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Mumbling as a Potential Marker of Posttraumatic Distress

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ABSTRACT

This study sought to examine whether mumbling might, for some youths, arise among traumatic sequelae. College students provided retrospective reports of mumbling and completed standardized measures of trauma history and posttraumatic distress (Brief Trauma Questionnaire, Beck Anxiety Inventory for Primary Care, Toronto Alexithymia Scale, and the Brief Fear of Negative Evaluation Scale). Mumbling was associated with a higher likelihood of sexual abuse but not other forms of trauma. Several measures of distress were significantly elevated for those who reported mumbling (Fear of Negative Evaluation, Difficulty Identifying Feelings, Difficulty Describing Feelings, and Anxiety – with the first two accounting for significant specific variance). Findings suggest that mumbling in young people could be a sign that encourages screening for sexual trauma and distress.

Keywords:

Mumbling, speech, child abuse, alexithymia, anxiety

1. Introduction

Children in distress often suffer in silence or are not heard. This may be particularly true when their symptoms are internalizing and adverse experiences involve sexual abuse. Based on a systematic review of the literature across nearly three decades, Manay and Collin-Vézina (2021) concluded that “only a small portion of all [child sexual abuse] victims are known to professionals and authorities” (p.17). The purpose of the current study is to begin scientific inquiry into the possibility that mumbling might be a marker of posttraumatic distress.

Mumbling among young people tends to be dismissed by adults as a meaningless behavioral phase, and the phenomenon has received relatively little scientific and clinical attention in psychology and psychiatry. The scant research that mentions childhood mumbling focuses on rarities like prodromal psychosis, peri-ictal phenomena, and medication side-effects. Beyond psychology, some dismiss the potential mental health implications of mumbling while suggesting it is an efficient form of data compression (Sedivy, 2015), a socially constructed expression of masculinity (Heffernan, 2010), or a consequence of smaller and less variable jaw openings (Weirich et al., 2016). The current study then rises almost *de novo*, but gains inspiration from unresearched ideas in psychoanalysis decades ago.

Psychoanalytic formulations of mumbling saw it primarily as therapeutic resistance, but Devereux (1966) speculated that a patient’s mumbling could be both a repetition of and defense against infantile distortions of sexual sounds. Likewise, McHale (1988) framed mumbling as a relatively primitive defense mechanism wherein an individual retreats from communication about anxiety-provoking sexual topics.

Some clinical speech differences are associated with psychological symptoms. Based on potential connections between trauma history and posttraumatic speech sequelae, mental health screening is now recommended for some patients with vocal cord dysfunction which may include speech changes (Cristel et al., 2019).

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Steinhausen et al. (1996) found that two-thirds of their sample of children with a diagnosis of elective mutism had elevated anxiety, and a retrospective study by MacGregor et al. (1994) provided evidence of a possible association between elective mutism and abuse experiences for some children. Stuttering is a complex communication disorder that may be accompanied by negative self-perception and lower quality of life (Nang et al., 2018). Eggers et al. (2022) studied children who stutter, finding no consistent correlation between stuttering parameters and self-report or parent-report of clinically elevated anxiety. In an older sample of adolescents, Blood et al. (2007) found significantly higher self-reported anxiety scores among stutterers, but the mean score for the group remained in the normal range. Eggers et al. (2022) suggested that the risk for anxiety remains high in stuttering though not all stuttering children will experience elevations, and they urged clinicians to screen for anxiety and related negative affect when working with the heterogeneous population of stuttering children.

It seems reasonable to wonder if a subclinical difference in speech with no corresponding diagnosis (e.g., mumbling) could, in some young people, be a marker for trauma and mental health concerns. Beyond the psychoanalytic speculation cited above, however, related research is nearly nonexistent. Only an unpublished dissertation (Silva, 2006) provides evidence specific to a possible relationship between emerging dysfluency and sexual abuse.

Traumatic experience is common in childhood, and some children suffering sequelae evade detection – even when healthcare providers, for example, conduct routine screenings for depression symptoms (Selwyn et al., 2019). In this current study, we sought to examine whether mumbling might be correlated with distress related to traumatic experience. Symptoms of anxiety and impaired response to social cues are common sequelae of childhood trauma (Cohen et al., 2006). Alexithymia, a set of deficits related to the perception and expression of emotion, has also been implicated as a potential consequence of early trauma. Özgün and Kanak (2022), for example, found that alexithymia increased as traumatic experience increased in a sample of Turkish secondary school students.

This correlational study begins scientific inquiry into the possibility that mumbling might be a marker of posttraumatic distress. College students completed online surveys regarding their childhood history of mumbling. Participants who had participated in speech therapy were excluded, so the final sample included only persons reporting either no dysfluency or subclinical dysfluency (i.e., mumbling). Participants also completed standardized measures related to trauma history and present distress. We hypothesized that college students reporting a childhood history of mumbling would be more likely to report a childhood history of sexual abuse and to report current symptoms related to anxiety, fear of negative evaluation, and alexithymia.

2. Methodology

2.1. Research Model

This study employed the correlational survey model, a non-experimental approach in which multiple statistical tools may be used to reveal degrees of relatedness between measured variables. Ethical and practical barriers exist to experimentally manipulating the variables in this study, so all study variables were measured simultaneously through an online survey system.

2.2. Research Sample

The initial pool included 296 participants who provided informed consent for this IRB-approved study. To ensure a nonclinical sample in terms of speech, participants who indicated a history of speech therapy ($n = 65$) were excluded resulting in a final sample of 231 (170 female; 61 male) with an average age of 19.03 years ($SD = 1.45$). Approximately 83% identified as non-Hispanic White. All participants responded to an online protocol delivered through Qualtrics survey software.

2.3. Data Collection Tools and Procedure

The protocol included four questions asked about current mumbling, mumbling in middle school, mumbling in high school, and receiving complaints about clarity; the four response options for each question spanned never, rarely, sometimes, and often. The Mumbling Group ($n = 65$) responded with “often” to at least one of the four questions regarding mumbling while the Non-Mumbling Group ($n = 166$) responded with rarely or

never to each of the four questions. The protocol also included the Brief Trauma Questionnaire (Schnurr, Vielhauer, Weathers, & Findler, 1999), Beck Anxiety Inventory for Primary Care (BAI-PC; Beck et al., 1997), Toronto Alexithymia Scale (TAS; Bagby et al., 1994), and the Brief Fear of Negative Evaluation Scale (BFNE; Rodebaugh et al., 2004).

The BTQ (Schnurr et al., 1999) is a self-report measure of lifetime exposure to ten specified traumatic events. Participants were alerted that “The following questions ask about events that may be extraordinarily stressful or disturbing for almost everyone,” and they were asked to “select as many items as you have experienced or select none if you have not experienced any events from the list.” The Unwanted Sexual Contact variable resulted from forming groups who selected Unwanted Sexual Contact ($n = 59$) or who or who selected “None” ($n = 102$) from the BTQ list. The Non-Sexual Trauma variable resulted from forming groups who selected any one or more other BTQ items (i.e., other than unwanted sexual contact; $n = 70$) or who selected “None” ($n = 102$).

The TAS (Bagby et al., 1994) is twenty-item, self-report inventory with three subscales confirmed through factor analysis: difficulty identifying feelings (DIF), difficulty describing feelings (DDF), and externally oriented thinking (EOT). The subscales are thought to reflect distinct aspects of impediments to experiencing and expressing emotion through language. The TAS retains reliability (internal and retest) when administered online (Bagby et al., 2014); similar to the reliabilities reported by Bagby et al. (2014), the internal consistencies were .81 (DIF), .75 (DDF), and .51 (EOT) in the present study.

The BFNE (Rodebaugh et al., 2004) is an eight-item self-report measure for expectation of, anxiety about, and avoidance of negative evaluation by others. This “straightforwardly worded” version of the BFNE (i.e., no reverse-coded items) produces stronger reliability and clearer convergent validity than versions that include reverse-coded items. Each item is rated on a scale ranging from 0 (never) to 4 (always), and a total score is calculated by summing responses across the eight items. The internal consistency for the BFNE was .96 in the current study.

The BAI-PC (Beck et al., 1997) includes seven items from the Beck Anxiety Inventory (BAI; Beck & Steer, 1993) that focus on subjective (i.e., non-somatic) symptoms of anxiety experienced in the past two weeks. Each item is rated on a scale ranging from 0 to 3, and a total score is calculated by summing responses across the seven items. The BAI-PC has been found to be reliable, and persons with anxiety disorders obtain higher total scores on the BAI-PC than persons with other mental illnesses (Beck et al., 1997). The internal consistency for the BAI-PC was .78 in the current study.

We performed a chi-square test and independent sample *t*-tests to examine our hypotheses. Variables from significant *t*-tests were then entered into a stepwise binary logistic regression with Mumbling Group as the dichotomous dependent variable. All statistical analyses were conducted with IBM’s SPSS (version 28).

2.4. Ethical

The author declared that all the study procedures were conducted in compliance with the Helsinki Declaration. Voluntary participation, anonymity, and informed consent were ensured for all participants and there was no experimental manipulation involved in the study.

3. Findings

Independent sample *t*-tests were performed to examine differences in anxiety-related variables between the Mumbling and Non-Mumbling groups (See Table 1). Participants in the Mumbling Group reported significantly higher levels of Difficulty Describing Feelings ($t(229)=4.82, p<.001$), Difficulty Identifying Feelings ($t(229)=5.84, p<.001$), Fear of Negative Evaluation ($t(229)=5.83, p<.001$), and Anxiety ($t(229)=3.76, p<.001$) than participants in the Non-Mumbling group. The groups did not differ in Externally Oriented Thinking ($t(229)=0.88, p=.383$). While mumbling was not associated with non-sexual trauma ($\chi^2(1) = .221, p=.638$), mumbling was significantly associated with reporting trauma in the form of unwanted sexual contact ($\chi^2(1)=5.57, p=.018$).

Table 1. Independent Sample t-tests

	Mumbling		Non-Mumbling		t value	p value
	Mean	SD	Mean	SD		
Alexithymia – DDF	2.14	0.57	1.75	0.54	4.82	<.001
Alexithymia – DIF	1.82	0.47	1.43	0.44	5.84	<.001
Alexithymia – EOT	1.63	0.32	1.67	0.34	0.88	.383
Fear of Negative Evaluation	3.81	1.14	2.85	1.12	5.83	<.001
Anxiety	2.55	0.65	2.17	0.70	3.76	<.001

To examine the independence of and overall contribution of the symptom variables with significant zero-order relationships to mumbling, we conducted a binary logistic regression with mumbling as the dependent variable and stepwise introduction of difficulty describing feelings, difficulty identifying feelings, fear of negative evaluation, and anxiety.

Table 2. Binary Logistic Regression Analysis Predicting Mumbling with Stepwise Introduction of Variables

Variable	B	S.E.	Wald	df	Sig.	Exp(B)
Difficulty Identifying Feelings	1.218	.359	11.517	1	<.001	3.382
Fear of Negative Evaluation	.538	.152	12.563	1	<.001	1.713
Model	$\chi^2(2) = 43.06, p < .001$ Nagelkerke $R^2 = .245$					

Results are shown in Table 2. difficulty identifying feelings and fear of negative evaluation made significant contributions to the prediction of Mumbling; the resulting model was statistically significant ($\chi^2(2) = 43.06, p < .001$) and explained almost a quarter of the variance in Mumbling (Nagelkerke $R^2 = .245$). The overall classification success of the model was 76% (almost a four-point rise over chance-level prediction at 72%).

4. Conclusion and Discussion

Based on retrospective reports by college students, we compared youths with and without a history of mumbling in terms of trauma history and present distress. Mumbler were significantly more likely to report experience of sexual trauma but not non-sexual trauma, a finding that resonates with psychoanalytic formulations of mumbling. Fear of Negative Evaluation, Difficulty Identifying Feelings, Difficulty Describing Feelings, and Anxiety were significantly elevated for those who reported mumbling. Mumbling was not significantly related to Externally Oriented Thinking – an unsurprising nonfinding given the problematically low reliability of this subscale (Bagby et al., 2014). Fear of Negative Evaluation and Difficulty Identifying Feelings then accounted for significant specific variance in a stepwise logistic regression. Rather than meaningless behavior, a pattern of mumbling might for some be a marker of clinically significant concerns.

Mumbling has received little research attention. The current findings appear to be consistent with results from one unpublished dissertation (Silva, 2006). Broadly, finding that mumbling may be associated with a history of trauma and with current distress is consistent with research on clinical samples with diagnoses related to speech. Though trauma and anxiety are not necessarily causal or even universally present, researchers have encouraged related screening in patients with vocal cord dysfunction (Cristel et al., 2019), elective mutism (MacGregor et al., 1994; Steinhausen et al., 1996), and stuttering (Eggers et al., 2022). Similarly, the findings of the current study suggest cautious vigilance for evidence of trauma history and anxiety when observing mumbling in a young person.

Just as Kim et al. (2021) found that mumbling in older adults could be an early sign that encourages screening for cognitive impairment that is not yet evident in casual observation, our findings suggest that mumbling in young people could be a sign that encourages screening for sexual trauma and distress (prominently marked, perhaps, by insecurity and difficulty understanding one’s own emotional states).

Mumbling, once established, might interfere with therapeutic efforts to address the sequelae of trauma. Formal and informal interventions for posttraumatic sequelae are extensively mediated by spoken language (see Bailey et al., 2020), and under-developed trauma narratives may interfere with recovery (Amir et al., 1998). Perhaps even more than just a signal to adults to screen for trauma history, mumbling could incur learning costs for the adolescents affected. Ozubko et al. (2020) included mumbling in a new study of the “production

effect” (memory advantage for words read aloud versus words read silently; Gathercole & Conway, 1988). Since Ozubko et al. (2020) found a memory deficit for words mumbled, posttraumatic mumbling might conceivably interfere with the new learning needed to understand and cope with traumatic experience (also see Putica et al., 2021).

Several limitations deserve discussion. The findings of the current study are consistent with the possibility that sexual trauma elevates the risk for distress and mumbling. However, the correlational nature of this study leaves open other causal and noncausal interpretations. Alexithymia, for example, could be a *consequence* of an acquired speech pattern (Hobson et al., 2019; Karukivi et al., 2012) rather than the two being co-consequences of traumatic experience. Indeed, researchers have found “multiple routes” to alexithymia, and the results of the current study highlight just one such path. The correlational possibilities even include pre-existing enduring disfluency (mumbling) and emotional insecurity increasing the risk for being targeted by a sexual predator.

The study is also limited by drawing solely from the college students at one university. As Hyde (2007) pointed out, college samples feature distinctive patterns of resilience that may limit the generalizability of findings regarding the sequelae of child sexual abuse. The academic success and self-regulatory skill associated with college admission (Lowe et al., 2013) might distinguish our sample and interact with one or more of the variables in this study.

Another limitation is evident in the singular reliance on survey tools for all data collection. Retrospective self-reports of experience, like abuse and mumbling in the case of this study, may be subject to biases that significantly impact the validity of those data (Berg et al., 2020). The correlations here found, therefore, might have arisen from or been inflated by shared method variance.

Though limitations exist, this study breaks ground and supports the reasonableness of both future research and vigilant clinical care. Professionals might well be encouraged to screen for signs of distress when a young person displays a pattern of mumbling. Screening for the possibility of posttraumatic mental health symptoms, professionals may need to be prepared to overcome formal reticence (Stolzenberg & Lyon, 2017) – a tendency, beyond the mumbling itself, to provide underinformative responses. An open-ended interviewing approach may be particularly helpful.

Future research should include diverse samples, prospective designs (starting in childhood), multiple measurement methods, and broader specifications of the distress domain. Mumbling likely has many possible causes or meanings (including, in some cases, meaninglessness), and prescriptive overreaction is as unwarranted as has been historic underreaction. Clinicians can start to listen to young mumblers even as researchers now work to clarify and contextualize the implications.

5. References

- Amir, N., Stafford, J., Freshman, M. S., & Foa, E. B. (1998). Relationship between trauma narratives and trauma pathology. *Journal of Traumatic Stress, 11*(2), 385–392. <https://doi.org/10.1023/A:1024415523495>
- Bagby, R. M., Parker, J. D. A., & Taylor, G. J. (1994). The twenty-item Toronto Alexithymia Scale-I: Item selection and cross-validation of the factor structure. *Journal of Psychosomatic Research, 38*, 23–32.
- Bagby, R. M., Watters, C., Ayearst, L. E., Morariu, R. A., & Taylor, G. J. (2014). The internet administration version of the 20-item Toronto Alexithymia Scale. *Psychological Assessment, 26*, 16–22.
- Bailey C, McIntyre E, Arreola A, Venta A. (2020). What are we missing? How language impacts trauma narratives. (2020). *Journal of Child & Adolescent Trauma, 13*(2), 153-161. doi:10.1007/s40653-019-00263-3
- Beck, A. T., & Steer, R. A. (1993). *Manual for the Beck Anxiety Inventory*. San Antonio, TX: The Psychological Corporation.
- Beck, A. T., Steer, R. A., Ball, R., Ciervo, C. A., & Kabat, M. (1997). Use of the Beck Anxiety and Depression Inventories for primary care with medical outpatients. *Assessment, 4*(3), 211–219.
- Berg, M. T., Lei, M.-K., Beach, S. R., Simons, R. L., & Simons, L. G. (2020). Childhood adversities as determinants of cardiovascular disease risk and perceived illness burden in adulthood: Comparing

- retrospective and prospective self-report measures in a longitudinal sample of African Americans. *Journal of Youth and Adolescence*, 49(6), 1292–1308. <https://doi.org/10.1007/s10964-020-01207-z>
- Blood, G. W., Blood, I. M., Maloney, K., Meyer, C., & Qualls, C. D. (2007). Anxiety levels in adolescents who stutter. *Journal of Communication Disorders*, 40(6), 452–469. <https://doi.org/10.1016/j.jcomdis.2006.10.005>
- Cohen, J. A., Mannarino, A. P., & Deblinger, E. (2006). *Treating Trauma and Traumatic Grief in Children and Adolescents*. Guilford Press.
- Cristel, R. T., Russell, P. T., & Sims, H. S. (2020). Trauma-informed care improves management of paradoxical vocal fold movement patients. *The Laryngoscope*, 130(6), 1508–1513. <https://doi.org/10.1002/lary.28279>
- Devereux, G. (1966). Mumbling. The relationship between a resistance and frustrated auditory curiosity in childhood. *Journal of the American Psychoanalytic Association*, 14(3), 478–484. <https://doi.org/10.1177/000306516601400303>
- Eggers, K., Millard, S. K., & Kelman, E. (2022). Temperament, anxiety, and depression in school-age children who stutter. *Journal of Communication Disorders*, 97, 1–15. <https://doi.org/10.1016/j.jcomdis.2022.106218>
- Gathercole, S. E., & Conway, M. A. (1988). Exploring long-term modality effects: Vocalization leads to best retention. *Memory & Cognition*, 16(2), 110–119. <https://doi.org/10.3758/BF03213478>
- Heffernan, K. (2010). Mumbling Is macho: Phonetic distinctiveness in the speech of American radio DJs. *American Speech*, 85(1), 67–90. <https://doi.org/10.1215/00031283-2010-003>
- Hobson, H., Brewer, R., Catmur, C., & Bird, G. (2019). The role of language in alexithymia: Moving towards a multiroute model of alexithymia. *Emotion Review*, 11(3), 247–261. <https://doi.org/10.1177/1754073919838528>
- Hyde, J. S. (2007). Methodological issues in inferences from meta-analysis about the effects of child sexual abuse. *International Journal of Sexual Health*, 19, 15–19. https://doi.org/10.1300/J514v19n04_02
- Karukivi, M., Joukamaa, M., Hautala, L., Kaleva, O., Haapasalo-Pesu, K.-M., Liuksila, P.-R., & Saarijärvi, S. (2012). Deficit in speech development at the age of 5 years predicts alexithymia in late-adolescent males. *Comprehensive Psychiatry*, 53(1), 54–62. <https://doi.org/10.1016/j.comppsy.2011.01.012>
- Kim, K. W., Na, S.-H., Chung, Y.-C., & Shin, B.-S. (2021). A comparison of speech features between mild cognitive impairment and healthy aging groups. *Dementia and Neurocognitive Disorders*, 20(4), 52–61. <https://doi.org/10.12779/dnd.2021.20.4.52>
- Lowe, S. R., Dillon, C. O., Rhodes, J. E., & Zwiebach, L. (2013). Defining adult experiences: Perspectives of a diverse sample of young adults. *Journal of Adolescent Research*, 28(1), 31–68. <https://doi.org/10.1177/0743558411435854>
- MacGregor, R., Pullar, A., & Cundall, D. (1994). Silent at school--elective mutism and abuse. *Archives of Disease in Childhood*, 70(6), 540–541. <https://doi.org/10.1136/ad.70.6.540>
- Manay, N., & Collin-Vézina, D. (2021). Recipients of children's and adolescents' disclosures of childhood sexual abuse: A systematic review. *Child Abuse & Neglect*, 116. <https://doi.org/10.1016/j.chiabu.2019.104192>
- McHale, M. D. (1988). Mumbling. A defense mechanism in therapy resistance. *Journal of Psychosocial Nursing and Mental Health Services*, 26(9), 27–30. <https://doi.org/10.3928/0279-3695-19880901-11>
- Nang, C., Hersh, D., Milton, K., & Lau, S. R. (2018). The impact of stuttering on development of self-identity, relationships, and quality of life in women who stutter. *American Journal of Speech-Language Pathology*, 27(3S), 1244–1258. https://doi.org/10.1044/2018_AJSLP-ODC11-17-0201
- Özgül, H., & Kanak, M. (2022). Investigation of the relationship between the alexithymic characteristics of secondary students and their childhood maltreatment experiences. *Journal of Nervous and Mental Disease*, 210, 446–453. <https://doi.org/10.1097/NMD.0000000000001508>

- Ozubko, J. D., Bamburoski, L. D., Carlin, K., & Fawcett, J. M. (2020). Distinctive encodings and the production effect: failure to retrieve distinctive encodings decreases recollection of silent items. *Memory, 28*(2), 237–260. <https://doi.org/10.1080/09658211.2019.1711128>
- Putica, A., Van Dam, N. T., Steward, T., Agathos, J., Felmingham, K., & O'Donnell, M. (2021). Alexithymia in post-traumatic stress disorder is not just emotion numbing: Systematic review of neural evidence and clinical implications. *Journal of Affective Disorders, 278*, 519–527. <https://doi.org/10.1016/j.jad.2020.09.100>
- Rodebaugh, T. L., Woods, C. M., Thissen, D. M., Heimberg, R. G., Chambless, D. L., & Rapee, R. M. (2004). More information from fewer questions: The factor structure and item properties of the original and brief fear of negative evaluation scale. *Psychological Assessment, 16*(2), 169–181.
- Sedivy, J. (2017). Mumbling is a clever data-compression trick. *Nautilus, 19*, 16–17.
- Selwyn, C. N., Schneider, M., Anderson, C., & Langhinrichsen-Rohling, J. (2019). Recognizing the hurt: Prevalence and correlates of elevated PTSD symptoms among adolescents receiving mental/behavioral health services in primary care. *Psychological Services, 16*(1), 58–66. <https://doi.org/10.1037/ser0000322>
- Schnurr, P., Vielhauer, M., Weathers, F., & Findler, M. (1999). *The Brief Trauma Questionnaire (BTQ)*. Available from <http://www.ptsd.va.gov>
- Silva, C. K. (2006). *An investigation of dysfluent speech and sexual abuse* [Doctoral dissertation]. Alliant International University.
- Steinhausen, H.-C., & Juzi, C. (1996). Elective mutism: An analysis of 100 cases. *Journal of the American Academy of Child & Adolescent Psychiatry, 35*(5), 606. <https://doi.org/10.1097/00004583-199605000-00015>
- Stolzenberg, S. N., & Lyon, T. D. (2017). 'Where were your clothes?' Eliciting descriptions of clothing placement from children alleging sexual abuse in criminal trials and forensic interviews. *Legal and Criminological Psychology, 22*(2), 197–212. <https://doi.org/10.1111/lcrp.12094>
- Weirich, M., Fuchs, S., Simpson, A., Winkler, R., & Perrier, P. (2016). Mumbling: Macho or morphology? *Journal of Speech, Language, and Hearing Research, 59*(6), S1587–S1595. https://doi.org/10.1044/2016_JSLHR-S-15-0040