The Relationship of Self-Efficacy and Depression to Stuttering*

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This study investigated the relationship of self-efficacy for verbal fluency, academic self-efficacy, and depression between adolescents who stutter and fluent speakers. Two separate discriminant function analyses were performed. The first analysis used the self-efficacy and depression scores as response variables and fluency classification as the grouping variable. Results indicated that self-efficacy for speech was the sole significant variable and accounted for 61% of the variance in group status. A second simplified discriminant function analysis was performed using speech self-efficacy as the sole predictor of group membership. This single discriminant function correctly classified 81% of the overall sample into their known groups. Further, classification for participants who did not stutter (95.2%) was better than for those who did stutter (67%). Based on this and earlier research, adolescents appear to be capable of using self-efficacy scaling as a measure of confidence for verbal fluency, which may eventually prove to be useful in treatment.

Key Words: stuttering, depression, self-efficacy, self-modeling, communication

Historically, there have been many causes proposed for stuttering. Since the 1960s, the most frequently suggested explanations include genetic transmission, emotions, self-beliefs about one's speech, linguistic deficits, learning, speech motor disorders, and neurological impairments. It appears most probable that stuttering is, to a degree, influenced by a combination of these variables (Smith, 1990).

With respect to self-beliefs, there is considerable evidence to suggest a correlation with stuttering (Manning, 1994). Specifically, stuttering has been linked with lower self-efficacy (Perkins, 1993; Prins, 1993) and depression (Ardila et al., 1994; Becker, 1989; Yanagawa, 1973). The interrelationship among the variables of stuttering, self-efficacy, and depression is logical when considering the possible associations between stuttering and self-efficacy for speaking (Manning, 1994; Ornstein & Manning, 1985), stuttering and depression (Ardila et al., 1994; Becker, 1989; Yanagawa, 1973), and self-efficacy and depression (Bandura, Pastorelli, Barbaranelli, & Caprara, 1999).

Self-efficacy is defined as a measure of an individual's confidence regarding successful performance of particular behaviors (Bandura, 1986; Ornstein & Manning, 1985). In support of this variable affecting fluency, both adolescents (Manning, 1994) and adults (Ornstein & Manning, 1985) who stutter, when compared to their peers who speak fluently, have been shown to have decreased self-efficacy. Further support is derived from Blood's (1995) investigation of a cognitive–behavioral treatment package that incorporated problem solving strategies, assertiveness training, and alteration of expectations for stuttering. Results indicated that all participants' stuttering dropped below the criterion of 3% stuttered syllables for fluent speech. However, in addition to the substantial reduction in stuttering, the participants' also showed significant increases in their self-efficacy for fluent speech as measured by the Self-Efficacy Scale for Adult Stutterers (SESAS; Ornstein & Manning, 1985). A key aspect of this scale, according to W. Manning (personal communication,

*J. Scott Yaruss acted as guest Associate Editor for this article.

March 1, 2003), and generally the self-efficacy scaling procedure, is that they were designed to provide an indication of how individuals who stutter will perform beyond treatment. That is how these individuals perceive themselves performing in real-life speaking situations.

Additional support for the role of self-efficacy in stuttering comes from the treatment of stuttering using self-modeling (Bray & Kehle, 1996, 1999, 2001). Self-modeling is derived from Albert Bandura's (1986) social cognitive theory.

> Self-modeling is defined as an intervention procedure using the observation of images of oneself engaged in adaptive behavior. Most commonly, these images are captured on video, edited into 2 to 4 minute vignettes, and repeatedly reviewed to learn skills or adjust to challenging environments as a part of a training or therapy protocol. (Dowrick, 1999, p. 23)

Bandura postulated that a change in one's behavior is prompted by self-beliefs (Dowrick, 1999). Thus, an individual's cognitions and beliefs regarding their capabilities appear to influence and impact one's behavior. The alteration of self-efficacy beliefs may have relevant treatment implications.

Self-modeling, which portrays an individual performing a desired behavior, has been successfully used to treat various disorders (Bray & Kehle, 1996). In addition, it has been presupposed to modify one's efficacious beliefs (Bray & Kehle, 1996). Support and credence for the use of self-modeling as an intervention to reduce stuttering came from the investigations later conducted by Bray and Kehle (1996, 1999, 2001). The participants in these investigations viewed themselves engaged in fluent speech approximately six times over a period of 5 weeks. The authors found a marked improvement with respect to the students' stuttering that generalized across settings and was maintained for as long as 4 years. Therefore, it would be tenable to assume that in order to remediate stuttering behavior, it would be important to alter one's efficacious beliefs.

In concert with Bandura's (1986) social cognitive theory, self-inefficacy for fluent speech may in fact promote and maintain the behavior of stuttering. Efficacy beliefs are a product of self-persuasion that are related to behavior and can be modified to alter behaviors (Bandura, 1989). Therefore, it is tenable to suggest, as Johnson did as early as 1939, that a viable treatment strategy for stuttering, such as self-modeling, that would also promote generalization and maintenance would involve targeting self-perceptions for speaking fluently.

The potential involvement of self-efficacy in the generalization and maintenance of fluent speech appears logical. Generalization and maintenance of fluent speech has historically been difficult to achieve (Hasbrouck & Lowry, 1989; Ladouceur & Auger, 1980; Wagaman, Miltenberger, & Arndorfer, 1993). It has been suggested that when success is achieved with transfer and maintenance that it was most probably because the individual who stuttered continued a self-administered posttherapy treatment program (Ingham, 1993). In support of this suggestion, studies that have reported enduring gains have also included self-help groups that target maintenance that includes focus on self-beliefs (Andrews & Feyer, 1985). Behavioral interventions in particular have been noted for a lack of maintenance (Martin, 1993), most probably because the stuttering reoccurs as a result of the removal of established contingencies and the lack of focus on self-beliefs. Overall, it appears that generalization and maintenance of fluent speech are promoted by interventions designed to alter negative attitudes (Andrews & Cutler, 1974).

Relatedly, the variables of mastery of verbal fluency skills, positive communication attitudes toward speaking, and internalization of locus of control were examined as potential predictors of relapse after behavioral or cognitive treatments (Andrews & Craig, 1988). All three were found, posttherapy, to be significant contributors to the maintenance of fluent speech. Ninety-seven percent of those who achieved all three goals remained fluent. It was reported that no one of these goals alone was sufficient to maintain fluency.

Stuttering has been shown to be related not only to poor self-efficacy, but also to depression. However, research has yielded inconclusive findings (Ehrenberg, Cox, & Koopman, 1991; Miller & Watson, 1992). Depression is defined as a pervasive feeling of unhappiness, according to the *Diagnostic and Statistical Manual of Mental Disorders–4th Edition–Text Revision* (*DSM-IV-TR*; American Psychiatric Association, 2000). With regard to stuttering, self-reported depressive symptoms have been reported to be higher among individuals who stutter than among fluent speakers (Ardila et al., 1994; Becker, 1989; Liu et al., 2001; Yanagawa, 1973). In addition, taking into consideration studies using genetic linkage analyses, genes associated with bipolar depression and stuttering appear to occur at linked loci (Hays, 1993; Hays & Field, 1989). Further, bipolar disorder appears to be more prevalent in families that have a history of stuttering (Ludlow & Dooman, 1992).

The relationship between self-efficacy and depression is supported by the findings of Bandura et al. (1999), who investigated the relationship between social and academic self-efficacy and childhood depression. The findings indicated that low self-efficacy contributed to the development of depression.

Finally, it is hypothesized that along with the interrelationship amongst stuttering, depression, and self-efficacy for verbal fluency, self-efficacy for academic performance would be also related to stuttering. This assertion is based on the equivocal finding that students who stutter are typically below average academically (Williams, Melrose, & Woods, 1969). This may partially be because of their anxiety concerning their verbal engagement in academic matters. For example, students who stutter are often anxious about responding to teachers' questions and evidence negative shifts in their attitudes toward school (Bubenickova, 1977). This anxiety is assumed to influence academic performance and eventually may promote negative attitudes toward school (Bray & Kehle, 1996). Further, when anxiety and stuttering are reduced, students typically evidence improved academic competence (Bhargava, 1988).

Given the interrelationships between the variables of stuttering, self-efficacy, and depression and the dearth of literature in this area, it appeared prudent to further investigate these variables. In support of the purpose of this study, Manning (2001) stated that the intrinsic aspects of stuttering are in need of further research. Additionally, self-efficacy's affect on stuttering and its resulting implication for treatment, especially with regard to transfer and maintenance, has enormous promise. Also, the relationship of stuttering and depression, with the mediating associations of self-efficacy and depression, along with the potential affects of stuttering on academic self-efficacy, appear to also have potential for treatment utility. Further, research has suggested that academic self-efficacy and academic achievement may be related (Schunk, 1995).

In summary, the intent of the present study was to investigate the relationship of self-efficacy for verbal fluency, academic self-efficacy, and depression between adolescents who stutter and fluent speakers. If these variables are indeed correlated, it is tenable to assume that individuals who stutter may, in addition to exhibiting poor self-efficacy for verbal fluency, evidence poor self-efficacy for academic achievement and depression. We hypothesized that differences in self-efficacy for speaking and academic competence, along with depression, would exist between 21 adolescent students who stuttered and matched controls.

Method

Participants

Twenty-one adolescents who stuttered, which comprised all of the disfluency cases of six speech-language pathologists (SLPs), and an equal number of individually matched fluent speakers served as participants in the study. All participants were Caucasian and from middle socioeconomic status suburban New England towns. These participants volunteered to take part in the study as a result of a formal letter mailed to the school districts that called for students who stutter to participate in an investigation designed to study adolescent stuttering. Ultimately the school SLPs contacted relevant parents and students to secure participation. Participants were 10 females and 32 males between the ages of 13 and 19 years. The classroom teacher and SLP matched each student who stuttered with a control who was verbally fluent on the basis of their gender, age, grade, and academic achievement. The academic achievement of the controls was within the average to below-average range so as to match the participants who stuttered. This was assessed by having the participant's classroom teacher rate their overall academic achievement. In order to do this, the teachers were asked to consider the students' standardized test scores and classroom grades. From this, the teachers were instructed to assign each student a letter grade from A to F (A = *excellent*, B = *above average*, C = *average*, D = *below average*, F = *failing*).

The individuals who stuttered were diagnosed by certified SLPs as having fluency disorders in the moderate to severe range consisting primarily of whole- and part-word repetitions, sound and syllable prolongations, and blocking. They all stuttered since early childhood (by age 6). In addition, all of the individuals who stuttered were receiving speech-language therapy services that primarily focused on breath stream management, reduction of speech rate, prolonged speech, and easy onset. Their academic achievement was within the average to below-average range as determined in the same manner as for the controls. Again, this was assessed by having the participant's classroom teacher rate their overall academic performance. In order to do this, the teachers were asked to also consider the students' standardized test scores and classroom grades.

Data Collection

Data were collected using the following instruments:

1. The degree of confidence the participants had regarding speaking (self-efficacy for verbal fluency) was measured using an abbreviated version of Manning's (1994) Self-Efficacy Scaling for Adolescents Who Stutter (SEA) that was constructed specifically for this investigation. The modified instrument**,** which was not validated**,** contained 39 items that were rated on a 5-point Likert-type scale (see the Appendix). The items assessed the degree of confidence an individual had about speaking in various social, family, and educational speaking situations. Cronbach's coefficient alpha was calculated as .98 for this modified speech self-efficacy scale; this was the same as the original scale.

   This abbreviated version was constructed because the full version of the SEA was in the process of being validated, and some of the items did not appear appropriate for this age group (e.g., arguing with a friend about a member of the opposite sex that you both like). The time required for the full assessment was thought to be extensive for the purposes of this investigation. The modification of the SEA was done in consideration of time constraints, restrictions, and schedule demands of the school setting.
2. The degree of confidence the participants had regarding various academic tasks (academic self-efficacy) was measured using the Self-Efficacy for Academic Tasks (SEAT; Baum & Owen, 1988). The SEAT has been shown to possess adequate psychometric properties (Owen & Froman, 1992). The instrument contained 34 items that were rated on a 5-point response scale. Cronbach's coefficient alpha for the current set of data was .96.
3. Adolescent depressive symptomatology was measured using the Reynolds Adolescent Depression Scale (RADS; Reynolds, 1986). This instrument contained 30 items that were rated on a 4-point Likert-type scale. Published internal consistency reliability was reported to be .92, split-half reliability was .91, and estimated test–retest stability was .80 (Reynolds, 1986). The RADS has also been shown to have relatively high criterion related validity (Kahn, Kehle, Jenson, & Clark, 1990) with the Children's Depression Inventory (Kovacs, 1985) and the Bellevue Index of Depression (Petti, 1978).

Overall, Cronbach's coefficient alphas in the current data for each of the above scales ranged from .80 to .96. A packet containing the three scales was mailed to six certified SLPs with instructions regarding the administration procedures.

Procedural Integrity

The procedure regarding the administration of the three scales was the same across the six SLPs. The scales were administered to the participants during the school day at times that were convenient for both the student and classroom teacher. The order of the administration of the scales (self-efficacy for verbal fluency; academic self-efficacy; depressive symptomatology) was random. This was assured by providing the SLPs with packets that contained the scales in randomized order. Procedural integrity was evaluated during the study by comparing their participant selection and administration procedures to a checklist protocol. The protocol assessed that (a) the selection of participants who stuttered were properly diagnosed; (b) matched controls were appropriately selected on the basis of gender, age, grade, and academic competence; and (c) the scales were presented in randomized order. It was determined that all aspects of the protocol were followed with 100% accuracy.

Results

Missing data within the sets of surveys were rare (less than a fraction of a percent) and judged to be missing at random. Nevertheless, to avoid the loss of entire cases of data, the few missing data points were replaced using a regression imputation technique. Before statistical analysis, all data were screened for univariate and multivariate outliers; none were identified. Additionally, the data were evaluated for violation of the assumptions of normality and linearity. No threat to the analyses was revealed.

The means for the individuals who stutter and the nonstutterers were, respectively, 3.46 and 4.59 for SEA; 3.45 and 4.20 for SEAT, and 2.19 and 1.57 for RADS (see Table 1). A direct discriminant function analysis was performed, in which mean scores derived from the SEA, SEAT, and RADS served as the predictors of speaking classification (stuttering vs. nonstuttering). A single discriminant function emerged, accounting for approximately 61% of the between-groups variability. Inspection of each predictor's contribution to the discriminant function revealed that speech self-efficacy was the only significant variable in the equation, $F(1, 40) = 23.2$, $p < .01$. Although academic self-efficacy by itself significantly distinguished the groups, $F(1, 41) = 9.72$, $p < .01$, this explanatory power was evidently eclipsed by speech self-efficacy in the multivariate analysis.

Because the inclusion of nonsignificant variables can only hinder statistical analysis and obscure interpretation, a second direct discriminant function analysis was performed using speech self-efficacy as the sole predictor of group membership (see Table 2). This simplified discriminant function explained 61% of the between-groups variance. Following Cohen's (1988) guidelines, this represents a very large practical effect. This single discriminant function correctly classified 81% of the overall sample into their known groups. Classification for participants who did not stutter (95.2%) was better than for those who did stutter (67%), although both groups were classified by the discriminant function at a level far higher than would be expected by chance alone.

TABLE 1. Means and standard deviations by group for SEA, SEAT, and RADS.

Group	*M*	*SD*
SEA		
Individuals who stutter	3.46	0.99
Nonstutterers	4.59	0.41
SEAT		
Individuals who stutter	3.45	0.89
Nonstutterers	4.20	0.63
RADS		
Individuals who stutter	2.19	1.12
Nonstutterers	1.57	0.98

Note. SEA = Self-Efficacy Scaling for Adolescents Who Stutter; SEAT = Self-Efficacy for Academic Tasks; RADS = Reynolds Adolescent Depression Scale.

Discussion

The results of this study indicated that adolescents who stutter are different from fluent adolescent speakers with respect to their self-efficacy for speaking. Reasons for this may include difficulty maintaining fluency and possible embarrassment following disfluency.

Certainly self-efficacy for verbal fluency is worthy of further investigation. As previously discussed, it has the potential to promote treatment gains and the corresponding goals of transfer and maintenance of the newly acquired speech skills. Self-modeling appears to facilitate transfer and maintenance, and consequently is a well-suited intervention for the remediation and long-term maintenance of fluency.

Further supporting this assumption are the results of an investigation conducted by Vanryckeghem and Brutten (1996). They found that the differences between children who do and who do not stutter involve more than the degree of disfluent speech, but also their beliefs and

TABLE 2. Discriminant function analysis prediction of group membership using speech self-efficacy as the sole predictor variable.

	% Correctly Classified	
Actual Group	Adolescents Who Stutter	Adolescents Who Do Not Stutter
Individuals who stutter	67%	33%
Individuals who do not stutter	5%	95%

attitudes about their speech. Further, they suggested that children's attitudes toward their stuttering can affect treatment outcome and maintenance of fluent speech.

Additionally, as alluded to earlier, stuttering may be a form of defensive behavior that is a response to cognitive cues (Prins, 1993), and as such may be mediated and affected by self-efficacy. It appears, based on both this and Manning's (1994) earlier study, that adolescents, similar to adults (Ornstein & Manning, 1985) are capable of using self-efficacy scaling as a measure of their confidence for verbal fluency. Therefore, this type of scaling should prove useful in not only perhaps predicting the degree of treatment gains, but also as a viable target of treatment in and of itself.

Although no difference between the groups on academic self-efficacy was found, there is some research supporting the idea that students who stutter may perform below average academically (Williams et al., 1969) and feel anxious concerning verbal engagement in academic matters (Bubenickova, 1977). This anxiety is assumed to influence academic performance and eventually promote negative attitudes toward school (Bray & Kehle, 1996). Further, it has been demonstrated that when anxiety and stuttering are reduced, students typically evidence improved academic competence (Bhargava, 1988). Perhaps the lack of differences for academic self-efficacy in the current study was due to the manner in which the teachers evaluated academic performance, which could have been insensitive to true differences in academic achievement.

Perhaps those individuals who stutter and evidence poor academic achievement also have concomitant language impairments. This would make sense in light of the abundant literature showing that up to 60% of children with language deficits also have learning disabilities and resulting poor academic achievement, especially in the area of reading (Bashir & Scavuzzo, 1992; Mercer, 1997; Wiig & Semel, 1984; Young et al., 2002). In summary, although students who stutter can evidence increased negative attitudes toward school (Bubenickova, 1977), and also possibly poorer efficacious beliefs, in the present study this was not apparent. This may be related to one important limitation of this study, the lack of information on the students' concomitant speech and language disabilities.

Further, it is perhaps possible that school attitudes and self-efficacy may not necessarily be linearly related. It seems plausible that low academic self-efficacy and a poor attitude toward school would go hand in hand; but those with academic confidence may hold negative attitudes for other reasons (i.e., perceptions of unfair grading or bias, lack of motivation or challenge in instructional materials).

Despite the evidence relating self-ratings of depression and stuttering (Ardila et al., 1994; Yanagawa, 1973), other studies, including the present one, have revealed a lack of relationship (Miller & Watson, 1992). These contradictory findings may be due to the possibility that depression and stuttering may co-occur in some individuals and not in others. This relationship is further supported by investigations of individuals with depression and the resulting medications that have been shown to induce or reduce stuttering (e.g., Meghji, 1994). Perhaps a combination of factors is necessary to produce both depression and stuttering in the same individual. In support of this, there is increased suspicion that with regard to stuttering, there exist clinical subtypes with differing etiologies each in need of unique treatment (Pauls, 1990).

The findings of the present study suggest that adolescents who stutter are different than adolescents who are fluent speakers with respect to their self-efficacy for speaking. Ornstein and Manning (1985) found similar results with adolescents and adults who stutter. A limitation in the present study is that measures of the participants' verbal fluency characteristics were not obtained. Therefore, replication of this study with adolescents who stutter with dissimilar speech and language characteristics may lead to different results. In addition, their unique speech and language histories could have affected how they responded to the assessment of the dependent variables. Finally, perhaps the methodological refinement of having a constant group of individuals observe and test the participants would improve the reliability and validity of the results. Therefore, the results are tentative; however, it is recommended that self-efficacy scaling be incorporated into future experimental research to determine the causal relationship between self-efficacy for verbal fluency and stuttering.

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Received October 27, 2002
Accepted March 28, 2003
DOI: 10.1044/1058-0360(2003/088)

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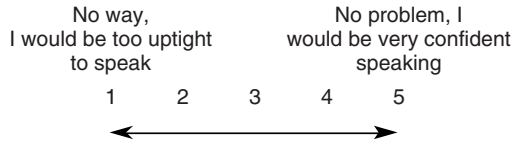
Appendix

Adolescent Communication Questionnaire

ID: S or NS # _____

We are interested in learning more about speaking ability. Your responses are confidential.

DIRECTIONS: How much confidence do you have about doing each of the behaviors listed below? Circle the number that best represents your confidence.



No way	No problem		
1 2 3 4 5		1. Talking with a parent about a movie.	
1 2 3 4 5		2. Talking to a brother or sister at the dinner table.	
1 2 3 4 5		3. Talking with three friends during lunch at school.	
1 2 3 4 5		4. Talking with a large group of friends during lunch at school.	
1 2 3 4 5		5. Answering the telephone.	
1 2 3 4 5		6. Talking with the teacher during class.	
1 2 3 4 5		7. Talking with the principal.	
1 2 3 4 5		8. Asking a friend to come to your house after school.	
1 2 3 4 5		9. Arguing with a brother or sister.	
1 2 3 4 5		10. Asking a parent if you can spend the night at a friend's house.	
1 2 3 4 5		11. Telling a new friend about your family.	
1 2 3 4 5		12. Telling your teacher your birth date.	
1 2 3 4 5		13. Calling your friend on the telephone.	
1 2 3 4 5		14. Asking your parent if you can go to bed later than usual.	
1 2 3 4 5		15. Talking to a family member on the telephone.	
1 2 3 4 5		16. Explaining how to play a game to your friends.	
1 2 3 4 5		17. Asking a librarian for help in finding a book.	
1 2 3 4 5		18. Talking with a friend alone.	
1 2 3 4 5		19. Asking a sales clerk how much an item costs.	
1 2 3 4 5		20. Telling a police officer your home address.	
1 2 3 4 5		21. Calling a store to find out what time it opens.	
1 2 3 4 5		22. Talking to a teacher alone after class.	
1 2 3 4 5		23. Reading aloud to a whole class.	
1 2 3 4 5		24. Reading aloud to 5 classmates.	
1 2 3 4 5		25. Reading aloud to your family.	
1 2 3 4 5		26. Speaking to your pet.	
1 2 3 4 5		27. Raising your hand to ask the teacher a question.	
1 2 3 4 5		28. Answering a question in class.	
1 2 3 4 5		29. Asking a question in class.	
1 2 3 4 5		30. Ordering food at a restaurant.	
1 2 3 4 5		31. Telling a joke.	
1 2 3 4 5		32. Giving a book report in front of the class.	
1 2 3 4 5		33. Taking a speaking part in a school play.	
1 2 3 4 5		34. Reading aloud just to your teacher.	
1 2 3 4 5		35. Talking with a large group of your friends.	
1 2 3 4 5		36. Talking aloud to yourself with no one else there.	
1 2 3 4 5		37. Talking with the school secretary.	
1 2 3 4 5		38. Reading a book aloud with no one else in the room.	
1 2 3 4 5		39. Talking to your teacher on the telephone.	