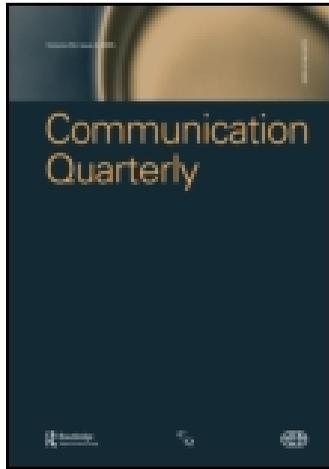


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### The Communication Anxiety Regulation Scale: Development and Initial Validation

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# The Communication Anxiety Regulation Scale: Development and Initial Validation

Kaitlin Hanley White, Matt C. Howard, Bu Zhong, José A. Soto, Christopher R. Perez, Elizabeth A. Lee, Nana A. Dawson-Andoh, & Mark R. Minnick

*A series of studies present the development and validation of the Communication Anxiety Regulation Scale (CARS), a self-report measure designed to assess the use of emotion regulation strategies to manage acute communication anxiety—in contrast to measures of general emotion regulation tendencies. Study 1 delineates the item derivation and selection process that yielded the final 12 CARS items. Results of an exploratory factor analysis supported the existence of four distinct subscales, each representing one of four anxiety regulation strategies (suppression, reappraisal, avoidance, and venting). Study 2 confirmed this factor structure and also examined correlations of the CARS with existing measures in an attempt to establish concurrent validity. Finally, Study 3 presents results of an item-sort task demonstrating the scale's face validity and items' substantive validity. Overall, findings provide preliminary*

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*support for the utility of the CARS as measure of communication anxiety regulation to be used by communication and psychology researchers.*

*Keywords: Communication Anxiety; Emotion Regulation; Measure; Self-Report Scale; Speech Anxiety*

The etymological root of the word communication (*communicatio*) means *sharing* or *distributing*. Effective communication can thus be defined as transmitting specific messages from one entity to another, or sharing information between them (MacKay, 1972). During the process of human communication, how something is expressed (non-verbal communication) can carry more significance and weight than the actual words that are said (verbal communication; Grant, 1972; Moore, Hickson, & Stacks, 2010). From this perspective, non-verbal aspects of communication such as affect, facial expression, body language, and tone of voice become as critical as the structure and choice of language itself. In contexts where the communication itself can be a source of strong emotions (e.g., a public speech), these emotions can shape both the non-verbal aspects of communication as well as the cognitive processes necessary for the verbal aspects of communication (Hullett, 2005; Schwarz, 1990; Schwarz, Bless, & Bohner, 1991). Thus, effective communication partially depends on how individuals modulate or regulate the emotions brought on by a communicative task.

One emotion that has received attention in the communication literature is anxiety. All individuals experience anxiety in a variety of contexts and situations, but not all types of anxiety are alike (Baralt & Gurzynski-Weiss, 2011). McCroskey (1976) terms communication-bound anxiety as “communication apprehension,” referring to an individual’s level of fear or anxiety “associated with either real or anticipated communication with another person or persons” (p. 39). Researchers in this area have divided communication apprehension into trait and state apprehension (Hunt, Atkin, & Krishnan, 2012). The trait view of communication apprehension tends to dominate the communication literature, where communication apprehension has been described as “a relatively enduring, personality-type orientation toward a given mode of communication across a wide variety of contexts” (Richmond & McCroskey, 1998, p. 85). This study tries to measure the anxiety that is caused by a specific situation, such as giving a public speech. It thus focuses on the context-based dimension of communication-bound anxiety, or its state-like, rather than trait-like, aspect. The present study refers to this as “communication anxiety” so as to differentiate it from communication apprehension, which mostly emphasizes the trait-like dimension.

About one in five Americans experience an abnormally high level of communication anxiety, resulting in numerous problematic behaviors, including poor communication skills, withdrawing from communication, and even avoiding communication (McCroskey & Beatty, 1998). Researchers have examined anxiety in a number of communication settings, especially in public speaking (Ayres, 1988; Finn, Sawyer, & Behnke, 2009; Robinson, 1997), instructional communication (McCroskey & Sheahan, 1978), organizational communication (Richmond & McCroskey, 1979),

mood management during media consumption (Zillmann, 1988; Zillmann & Bryant, 1985), and interpersonal communication (McCroskey, Daly, Richmond, & Cox, 1975). Surprisingly, little attention has been paid in the communication literature to how individuals *regulate* their anxiety in such communication scenarios. The above outcome-focused efforts would be complemented by a simultaneous focus on the process of experiencing and regulating anxiety in anticipation of a stressful communicative task. The current study presents three studies detailing the development and validation of the Communication Anxiety Regulation Scale (CARS), a self-report measure that attempts to accurately assess how individuals manage anxiety (by decreasing, increasing, or maintaining a specific level of anxiety) in response to an anxiety-provoking communication task. Importantly, the CARS is not meant to measure whether or not individuals are effectively managing their communication anxiety but rather what kinds of strategies individuals would be predisposed to use in a situation where they experience acute communication anxiety.

Although anxiety has figured prominently in the communication literature (e.g., Finn et al., 2009; Hsu, 2009), we make the distinction between individuals being anxious about communicating generally and individuals experiencing momentary anxiety, or acute communication anxiety, in response to communication in high-stakes scenarios. Not surprisingly, these two forms of anxiety are clearly related; prior literature has demonstrated that communication anxiety can lead to increases in acute measures of anxiety by affecting perceptions of situational factors (Ayres, 1990; Beatty, 1988; Beatty, Balfantz, & Kuwabara, 1989; Beatty & Friedland, 1990; Harris, Sawyer, & Behnke, 2006). The present study thus will focus on acute communication anxiety as a state-specific experience of anxiety and how it is regulated in communication settings.

Being able to assess how individuals typically regulate the anxiety experienced in communication settings can have a number of benefits for communication researchers and also for emotion researchers and clinical researchers. A scale of anxiety regulation may help improve techniques for diagnosing and treating communication anxiety by shedding light on individual preferences for managing anxiety in direct response to an anxiety-provoking communicative task. Depending on the regulation strategies used, the anxiety about the task may either get weaker or stronger. In fact, emotion regulation deficits in response to the momentary experience of anxiety may play a role in the development and maintenance of communication anxiety, as such deficits have been implicated with other anxiety disorders (Amstadter, 2008; Carthy, Horesh, Apter, & Gross, 2010; Olatunji, Forsyth, & Feldner, 2007). However, before something can be done to help prevent or target communication anxiety, there needs to be a readily available option for measuring *how* people regulate this anxiety. To date, such a measure has not been available, although the utility of a scale to measure anxiety regulation in the context of a specific anxiety-provoking communication scenario stands to be multifold.

### Existing Self-Report Measures of Emotion Regulation

Although there is no existing measure of regulation of communication anxiety, there are several measures that target the regulation of emotion, more generally.

The majority of existing self-report measures of emotion regulation emerge from the psychological literature and focus on general beliefs or tendencies that people have about the ways they handle their emotions. Perhaps the most frequently used measure of emotion regulation is Gross and John's (2003) Emotion Regulation Questionnaire (ERQ). The ERQ asks individuals to rate the extent to which they typically employ two emotion regulation strategies to alter positive and negative emotions: cognitive reappraisal and expressive suppression. Cognitive reappraisal refers to changing how one thinks about an emotion-eliciting stimulus to change the emotional experience. Expressive suppression refers to hiding the behavioral response to an emotion. Another measure that gets at emotion regulation, although its primary focus is "coping," is Carver, Scheier, and Weintraub's (1989) self-report measure of coping strategies (COPE). The COPE asks about specific strategies that individuals use to handle stress and considers strategies that are problem-focused (e.g., planning, seeking of instrumental social support) or emotion-focused (e.g., seeking of emotional social support, positive reinterpretation) and adaptive or maladaptive. Importantly, the COPE focuses on use of these strategies generally, much like the ERQ, as opposed to in response to a specific situation.

Other self-report measures of emotion regulation exist but are less widely used. Garnefski, Kraaij, and Spinhoven (2001) developed the Cognitive Emotion Regulation Questionnaire (CERQ), which assesses the general use of nine strategies to cope with negative emotions such as positive reinterpretation. The strategies parallel many of those used by Carver and colleagues (1989) in the COPE, but the authors of the CERQ focused on the cognitive aspects of these coping strategies. In addition to the measures already presented, Gratz and Roemer (2004) developed the Difficulties in Emotion Regulation Scale (DERS) to better understand the negative beliefs that people hold about their ability to handle their emotions. This questionnaire has particularly been used with clinical populations to assess the influence of emotion regulation deficits on psychopathology.

These self-report measures have provided a means for studying emotion regulation from a number of perspectives and in a variety of contexts, but they have not addressed how individuals regulate anxiety in a specific context. Instead, existing measures of emotion regulation all suggest an implicit link between how emotions are typically regulated and how specific emotions are regulated in situations that elicit those specific emotions. This methodological limitation may obscure important differences in how individuals manage different specific emotions across different situations. For instance, an individual tendency to suppress the experience of emotions might tell us very little about how a person would attempt to manage the acute anxiety brought on by a stressful, high-stakes communication task. Likewise, the effectiveness of using suppression as a general strategy to regulate the experience of emotion may not bear relevance on the effectiveness of suppression as a strategy to regulate communication anxiety. Thus, what individuals engage in to regulate anxiety in high pressure communicative tasks is not well understood and yet this knowledge represents an important step forward in the research on communication anxiety.

## The Present Study

In response to the need to further understand what people do to manage acute communication anxiety, the current study presents the development of a measure of anxiety regulation as it unfolds in response to an impromptu, evaluative speech task. In order to properly capture the regulation strategies most commonly employed in response to anxiety, our measure focuses on usage of four specific regulation strategies. In addition to the well-studied strategies of cognitive reappraisal and expressive suppression, we also examine the use of avoidance and venting. We included avoidance—not thinking about an emotion by focusing on something unrelated—because research has shown anxiety disorders to be associated with underlying efforts to avoid internal experiences, including thoughts and feelings (Amstadter, 2008; Hayes, Wilson, Gifford, Follette, & Strosahl, 1996; Stewart, Zvolensky, & Eifert, 2002). We also included venting, or expressing the subjective emotional experience with the goal of “getting it all out” or unburdening oneself by sharing one’s internal experience with others, because it has been related to higher levels of trait anxiety and thus may relate to communication anxiety (Carver et al., 1989). These four strategies have been studied previously in a laboratory study of emotion regulation among youth and adolescents being treated for anxiety (Carthy et al., 2010).

### Study 1: Establishment of the Communication Anxiety Regulation Scale

#### *Methods*

*Participants.* Seven hundred thirteen participants completed this study (56.2% female, 43.7% male, 0.1% transgender; 3 participants did not report gender). All participants were undergraduate students who received course credit for their participation ( $M_{age} = 19.33$ ,  $SD = 1.58$ ; 7 participants did not report age). The participants were 83.1% European American, 5.9% Asian American, 3.9% African American, 3.8% Latino or Hispanic, 1.5% Multiethnic, 0.1% Native American, and 1.5% Other. One participant did not report ethnic background.

*Measures and procedure.* Data were collected through an online survey format using PsychData™. Participants first completed a demographics questionnaire that asked about their age, gender, ethnic background, and additional variables. Immediately afterwards, participants completed the 18-item version of the CARS.

The CARS makes use of an imaginal exposure whereby participants are instructed to imagine that they have to give an unprepared speech in front of a crowd of people.<sup>1</sup> Once the speech context is set up, participants are then asked to “imagine that you are given an opportunity to do the following activities during the two minutes before the speech. Assume that there are no restrictions and that you will be able to do any of the activities.”<sup>2</sup> Rate how likely you would be to choose each of the following in order to deal with your anxiety.” Participants then rated 18 items representing a variety of activities that participants could choose to do using a scale from 1 (*definitely would not choose this*) to 6 (*definitely would choose this*). These

activities were hypothesized to represent our four anxiety regulation strategies of interest (suppression, reappraisal, avoidance, and venting). For example, “I would think about all of the other things I need to do this week and try not to think about the speech I will be giving” (avoidance), and “I would brainstorm all of the positive things that could come about from giving this speech” (reappraisal).

To create the initial CARS, the authors created 18 rationally derived items which closely followed the definitions of the four strategies of interest in order to maximize face validity. The authors were thoroughly familiar with various anxiety regulation strategies and attempted to create questions that gauged all aspects of the strategies of interest. Several of these items were pilot tested with other samples, but they had not been studied all together. Therefore, the purpose of Study 1 was to statistically analyze these 18 items. In particular, we were interested in determining items to represent venting, suppression, and avoidance strategies since the reappraisal items were very straightforward and we were confident that they would load significantly on one factor. Thus, we included more items for venting (7), avoidance (4), and venting (4) than we did for reappraisal (3). Although we had a priori hypotheses in regards to the number of factors and their respective items, it is appropriate to perform an exploratory factor analysis (EFA) to investigate the emergent factor structure (Floyd & Widaman, 1995).

### *Results and Discussion*

We conducted an EFA using Principal Axis Factoring with a direct oblimin rotation using SPSS. Principal axis factoring was chosen based on previous recommendations by several psychometricians that point to this method of extraction as more accurate in capturing the underlying factor structure of a set of items (Costello & Osborne, 2005). Also, a direct oblimin rotation was chosen because it allows factors to correlate (i.e., factors need not be orthogonal). Given that the dimensions of the CARS share an underlying similarity as strategies to regulate the experience of communication anxiety, the direct oblimin rotation was deemed most appropriate. This rotation procedure also results in more conservative factor loadings (Costello & Osborne, 2005), ensuring that the resulting factor structure is robust. Together, our chosen method of extraction and rotation for the EFA follow the recommendations of previous scholars given the nature of our research questions and further ensure that the factor loadings would not be overly inflated, as is sometimes the case with other approaches (Costello & Osborne, 2005; Floyd & Widaman, 1995).

To determine the appropriate number of factors to interpret from the EFA, a scree plot analysis was used. For the initial 18-item CARS, a five factor solution emerged, which also adhered to the Kaiser rule (eigenvalue >1). Three of the factors seemed to align with the intended structure (reappraisal, avoidance, and suppression); however, the venting items were divided between two factors. One of the venting factors was comprised of items describing actions with the intended purpose of expressing anxiety to others, while the other was comprised of items that described actions with the purpose of releasing anxiety or restlessness. Since the former factor adheres more

closely to the conceptualization of venting used here (e.g., Carver et al., 1989), it was retained in the CARS while the latter factor was removed from further consideration. This resulted in the elimination of four items.

Next, individual item loadings from the EFA were analyzed. Although some have suggested item loading cutoffs as low as 0.32 or 0.40 (Comrey & Lee, 1992; Hinkin, 1995, 1998; Tabachnick & Fidell, 2001), we chose the much more conservative cutoff of 0.60 for the current study (McCroskey & Young, 1979). This resulted in the elimination of five additional items. However, after applying this cutoff, the avoidance, reappraisal, and venting factors were reduced to two items, considered by many to be too few for a reliable subscale (Cook, Hepworth, Wall, & Warr, 1981). For this reason, an item with a factor loading below the chosen cutoff (0.493) was retained in the avoidance subscale. This item was chosen over an alternative item with a higher factor loading (0.560) because the alternative item mentioned a university newspaper specific to the data collection site and as such would not make sense to individuals in any other setting. Another item below the cutoff for the reappraisal subscale was retained, with a factor loading of  $-0.581$ . Similarly, one item with a factor loading of 0.474 was retained in the venting factor. Although the factor loadings of these items were lower than our cutoff of 0.70, they are well above many other suggested cutoffs (Comrey & Lee, 1992; Hinkin, 1995, 1998; Tabachnick & Fidell, 2001) and, as such, their inclusion does not pose a serious concern. In all, this process resulted in 12 items which form four factors, with three items for each factor. The final, 12-item CARS is presented in Appendix A and the factor loadings are presented in Table 1.

Additionally, the reliability coefficient for the full CARS scale was 0.68. Reliability coefficients were 0.68 for venting, 0.74 for avoidance, 0.75 for suppression, and 0.80 for reappraisal. In addition, the inter-correlations of items within each individual dimension were largely strong ( $r = 0.50$ ; Cohen, 1992), which provides evidence for the internal consistency of the subscales. While these reliabilities demonstrate very good internal consistency relative to the number of items included in each subscale (i.e., three items per subscale; see John & Benet-Martínez, 2000), they are weaker than ideal and represent a limitation of the CARS.

The correlations between subscales are presented in Table 2. The suppression subscale was negatively correlated with the venting subscale, consistent with the focus on opposite processes in these strategies: not expressing vs. expressing, respectively. Suppression was also uncorrelated with avoidance, suggesting these are orthogonal processes, but it was positively correlated with reappraisal. This latter correlation is contrary to Gross and John's (2003) original conceptualization of these as independent processes; several studies have since shown that these two constructs are often correlated (e.g., Matsumoto, Yoo, & Nakagawa 2008). Reappraisal was uncorrelated with venting but was positively correlated with avoidance, possibly reflecting that both avoidance and reappraisal explicitly entail not thinking about the negative aspects of the speech to manage anxiety whereas venting does not necessarily orient the individual away from the negative aspects of the speech. Finally, venting and avoidance were positively correlated, which is consistent with literature suggesting

**Table 1** Principal Axis Factoring Loadings With Direct Oblimin Rotation Pattern Matrix for the Final CARS Items

Item	Factor loadings				
	Factor 1	Factor 2	Factor 3	Factor 4	Factor 5
1. I would think about how this could be a good opportunity to practice my public speaking skills.	0.745				
2. I would think about how giving the speech will make me a more competent individual and help me learn how to think fast on my feet for the future.	0.917				
3. I would brainstorm all of the positive things that could come about from giving this speech.	0.605				
4. I would watch a brief video clip from a TV show I enjoy.		0.874			
5. I would think about all of the other things I need to do this week and try not to think about the speech I will be giving.		0.440			
6. I would play a video game on a computer or handheld device.		0.712			
7. I would try to control my anxiety by not expressing it.			0.806		
8. I would make a conscious effort to keep my face and body language from appearing anxious.			0.646		
9. I would mask any anxiety that I am feeling.			0.650		
10. I would bury my face in a pillow and scream.				0.435	
11. I would show my anxiety so that everyone would know how I am feeling.				0.811	
12. I would show my anxiety in order to get people to comfort and help me.				0.661	

*Note.* Loadings above 0.4 are presented although our cutoff was 0.60 in order to illustrate where each item loads most highly.

**Table 2** Correlations Between CARS Subscales in Study 1

CARS Scale	Suppression	Reappraisal	Avoidance	Venting
Suppression	—			
Reappraisal	0.22**	—		
Avoidance	0.01	0.32**	—	
Venting	0.29**	0.05	0.34**	—

\*\* $p < 0.01$  (two-tailed).

that perseverating about negative events (e.g., worry), which may be a consequence of venting, can be a way to avoidance experiencing emotions (e.g., Borkovec, Alcaine, & Behar, 2004).

In summary, the EFA reduced the initial 18-item CARS into a 12 item measure and demonstrated that the items formed four factors as intended. Furthermore, the four subscales demonstrate a pattern of correlations with each other that is reasonable given the theoretical underpinnings of these strategies and previous literature on emotion regulation. Thus, Study 1 provides preliminary evidence for the structure and coherence of a measure of communication anxiety regulation. The final version of the CARS with instructions and items is presented in Appendix A.

## Study 2: Establishing Concurrent Validity

The goal of Study 2 was to confirm the factor structure and begin to establish the validity of the CARS. As an initial step in the validation process we sought to establish concurrent validity. Although there are no existing measures for the same exact construct targeted by the CARS (regulation of acute anxiety in communication setting), we expected our subscales to demonstrate moderate associations with general measures of emotion regulation strategies that also ask about the same or a theoretically similar set of regulation strategies. We also expected to show preliminary discriminant validity by demonstrating that the CARS subscales do not correlate with the conceptually unrelated constructs of social desirability.

### *Hypotheses*

We had several hypotheses with regard to how the four subscales of the CARS would relate to other measures. First, we expected that the CARS suppression subscale would be positively correlated related with general usage of suppression as measured by the ERQ suppression subscale (Gross & John, 2003). Similarly, the CARS reappraisal subscale was hypothesized to correlate positively with general usage of reappraisal (ERQ reappraisal subscale) and the positive reinterpretation and growth subscale of the COPE (Carver et al., 1989). The CARS avoidance subscale was expected to correlate positively with the COPE denial subscale. Finally, the CARS venting subscale was predicted to correlate significantly with the COPE's focus on and venting of emotions subscale. Importantly, we expected the predicted correlations to be positive and significant yet modest in size due to the difference between reporting on general regulation tendencies (i.e., ERQ, COPE) and how an individual regulates anxiety in a specific, anxiety-inducing, communication task.

In addition to measures of emotion regulation, we also included measures of general emotion dysregulation and social desirability. In developing these hypotheses, it is important to note that the strategies represented by the CARS subscales are in reference to the specific anxiety engendered by a high-pressure communication task. For example, in other measures of emotion regulation, suppression is largely construed as a maladaptive strategy associated with a number of negative consequences such as

increased physiological response and greater negative affect (Gross & John, 2003). However, there are obvious benefits to employing this strategy when preparing to give a public speech, thereby canceling out some of the possible negative effects typically seen with use of suppression. Thus, we hypothesized the following:

- H1: Endorsing suppression as a strategy to manage communication anxiety would not be associated with self-reported difficulties in regulating emotions, as measured by the DERS.*
- H2: The CARS reappraisal subscale would be negatively related to the DERS given the robust and positive outcomes associated with reappraisal in previous literature (Gross & John, 2003).*
- H3: We expected venting and avoidance to be positively correlated with general difficulties in emotion regulation (i.e., the DERS) because these strategies might not effectively reduce the acute anxiety experienced in our speech task.*
- H4: Lastly, we expected that social desirability would be unrelated to all CARS subscales as an indication of discriminant validity.*

### *Method*

*Participants.* Participants were 402 undergraduate students who received course credit for their participation (mean age = 18.67 years,  $SD = 1.186$ ; 2 participants did not report age). The participants were 84.3% European American, 7.7% Asian American, 2.5% African American, 3.7% Latino or Hispanic, 1.0% Multiethnic, 0.2% Native American, and 0.2% Other. One participant did not provide ethnicity data. The majority of participants were female (73.6%, 26.1% male, 0.2% transgender).

*Measures and procedure.* As in Study 1, participants initially completed a demographic questionnaire and the CARS through an online survey using PsychData™. Internal consistency for the CARS subscales in this sample ranged from adequate to good (Cronbach's  $\alpha = 0.85$  for Suppression, 0.83 for Reappraisal, 0.69 for Avoidance, 0.66 for Venting, and 0.53 for the full CARS scale). Participants in Study 2 also completed the measures described below.

*Emotion regulation and coping tendencies.* The DERS (Gratz & Roemer, 2004) is a 36-item measure that assesses how participants view their emotions and whether they feel able to regulate them effectively (e.g., "When I'm upset, I feel guilty for feeling that way"). Items are rated on a scale ranging from 1 (*almost never, 0–10%*) to 5 (*almost always, 91–100%*). This scale demonstrated good internal consistency in the current sample (Cronbach's  $\alpha = 0.91$ ).

The ERQ (Gross & John, 2003) is a 10-item measure about general use of expressive suppression and cognitive reappraisal. The reappraisal subscale (e.g., "I control my emotions by *changing the way I think* about the situation I'm in.") and suppression subscale (e.g., "I control my emotions by *not expressing them.*") are both rated using a Likert-type scale ranging from 1 (*strongly disagree*) to 7 (*strongly agree*).

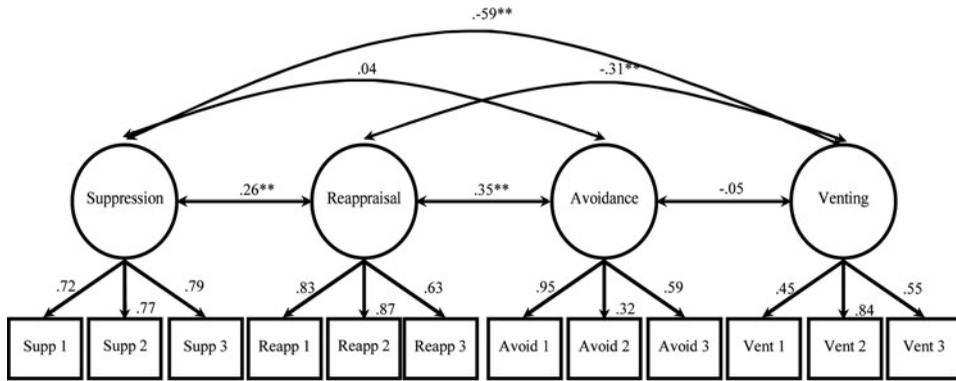
The Cronbach's alphas for the subscales in our sample were 0.84 for reappraisal and 0.78 for suppression, indicating good internal consistency.

The COPE (Carver et al., 1989) is a 60-item, self-report measure of specific coping strategies that people typically use to deal with stressful events in life. The measure assesses a range of maladaptive (e.g., denial) and adaptive coping (e.g., positive reinterpretation and growth) strategies that can generally be considered problem-focused or emotion-focused in their orientation toward the stressor. Participants rate the items on a 4-point scale from 1 (*I usually don't do this at all*) to 4 (*I usually do this a lot*). Three of the COPE's subscales represent similar constructs as those measured in the CARS and were therefore used to establish concurrent validity. The internal consistencies (Cronbach's alpha) for the subscales utilized in our analyses were 0.79 for positive reinterpretation and growth, 0.84 for focus on and venting of emotions, and 0.79 for denial.

*Social desirability.* The Marlowe-Crowne (Crowne & Marlowe, 1960) is a 33-item questionnaire that indicates the extent to which participants depict themselves in a socially desirable way or within the norms of the dominant culture. It reflects one dimension of social desirability along which participants can either score high or low. Items are rated as *true* or *false*, such as "I'm always willing to admit it when I make a mistake" where a *true* answer would indicate a preference toward social desirability. In this study, the Cronbach's alpha was 0.76 for the full scale, indicating good internal consistency.

### *Results and Discussion*

Before analyzing the interrelationships between the CARS and additional measures, we wished to replicate the results of Study 1 demonstrating the stable underlying structure of the CARS. To do so, we performed a confirmatory factor analysis on the data using Mplus version 6 (Muthén & Muthén, 1998–2010). To evaluate overall model fit in CFA, Brown (2006) recommends including measures of absolute fit (indicating the similarity between the observed variance-covariance matrix and the proposed, estimated matrix; e.g., chi-square and standardized root mean square residual, SRMR), parsimony correction (evaluating fit in the context of maximizing model parsimony; e.g., root mean square error of approximation, RMSEA), and comparative fit (evaluating the fit of the hypothesized model compared to the null model; e.g., comparative fit index, CFI, and Tucker-Lewis index, TLI). Hu and Bentler (1999) provide well-accepted suggestions for evaluating these indices. For strong model fit, chi-square will be non-significant (though it is highly sensitive to sample size so often is significant; therefore, the SRMR is also included), SRMR will be equal to or less than 0.08, RMSEA will be equal to or less than 0.06, and CFI and TLI will be equal or greater than 0.95. In the model tested, depicted in Figure 1, each item loaded only onto its respective factor, and each factor was covaried with the others. The model fit was adequate, with each fit index falling within or very near the Hu and Bentler (1999) guidelines,  $\chi^2(48) = 124.23$ ,  $p < 0.01$ , CFI = 0.94, TLI = 0.92, RMSEA = 0.07, SRMR = 0.05,



**Figure 1** Study 2 confirmatory factor analysis with primary factor loadings (directly above each item) and correlations among CARS subscales (paths between latent constructs). *Note.* \*\*indicates correlation is significant,  $p < .01$  (two-tailed).

confirming the factor structure of the CARS. Therefore, the subscales determined from Study 1 remain a psychometrically valid representation of the scale and its items, suggesting that the CARS has an identifiable and stable factor structure. The correlations between individual subscales and measures for establishing concurrent validity are presented in Table 3. Findings are discussed below by subscale.

**Table 3** Study 2 Correlations Among CARS Subscales and Between Subscales and External Measures

Scale	CARS Subscales			
	Suppression	Reappraisal	Avoidance	Venting
CARS				
Suppression	—			
Reappraisal	0.24**	—		
Avoidance	0.03	0.20**	—	
Venting	0.42**	0.28**	0.11*	—
DERS	0.09	0.21**	0.16*	0.27**
ERQ				
Suppression	0.18**	0.09	0.19**	0.00
Reappraisal	0.23**	0.32**	0.01	0.15**
COPE				
Positive reinterpretation and growth	0.12*	0.39*	0.00	0.11*
Focus on and venting of emotions	0.22**	0.05	0.05	0.31**
Denial	0.18**	-0.05	0.22**	0.30**
Marlowe-Crowne	0.01	0.18**	0.06	0.10

\*indicates correlation is significant,  $p < 0.05$  (two-tailed); \*\*indicates correlation is significant,  $p < 0.01$  (two-tailed). CARS = Communication Anxiety Regulation Scale; DERS = Difficulties in Emotion Regulation Scale, ERQ = Emotion Regulation Questionnaire.

*Suppression.* The CARS's suppression subscale was positively correlated with the ERQ's suppression subscale, as predicted. Also as predicted, this relationship was modest in strength, highlighting the conceptual difference between the two constructs. Noteworthy from our results is the overlap between suppression and reappraisal, both within the CARS and in relation to the ERQ and COPE, perhaps because those who suppress may be able to utilize some of the positive aspects of reappraisal in service of hiding their behavioral expression of emotions. Although not predicted, the CARS suppression subscale was also negatively related to the COPE denial and venting subscales, emphasizing the opposite focus in the suppression process (acknowledging but not expressing) relative to these other processes. Furthermore, as hypothesized, suppression was not correlated with the DERS scale nor was it correlated with social desirability, with the latter providing some evidence of discriminant validity.

*Reappraisal.* The CARS's reappraisal subscale was positively correlated with the ERQ's reappraisal and the COPE's positive reinterpretation and growth subscales, which demonstrates support for our hypothesis of these as similar regulatory processes. In addition, reappraisal was negatively correlated with the DERS scale, which indicates, consistent with previous research, that it may be an effective way to regulate emotions (e.g., Gross & John, 2003). The positive correlation between social desirability and reappraisal, though not predicted, likely reflects the social values placed on presenting positive emotions instead of negative emotions. Since the reappraisal subscale involves thinking about anxiety in a more positive way, this may underlie the correlation between reappraisal and social desirability. Previous researchers have also observed this association between ERQ reappraisal and social desirability (Gross & John, 2003). Although the reappraisal subscale failed to demonstrate divergence with the social-desirability measure, it did demonstrate some discriminant validity in not significantly relating to the COPE venting and denial subscales.

*Avoidance.* The avoidance subscale of the CARS was positively correlated with the COPE's denial subscale, as predicted. Furthermore, avoidance was positively correlated with the DERS scale, suggesting that individuals who use avoidance may feel that they cannot effectively regulate their emotions. This interpretation is strengthened given the positive correlation between the CARS avoidance subscale and the ERQ suppression subscale, which has also been associated with ineffective regulation of emotion. Lastly, avoidance was not related to social desirability, providing evidence of discriminant validity.

*Venting.* The CARS's venting subscale correlated positively with the COPE's focus on and venting of emotions subscale, supporting the hypothesized conceptualization of this construct. Furthermore, venting was positively correlated with the DERS scale, suggesting that venting may involve an element of uncontrollable expression in a manner that may actually represent dysregulation as opposed to an adaptive way of regulating emotions (Carver et al., 1989). In fact, venting was positively correlated

with denial, suggesting that the key element of venting involves expression of an undesirable emotion without necessarily acknowledging or processing the nature of the emotion. Finally, as expected, social desirability was uncorrelated with venting or the ERQ suppression scale indicative of discriminant validity.

### Study 3: Face and Substantive Validity

In Studies 1 and 2, the CARS was shown to have an identifiable factor structure and adequate concurrent validity. While these findings support some aspects of the CARS validity, other aspects of its validity remain unknown (e.g., face and content validity). To provide further evidence of the validity of the CARS, an item-sort task was performed with the 12 items from the CARS. Item-sort tasks are typically used in early phases of scale development to pare over-representative item lists, but they can also be used to support individual items' face and substantive validity. Substantive validity refers to, "the extent to which a measure is judged to be reflective of, or theoretically linked to, some construct of interest" (Anderson & Gerbing, 1991, p. 732). Due to its close relationship with construct validity, evidence of a scale's substantive validity is necessary in establishing the scale's construct validity. Therefore, an item-sort task can provide evidence of items' face and substantive validity, and a scale which consists of several items with high substantive validity is indicative of good construct validity for the overall scale (Anderson & Gerbing, 1991). If the CARS items were shown to have high substantive validity, then this would provide support for the further investigation and use of the CARS.

#### Method

*Participants.* Participants were 30 undergraduate students who received course credit for their participation. Previous studies have repeatedly shown successful item-sort task results with sample sizes as small as 20 (Anderson & Gerbing, 1991; Bauer et al., 2001; Chen, Gully, & Eden, 2001; Ferris, Brown, Berry, & Lian, 2008). Since item-sort tasks do not ask participants to give responses in regards to themselves, no demographic information was recorded.

*Procedure.* To perform the item-sort task, participants were first given definitions of the CARS dimensions. This was to ensure that participants had a common frame-of-reference when answering items and is recommended when performing item-sort tasks (Anderson & Gerbing, 1991). Then, they were presented the CARS items, as well as the items removed during previous phases of the current article and several distractor items. For each item, participants were asked to identify which dimension they believed the item gauged. Answer choices were the four dimensions of the CARS, as well as a "none of the above" option. Also, a free-response option was provided after each item, so participants could indicate if they believed the item had problematic wording.

For each item, a coefficient of substantive validity ( $c_{sv}$ ) was calculated and subjected to statistical evaluation. A significant coefficient demonstrates that an item

is assigned to its intended construct more so than any other construct and that this assignment is at a level that is statistically greater than chance. Items with statistically significant  $c_{sv}$  values are considered to have high face and substantive validity.

### *Results and Discussion*

The calculated  $c_{sv}$  for each of the final 12 CARS items was statistically significant ( $p < 0.05$ ), using the formula provided by Anderson and Gerbing (1991). Also, no participant expressed any concerns with the wording of the CARS items. Together, these results demonstrate that the CARS items have satisfactory face validity, substantive validity, and limited wording issues. Since all of the CARS items resulted in statistically significant item-sort task results, these results demonstrate further support for the construct validity of the CARS. These results, paired with the results from Studies 1 and 2, suggest that the CARS is a valid measure for assessing individuals' communication anxiety regulation strategies.

### **General Discussion**

Since the late 1960s, anxiety has been “one of the most researched constructs in the field of human communication” (McCroskey, 2009, p. 158). In that vein, serious efforts have been made to address two key issues associated with communication anxiety—how to measure it (McCroskey, 1978, 1982) and how to reduce it (Beatty, McCroskey, & Heisel, 1998; Glowgower, Fremouw, & McCroskey, 1978; McCroskey, 1976). Less recognized has been how individuals regulate (or fail to regulate) anxiety in those anxiety-provoking communication settings. The ability to carefully assess *how* individuals regulate their anxiety in such settings is a critical new direction in this area of research. The goal of the three studies presented was the initial development and preliminary validation of a self-report questionnaire, the CARS, which allows researchers to measure the specific regulation of anxiety in response to an imagined high-stress speech task. On the whole, our psychometric findings provide preliminary evidence that the CARS measures the four strategies we intended to capture (reappraisal, suppression, avoidance, and venting) and that these subscales demonstrate modest evidence of concurrent validity. While future research is needed on the CARS to further validate its use and applicability, the work presented here represents the initial steps in that process.

This study proposes that having the capability to measure how individuals choose to regulate their anxiety in a prototypical anxious communication scenario has a number of advantages. First, this allows for a careful assessment of behavior that can be both clinically and socially informative. Rather than inferring how individuals with anxiety around communication may cope with their anxiety, the CARS allows for this to be directly assessed. Second, the CARS can be used to measure the success of interventions that attempt to alter regulation strategies in such anxious settings, whether in communication settings (Beatty et al., 1998) or clinical settings where such anxiety might also be a focus of intervention (Cole, Michel, & Teti, 1994).

Third, use of the CARS in conjunction with more general emotion regulation measures (e.g., ERQ) can allow for the differentiation of effects due to typical usage of emotion regulation strategies versus the specific use of emotion regulation strategies within the context of communication anxiety.

With regard to the specific subscales of the CARS, a number of interesting points emerged from our findings. First, several significant but relatively low correlations emerged between the CARS subscales and subscales from other measures of similar strategies. We expected such moderate associations with other emotion regulation measures due to the difference between the constructs of general emotion regulation and that of specific anxiety regulation in a specific communication anxiety context. In particular, how people manage emotions generally may be different from how they manage anxiety in this specific context. For instance, use of suppression may not be as negative in this communication anxiety context as it may be in other contexts. In particular, in preparation for an evaluative, public speaking task, hiding one's anxiety may be an adaptive approach and perhaps even critical to success as individuals attempt to portray confidence instead of nervousness. Furthermore, suppression likely does not function by itself, but may instead involve simultaneous usage of other strategies such as reappraisal in order to achieve suppression of the behavioral response.

Another notable finding involves the positive associations between venting and dysregulation and denial, indicating that venting in this context may typically be used by individuals who appear to lack other, more adaptive strategies (e.g., reappraisal). Venting as captured by the CARS appears to reflect an attempt "get the anxiety out" because these individual may be unable to effectively regulate their anxiety internally. This description evokes the often-caricatured image of a neurotic individual whose excessive worry results in uncontrollable expression of their anxiety. The CARS avoidance subscale also showed similar relationships with other constructs, suggesting it may be less useful as a strategy for regulating acute communication anxiety.

### **Strengths and Limitations**

The CARS is a short and easy-to-administer self-report measure that may be of interest to communication researchers, emotion researchers, and clinical psychologists interested in anxiety in non-clinical settings. While we specifically sought to make the CARS a brief measure, this may have weakened the psychometric properties of the measure, leading to lower reliabilities on some of the subscales and pointing to a clear limitation of the scale (Netemeyer, Bearden, & Sharma, 2003). Furthermore, our data may not be generalizable given that our participants were predominantly White, college-aged females recruited via convenience techniques. While confirming the hypothesized structure with two large samples over a period of several months suggests some robustness to our findings, using the measure with more diverse community samples will be an important next step for research in order to further establish the validity of the CARS. Finally, the validation of the CARS

needs to continue into establishing additional aspects of validity, such as nomological validity (see Campbell, 1960), which were not a part of the current study.

The specific focus on anxiety regulation in a communication setting may also be seen as a limitation by those who wish to study regulation of other emotions in communication contexts or the study of anxiety in other contexts. However, we propose that the CARS might be readily modified to capture the regulation other emotions, given its fairly simple structure. There is also some question as to whether the CARS, as currently configured, might be applicable to other public speech scenarios or whether it may be specific to impromptu, high-stakes speaking. Again, we feel that the stem of the CARS could easily be modified to provide a preliminary assessment of this possibility. Future work with the CARS should consider such piloting as a means to expand its utility and applicability.

## Conclusion

Studies examining the negative impact of anxiety in a communication context have clearly demonstrated its negative effects (McCroskey, 2009). Individuals with high communication anxiety are less likely to become opinion leaders, less likely to be selected as friends, have less influence in their work environment, and are more likely to report being lonely (Hurt & Joseph, 1975). As the study of communication continues to grow, so too must our methodologies. In this regard, the CARS offers a new assessment tool that is different from established emotion regulation measures in that it measures how individuals regulate their anxiety in response to an anxiety-provoking communication task that may be a fairly common experience for some. While this was an inferred process previously, the CARS offers the opportunity to study this process directly and empirically. As McCroskey (2009) pointed out, there cannot be enough research on communication anxiety until its effects can be prevented for everyone in our society and in other cultures. Meanwhile, communication scholars have found that exploring productive approaches for dealing with communication anxiety depends on a comprehensive understanding of the nature of the construct (Beatty et al., 2011). This study represents such an insight. We believe that the CARS offers the capability to begin to move the research agenda in this direction.

## Notes

- [1] Although participants in this study were not asked about their experience of anxiety in response to the imagined speech scenario, subsequent data collected using this exact procedure ( $N = 675$ ) indicated that participants consistently report feeling significantly more anxiety immediately after the imaginal speech induction than beforehand,  $t(673) = 25.16$ ,  $p < 0.01$ .
- [2] Because participants were instructed to imagine that they had no restrictions on what they could do to regulate their emotions, some items entailed the use of materials (e.g., computers, video games) or actions (e.g., leaving the situation) that might not typically be available

to participants in the imagined scenario. These items were included because our primary goal was to ensure that we fully represent the construct of interest (e.g., avoidance, reappraisal) rather than whether the items were feasible within the imagined scenario, although advances in technology make several of these options possible now.

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## Appendix A

### *Communication Anxiety Regulation Scale*

We would like you to imagine yourself in a particular situation. Do your best to pretend that you are really in the imagined scenario, complete with all the thoughts, feelings, and behaviors that might be appropriate in that scenario. Do not just think about the situation; rather, imagine that you are truly in it.

Rate how likely you would be to choose each of the following in order to deal with your anxiety.

1 = Definitely would not; 2 = Probably would not; 3 = Maybe would not; 4 = Maybe would; 5 = Probably would; 6 = Definitely would

- 1) I would think about how this could be a good opportunity to practice my public speaking skills.
- 2) I would watch a brief video clip from a TV show I enjoy.
- 3) I would bury my face in a pillow and scream.
- 4) I would think about how giving the speech will make me a more competent individual and help me learn how to think fast on my feet for the future.
- 5) I would think about all of the other things I need to do this week and try not to think about the speech I will be giving.
- 6) I would show my anxiety so that everyone would know how I am feeling.
- 7) I would try to control my anxiety by not expressing it.
- 8) I would make a conscious effort to keep my face and body language from appearing anxious.
- 9) I would play a video game on a computer or handheld device.
- 10) I would brainstorm all of the positive things that could come about from giving this speech.
- 11) I would mask any anxiety that I am feeling.
- 12) I would show my anxiety in order to get people to comfort and help me.