. Specifically, we examined

<sup>14</sup> If the new expressing and learning scales were not controlled in a regression predicting each role type, then the original NE scale significantly predicted participants' preference for expressor role positions,  $B = .39$ ,  $t(116) = 3.03$ ,  $p = .003$ , 95% CI [.14, .64]. In addition, the original NE scale significantly predicted participants' lack of preference for the neutral role positions  $B = -.36$ ,  $t(116) = -3.14$ ,  $p = .002$ , 95% CI [-.59, -.13]. However, the original NE scale was not a significant predictor of participants' preference for the learner role positions.

the utility of NE-expressing to predict persuasion outcomes using the classic persuasion role-playing paradigm.

Earlier in this article we noted that the arguments people generate themselves can be quite effective in producing attitude change in the direction of those arguments (e.g., Janis & King, 1954; Kill-eya & Johnson, 1998; King & Janis, 1956). That is, when people generate (express) arguments ostensibly to persuade others, they themselves can end up being persuaded by those arguments (e.g., Briñol et al., 2012; Greenwald & Albert, 1968). In our Study 5, we predicted that this self-generation persuasion effect would be greater for participants who score higher on the NE-expressing scale (i.e., those motivated to express their own evaluations), because the expression task should be more familiar and fluent for them. Prior research on ease of memory retrieval (Schwarz et al., 1991) and ease of argument generation (Tormala et al., 2002) has clearly shown that when thoughts are easy to generate or retrieve, they are more impactful on judgment than when retrieval or generation is difficult. Thus, when people find it easy to generate favorable thoughts on an issue, they show more change in the direction of those thoughts than when those thoughts seem difficult to generate (e.g., Tormala et al., 2007). However, this is not to say that perceived difficulty can never be associated with more persuasion. Classic work in social psychology on cognitive dissonance shows that perceived difficulty or effort can sometimes enhance attitude change (e.g., Aronson & Mills, 1959). However, for dissonance (or effort justification effects) to occur, the argument generation task should be counter-attitudinal, conducted under conditions where high choice is salient, and the task should be highly consequential (Elliot & Devine, 1994; see Cooper & Fazio, 1984; for a review). These conditions did not hold in our study and thus we expected ease or fluency to lead to more persuasion.

Importantly, we did not expect the NE-learning scale to be related to the self-generation persuasion effect because people high in NE-learning prefer to learn rather than express opinions. Indeed, it was plausible that the self-generation of arguments might be particularly ineffective for them because if it is difficult for those high in NE-learning to express their opinions, this perceived difficulty of argument generation should lead to less impact of the arguments generated. Given that the NE-having scale is related to possession of attitudes and given its relatively high correlation with the NE-expressing scale, we would expect that on its own, NE-having might show a similar effect as the NE-expressing scale. However, we expected NE-expressing to be a better predictor and that when controlling for each other, the NE-expressing scale would show the predicted effect over and above the NE-having scale. Regression analyses were used to analyze the differential predictive abilities of the NE scales in terms of people's attitudes in support of the advocated position after argument generation when controlling for their premessage attitudes.

## Method

### Participants

Two-hundred and two Amazon Mechanical Turk workers (93 women, 108 men, and one unidentified;  $M_{\text{age}} = 35.43$ ,  $SD_{\text{age}} = 10.24$ ) were eligible and participated in this 8-min study in exchange for \$.75. Two pre-advocacy attitude questions were used as prescreening questions such that those who were already extremely positive

and favorable toward the topic—facemask wearing—were not allowed to participate in the argument generation task. The target sample size was estimated when the Type I error was set at 5% and the power was 80% using G\*Power (Faul et al., 2009). Using the effect size obtained for the two-way interaction between condition and NE-expressing scale from a prior exploratory study ( $f^2 = .042$ ), approximately 189 participants were needed.<sup>15</sup> About 10 additional participants were run to allow for possible exclusions after they were eligible to participate in the current study (i.e., due to failure to follow instructions, identification of bots). The criterion to be eligible to complete the study is explained in detail in the next section.

### Procedure

Participants were asked to follow instructions presented using the Qualtrics survey program. Participants rated their attitudes toward the following three topics: facemask wearing during the COVID-19 pandemic, recycling, and work-life balance. Two attitude questions on the topic of facemask wearing were used as pre-screening questions. Those who were already extremely positive and favorable (i.e., those who rated 6 on both attitude questions) were not eligible to participate in the rest of the study because there was no room for them to be even more positive on this topic following their advocacy. Then, for all eligible participants, they were told that in order to minimize the time each participant spent on this study, they would be randomly assigned to one of the previous topics for the next task. In reality, all participants were randomly assigned to spend up to three minutes to write either in favor or wearing facemasks in the relevant condition or in favor of attaining work-life balance in the irrelevant condition. Participants were told that they would be randomly assigned to argue for the given position.

In the relevant condition, all participants were instructed to generate three reasons why people should always wear a facemask or face covering when outside their home during the COVID-19 pandemic. They were further told that they were generating arguments in order to convince another person to follow this recommendation. The rationale of playing the role of an advocate to convince others is common in the classic work on self-persuasion using the role-playing paradigm (e.g., Greenwald & Albert, 1968; Janis & King, 1954; Watts, 1967). In the irrelevant condition, all participants were instructed to generate three reasons why people should keep a healthy work-life balance in order to convince another person to do so. After the argument generation task, participants, regardless of the condition they were in, rated their opinions toward facemask wearing, the topic of interest, once again. Finally,

<sup>15</sup> As a precursor to this study, we conducted another study using a similar self-persuasion paradigm. Participants were randomly assigned to generate arguments to convince another person why a certain movie was their third favorite or least favorite movie (i.e., argument direction condition: positive vs. negative). Preadvocacy and postadvocacy attitudes toward the movie they came up with was measured along with the NE-expressing and NE-learning scales. A regression analysis was conducted to examine the interactive effect of argument direction and NE-expressing on attitude change. The hypothesized two-way interaction between argument direction and NE-expressing was significant,  $B = -.31$ ,  $t(114) = -2.23$ ,  $p = .028$ , 95% CI  $[-.58, -.03]$ , showing that attitudes became more polarized following advocacy as NE-expressing increased. We used the effect size obtained for this two-way interaction as a basis for our a priori power analysis in the current study. Full discussion of the preliminary study can be found in the [online supplement materials](#).



all participants completed the 10-item NE-expressing, learning, and having scales. The order in which these scales were presented was randomized. Our hypothesis was that participants who generated arguments on the relevant topic would become more favorable toward facemask wearing than those generating arguments on the irrelevant topic, but that this effect would be especially pronounced among those high in NE-expressing. That is, we predicted an NE-Expressing X Advocacy Type interaction on post-advocacy attitudes controlling for pre-advocacy attitudes. This effect was expected to hold above and beyond any effects of NE-having or NE-learning, neither of which was hypothesized to play a role.

### Preadvocacy Attitude

As just noted, participants rated their attitudes toward three topics including the key issue, facemask wearing during the COVID-19 pandemic. The order of the topics was randomized. For each topic, participants rated their attitudes on two 6-point scales (ranging from 1 to 6) anchored at extremely negative/unfavorable to extremely positive/favorable.

### Argument Generation Task

In the argument generation task, participants were given up to 3 min to generate three reasons in support of the given position. In the relevant condition, they were instructed to express their view regarding why people should always wear a facemask/face covering when they leave home during the COVID-19 pandemic. In the irrelevant condition, they were asked to express their opinions on why people should keep a healthy work-life balance. In both cases, the stated goal was to engage in the task in an attempt to convince another person to adopt the expressed opinion. The computer program automatically advanced to the next page after 3 min. In order to help participants in generating arguments, four brief statements in support of the advocacy were provided in each condition. Providing sample arguments is a common practice in this paradigm so as not to make the task too difficult (e.g., Greenwald & Albert, 1968; Janis & King, 1954). Participants were told that they could feel free to use some of these arguments by paraphrasing and elaborating on these points. There were no significant differences in the preadvocacy attitudes of those in the relevant ( $M = 3.95$ ,  $SD = 1.41$ ) and irrelevant conditions ( $M = 3.85$ ,  $SD = 1.52$ ),  $t(200) = .49$ ,  $p = .63$ , suggesting that there was no failure of random assignment.

### Postadvocacy Attitude

After the argument generation task, regardless of the condition they were in, participants rated their current attitudes toward always wearing a facemask or face covering when they leave home during the COVID-19 pandemic. They responded on the same two 6-point scales as used for the preadvocacy measure (negative—positive; unfavorable—favorable).

### Need to Evaluate—Expressing, Learning, and Having

Participants responded to the 10-item NE-expressing, learning, and having scales. The correlation between the NE-expressing and learning scales was .41 ( $p < .001$ ) in this sample. The correlation between the NE-expressing and having scales was .76 ( $p < .001$ ) and the correlation between the NE-learning and having scales was .43 ( $p < .001$ ). The three NE scales were standardized and treated as continuous variables to examine their respective

predictive abilities. None of the scales was affected by whether participants engaged in the relevant or irrelevant advocacy (all  $ps > .17$ ).

## Results

### Regression Analysis: NE-Expressing as the Predictor

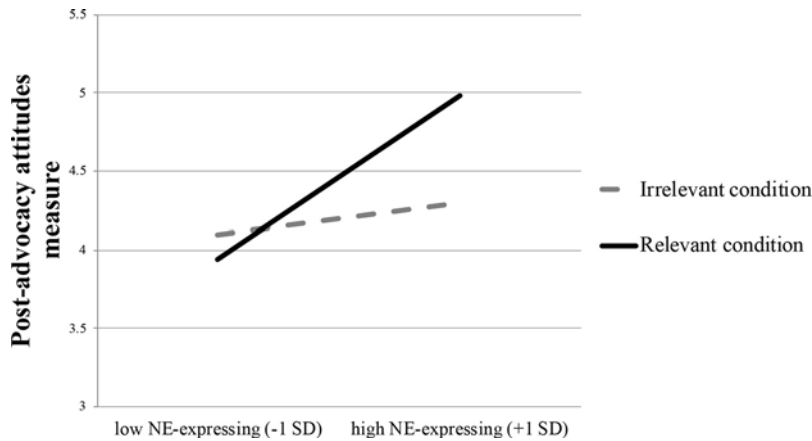
Data were first submitted to a stepwise hierarchical regression model with the post-advocacy attitude measure as the dependent variable, type of advocacy condition (relevant vs. irrelevant advocacy), standardized NE-expressing scale, and the interaction between type of advocacy condition and NE-expressing as the independent variables, while controlling for the pre-advocacy attitude measure. The NE-expressing scale and the relevance condition were entered in the first step of the model and the pre-advocacy attitude measure served as the covariate. The two-way interaction between relevance condition and NE-expressing was entered in the second step. Results are interpreted from the first step of the model in which they appear.

The result showed that there was a significant positive effect of pre-advocacy attitude on the post-advocacy attitude measure,  $B = .87$ ,  $t(198) = 19.39$ ,  $p < .001$ , 95% CI [.79, .96], suggesting the more people favored mask wearing before their advocacy, the more they favored it after the advocacy. There was also a significant type of advocacy condition effect  $B = .26$ ,  $t(198) = 2.06$ ,  $p = .04$ , 95% CI [.01, .51], suggesting that those who generated arguments in favor of mask wearing were more favorable to that position than those who advocated in favor of work-life balance, replicating the standard persuasive impact of generating arguments. In addition, there was a significant effect of NE-expressing on the dependent measure,  $B = .33$ ,  $t(198) = 5.00$ ,  $p < .001$ , 95% CI [.20, .46], suggesting that those who scored higher on the NE-expressing scale were more supportive of mask wearing.

Most importantly, the predicted two-way interaction between type of advocacy and NE-expressing was obtained,  $B = .42$ ,  $t(197) = 3.42$ ,  $p = .001$ , 95% CI [.18, .67] (see Figure 5). Decomposing the two-way interaction suggested that in the relevant advocacy condition, the effect of NE-expressing was significant on the post-advocacy attitude measure,  $B = .52$ ,  $t(197) = 6.11$ ,  $p < .001$ , 95% CI [.35, .69]. That is, when participants advocated for facemask wearing, as NE-expressing increased, they were more in favor of this view. However, the simple slope for the irrelevant condition was not significant,  $B = .10$ ,  $t(197) = 1.09$ ,  $p = .28$ . This suggested that those people who scored higher on the NE-expressing scale only showed enhanced self-persuasion when they were expressing their opinions on the relevant topic, not when they were expressing opinions on an irrelevant topic (i.e., work-life balance).

Decomposing the interaction differently, for those relatively high in NE-expressing (+1 SD above the mean), engaging in relevant advocacy enhanced persuasion compared to irrelevant advocacy,  $B = .68$ ,  $t(197) = 3.92$ ,  $p < .001$ , 95% CI [.34, 1.03]. But for those relatively low in NE-expressing, there was no such effect,  $B = -.16$ ,  $t(197) = -.93$ ,  $p > .35$ , 95% CI [-.50, .18]. Or stated differently, the classic effect of self-generation of arguments on attitude change held for those relatively high but not those relatively low in NE-expressing.

**Figure 5**  
*Effect of Relevance Condition on Post-advocacy Attitude Measure Moderated by People's Standardized NE-expressing Score in Study 5*



We then ran a similar hierarchical linear regression model only replacing the NE-expressing variable with participants' NE-learning scores. The result showed that again there was a significant positive effect of preadvocacy attitude on the postadvocacy attitude measure,  $B = .81$ ,  $t(198) = 17.77$ ,  $p < .001$ , 95% CI [.72, .90]. There was also a trending effect of type of advocacy on the post-advocacy attitude measure,  $B = .25$ ,  $t(198) = 1.91$ ,  $p = .06$ . Consistent with our initial prediction, there was no significant two-way interaction between type of advocacy condition and NE-learning,  $B = -.21$ ,  $t(197) = -1.55$ ,  $p = .12$ , though the trend was in a direction opposite to that for NE-expressing.

#### Regression Analysis: NE-Having as the Predictor

When we ran the hierarchical linear regression model replacing the NE-expressing variable with participants' NE-having scores, the result showed that there was a significant positive effect of preadvocacy attitude on the postadvocacy attitude measure,  $B = .83$ ,  $t(198) = 18.06$ ,  $p < .001$ , 95% CI [.74, .92] and a significant type of advocacy condition effect,  $B = .30$ ,  $t(198) = 2.23$ ,  $p = .03$ , 95% CI [.03, .56]. In addition, there was a significant effect of NE-having on the dependent measure,  $B = .16$ ,  $t(198) = 2.37$ ,  $p = .02$ , 95% CI [.03, .29], suggesting that scoring higher on the NE-having scale were associated with higher post-advocacy attitude scores. Last, there was a significant two-way interaction between type of advocacy condition and NE-having in the same direction as NE-expressing,  $B = .29$ ,  $t(197) = 2.16$ ,  $p = .03$ , 95% CI [.03, .55].

#### Regression Analysis: All Scales as Predictors

In a final analysis, we included all three NE-scales in the same model, along with the preadvocacy attitude measure and relevance condition and the interaction between type of advocacy condition and each of the three NE scales (i.e., NE-having, expressing and learning). The results suggested that the interaction between type of advocacy condition and NE-having ceased to be significant,  $B = -.10$ ,  $t(193) = -.48$ ,  $p = .63$ , and the interaction between type of

advocacy condition and NE-expressing remained significant,  $B = .63$ ,  $t(193) = 3.18$ ,  $p = .002$ , 95% CI [.24, 1.03] in the predicted direction. It is also worth noting that in this model, the two-way interaction between type of advocacy condition and NE-learning became significant, but in the opposite direction as for NE-expressing,  $B = -.32$ ,  $t(193) = -2.24$ ,  $p = .03$ , 95% CI [-.60, -.04].

#### Discussion

Study 5 examined a context in which the NE-expressing scale was expected to have predictive validity above and beyond the other NE scales. Supporting the utility of NE-expressing, we demonstrated that this scale predicted susceptibility to persuasion in a classic self-generation persuasion paradigm. That is, people who were higher in NE-expressing showed post-advocacy attitudes that were more in favor of the position they advocated than were those lower in NE-expressing. However, if they advocated for an irrelevant topic, this did not occur. The interaction between NE-expressing and type of advocacy (relevant or not) showed that the classic role-playing effect whereby people become more favorable toward a position they advocate to others was more prominent as NE-expressing increased. Importantly, this interaction outcome between topic relevance and NE-expressing held even when controlling for the other two NE scales.

We observed no significant interactive effect when considering scores on the NE-learning scale on its own. In fact, when controlling for the other two scales, the interaction between NE-learning and topic relevance was opposite to that for NE-expressing. This is the expected outcome if expressing one's views is especially difficult for those who prefer to learn about the views of others rather than express their own. As for the NE-having scale, even though on its own, it showed a similar interactive effect with topic relevance as the NE-expressing scale, when controlling for NE-expressing scores, this interactive effect was no longer significant. This suggested that NE-expressing scale is a better predictor of self-generated persuasion than is NE-having as it showed an impact above and beyond the NE-having scale.

### Study 6: NE-Learning Moderates the Influence of Evaluative Message Style

In Study 5, we provided evidence that the NE-expressing scale is a useful moderator of the self-generation persuasion effect because generation of evaluative information is compatible with the motive of those high in this trait to express their views. The data from Study 5 also provided some suggestion that those high in NE-learning might be experiencing a mismatch in their underlying motivation to learn and the task of expressing evaluative information. If the self-generation of information is not the way to influence those high in NE-learning, what is? In a traditional persuasion paradigm, people receive information from others, and thus this type of influence might generally be more appealing to those high in NE-learning. But, people high in NE-learning are particularly interested in other people's evaluations and not necessarily just the facts that they present on some issue. Thus, we hypothesized that persuasive messages that contained explicitly evaluative statements should be especially attractive to those high in their motivation to learn opinions. This is because such messages would match the underlying motivation of high NE-learning individuals.

Thus, in Study 6 we turned from a paradigm in which participants generated messages (i.e., expressing opinions) to one in which participants received messages (i.e., learning opinions). Furthermore, because those high in NE-learning are particularly interested in learning the evaluations of others, we varied whether the persuasive message contained explicit evaluative statements or presented the same information in a more factual (nonevaluative) manner. For this study, we predicted the result would be consistent with much prior research on matching effects in persuasion (i.e., when persuasive messages are matched to some characteristic of the recipient; e.g., Hirsh et al., 2012). In the accumulated research on matching, people tend to be more influenced by messages that match or are consistent with some aspect of their personality (e.g., extraverts are more influenced by arguments focused on social engagement than are introverts; Wheeler et al., 2005; see Teeny et al., 2021, for a review of persuasion matching effects). In the prior study, we saw that the more people liked to express their opinions, the more they were influenced by messages that involved their own self-expression. In the current study we predicted that the more people liked to learn the opinions of others, the more they would be influenced by a message that was highly evaluative rather than factual. This is because such a message would match the person's motive to learn opinions. Thus, we predicted a two-way interaction between NE-learning and message style (evaluative vs. factual). However, we did not expect to observe a similar interaction effect for the NE-expressing scale. Therefore, although NE-learning was expected to moderate the effectiveness of evaluative versus nonevaluative persuasive messages, NE-expressing was not expected to play a moderating role, nor did we expect a three-way interaction among these variables. We did not include the NE-having scale in this study because NE-learning and NE-having are not very highly correlated and it was likely that distinguishing NE-learning from expressing would also distinguish it from having.

## Method

### Participants and Design

Four-hundred and 53 undergraduates (263 women, 190 men) from a large midwestern university participated in partial

fulfillment of an introductory psychology requirement. Data from eight participants with response times of < 250 ms on multiple items were excluded. Removing these individuals from the analysis left a final sample size of 445 participants (260 women, 185 men). Each participant was randomly assigned to one of the two experimental conditions: evaluative or nonevaluative message. Each participant also completed the NE-expressing and NE-learning scales. The target sample size was estimated when the Type I error was set at 5% and the power was 80% using G\*Power (Faul et al., 2009). Given that no prior work has manipulated whether a persuasive message used evaluative language or not, and this induction was rather subtle, we powered the study for a small effect size for a two-way interaction between message type and the NE-learning scale ( $f^2 = .02$ ; Cohen, 1988). This assumption led to a requirement of 395 participants. Given that the current study was collected following another study (see Footnote 1), roughly 50 more participants were run to allow for potential dropouts.

### Procedure

All participants were informed that the task involved evaluating messages. The experimental materials, including the informed consent document, were presented via MediaLab software (Jarvis, 2006). Participants first completed the NE learning and expressing scales.<sup>16</sup> Next, participants were randomly assigned to receive a message that advocated in favor of a new foster care program for the state of Rhode Island (see Petty et al., 1993; also Briñol et al., 2007). The messages, though containing the same basic arguments, were written to contain either highly evaluative or nonevaluative statements. After reading the assigned message, participants reported their attitudes toward the foster care program and indicated their behavioral intentions with respect to the program. Participants then completed demographic questions and ancillary measures for exploratory purposes. Once participants completed the study, they were debriefed, thanked for their time, and dismissed. This study also included an argument quality manipulation designed to gauge whether the predicted matching effect varied as a function of message cogency (Petty et al., 1976). Although the argument quality manipulation had an overall main effect on attitudes,  $B = .86$ ,  $t(443) = 10.31$ ,  $p < .001$ , in the expected direction (i.e., more positive attitudes following strong than weak arguments), it did not modify any of the results and is thus not discussed further.<sup>17</sup>

<sup>16</sup> This time, the individual difference measures of interest were presented to the participants first to avoid the manipulation of evaluation used in the study differentially affecting the mindset of the participants when they were completing the NE scales.

<sup>17</sup> In accord with the elaboration likelihood model of persuasion (Petty & Cacioppo, 1986), if the predicted matching effect was observed only for strong arguments, it would suggest that the match of message language with NE-learning was provoking more processing of the message (Petty & Wegener, 1998). If the effect was observed equally for strong and weak arguments, it would suggest that the message match serves as a simple positive cue for acceptance (e.g., it fits me so I like it). Prior research on message matching has shown that matches tend to serve as simple positive cues when the overall level of elaboration is on the low side, but matches serve in other roles such as motivating more thinking about the message if elaboration is unconstrained. Because the message used in this study was very low in personal relevance, overall thinking was likely low (Petty & Cacioppo, 1990), and a simple cue effect of matching would be expected (see Teeny et al., 2021, for a review of the multiple mechanisms by which matching effects can occur).

## Message Style

The initial framing of the message, the wording of the arguments and the closing statements of the messages were modified so that two versions were created. Each message contained the same basic arguments in favor of the foster care program. For example, one argument was that in the program children are required to stay with their foster parents until they are 18 rather than 16 which allows for more support. However, the evaluative message was tailored so that the author explicitly evaluated the claims made (e.g., “Based on these views, this program is really great”) whereas the nonevaluative message was tailored to make the same statements appear to be more objective descriptions of the program (e.g., “Based on this description, this program really has an effect”). That is, in the evaluative version of the message, evidence for the foster care program was presented, evaluated, and predetermined to be good by the author of the message whereas in the nonevaluative version, the same claims about the foster care program were made, but the proposal author did not explicitly provide an evaluation of the claims. Although both messages were clearly advocating for the foster care program and presented the same evidence, the evaluate message was full of the author’s opinions whereas the nonevaluative message simply made claims in a matter-of-fact manner (see the [online supplement materials](#) for the full text of the messages).

## Need to Evaluate—Expressing and Learning

All participants completed the NE learning and expressing scales. The correlation between the two scales in this sample was .35 ( $p < .01$ ). When conducting the analysis, we standardized these measures.

## Attitudes

Participants rated their attitudes toward the Rhode Island foster care program on six 9-point (1 to 9) semantic differential scales anchored at good-bad, positive-negative, wise-foolish, unfavorable-favorable, against-in favor, and harmful-beneficial. Because these items showed good internal reliability ( $\alpha = .98$ ), they were averaged to form a summary attitude index in which higher numbers corresponded to more positive attitudes toward the program.

## Behavioral Intentions

Intentions with respect to the foster care program were assessed with five questions. These questions asked participants: (a) to indicate how willing they were to provide personal information to the program, (b) how many letters they were willing to write on the program’s behalf, (c) how many phone calls they were willing to make for the program, (d) their willingness to sign a petition for the program, and (e) how many petition signatures they were willing to get from other people for the program. Responses were made using 9-point Likert-type scales anchored at 1 for no intention to help and 9 for maximum intention to help. Because these items showed good internal reliability ( $\alpha = .81$ ), they were averaged to form a summary behavioral intention index in which higher numbers corresponded to more intention to provide help to the Rhode Island foster care program.

## Results

### Regression Analysis: Attitude

To identify the effects of matching message style to individual differences, data were submitted to a stepwise hierarchical multiple regression model that tested the main effects and all interactions among the three variables in the model (NE-expressing, NE-learning, message style) as predictors of participants’ attitudes toward the Rhode Island foster care program. The two NE scales and message style were entered in the first step of the model. All two-way interactions were entered in the second step, and the three-way interaction was entered in the third step. Results are interpreted from the first step of the model in which they appear.

The regression analysis showed no main effects of NE-expressing or NE-learning ( $ps > .29$ ). People high or low in NE-expressing or learning did not have differential attitudes toward the Rhode Island foster care program. Also, there was no evidence of a two-way interaction of NE-Expressing X Message Style on attitudes,  $B = -.20$ ,  $t(438) = -1.00$ ,  $p = .32$ . This indicated that high NE-expressing individuals were not differentially sensitive to message style compared to those scoring low on this measure.

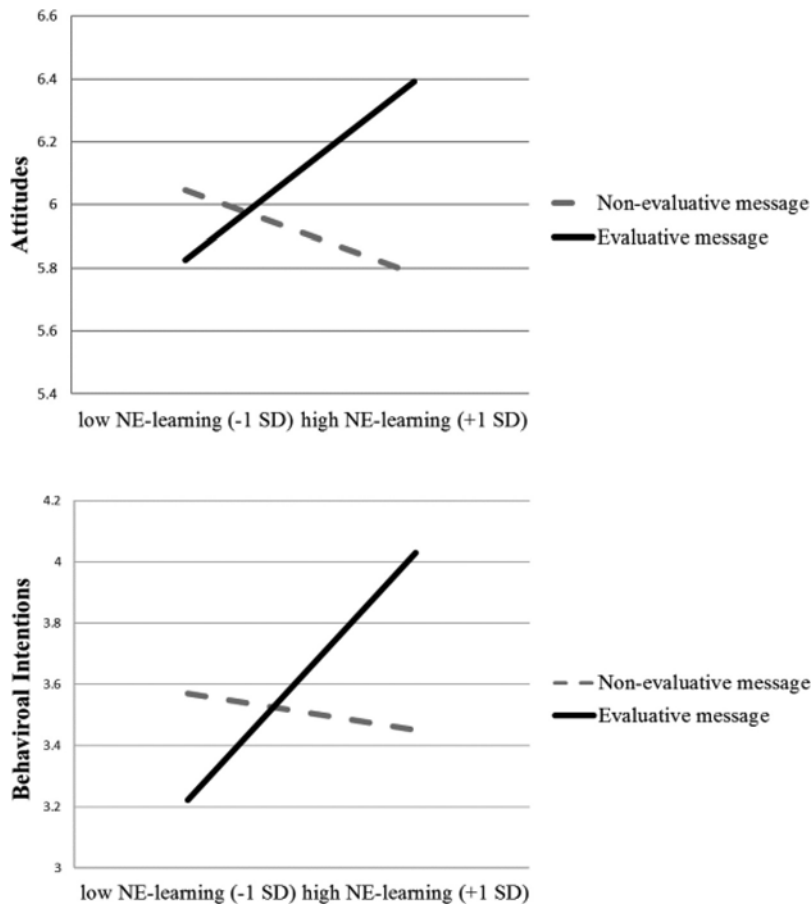
Most importantly, there was a significant two-way interaction of message style and NE-learning on attitudes,  $B = .44$ ,  $t(438) = 2.22$ ,  $p = .03$  (see [Figure 6](#), top panel). For the evaluative message, there was a significant effect of NE-learning on attitudes,  $B = .29$ ,  $t(438) = 2.12$ ,  $p = .04$ , such that as NE-learning increased, so too did favorable attitudes toward the proposal. For the nonevaluative message there was no effect of NE-learning on attitudes,  $B = -.15$ ,  $t(438) = -1.05$ ,  $p = .30$ . Decomposing this interaction differently, for those relatively low in NE-learning (i.e.,  $-1$  SD below the mean), the style of the message did not have a significant effect on attitudes,  $B = -.33$ ,  $t(438) = -1.23$ ,  $p = .22$ , indicating a lack of sensitivity to evaluative language. For those relatively high in NE-learning (i.e.,  $+1$  SD above the mean), however, message style produced a significant effect on attitudes,  $B = .55$ ,  $t(438) = 2.02$ ,  $p = .04$ , indicating that individuals high in NE-learning responded more favorably to the evaluative than the nonevaluative message.

### Regression Analysis: Behavioral Intention

The behavioral intention data were submitted to the same analysis as used for the attitudes measure. The effect of NE-expressing on behavioral intentions was nonsignificant,  $B = -.44$ ,  $t(441) = .50$ ,  $p = .62$ . Furthermore, there was no evidence of a two-way interaction of message style and NE-expressing on intentions,  $B = -.04$ ,  $t(438) = -.23$ ,  $p = .82$ .

However, NE-learning showed a significant main effect on behavioral intentions,  $B = .20$ ,  $t(441) = 2.26$ ,  $p = .03$ . Individuals higher in NE-learning intended to perform more behaviors in support of the program than individuals low in NE-learning. More importantly, this effect was qualified by a significant two-way interaction of message style and NE-learning,  $B = .47$ ,  $t(438) = 2.62$ ,  $p = .009$  (see [Figure 6](#), bottom panel) that replicated the pattern obtained on attitudes. For the evaluative message, there was an effect of NE-learning,  $B = .41$ ,  $t(438) = 3.29$ ,  $p = .001$ , indicating that as NE-learning increased, so too did intentions to behave favorably toward the foster care program. For the nonevaluative message, there was no main effect of NE-learning,  $B = -.06$ ,  $t(438) = -.49$ ,  $p = .63$ . Decomposing the interaction differently, for

**Figure 6**  
*Effect of Message Style on Attitudes Moderated by People's Standardized NE-learning Score in Study 6 (Top Panel). Effect of Message Style on Behavioral Intentions Moderated by People's Standardized NE-learning Score in Study 6 (Bottom Panel)*



those relatively low in NE-learning (i.e.,  $-1$  SD below the mean), message style did not show a significant effect on behavioral intentions,  $B = -.37$ ,  $t(438) = -1.51$ ,  $p = .13$ . However, for people relatively high in NE-learning (i.e.,  $+1$  SD above the mean), message style showed a significant effect,  $B = .57$ ,  $t(438) = 2.33$ ,  $p = .02$ , indicating that people high in NE-learning were more likely to support the foster care program after reading the evaluative than the nonevaluative message.

## Discussion

Study 6 examined a context in which we anticipated that the NE-learning rather than the NE-expressing scale was more likely to predict persuasion outcomes. Using a traditional persuasion paradigm, this study provided evidence for the unique predictive ability of the NE-learning scale. Specifically, NE-learning interacted with message style (evaluative vs. nonevaluative) whereas NE-expressing did not in predicting people's postmessage attitudes and behavioral intentions. Specifically, evaluative messages

became more persuasive as NE-learning increased. However, NE-learning was not related to persuasion when the message used non-evaluative rather than evaluative language. This suggests that those higher in NE-learning are not just more susceptible to any external persuasion—only to clearly evaluative messages. Although we did not assess NE-having in this study, given it is more highly correlated with NE-expressing than NE-learning, it was not expected to predict the outcome in the current paradigm.

## Study 7: Original NE Scale Predicts the Likelihood of Possessing Attitudes

In Studies 4, 5, and 6, we provided evidence that the NE-expressing and NE-learning scales showed unique ability to predict outcomes. After introducing the expressing and learning aspects of evaluation and scales to measure them, a remaining question is whether there are situations in which the original NE scale (or NE-having) would show more predictive power over and above the learning and expressing scales. To address this question,

in Study 7, we revisited one of the paradigms used in the original NE scale article (Jarvis & Petty, 1996) in which participants were asked to respond to an array of social and political survey attitude items. Participants could either indicate their attitudes on the rating scale or choose the “no opinion” option to indicate that they did not have an attitude on the issue.

Previous work using this method demonstrated that the original NE scale was related to the extent to which people reported holding evaluations versus no opinion. That is, there was a significant negative association between the original NE scale score and the number of “no opinion” options that participants chose, suggesting that the higher the NE score, the fewer “no opinion” responses that were given. Because the original NE scale was mainly tapping into the having aspect of evaluations, we expected that it would show a greater ability to predict this outcome (i.e., having opinions) than the learning and expressing aspects of evaluation. On the one hand, given the relatively high correlation between the original NE scale and the NE-expressing scale observed in previous studies, it seemed likely that on its own, NE-expressing would show a similar effect. However, when controlling for each other, we hypothesized that the original NE scale would be the sole predictor or show a significantly greater association with the number of the “no opinion” responses people chose. We did not expect NE-learning to be a significant predictor.

Another important goal of the current study was to show that the original NE scale and the NE-having scale can be used interchangeably and thus the NE-having scale can be used as a short version of the original NE scale. Thus, in the current study, we included both the original NE scale and the NE-having scale along with the learning and expressing scales to demonstrate empirically that the first two scales show comparable predictive abilities and can be used similarly.

## Method

### Participants and Design

One-hundred and 53 Amazon Mechanical Turk workers (60 women and 93 men;  $M_{\text{age}} = 38.32$ ,  $SD_{\text{age}} = 10.70$ ) participated in this seven-minute study in exchange for \$.75. Each participant completed a 30-item social and political survey (see [online supplement materials](#) for details). Then, they also completed the NE-having, NE-expressing, and NE-learning scales, along with the original NE scale. The target sample size was estimated when the Type I error was set at 5% and the power was 80% using G\*Power (Faul et al., 2009). Based on the effect size obtained from the original study ( $f^2 = .12$ ; Jarvis & Petty, 1996), we derived the requirement of 68 participants. However, given that in the current study, we are including more predictors in the model, we doubled the sample size and added 10 more participants to allow for potential bot detection.

### Procedure

Mechanical Turk workers completed all of the measures (described shortly) presented using Qualtrics (Provo, UT). All participants were told that the first task was to complete a social and political survey. Participants then completed the original NE scale

and the NE-having, learning, and expressing scales. The order in which these scales were presented was randomized.

### Social and Political Survey

In the original NE article (Jarvis & Petty, 1996), a 29-item questionnaire was used to assess participants’ attitudes toward various national issues such as environmental protection, legalized abortion, capital punishment, and so forth. We create a similar version of a 30-item social and political survey assessing comparable issues along with the addition of more timely topics such as mandatory facemask requirements during the COVID-19 pandemic, use of military drones, and classification of Bitcoin as a legal currency. All items used are documented in the [online supplement materials](#). Participants answered the survey questions on 7-point scales anchored at extremely negative to extremely positive. For each question, participants were also provided with a “no opinion” option. In the instructions, participants were told that sometimes people might not have an opinion on a given issue, so if they do not have or hold an opinion on a particular issue, they should feel free to choose the “no opinion” option instead of giving a random rating. The need for accuracy in responding was emphasized to the participants to ensure that they gave truthful responses to these questions.

### Need to Evaluate—Having, Expressing, and Learning

All participants completed the original NE scale, along with the NE-having, expressing, and learning scales. The correlation between the NE-expressing and NE-learning scales was  $.56$  ( $p < .01$ ). The correlation between the NE-expressing and the original NE scale was  $.63$  ( $p < .01$ ). The correlation between the NE-learning and the original NE scale was  $.35$  ( $p < .01$ ). The correlation between the NE-expressing and NE-having scales was  $.69$  ( $p < .01$ ). The correlation between the NE-learning and NE-having scales was  $.40$  ( $p < .01$ ). Lastly, consistent with Study 2, the correlation between the NE-having and the original NE scale showed the highest correlation of  $.87$  ( $p < .01$ ). When conducting the analyses, we standardized these measures. Although we included both the original NE scale and the NE-having scale in this study, in order to make our report succinct, we only report the results for the original NE scale in the analyses because it was the one used to tap into the having aspect of evaluation in the original paper (Jarvis & Petty, 1996). However, it is important to note that the NE-having scale produced very similar effects in all the analyses (see the [online supplement materials](#)).

### “No Opinion” Count

Consistent with the original NE study, the key dependent measure was the number of times participants chose the “no opinion” option instead of indicating their attitudes. In the current data, this measure ranged from 0 to 21 ( $M_{\text{count}} = 2.82$ ,  $SD_{\text{count}} = 4.18$ ).<sup>18</sup> There was no gender effect on this measure,  $M_{\text{diff}} = -.45$ ,  $t(151) = -.66$ ,  $p = .51$ .

<sup>18</sup> To control for outliers, we also conducted the same set of linear regression analyses with the log-transformation of the “no option” count as the dependent measure and the same conclusions were drawn. See the [online supplement materials](#) for more information.

## Results

### Regression Analyses With the Individual Scales

Data were first submitted to a linear regression model with the original NE scale as the sole predictor. The result showed that there was a significant negative effect of the NE scale on the “no opinion” count,  $B = -1.53$ ,  $t(151) = -4.81$ ,  $p < .001$ , 95% CI  $[-2.15, -.90]$ , suggesting that higher scores on the original NE scale were associated with selecting fewer “no opinion” options, replicating the original study. When NE-expressing was the sole predictor in the model, the result showed a significant negative effect on the “no opinion” count,  $B = -.82$ ,  $t(151) = -2.44$ ,  $p = .02$ , 95% CI  $[-1.48, -.16]$ . This indicates that higher scores on the NE-expressing scale were associated with selecting fewer “no opinion” responses. When NE-learning served as the sole predictor of the “no opinion” count, the effect on the dependent measure was not significant,  $B = -.29$ ,  $t(151) = -.84$ ,  $p = .40$ .

### Regression Analysis With All Scales as Predictors

Most importantly, in a separate analysis, we included all three scales in the same linear regression model predicting “no opinion” count. In this analysis, the original NE scale was the sole significant predictor,  $B = -1.68$ ,  $t(149) = -4.09$ ,  $p < .001$ , 95% CI  $[-2.49, -.87]$ . This result still holds when the model also controls for participants’ gender and age,  $B = -1.66$ ,  $t(147) = -3.98$ ,  $p < .001$ , 95% CI  $[-2.49, -.84]$ .

### Comparing Correlations

In a separate set of analysis, we also calculated the correlations between the “no opinion” option and each of the three scales. We first used the Fisher’s  $r$ -to- $z$  transformation to convert the correlations to  $z$ -values and then tested the difference between two dependent correlations with one variable in common. The correlation between the “no opinion” count and the original NE scale ( $r = -.37$ ,  $p < .001$ ) was significantly greater than that between the “no opinion” count and the NE-expressing scale ( $r = -.20$ ,  $p = .02$ ),  $z = 2.57$ ,  $p = .01$ , as well as that between the “no opinion” count and the NE-learning scale ( $r = -.07$ ,  $p = .40$ ),  $z = 3.39$ ,  $p < .001$ , yielding a conclusion similar to the regression analysis. That is, the original NE scale predicts having no opinions better than the learning and expressing scales. Finally, the original NE scale did not predict the outcome better than the NE-learning scale (correlation between the “no opinion” count and the NE-learning scale:  $r = -.31$ ,  $p < .001$ ),  $z = 1.54$ ,  $p = .12$ , supporting the comparability of these measures.

## Discussion

Study 7 examined a context in which we anticipated that the original NE scale was likely to have the greatest predictive validity. Using a paradigm employed in the original NE article (Jarvis & Petty, 1996), this study provided evidence for the unique predictive ability of the original NE scale over NE-learning and expressing suggesting that it is particularly useful in predicting who is more likely to hold opinions across a diverse set of issues. Specifically, when controlling for the NE-expressing and learning scales, the original NE remained as the only significant predictor for people’s tendency to endorse the “no opinion” option when responding to a broad social and political survey. Additionally, we also

obtained empirical evidence that the NE-learning scale and the original NE scale overlap with each other and showed comparable predictive abilities. Therefore, we suggest that the NE-learning scale can be treated as a short version of the original NE scale.

## General Discussion

The original Need to Evaluate Scale (Jarvis & Petty, 1996) has proven useful in a number of domains. Most notably, it predicts the extent to which people engage in evaluative thinking, and thus form and hold attitudes. Indeed, when we constructed a new scale focused exclusively on the desire to have and hold attitudes (NE-learning), the original NE scale correlated highly with it and both the original and the new NE-learning scale were equally effective in predicting the extent to which people held attitudes on various social and political issues. Importantly, in the current work we identified and provided a means to assess two additional motives that involve evaluation in a more interpersonal context—the motives to express (share) evaluations with others and the motive to learn (seek) the opinions of others. These three aspects of evaluation—having, expressing, and learning—were shown to load on separate dimensions in a factor analysis. Furthermore, in the current research, we not only demonstrated that the NE-expressing and NE-learning scales tap into two new and distinguishable aspects of evaluation that were not captured well by the original NE scale, but we also clarified what aspect of evaluation that the original NE scale represents—the desire to have opinions. Perhaps of most interest, we also demonstrated that scales tapping into these three aspects of evaluation were differentially effective in predicting different outcomes relevant to attitudes and persuasion. For example, the NE-expressing scale predicted how influenced people were by self-generated persuasive messages, but the NE-learning scale predicted how influenced people were when receiving external messages that used evaluative language.

Given these persuasion findings, the assessment of these individual differences could prove beneficial in various applied contexts as well. For example, consider the use of self-persuasion paradigms in various social interventions. One study by Arieli et al. (2014) used a self-persuasion paradigm to enhance benevolence values and helping behaviors among undergraduate students. Another study by Loman et al. (2018) used leading open-ended questions (i.e., self-generation of arguments) to induce favorable views toward the reduction of alcohol consumption among college students. The current work potentially adds to the intervention literature in suggesting that these self-persuasion interventions could work better for those higher in NE-learning. In contrast, interventions that rely on external messages containing the opinions of others (e.g., normative messages) could work better for those higher in NE-learning. In addition, consistent with our theorizing that the motives to express and learn evaluations map onto more general power and epistemic motivations, people who score high on these two scales might also respond differently to different aspects of persuasive source, with those higher in NE-learning being more responsive to source credibility whereas those higher in NE-expressing being more responsive to other features relevant to power motives such as social status.

Besides the self-persuasion and traditional persuasion domains, one could also speculate about the implications for popular interventions that rely on self-affirmation techniques, power inductions,

diary writing, and beyond. For example, individuals higher in NE-expressing might react particularly well to self-affirmation inductions because this kind of intervention is based on expressing one's most important values (Cohen & Sherman, 2014). Individuals scoring higher in NE-expressing might be particularly responsive also to power inductions because putting people in a high (vs. low) power role has been shown to facilitate people expressing their opinions (Guinote et al., 2012). On the other hand, individuals higher in NE-learning might be more likely to respond to interventions based on receiving evaluations from others (e.g., learning about others' opinions, attending seminars, normative messages, receiving lessons, etc.; e.g., Sparkman & Walton, 2019). In short, the current work suggests that various self-improvement intervention strategies might be tailored to the appropriate audience to maximize effectiveness.

### Potential Limitations

One potential limitation of the current work is that in four out of the seven studies, participants were from a college student sample. Because of this, one might argue that it is possible that our findings do not apply to the general population. However, given that we envisioned the two scales to measure general human motivations relevant to evaluation, we expect that these motivational tendencies would be ones that people share. In addition, in Studies 2, 5, and 7, when using a more diverse Amazon Mechanical Turk sample, we obtained results consistent with the theoretical predictions we made for the scales. Furthermore, the correlations among the scales that we obtained in the more diverse Mechanical Turk sample fell in the range of correlations obtained in the studies using college students. Therefore, we expect our results are likely to be generalizable to the more diverse U.S. population. Furthermore, in the current research, we were able to show that all effects reported generalized across gender (see Footnote 2).

Another issue is that although we demonstrated that the NE-expressing and NE-learning scales could predict outcomes above and beyond the original NE scale in Studies 4 and 5, this was not examined in Study 6. We thought it was especially important to show that the NE-expressing scale could predict above and beyond the original NE scale because these are the two scales that are the most highly correlated. In addition to the documented ability of NE-expressing to predict above and beyond the original NE scale in Studies 4 and 5, another reason to suspect that the NE-expression scale will be able to predict above and beyond the original NE scale in various contexts is that in Study 3, we showed unique NE-expressing correlations with the self-monitoring scale and the need to belong scale—correlations that were not present for the original NE scale. This along with its high correlation with the desirability of control scale suggests that the NE-expressing scale could be linked to a more general power motive. With respect to NE-learning, because of its lower correlation with the overall NE scale, it seems more likely that it would predict above and beyond the original NE scale and especially in situations where evaluation is tied to more general epistemic motives (e.g., seeking opinions to understand group norms). These issues should be examined more extensively in future research.

## New Research Directions

### Attitude Functions

Two potentially interesting issues not addressed in the current work is how the motives to have, express, and learn attitudes might be related to attitude functions (Katz, 1960; Smith et al., 1956), and whether the attitude function literature might suggest that there are some evaluative motives that are missing from our analysis. Prior work on attitude functions has examined them with respect to particular attitude objects with one attitude serving one function (e.g., knowledge) and another attitude serving a different function (e.g., social adjustment). Functions have not been examined explicitly as individual differences. Nonetheless, it is possible that our postulated individual differences in the learning and expressing motives might link to some attitude functions more than others. For example, the expressing goal might tap predominantly into the value-expressive function of attitudes, allowing people to express who they are through their evaluations. Of course, when people are expressing their attitudes, it is not just values that can be conveyed. It also enables a form of more general self-expression (He et al., 2019) such as showing to others how smart and/or knowledgeable one is, potentially serving to gain influence (power) over others via self-enhancement or impression management. On the other hand, the learning goal may appear to tap most clearly into the more epistemic knowledge function of attitudes, helping people to better organize and understand their environments.

Given that there were no existing validated scales that specifically measured the various attitude functions as individual differences, we could not use existing scales to examine the associations between our newly developed scales and scales assessing attitude functions. Therefore, it would be worthwhile for future researchers to examine the relationships between our new scales and the various attitude functions. Nonetheless, as a first step in exploring the link between our new scales and possible individual differences in attitude functions, we developed survey items to tap into each of five commonly identified attitude functions, including the knowledge, utilitarian, ego-defensive, value-expressive, and social adjustive functions.<sup>19</sup> At the end of Study 2, participants rated the extent to which each of these attitude functions characteristically described themselves (e.g., "My attitudes help me gain useful information about various objects and issues" for the knowledge function, and "My attitudes help me articulate my core beliefs" for the value-expressive function). Examining the extent to which our new measures related to the various attitude functions in a linear regression model, we concluded that the NE-learning scale was most related to the questions assessing the ego-defensive and utilitarian functions. In contrast, the NE-expressing scale was best among the three scales at predicting evaluation based on the value-expressive function and was inversely related to the knowledge, utilitarian, and ego-defensive functions. Interestingly, NE-learning was positively associated with all of the attitude functions, suggesting it is the most general scale as might be expected since all of the attitude functions were designed to explain why people have

<sup>19</sup> We have included the three items used to measure each of the five attitude functions and results of the regression analysis in the [online supplement materials](#).



attitudes in the first place. Although there is much more that can be done to relate our three motives to attitude functions, our preliminary evidence serves as an initial attempt to move in that direction.

### Transmission Versus Reception Sets

Another interesting direction for future research is to consider the parallel between the two new NE scales and the classic distinction mentioned earlier between transmission and reception sets in interpersonal communication (Zajonc, 1960). It is possible that people who are higher in NE-expressing are chronically in a transmission mindset and people who are higher in NE-learning are chronically in a reception mindset. Therefore, future research could explore whether people's individual differences in terms of their NE-learning versus expressing scale scores would predict outcomes that mirror those that have been produced with situational inductions. It would also be interesting to explore if the effect would be stronger when there is a match between the situational demands (i.e., transmission set vs. reception set) and individual traits (i.e., higher on NE-expressing vs. higher on NE-learning).

Furthermore, beyond the classic distinction and research on transmission and reception sets, more contemporary work has focused on similar distinctions such as whether social media users are active versus passive participants (e.g., Kross & Chandhok, 2020; Schlosser, 2005). That is, whether they are actively engaged in posting about themselves (expression) or more passively digesting information about others (learning). The learning and expressing NE scales might profitably be used to predict behavior in this important context as well. In particular, if chronic posting on social media (expressing) leads to higher well-being than chronic passive exposure (learning), then it might be expected that individuals higher in NE-expressing would have more healthy outcomes from social media use than those higher in NE-learning.

### Spontaneous Formation of Attitudes

Another potentially relevant line of work is on the spontaneous formation of attitudes (Fazio et al., 1984) versus forming them in a memory-based manner (Hastie & Park, 1986). For example, in two studies by Fazio et al. (1984), people in an attitude "consolidation" condition were given the opportunity to report their attitudes regarding a series of intellectual puzzles. This consolidation opportunity led people to report their attitudes more quickly than those who had not expressed their attitudes previously. More relevant to the present research, participants in the Fazio et al. (1984) studies were given situational cues that implied the functionality of knowing their attitude toward the object. In one condition, participants were told that they were to engage in an interview regarding the puzzles. In another condition, participants were told that they would make a decision regarding the puzzles. In these functionality conditions, people reported their attitudes as quickly as those in the consolidation condition, suggesting that these individuals spontaneously formed an attitude toward the puzzles. The condition that led people to expect to be interviewed about the puzzles requires attitude expression whereas making a decision requires learning about the attitude object. Thus, the interview condition might especially prompt spontaneous attitude formation among those higher in NE-expressing whereas the decision

condition might especially prompt spontaneous attitude formation among those higher in NE-learning. Future research could examine whether the learning and expressing NE scales would further moderate the likelihood for people to spontaneously form attitudes in different circumstances. Because the original NE scale has been related to the spontaneous formation of attitudes (Tormala & Petty, 2001), those high in NE-learning may be equally likely to spontaneously form attitudes under both the interview and decision conditions.

### Expression in a Cross-Cultural Context

Finally, work by Morling et al. (2002) suggested that there are cultural differences in people's preference for influencing the situation versus adjusting to the situation. In addition, other research by Kim and Sherman (2007) examines the cultural differences in the motive to engage in self-expression. Given these cultural differences between East Asian versus Western cultures, it would be interesting to explore how the theorizing and conceptualization of attitude expression might be different in a cross-cultural context. For example, it is possible that unlike our theorizing that the expression motive would be positively associated with the value-expressive function, in East Asian cultures people's desire to express might show weaker associations or no associations with the value-expressive function. Of course, we recognize that even within the same culture, different environments can also facilitate and reinforce the emergence and subsequent maintenance of differences in NE-expressing and learning.

### Conclusion

Overall, the primary goals of the current research were achieved. That is, we introduced and validated two unique aspects of evaluation, expressing and learning, that supplement the original NE scale that primarily focused on the having aspect of evaluation (Jarvis & Petty, 1996). We further demonstrated convergent and discriminant validity of the two new NE scales and the predictive validity of all three aspects of evaluation was demonstrated using four different paradigms. The current research helps to provide a more complete picture of people's motives with respect to evaluation. Our studies provide new tools to understand various phenomena (e.g., selection of group roles, Study 4) and also provide new moderators for well-established attitudinal effects (e.g., self-generated persuasion, Study 5; traditional message-based persuasion, Study 6). In conclusion, the current research suggests that the development and further examination of the learning, expressing, and having motivations in evaluation are worthwhile and can enrich various domains of inquiry.

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