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Attentional Control Buffers the Effect of Public Speaking Anxiety on Performance

Christopher R. Jones, Russell H. Fazio, & Michael W. Vasey

Ohio State University

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Please address correspondence to:

Russell H. Fazio  
Department of Psychology  
Ohio State University  
1835 Neil Avenue  
Columbus, OH 43210-1287  
Phone: 614-688-5408  
Fax: 614-292-5601  
E-mail: [fazio.11@osu.edu](mailto:fazio.11@osu.edu)

Abstract

We explored dispositional differences in the ability to self-regulate attentional processes in the domain of public speaking. Participants first completed measures of speech anxiety and attentional control. In a second session, participants prepared and performed a short speech. Fear of public speaking negatively impacted performance only for those low in attentional control. Thus, attentional control appears to act as a buffer that facilitates successful self-regulation despite performance anxiety.

Key words: attention, attentional control, public speaking, self-regulation, anxiety

### Attentional Control Buffers the Effect of Public Speaking Anxiety on Performance

The prospect of speaking in public evokes fear and anxiety for many individuals, and speech anxiety often poses a serious problem for those who have it. Numerous occupations require people to speak publicly, at least on occasion, and for many individuals the fear and anxiety that it evokes can greatly impair performance. While anxiety tends to impair performance on difficult cognitive tasks generally, it poses especially difficult problems for public speaking. The cognitive demands of delivering a speech can be considerable. Speech performance may generally benefit from the individual's flexibly shifting attention between the self, speech, and audience, as desired. However, unintentional breaks in focus at inopportune times are likely to prove detrimental. Moreover, the experience of speech anxiety and efforts to control it may themselves consume considerable cognitive resources. Thus, public speaking can pose a formidable self-regulatory challenge. This analysis is consistent with attentional control theory (Eysenck, Derakshan, Santos, & Calvo, 2007), which distinguishes between two relevant attentional systems and posits that anxiety impairs cognitive performance by hampering goal-directed attentional processes while leaving stimulus-driven processes that respond to environmental cues relatively intact. This disruption of goal-directed processes and maintenance of stimulus-driven processes leads to increased attention capture by salient stimuli, especially threatening ones.

Some indication of the interplay between emotion and attention in public speaking can be gleaned from psychological studies of public speaking. For example, even those without particularly strong fear of public speaking tend to experience an "illusion of transparency," in which they overestimate the extent to which anxiety is apparent to an audience (Savitsky & Gilovich, 2003). Ironically, this illusion of transparency can exacerbate anxiety and impair

performance. Both because speakers want to hide anxiety and because it makes speaking more difficult, they often attempt to suppress these feelings. One study found that even though suppression tended to reduce nervousness as perceived by an audience, it had the consequences of increasing actual physiological arousal and decreasing later memory for the speech (Egloff, Schnukle, Burns, & Schwedtfeger, 2006). Finally, Rapee and Abbott (2007) found that a retrospective measure of inappropriate attention during a speech (e.g. focusing on one's heartbeat or recalling prior anxiety-provoking experiences) mediated the effect of general social anxiety on experienced anxiety following a speech.

Anxiety produced by public speaking should be more debilitating for those who have difficulty self-regulating their attention. Substantial variability in this capacity has been observed across individuals. Attentional control is considered by some investigators to be a factor of temperament, in other words, a heritable individual difference (Derryberry & Rothbart, 1988; Rothbart & Derryberry, 1981). Prior research on attentional control has found it is capable of accounting for differences in self-regulatory performance (e.g., Derryberry & Rothbart, 1988; Lonigan, Vasey, Phillips, & Hazen, 2004). Derryberry and Reed (2002) demonstrated that self-reported attentional control predicted performance on an objective attentional control task: individuals with high trait anxiety were better able to overcome an attentional bias for threatening information in a dot-probe task to the extent that they also reported higher attentional control. For those with lower attentional control, the threatening information interfered with task performance. Lonigan and Vasey (2009) reported a similar pattern in a youth sample. Peers and Lawrence (2009) provided evidence that self-reports of attentional control predicted objective performance in a rapid serial visual presentation task with distractors.

Several studies have demonstrated correlations between measures of attentional control and diverse outcomes including psychopathology (Baskin-Sommers, Zeier & Newman, 2009; Muris et al., 2008), anxiety (Muris, de Jong, & Engelen, 2004), and resilience to trauma (Bardeen & Read, 2010). However, only a few studies have examined attentional control in a moderating role. Ayduk and colleagues (2008) showed that rejection sensitivity was associated with self-reported borderline personality symptoms only for those with low attentional control. Gyurak and Ayduk (2007) found that low self-esteem predicted increased startle responses to rejection-related stimuli unless participants also had high attentional control. Treating self-reported anxiety as an outcome variable, Meesters and colleagues (2007) found its relationship with neuroticism attenuated in those with high attentional control. Finally, Bardeen and Orcutt (in press) reported an interaction between attentional control and post-traumatic stress symptoms predicting attention to threat stimuli.

Our analysis suggests that those individuals who report having more impressive attentional control capacity should be better equipped to deal with any anxiety produced by public speaking. We measured individual differences in public speaking anxiety and attentional control and then examined performance during a public speaking task. To our knowledge, this is the first study to examine the postulated moderating role of self-reported attentional control with respect to the performance of a social behavior.

### *Participants and Method*

Sixty-three undergraduates participated for partial course credit. Two participants did not return for the study's second session. Thus, data from 61 participants were analyzed.

In the first session, participants completed individual difference measures of public speaking anxiety and attentional control. First, participants completed the Personal Report of

Confidence as a Speaker (PRCS; Paul, 1966), a widely used and validated measure of public speaking anxiety (for a review see Phillips et al., 1997). This scale includes thirty true/false items, some of which are reverse-scored. Scores can range from zero (no fear) to thirty (extreme fear). It includes such face-valid items as “I prefer to have notes on the platform in case I forget my speech,” “I feel relaxed and comfortable while speaking,” and “I look forward to the opportunity to speak in public.”

To measure individual differences in the attentional self-regulatory skill, we employed the Attentional Control Scale (ACS; Derryberry & Reed, 2002). The 20-item ACS assesses the ability to effortfully sustain focus on desired objects or tasks and the ability to shift attention in a controlled and desired manner between multiple objects or ongoing tasks. Each item is a statement about the self (e.g. “My concentration is good even if there is music in the room around me,” “It takes me a while to get really involved in a new task,” and “It is easy for me to read or write while I am also talking on the phone”) with which the participant can express agreement on a four-point scale.

Participants returned for a second session one to two weeks later to give a brief videotaped speech about a novel topic. Ostensibly, the research concerned educational methods and how presentation style relates to students’ learning. Participants were led to believe that these speeches would be later shown to elementary school students who would be tested over the speech’s material. They were asked to prepare a three-minute speech concerning the astronomical categorization of Pluto, specifically, “what defines a true planet and why Pluto might not qualify” as one. They were provided a rather difficult and scholarly (but brief) article on the topic from *Scientific American* (Luu & Jewitt, 1996). Participants were given ten minutes to prepare and could write notes to do so, but were allowed no aids during the speech itself. The

source material and educational cover story were chosen to create a relatively challenging public speaking task that participants would feel compelled to take seriously.

Participants gave the speeches alone in front of a video camera, communicating with the experimenter via intercom. Participants were instructed to speak for a full three minutes. If that mark was reached, the participant was asked to finish his or her thought and terminate the speech. Length of the speeches was recorded. Brevity may indicate a faster rate of speech, less content, or both. After the speech participants responded to the question “How would you rate the overall quality of the speech?” on a 0-10 scale from “Very low” to “Very high.” Two judges, who were unaware of the speakers’ scores on other measures, viewed taped speeches and rated their quality using the same scale ( $\alpha = .75$ ).

### *Results*

Public speaking anxiety was quantified as the number of PRCS item endorsements that reflected negativity towards public speaking. The mean response to ACS items was calculated after reverse-scoring items such that higher numbers indicated greater attentional control. The primary indicator of speech quality was the judges’ combined ratings of the speech. We also examined speech length in seconds as an indicator of to what extent the participant achieved the assigned task goal. Means, standard deviations, and correlations among these variables appear in Table 1. As expected, participants with greater speech anxiety gave shorter ( $r = -.34, p < .01$ ), more poorly received speeches ( $r = -.37, p < .01$ ).

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Insert Table 1 about here

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We conducted a series of regression analyses predicting speech-related outcome variables from mean-centered ACS and PRCS and their interaction. On the primary dependent variable, judges' ratings of speech quality, an interaction between ACS and PRCS was obtained:  $b = .17$ ,  $t(57) = 2.41$ ,  $p = .02$ . The form of this interaction conformed to predictions: an effect of public speaking anxiety on performance was evident only for those with low attentional control. We probed this interaction using the Johnson-Neyman procedure, in which it is examined at what level(s) of the moderator (ACS) the conditional effect of the focal variable (PRCS) on the dependent variable (judged quality) is or is not statistically significant (see Bauer & Curran, 2005). The effect of public speaking anxiety on judged performance was negative and statistically significant ( $\alpha = .05$ ) at ACS values of 2.59 ( $z = -.26$ ) or less. At 1 *sd* below the mean, the effect of PRCS on judged quality was clearly negative:  $b = -.12$ ,  $t(57) = 3.32$ ,  $p < .01$ . At mean ACS, the effect of PRCS on judged performance merely trended negatively ( $b = -.04$ ,  $t = 1.31$ ,  $p = .19$ ), and at high ACS (+1 *sd*) anxiety's effect was not at all evident ( $b = .03$ ,  $t < 1$ ,  $p = .57$ ). Figure 1 displays this interaction at various levels of ACS.

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Insert Figure 1 about here

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We also examined whether this interaction would predict successful completion of the assigned speech task by examining seconds of speech as a dependent variable. An interaction emerged between ACS and PRCS:  $b = 3.25$ ,  $t(57) = 1.92$ ,  $p < .06$ . We probed this interaction using the Johnson-Neyman procedure. The conditional effect of speech anxiety on speech length in seconds was statistically significant ( $\alpha = .05$ ) at ACS values at or lower than 2.60 ( $z = -.21$ ). At low (-1 *sd*) ACS, PRCS had a significant negative effect on speech length:  $b = -2.54$ ,  $t(57) =$



3.08,  $p < .01$ . The effects of speech anxiety on seconds of speech were not statistically significant at mean ( $b = -1.16, p = .14$ ) or +1 *sd* ACS ( $b = .22, p = .86$ )<sup>1</sup>.

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 Insert Figure 2 about here  
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Finally, we conducted the same analysis treating self-assessed performance as a dependent variable. For self-assessments of speech quality, the interaction between ACS and PRCS was of the same form as judged quality and speech length but was not statistically significant ( $p = .17$ ). Although judges' ratings and self-assessments correlated significantly ( $r = .47, p < .001$ ), we also found that participants consistently rated themselves harshly relative to judges ( $M$ 's of 3.02 versus 4.66,  $t(60) = 5.90, p < .001$ ).

The previous analyses involving ACS treated the measure as unidimensional, as is common practice (e.g. Ayduk et al., 2008; Bardeen & Orcutt, in press; Baskin-Sommers, Zeier, & Newman, 2009; Derryberry & Reed, 2002; Gyurak & Ayduk, 2007; Mathews, Yiend, & Lawrence, 2004; Peers & Lawrence, 2009). However, the ACS was originally created by combining separate measures of attentional focusing, which reflects the ability to maintain focus despite distraction, and attentional shifting, which reflects the ability to redirect attentional flexibly as needed (see Derryberry & Rothbart, 1988; Derryberry & Reed, 2002). Sometimes these two subscales have been treated separately (e.g. Muris, de Jong, & Engelen, 2004). Ólafsson and colleagues (2011) recently reported evidence in favor of a two-factor structure of the ACS, although they also noted that at the latent level, the correlation between the focusing and shifting factors was substantial: .73.

To investigate whether separating attentional focus and shifting would offer any additional insights, we computed ACS focusing and ACS shifting subscale scores by averaging the items from the ACS relevant to each (see Derryberry & Rothbart, 1988; Derryberry & Reed, 2002). The correlation between the two was  $r = .56, p < .001$ . The most important analysis concerns the interaction between ACS and PRCS on judged speech quality. We conducted two regressions in which mean-centered ACS (either the focus or shifting subscale), PRCS, and their interaction predicted judged quality. In each case, the interaction was of the same form as observed using the entire ACS, but the reliability of this effect varied slightly. When attentional focusing was treated as the moderator, the interaction between attentional focusing and PRCS predicting judged quality fell slightly short of statistical significance:  $b = .09, t(56) = 1.75, p = .08$ . When attentional shifting was treated as the moderator the interaction was significant:  $b = .14, t(56) = 2.15, p = .04$ .

### *Discussion*

A two-session study provided evidence that self-reported attentional control ability acts as a buffer that protects against the negative impact of public speaking anxiety on speech performance. Data indicated that individuals with worse attentional control gave shorter, poorer speeches. An interaction indicated that the effect of speech anxiety was negative and significant only for those low in attentional control. Further, the same interactive pattern predicted successful completion of the assigned speaking task as indicated by seconds of speech.

The findings have important implications regarding both attentional control and speech anxiety. By establishing the postulated moderating role of self-reported attentional control with respect to the performance of a social behavior, the present research provides further support for the concept of attentional control as an individual difference and its measurement via the

Attentional Control Scale (Derryberry & Reed, 2002). As noted earlier, previous work had demonstrated that individuals characterized by higher ACS scores are better able to control their attention to threatening stimuli presented during a visual task. The present findings illustrate the value of the ACS as a moderator of the extent to which anxiety interferes with speech performance. The ACS may prove similarly informative with respect to other social psychological phenomena in which optimal functioning is promoted by shifting attention away from potential distractions and focusing on the primary task. For example, performance-undermining responses to stereotype threat (Beilock, Rydell, & McConnell, 2007; Schmader, 2010; Steele, 1997) and succumbing to temptations in situations requiring self-control (Baumeister & Heatherton, 1996; Fujita, *in press*; Vohs & Heatherton, 2000) may be less pronounced for individuals who score higher on the ACS.

The present results also suggest that interventions aimed at improving public speaking might focus on the role of attention. An extensive body of research demonstrates that attentional training can improve emotion regulation (see Wadlinger & Isaacowitz, 2011, for a review). Interventions include meditative techniques (e.g. Lutz, Slagter, Dunne & Davidson, 2008), auditory attentional training (e.g. Wells, 1990), and methods such as dot probe tasks that train individuals to focus on or away from information of a particular valence (e.g. Dandeneau, Baccus, Sakellaropoulo & Pruessner, 2007; Hazen, Vasey & Schmidt, 2009). Webb and colleagues (2010) found that instructing participants to utilize implementation intentions related to attention reduced attentional bias for threatening information among highly anxious participants in a dot probe task (“If I see a neutral word, then I will focus all of my attention on it!”) and reduced the negativity of self-assessments in high-anxious individuals following a speech task (“If I feel concerned, then I will focus all of my attention on the back wall of the

room!”). Amir and colleagues (2008) employed a training procedure in the form of a dot probe task and found reduced state-anxiety (see also Klumpp & Amir, 2010) and improved performance in a public speaking task, though neither individual differences in attentional control nor fear of public speaking were examined as predictors in these experiments. Wadlinger and Isaacowitz (2011) suggest that these attentional training techniques each influence at least in part the alerting system of attention (see Posner & Peterson, 1990), which functions highly automatically. Importantly, this suggests that attentional training could prove effective in meeting the self-regulatory demands of public speaking without necessarily requiring effortful implementation during the speech itself. Other, more effort-intensive trained strategies may also be helpful. Future research might further thus address whether and how attentional training improves speech performance.

Also, it remains possible that the deployment of attentional resources to overcome speech anxiety is not without disadvantage. Further research might address whether more fearful individuals exerting attentional control experience more arousal, feel more exhausted after a speech, and so on. The use of physiological measures would be desirable to this end. As noted, other research (e.g. Egloff et al., 2006) has found that the effortful suppression of anxiety increased arousal and reduced later memory of the speech. Exerting attentional control may similarly be an executive function that taxes the speaker, albeit often while improving performance. If so, this might explain the persistence of fear despite successful performance. Notably, while relatively anxious individuals who were high in attentional control were judged more positively by judges than those lower in attentional control, this pattern was not clearly evident in self-assessments. This is consistent with the notion that those exerting attentional

control to combat anxiety are aware of this anxiety and the effortful nature of its regulation, rendering the subjective experience of speaking more negative.

In sum, this study suggested that those with good attentional control were protected against the detrimental effects of public speaking fear on performance. These findings highlight the importance of individual differences in attentional control for successful emotional self-regulation. They also suggest that bolstering attentional control may be an effective intervention to improve performance in speech-anxious individuals.

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## Footnotes

1. Noting the relations between public speaking anxiety and seconds of speech ( $r = -.37, p < .01$ ), and between seconds of speech and judged performance ( $r = .68, p < .001$ ), it seemed plausible that speech length mediated the effect of public speaking anxiety on performance. However, given the demonstrated role of ACS, we would only expect this mediational pattern to be evident given relatively low ACS. That is, if those high in attentional control do not show a relationship between public speaking anxiety and performance, but those with low attentional control do, then any mediational explanation of that relationship should hold primarily for the latter group. Therefore we tested a moderated-mediation model in which public speaking anxiety's effect on speech length is moderated by attentional control and speech length determines perceived speech quality. Analyses followed recommendations from Preacher, Rucker, and Hayes (2007) on addressing moderated-mediation hypotheses.

The first step of testing a moderated-mediation hypothesis of the form described involves a simple test of moderation: did ACS and PRCS interact to predict speech length? Centered ACS and PRCS and their interaction were entered in a regression as predictors of seconds of speech. An interaction emerged between ACS and PRCS:  $b = 3.25, t(57) = 1.92, p < .06$  (see main text for more detail). Having established the interaction determining speech length, we can test for indirect (via seconds of speech) effects of PRCS on judged speech quality at various levels of ACS. Bootstrap resampling (5000 samples) was used to generate confidence intervals of the conditional indirect effects using the “modmed” macro for SPSS (Preacher, Rucker, & Hayes, 2007). At low ACS ( $-1\ sd$ ), the conditional indirect effect of PRCS on judged quality via speech length was negative and statistically significant—the interval did not contain zero: 95%CI =  $(-.13, -.02)$ . At mean and high ACS, these confidence intervals *did* include zero, indicating the

invalidity of the meditational model at these levels of ACS. For individuals low in ACS, more anxious public speakers gave shorter speeches, which led them to be judged more negatively.

Figure Captions

Figure 1. Judged quality of speeches as a function of fear of public speaking and attentional control at mean and one standard deviation above and below mean ACS.

Figure 2. Seconds of speech as a function of fear of public speaking and attentional control at mean and one standard deviation above and below mean ACS. Successful task completion occurred at 180 s.

Table 1

*Means, Standard deviations, and Intercorrelations Among Attentional Control, Fear of Public Speaking, Speech duration, and Judged Performance of the Speech.*

	<i>m</i>	<i>sd</i>	1	2	3	4
(1) Attentional control	2.70	.42	--	--	--	--
(2) Fear of public speaking	12.26	8.67	-.49**	--	--	--
(3) Speech duration	162	45	.23 <sup>+</sup>	-.37**	--	--
(4) Judged performance	4.66	1.90	.17	-.34**	.68**	--
(5) Self-reported performance	3.02	2.29	.33**	-.41**	.47**	.47**

*Note.* \*\*:  $p < .01$ ; +:  $p < .10$

Figure 1

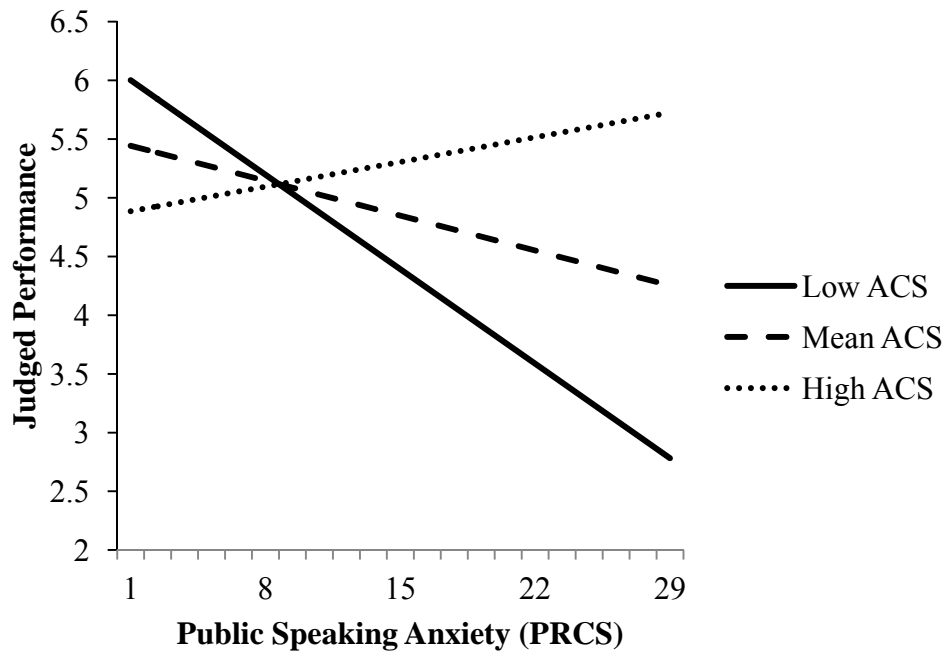




Figure 2.

