



Mental well-being, emotional-cognitive processing, and attention skills in individuals with cluttering

Yasmin Horev Nahum, Gil Zukerman, Michal Icht ^{*} 

Department of Communication Disorders, Ariel University, Ariel, Israel

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ABSTRACT

Background: Cluttering is a fluency disorder marked by a rapid and irregular speech rate and articulation difficulties such as “slurred” speech and sound omissions. These speech disruptions reduce intelligibility and negatively impact communication. Treatment for individuals with cluttering typically focuses on improving their speech clarity and fluency. In contrast, while addressing speech disruptions, treatment for stuttering, a related fluency disorder, extends to include psychological and emotional aspects. This broader approach is based on research linking stuttering to mental health indicators such as depression, anxiety, and attention disorders, as well as to psychological flexibility. These emotional and psychological aspects and their associations remain underexplored in the context of cluttering.

Objective: To examine mental well-being, emotional-cognitive processing, and attention abilities in individuals with cluttering and to explore the relationships between these measures.

Method: Thirty-one adults diagnosed with cluttering completed questionnaires designed to assess mental well-being (i.e., anxiety, depression, somatic complaints), emotional-cognitive processing (alexithymia, psychological flexibility), and attention skills.

Results: High rates of anxiety symptoms, somatic complaints, reduced emotional-cognitive processing (high alexithymia), and attention difficulties were found among the study participants. Typical levels of psychological flexibility were observed. Alexithymia was associated with lower well-being.

Conclusions: Our results suggest that lower mental well-being levels and higher rates of alexithymia symptoms and attention difficulties characterize individuals with cluttering. Accordingly, we recommend including an assessment of these factors in cluttering diagnosis. In treating cluttering, similar to stuttering treatment, it is advisable to address emotional aspects, specifically by methods designed to enhance emotional-cognitive processing.

Cluttering is a fluency disorder wherein segments of speech in the speaker’s native language are typically perceived as too fast overall, too irregular, or both (St. Louis & Schulte, 2011). These segments of rapid and/ or irregular speech must be accompanied by one or more of the following features: (a) excessive “normal” disfluencies, (b) excessive collapsing or deletion of syllables, and/ or (c) abnormal pauses, syllable stress, or speech rhythm, together referred to as the “lowest common denominator” of cluttering. Beyond these core speech characteristics, cluttering often involves deficits in language formulation, attention, and self-monitoring (St. Louis et al., 2003). A hallmark feature of cluttering is reduced speech intelligibility, frequently accompanied by a lack of self-awareness

^{*} Correspondence to: Department of Communication Disorders, Ariel University, 40700, Israel
E-mail address: lmichal@ariel.ac.il (M. Icht).

regarding the disfluencies and limited attempts at self-correction.

Treatment for cluttering primarily focuses on improving speech clarity and fluency by addressing these disruptions (e.g., Myers, 2007; Reichel et al., 2014). In contrast, stuttering therapy, although also targeting fluency, typically extends to encompass emotional and psychological factors, as research has shown stuttering to be linked to mental health conditions such as depression, anxiety, and attention disorders (Engelen et al., 2024). These emotional and psychological dimensions play a crucial role in stuttering therapy by influencing treatment success and overall quality of life (e.g., Beilby & Yaruss, 2018; Hart et al., 2024). This study aims to explore whether similar associations exist in cluttering, which has received less attention in this regard. Understanding the potential connections between cluttering, mental well-being, and attention may enable more tailored therapeutic approaches and lead to improved treatment outcomes for individuals with cluttering.

1. Cluttering symptoms and characteristics

Cluttering has received significantly less attention in the literature compared to stuttering and remains poorly understood (Góral-Pórlola et al., 2016). Although research in this field is relatively limited, existing studies suggest that, beyond the characteristic speech symptoms (St. Louis et al., 2007; Ward, 2006), cluttering may also involve language, pragmatic, and learning difficulties, including frequent topic shifts and excessive or disorganized speech (van Zaalen & Strangis, 2022). Other common characteristics or co-morbidities include motor clumsiness, impulsivity, and attention deficit hyperactivity disorder (ADHD) symptoms (Daly & Cantrell, 2006). Taken together, these characteristics impair speech intelligibility, the ability to convey coherent messages, and overall communication quality. Consequently, individuals with cluttering may experience social reactions similar to those seen in stuttering, including teasing, being ignored, or facing negative stigma. These, in turn, may have emotional (psychosocial) consequences such as frustration, anxiety, and communication avoidance.

Such emotional responses and negative self-perceptions, often overlooked in cluttering treatment, can affect therapy outcomes as well as various aspects of life, such as education, social interactions, and work (St. Louis & Schulte, 2011; Reichel & St. Louis, 2007; van Zaalen & Strangis, 2022). Recently, Giuffre and Scaler Scott (2025) suggested that adults who clutter often experience social avoidance and isolation, due to frequent misunderstandings by listeners. Miscommunication in academic settings may lead to educational struggles, such as difficulty being understood by instructors and peers, and challenges participating fully. In the workplace, cluttering may contribute to role limitations and trouble maintaining employment, often because speech patterns are misinterpreted or judged negatively. Thus, while cluttering is primarily classified as a speech disorder, its effects extend beyond speech, significantly influencing overall well-being.

In contrast to stuttering, low self-awareness of cluttering is common (St. Louis et al., 2003; Scaler Scott, 2017). Studies show that most individuals with cluttering are unaware of their condition and its impact on communication. Therefore, “pure” clutterers do not often seek treatment or are officially diagnosed, and those with co-occurring disorders, such as stuttering, are frequently diagnosed only with the latter (Garnett & St. Louis, 2014; Myers, 2007; St. Louis et al., 2003).

1.1. Cluttering treatment

The treatment of cluttering, like its diagnosis, remains underdeveloped due to low public awareness and a lack of standardized protocols (Icht et al., 2023; Myers, 2011). In the absence of standard treatment programs, speech-language pathologists (SLPs) typically tailor therapy to each patient’s specific symptoms (St. Louis et al., 2003; Lanouette, 2011). Treatment often targets speech and language characteristics, focusing on slowing speech rate, improving articulation, organizing messages, using proper intonation and pauses, and addressing pragmatic aspects of communication (Myers, 2007; Reichel et al., 2014). For patients with low self-awareness, therapy also involves increasing awareness and fostering self-monitoring (Reichel, 2010; van Zaalen & Reichel, 2014). Unlike stuttering therapy, which has increasingly incorporated psychological components, particularly cognitive-behavioral approaches such as Acceptance and Commitment Therapy (ACT), emotional aspects of cluttering, including anxiety reduction and self-confidence building, are not routinely addressed (Beilby & Yaruss, 2018; Hart et al., 2024; Mongia et al., 2019; but see van Zaalen & Reichel, 2014).

While traditional cluttering treatment has focused primarily on speech rate and clarity, Reichel (2010) supports a person-centered approach that addresses not only the mechanics of speech but also the emotional, social, and cognitive dimensions of communication. This broader approach acknowledges the real-world challenges cluttering poses and seeks to improve overall communicative competence and quality of life. Similarly, Scaler Scott and colleagues (2022) advocate for a holistic treatment approach that goes beyond speech rate control to support the individual as a whole communicator. By addressing affective factors (like emotional awareness and impact), social-pragmatic skills, and cognitive strategies (like self-monitoring and planning), SLPs can more effectively support individuals with cluttering in achieving fluent, confident, and meaningful communication.

1.2. Mental well-being indices, emotional-cognitive processing, and attention abilities in fluency disorders

Fluency disorders have been associated with mental well-being, emotional-cognitive processing, and attention abilities, as outlined below. While these associations have been extensively studied in stuttering, relatively fewer studies have addressed them in the context of cluttering. Nevertheless, emerging research has begun to examine affective and cognitive factors among individuals who clutter, suggesting this is a growing area of interest that warrants further investigation.

A substantial body of research has established a connection between stuttering and anxiety, a key component of mental well-being.

This association has been demonstrated across age groups. For example, [Ezrati-Vinacour and Levin \(2004\)](#) studied adult males aged 18–43 and found that individuals who stutter show higher trait anxiety compared to fluent speakers, with state anxiety levels correlating with stuttering severity. Similarly, [Iverach et al. \(2009\)](#) reported elevated rates of anxiety disorders in adults seeking treatment for stuttering, identifying that 61 % met diagnostic criteria for at least one anxiety disorder, primarily social anxiety. [Briley et al. \(2021\)](#) found that adolescents and young adults who stutter (aged 16–25) reported higher levels of depression and anxiety symptoms, with notable gender differences. [Livingstone-Pountney and Mitrevski \(2019\)](#) conducted a narrative review highlighting that some adult studies support an association between stuttering and depression. In contrast, studies examining the relationship between cluttering and mental well-being are limited. Notably, a recent study by [Icht et al. \(2023\)](#) reported a significant correlation between self-reported cluttering traits and increased psychological distress in adults.

Research has also demonstrated a link between fluency disorders and various aspects of emotional-cognitive processing. Two measures of emotional-cognitive processing have been previously associated with fluency difficulties; alexithymia and psychological flexibility. The first, alexithymia, is a condition characterized by difficulty recognizing, feeling, and describing emotions, as well as linking physical sensations to emotions ([Bagby et al., 1994](#); [Levant et al., 2022](#)). Alexithymia is widely regarded as a measure of emotional-cognitive processing since individuals with elevated alexithymic traits often demonstrate impairments in the appraisal and modulation of emotional stimuli, leading to challenges in decision-making and interpersonal functioning. These deficits indicate that alexithymia not only signals reduced emotional awareness but also compromised cognitive processing of affective information, making it a valuable construct for understanding the interplay between the emotional and cognitive systems in both clinical and non-clinical populations ([Bagby et al., 1994](#); [Sifneos, 1973](#); [Taylor et al., 1997](#)).

Although research on the relationship between alexithymia and fluency disorders is limited, existing studies have found that individuals who stutter tend to exhibit elevated levels of alexithymia. For example, [Ghadampour et al. \(2019\)](#) reported significantly higher alexithymia scores among Iranian adults who stutter compared to controls, highlighting challenges in emotional awareness and expression (see also [Nemiah et al., 1976](#); [Kooiman et al., 2002](#)). Stuttering has also been linked to elevated somatic complaints, potentially due to difficulties in expressing emotions verbally. For instance, [Craig et al. \(2009\)](#) studied Australian adults who stutter and found elevated somatic complaints and depressive symptoms, suggesting difficulties in verbal emotional expression. Some researchers have suggested that dysfunction in the basal ganglia circuitry could be associated with both stuttering and cluttering, potentially affecting emotional processing and expression ([Ward et al., 2015](#)). However, empirical research on emotional regulation in cluttering remains limited, and, to the best of our knowledge, there are no studies directly linking alexithymia to cluttering. Nonetheless, [Icht et al. \(2023\)](#), in a large-scale study of over 1500 Israeli undergraduates, found that self-identified clutterers exhibited elevated levels of somatic complaints. The combination of low self-awareness and heightened somatic complaints, which characterize individuals with cluttering, suggests potential challenges in identifying and expressing emotions.

The second key measure of emotional-cognitive processing is psychological flexibility, which reflects an individual's capacity to adaptively engage with internal experiences while pursuing valued goals. This construct involves the ability to remain present and accept distressing thoughts and emotions, subsequently using these experiences to inform behavior rather than hinder it. High levels of psychological flexibility indicate efficient emotional regulation and cognitive reappraisal, which are essential for maintaining mental health and effective functioning in daily life ([Hayes et al., 2006](#); [Kashdan & Rottenberg, 2010](#)). Research evidence indicates that individuals who stutter exhibit reduced cognitive flexibility, a key component of psychological flexibility, which reflects the ability to adapt behaviors in response to changing internal and external circumstances ([Ben-Itzhak et al., 2014](#)). For example, [Eichorn and Pirutinsky \(2021\)](#) investigated school-age children (ages 8–11) who stutter, revealing that these children performed more poorly than fluent peers on a task requiring attention shifting under varying cognitive demands. Their findings indicate that stuttering in childhood is associated with differences in both cognitive flexibility and effortful control. Recent work by [Paphiti et al., \(2022\), \(2024\)](#) further supports these findings, reporting reduced performance in executive functioning tasks among school-age children who stutter, specifically in tasks requiring rapid adjustment to changing cognitive demands. Psychological flexibility has been increasingly linked to mental well-being, with lower flexibility associated with conditions such as depression and anxiety ([Kashdan & Rottenberg, 2010](#); [Polk et al., 2016](#)). However, no studies have explored psychological flexibility in individuals with cluttering.

Finally, stuttering has been linked to elevated attention difficulties, with studies reporting higher rates of attention disorders among individuals who stutter compared to fluent speakers. For example, [Cangi and Erim \(2021\)](#) compared Turkish school-aged children (8–11 years) who stuttered and those who did not, finding that children who stutter exhibited significantly higher scores on measures of ADHD-related traits and cognitive inattention, as well as greater anxiety symptoms. Similarly, [Eggers et al. \(2012\)](#) demonstrated increased attentional difficulties and diminished attentional control in children who stutter aged 7–12 years, suggesting impaired executive functioning relative to fluent peers. [Tumanova et al. \(2020\)](#) studied preschool-age children and found that early stuttering is associated with increased symptoms of inattention and hyperactivity.

Research on cluttering and attention disorders also suggests several connections. [Gosselin and Ward \(2019\)](#), in their adult case studies, highlighted overlapping characteristics between cluttering and ADHD, such as distractibility, impulsivity, and disorganization, emphasizing the need for differential diagnosis. Scaler [Scott \(2017\)](#) likewise identified frequent co-occurrence of cluttering and ADHD among both children and adults, noting shared executive function challenges including planning, monitoring, and attention regulation. [Alm \(2011\)](#) proposed that both stuttering and cluttering may share neurological underpinnings with ADHD, especially in brain regions related to timing and inhibitory control.

1.3. The current study

The overlapping features of cluttering and stuttering, along with the successful integration of psychological concepts such as

acceptance and psychological flexibility in stuttering therapy, inspired us to explore these factors as well as their association with mental well-being in cluttering. This study aims to bridge the research gap by examining the prevalence and levels of various mental well-being indicators, emotional-cognitive abilities, and attention skills in individuals with cluttering and investigating the relationships between these factors. To achieve this, 31 adults diagnosed with cluttering completed questionnaires measuring anxiety, depression, somatic complaints, alexithymia, psychological flexibility, and attention. By mapping the emotional and cognitive profile of individuals with cluttering, the study contributes to diagnostic clarity by helping clinicians to identify better co-occurring psychological traits (such as alexithymia or attention difficulties). This approach supports a more holistic, patient-centered approach that considers both speech disruptions and their broader emotional and social impact. Specifically, the present study's goals and hypotheses were:

- (1) to assess the levels of well-being indicators (anxiety, depression, and somatic complaints) among individuals with cluttering. Based on previous research, we hypothesized that individuals with cluttering would exhibit lower well-being (higher levels of distress) compared to reports in the general population.
- (2) to examine emotional-cognitive processing abilities (alexithymia, psychological flexibility) within individuals with cluttering, and the association between these abilities and well-being indices. We expected to find high rates of alexithymia and significant associations with lower well-being levels.
- (3) to evaluate attention skills in individuals with cluttering. Based on the literature, we expected high rates of ADHD symptoms.

2. Methods

2.1. Participants

The study included 31 young adults (age ≥ 18 years) who had been formally diagnosed with cluttering by a certified SLP. Of these, 17 participants had received or were currently receiving therapy specifically for cluttering, while the remaining 14 had been diagnosed but had not undergone cluttering intervention, reflecting a range of clinical engagement. Additionally, 11 participants reported current or past emotional therapy, and 8 participants self-reported symptoms consistent with ADHD, of whom 5 (62.5 %) had engaged in cluttering therapy.

Participants were recruited through referrals from SLPs specializing in fluency disorders, as well as via social media platforms and online support groups. All participants self-reported cluttering-related speech characteristics. Inclusion criteria were: (a) age ≥ 18 years; (b) diagnosis of cluttering without co-occurring stuttering. Exclusion criteria included any known neurological, psychiatric, or developmental conditions that could confound communication outcomes.

Speech samples were not collected as part of this study; instead, participants self-evaluated their speech severity and symptom profile. Severity ratings were distributed across the scale, with most participants rating their cluttering as moderate ($n = 12$) or severe ($n = 7$). A wide range of self-identified symptoms was reported, most commonly perceived fast speech rate ($n = 29$), omission of sounds or syllables ($n = 25$), and frequent listener misunderstandings ($n = 18$). The demographic and clinical characteristics of the participants are summarized in Table 1a and Table 1b.

2.2. Tools and materials

To address our research questions, participants completed six self-report questionnaires. All were Hebrew versions that have been previously translated, validated, and normed, as detailed next. The questionnaires were administered online via Google Forms, with

Table 1a
Demographic characteristics of the study sample ($N = 31$).

Index	N
Age, Years (Mean, SD)	30.87 years (SD = 11.68 years)
Gender (Male, Female)	21, 10
Marital Status:	
Single	11
Married	20
Religious Affiliation:	
Secular	8
Traditional	1
Religious	11
Ultra-Orthodox	11
Education Level:	
Primary	5
High School	9
Secondary	5
Bachelor's / Master's Degree	12
Comorbidities:	
Attention Disorder	8
Crohn's	1

Table 1b

Clinical characteristics of the study sample (N = 31).

Index	N	%
Current or previous cluttering therapy	17	54.8
Current or previous emotional therapy	11	35.48
Age of Cluttering Therapy		
< 12	5	16.13
13–18	4	12.9
> 18	8	25.8
Self-evaluated Severity level		
Very Mild	6	19.35
Mild	6	19.35
Moderate	12	38.7
Severe	7	22.58
Very Severe	0	0
Self-identified type of symptoms*		
Speech rate perceived as too fast	29	93.55
Omission of sounds or syllables within words	25	80.65
Frequent listener misunderstandings	18	58.06
Frequent mid-word corrections, syllable or word repetitions, and use of fillers	9	29.03
Pauses occurring at inappropriate places within sentences	4	12.9
Other communication-related difficulties (e.g., language, learning, or social communication challenges)	1	3.23

* As participants were able to report multiple symptoms, the total number of responses exceeds the number of individuals in the sample (N = 31).

anonymity ensured and informed consent obtained through an opening section that also gathered demographic and relevant medical data (including data on cluttering diagnosis, severity, symptoms, and treatment).

2.2.1. Mental well-being

State-Trait Anxiety Questionnaire (STAI-T; Dennis et al., 2013; Spielberger, et al., 1983). A 20-item questionnaire designed to assess trait anxiety, where participants rate the items on a scale from 1 (Rarely) to 4 (Almost always). High reliability and validity were previously reported (Barnes et al., 2002).

The Hebrew version of the STAI-T has been widely used in both clinical and non-clinical populations in Israel. It demonstrates high internal consistency (Cronbach's $\alpha > .85$) and good construct validity, comparable to the original version (Solomon et al., 1988). In the current study, only trait anxiety was measured. Trait anxiety is closely associated with emotion regulation difficulties, including heightened emotional reactivity and reduced use of adaptive strategies (Aldao et al., 2010; Menin et al., 2005). Individuals high in trait anxiety are more likely to engage in maladaptive regulation patterns such as avoidance and suppression.

Beck Depression Inventory (BDI-II; Beck et al., 1996). A widely used 21-item tool to assess the severity of depression was used, with items rated on a 4-point Likert scale. High reliability and validity were previously reported, with strong correlations to other depression-related self-rating scales ($r = 0.66$) in studies by Beck et al. (1996) and Dozois et al. (1998). The Hebrew translation of the BDI-II has been validated among Israeli populations. It has shown excellent internal consistency ($\alpha > .90$) and strong convergent validity with clinical diagnoses of depression (Levav et al., 2007).

The Somatic Symptom Scale-8 (SSS-8) is a brief, self-report measure developed to assess somatic symptom burden in both clinical and general populations (Gierk et al., 2014). It consists of 8 items derived from the longer Patient Health Questionnaire-15 (PHQ-15), focusing on the most prevalent and impairing somatic complaints such as pain, gastrointestinal issues, fatigue, and dizziness. Respondents rate symptom severity over the past 7 days using a 5-point Likert scale ranging from 0 (Not at all) to 4 (Very much). The SSS-8 has demonstrated good internal consistency, with a Cronbach's alpha of .81 in a large sample of the general population (Gierk et al., 2014). It also shows strong convergent validity, correlating significantly with measures of depression, anxiety, and functional impairment, supporting its use in both research and clinical screening. The scale has shown adequate test-retest reliability and sensitivity to change, making it suitable for monitoring symptom progression and treatment outcomes (Gierk et al., 2014). Although less widely validated in Hebrew compared to other tools, the SSS-8 has been translated and used in Israeli research. Preliminary findings suggest good internal reliability ($\alpha \approx .80$) and construct validity when applied to somatic symptom populations (Siman-Tov & Podlipsky, 2019).

2.2.2. Emotional-cognitive processing

The Toronto Alexithymia Scale (TAS-20; Bagby et al., 1994) is a 20-item, self-administered questionnaire that measures difficulty in identifying and describing emotions, as well as externally oriented thinking. The 20 statements are divided into three main factors (difficulty identifying feelings, difficulty describing feelings, and externally oriented thinking), rated on a scale from 1 (Strongly Disagree) to 5 (Strongly Agree). Levant et al. (2022) demonstrated good reliability and validity. Higher scores indicate higher levels of alexithymia, reflecting greater difficulty in emotional-cognitive processing. The Hebrew version of the TAS-20 has been psychometrically validated in multiple studies. It retains the three-factor structure and shows acceptable to good internal consistency ($\alpha = .78-.83$; Zohar & Mikulincer, 2004).

Psychological Flexibility Questionnaire (PFQ; Ben-Itzhak et al., 2014). This tool includes 20 items tapping into 5 domains: (1) Positive perception of change, (2) Characterization of the self as flexible, (3) Self-characterization as open and innovative, (4) Perception of

reality as dynamic and changing, and (5) Perception of reality as multifaceted. The items are scored on a six-point Likert scale ranging from 1 (Strongly Disagree) to 6 (Strongly Agree). Scores are summed to produce a total score (higher scores indicating greater PF). Previous research indicated high reliability (Cronbach's $\alpha = .918$) and satisfactory construct validity (Ben-Itzhak et al., 2014). The Hebrew version has shown high internal reliability ($\alpha > .85$) and good content validity, developed and tested with Israeli student and clinical samples (Ben-Itzhak et al., 2014), and used in previous research among hospitalized patients (Zukerman et al., 2023).

2.2.3. ADHD symptoms

Adult ADHD Self-Report Scale (ASRS-v1.1, Kessler et al., 2005) Symptom Checklist. This screening tool is used to identify symptoms of ADHD in adults. It is based on the DSM-IV-TR criteria and aims to provide a quick and reliable way to assess whether an individual may have ADHD. It consists of 18 items, each reflecting a symptom of ADHD, to be rated on a 5-point Likert scale indicating how often the respondent experiences the symptom from 0 (Never) to 4 (Very Often). The Hebrew version of the ASRS-V1.1 was officially translated and validated under WHO guidelines. Validation studies in Israel report high reliability ($\alpha > .85$) and adequate discriminant validity between ADHD and non-ADHD groups (Mama & Icht, 2019; Manor et al., 2012).

2.3. Procedure

The primary researcher contacted participants who had expressed interest in the study via telephone, arranging a deadline for submission of the questionnaires. In the first stage, participants confirmed their consent and completed the demographic and medical questionnaire. They were then asked to fill out the six questionnaires in succession, either in sequence (approximately 30 min) or with breaks, depending on their preference. It was emphasized that all responses were anonymous.

2.4. Data analysis

Data analyses were performed using SPSS 25 (IBM Corp., 2013). Well-being data were evaluated by either comparison to normative data (ADHD - ASRS-v1.1, Depression - BDI-II, Somatic complaints - SSS-8, State anxiety - STAI-T, Alexithymia - TAS-20) and/or to data regarding prevalence of diagnosis in the general population (ADHD - ASRS-v1.1; Somatic complaints - SSS-8; Alexithymia - TAS-20).

Unlike well-established measures such as the BDI-II (Beck et al., 1996), STAI-T (Spielberger et al., 1983), ASRS-v1.1 (Kessler et al., 2005), and SSS-8 (Gierk et al., 2014), which are supported by robust normative data from large population studies, PFQ (Psychological Flexibility) and TAS-20 (Alexithymia) scores are more sensitive to contextual and cultural factors. Psychological flexibility, linked to experiential avoidance and behavioral regulation, is dynamic and context-dependent, lacking universally accepted norms (Bond et al., 2011; Kashdan & Rottenberg, 2010). Similarly, though normative data for the TAS-20 do exist, TAS-20 scores can vary significantly based on clinical status, age, gender, and culture, limiting the utility of global cut-offs (Franz et al., 2008; Taylor et al., 2003). Thus, using a demographically matched comparison group of individuals with no cluttering diagnoses provided a more valid interpretive basis for these measures in our sample. Accordingly, PFQ (Psychological Flexibility) and TAS-20 (Alexithymia) scores were compared to those of a comparison group without a cluttering diagnosis. TAS-20 scores were additionally evaluated against established normative data, as well as relative to the comparison group.

Normative data for BDI-II, SSS-8, STAI-T, TAS-20 were taken from Kessler et al., (2005); Roelofs et al., (2013); Gierk et al., (2014); Spielberger, 1983; Parker et al., (2003), respectively. Comparisons to normative data were conducted using one-sample tests. Data for prevalence rates of ADHD (ASRS-v1.1), Somatic complaints (SSS-8), and Alexithymia (TAS-20) were taken from Chaulagain et al., (2023), Gierk et al. (2014), Ricciardi et al. (2015), respectively. Comparisons with a comparison group (no cluttering diagnosis) were conducted specifically for Psychological Flexibility and Alexithymia due to limited and variable normative data for these constructs. Group comparisons for PFQ and TAS-20 scores were conducted using independent *t*-tests. A Chi-square goodness-of-fit test was conducted to examine whether the distribution of probable Alexithymia diagnoses (defined as TAS-20 scores > 60) differed significantly between individuals with cluttering and a comparison group of individuals with no cluttering diagnosis.

3. Results

3.1. Comparison to normative data

Table 2.1 presents the results of one-sample *t*-test comparisons to normative data in four of the study variables. Reviewing Table 2.1

Table 2.1

One-sample test comparisons between the study findings and normative data in four variables.

Variable (measure)	Individuals with Cluttering		Normative Mean	Source	<i>t</i> (30)	<i>p</i>
	M	SD				
Depression (BDI-II)	5.82	7.73	10.6	Roelofs et al., (2013)	-3.37	.01**
Somatic Complaints (SSS-8)	16.77	5.24	3.9	Gierk et al. (2014)	13.66	< .001**
Trait anxiety (STAI-T)	38.06	9.49	34.8	Spielberger (1983)	1.91	.03*
Alexithymia (TAS-20)	51.23	12.16	45.57	Parker et al., (2003)	2.49	.009**

M = mean; SD = standard deviation. $p^* < .05$, $p^{**} < .01$

indicates that individuals with cluttering reported markedly elevated psychological distress compared to published normative data. Specifically, participants in the cluttering group showed higher Somatic symptoms (SSS-8; 16.7 vs. 3.9 for normative adult samples), higher trait anxiety (STAI-T; 38 vs. ~35), and higher levels of Alexithymia (TAS-20; 51 vs. 45). These findings indicate a substantially higher prevalence of psychological distress among individuals with cluttering, far exceeding population-level expectations. Interestingly, participants in the cluttering group reported significantly lower levels of depression (BDI-II). These low depression scores, along with higher Somatic symptoms, may reflect a distinct affective profile characteristic of individuals with cluttering, one that contrasts with the *elevated* depression levels commonly observed among individuals who stutter. This possibility is further explored in the Discussion section.

3.2. Comparison to the prevalence of diagnosis in the general population

Table 2.2 displays the results of the Chi-square goodness-of-fit test, which assessed whether the observed rates of positive diagnoses in individuals with cluttering deviated from the expected prevalence rates in the general population. The analysis revealed that individuals with cluttering reported significantly higher rates of probable diagnoses for both ADHD and Alexithymia. Rates of self-reported ADHD symptoms in the cluttering group were dramatically elevated. Specifically, 32 % of individuals surpassed the clinical threshold on the ASRS Screener, compared to 4.5 % in normative samples (Kessler et al., 2005). This tenfold increase highlights a potential overlap between cluttering and attentional dysregulation. While these results do not confirm clinical diagnoses, they point to psychological domains that warrant further assessment and consideration in therapy planning. In addition, 33.3 % of participants exceeded the TAS-20 cutoff for Alexithymia-related traits (based on screening criteria) compared to an estimated 10 % in general populations (Ricciardi et al., 2015). This threefold increase suggests a meaningful emotional processing vulnerability in individuals with cluttering.

3.3. Comparison group analysis

PFQ and TAS-20 scores were compared between individuals with cluttering (n = 31) and a comparison group (no cluttering diagnosis; n = 35). There were no significant differences between groups in age or gender distribution ($p = .98$ and $p = .26$, respectively).

Complete PFQ data were available for 28 participants with cluttering and 33 in the comparison group. Mean psychological flexibility scores were nearly identical across the two groups (total PFQ scores: $M = 94.89$ vs. 94.18), and this difference was not statistically significant ($p > .05$; see Table 2.3), indicating similar overall capacity for adaptive emotional regulation in both samples. TAS-20 data were available for 31 participants with cluttering and 34 individuals in the comparison group.

While mean Alexithymia scores did not significantly differ between groups ($M = 51.23$ vs. 50.03 ; $p > .05$), group-level comparisons based on clinical cut-off scores revealed meaningful distinctions: 29.0 % of individuals with cluttering met the screening criterion for high Alexithymia (TAS-20 > 60), compared to only 11.8 % in the comparison group. This difference reached statistical significance, $p = .041$, suggesting that individuals with cluttering are more than twice as likely to present with clinically elevated Alexithymia-related traits relative to their peers. This categorical difference points to the potential clinical relevance of alexithymia in cluttering, which may not be fully captured by group mean comparisons alone. It highlights a subgroup of individuals with cluttering who may face pronounced difficulties in emotional awareness and expression, warranting further clinical attention.

3.4. Association between the study variables

Table 3 presents Pearson correlation coefficients (two-tailed) calculated to examine relationships between the study variables. Reviewing Table 3 reveals significant positive correlations between state-trait anxiety, depression levels, and somatic complaints, strengthening the association between the different mental well-being indices. Alexithymia (TAS-20) score showed significant correlations with mental well-being indices (state-trait anxiety), as well as with ADHD symptoms. These findings suggest that individuals with higher alexithymia also tend to experience elevated emotional and physical distress, as well as attention difficulties.

Notably, depression scores (BDI-II) were strongly associated with somatic complaints, reinforcing the interplay between affective and physical symptoms. However, psychological flexibility (PFQ scores) was not significantly correlated with any of the other variables, suggesting that it may represent a distinct regulatory process or that its relationship with distress may manifest differently in this population.

Table 2.2
Chi-square goodness-of-fit for diagnosis prevalence for ADHD and Alexithymia.

Variable (measure)	Individuals with Cluttering, %	Normative Prevalence, %	Source for prevalence; Criteria for Diagnosis	χ^2	p
ADHD symptoms (ASRS-v1.1)	32.25	4.5	Chaulagain et al. (2023); Kessler et al. (2005); 9 positive Items	413.33	< .01**
Alexithymia (TAS-20)	29	10	Ricciardi et al. (2015); < 60	134.28	< .01**

p** < .01.

Table 2.3

Group Comparisons: Psychological Flexibility and Alexithymia.

Variable	Group	n	M / %	SD	Test Statistic	p
Psychological Flexibility	Individuals with Cluttering	28	94.89	13.55	$t(59) = -0.01$	.99
	Comparison Group	33	94.18	15.03		
Alexithymia (TAS score)	Individuals with Cluttering	31	51.23	12.62	$t(60.10) = -0.40$	.688
	Comparison Group	34	50.03	11.11		
Alexithymia (Categorical: High %)	Individuals with Cluttering	31	29.0 %	—	$\chi^2(1) = 3.02$	.041
	Comparison Group	34	11.8 %	—		

Note. M = mean; SD = standard deviation.

Percentages for categorical Alexithymia reflect the proportion of participants classified as high Alexithymia (value = 1).

Welch's *t*-test was used for the TAS score due to unequal variances.

Chi-square analysis shows a trend-level group difference in categorical Alexithymia classification.

Table 3

Correlations between the study variables.

Measure	1	2	3	4	5	6
1. TAS	—					
2. STAI-T	.57**	—				
3. BDI-II	.33	.47*	—			
4. ASRS-v1.1	.41*	.34	.20	—		
5. PFQ	.03	-.04	.02	.16	—	
6. Somatic Complaints	.34	.45*	.62**	.21	.31	—

TAS = Alexithymia; STAI-T = State-Trait Anxiety Questionnaire; BDI-II = Beck Depression Inventory; ASRS-v1.1 = Adult ADHD Self-Report Scale; PFQ = Psychological Flexibility Questionnaire.

* $p < .05$, ** $p < .01$.

Pearson correlation coefficients are presented.

Sample sizes vary slightly across variables due to missing data.

3.5. Comparison between treatment seekers and non-treatment seekers

Previous studies have suggested that individuals with fluency disorders who seek clinical intervention often present with elevated rates of emotional and psychological comorbidities (e.g., Iverach & Rapee, 2014). To examine whether a similar pattern exists in cluttering, we compared comorbidity indicators, including levels of anxiety (STAI), depression (BDI-II), alexithymia (TAS-20), somatic symptoms (SSS-8), and psychological flexibility (PFQ), as well as categorical classification based on screening cutoffs (ASRS-v1.1, TAS-20), between participants with and without a history of treatment for cluttering. Sixteen participants reported having received treatment for cluttering, while twelve reported no prior treatment history; three participants did not provide information on this variable.

Across all measures, no significant differences were observed between the groups, with one exception: individuals with a treatment history demonstrated significantly higher psychological flexibility, as measured by the PFQ ($M = 100.00$, $SD = 7.91$), compared to their untreated peers ($M = 87.64$, $SD = 16.73$), $p = .02$. This finding may reflect greater emotional adaptability and engagement with therapeutic processes among those who pursued intervention.

4. Discussion

This study explored the under-researched psychological and cognitive dimensions of cluttering, a fluency disorder characterized by irregular speech patterns and limited self-awareness (St. Louis et al., 2003). As emphasized by St. Louis and Schulte (2011), cluttering is not merely a matter of speech rate; rather, it is a multidimensional communication disorder involving fluency (non-stuttering disfluencies such as revisions, interjections, and fillers), language formulation (e.g., narrative cohesion, syntax, word retrieval), attention and executive function (e.g., poor self-monitoring, distractibility), and prosody and rhythm. Drawing from parallels with stuttering, which has established links to mental well-being (Ezrati-Vinacour & Levin, 2004), and attention deficits (Cangi & Erim, 2021), this study sought to investigate whether similar associations exist in individuals diagnosed with cluttering. Specifically, the study examined the prevalence and levels of anxiety, depression, somatic complaints (well-being indices), and ADHD diagnosis in this population, alongside their relationships with two indices of emotional-cognitive processing, alexithymia and psychological flexibility.

The findings can be summarized into two main points. First, individuals with cluttering exhibited high rates of clinically significant levels of trait anxiety, higher rates of ADHD symptoms, and high rates of significant alexithymia in comparison to prevalence rates reported in neurotypical populations. These group differences were robust, with several outcomes exceeding normative prevalence rates by factors of 3–10. Second, the results showed significant associations between alexithymia and various well-being indices. These results support and extend the broader cluttering conceptualization (St. Louis & Schulte, 2011) and provide important insights for clinical assessment and intervention.

4.1. Well-being among individuals with cluttering

The present findings reveal a pronounced emotional profile among individuals with clinically confirmed cluttering, marked by *exponentially elevated* levels of anxiety, somatic complaints, and Alexithymia compared to neurotypical populations. Notably, this pattern emerged in the absence of elevated depressive symptoms, which are commonly documented in other fluency disorders, particularly stuttering (e.g., Briley et al., 2021). This dissociation, high arousal and distress without accompanying depression, may reflect a *distinct affective regulation mechanism* in cluttering. Rather than mirroring the typical internalizing profile seen in stuttering, individuals with cluttering may experience and express psychological strain more somatically and emotionally, underscoring the need for differentiated clinical assessment and intervention strategies. This finding complements recent work by Giuffre and Scaler Scott (2025), who emphasize the broad, real-world consequences of cluttering across social, educational, and occupational domains. Their work underscores the need for holistic assessment and intervention approaches that extend beyond speech fluency to address the broader communicative and psychosocial impact of the disorder.

This finding aligns partially with previous research on self-identified clutterers, which found that university students who self-identified as experiencing cluttering characteristics reported higher levels of psychosomatic complaints and stress, along with lower subjective happiness and self-esteem (Icht et al., 2023; Zukerman, Icht, Zigdon, & Korn, 2024). However, those studies relied on subjective self-perception, which may include individuals with milder or subclinical symptoms, or those who are more emotionally attuned or distressed by their perceived speech difficulties.

In contrast, the current study focused on individuals with confirmed cluttering diagnoses, assessed through structured criteria and professional SLP evaluation. The lower-than-expected depression levels observed in this group may reflect differences in emotional awareness, expression, or coping styles. One plausible explanation is that individuals with cluttering may be less prone to expressing affect in the form of reporting depressive symptoms in the BDI and instead manifest distress somatically, possibly due to difficulties with emotional labeling and processing (i.e., alexithymia), as also supported by our findings.

The gap between subjective self-identification and clinically verified cluttering stresses the variability within these individuals, for example, in their level of awareness of their speech difficulties. From a clinical perspective, this distinction is critical. While prior studies advocate for mental health screening tools in cluttering assessment (Icht et al., 2023), the current findings refine this recommendation by suggesting that specific focus should be given to anxiety and somatic complaints, rather than depression alone. Moreover, the inclusion of alexithymia measures may help clinicians identify patients who struggle to process and express emotions yet exhibit significant emotional dysregulation through physical symptoms.

4.2. Associations between emotional-cognitive processing abilities and well-being indices

Our findings reveal an association between Alexithymia and both anxiety and somatic complaints in individuals with cluttering. This pattern suggests that individuals with cluttering struggle with emotional awareness and regulation, likely experiencing emotional distress in ways that do not manifest through traditional affective symptoms such as depression. Notably, this aligns with a distinct emotional-cognitive processing profile characterized by impaired emotional insight, a style well-documented in the alexithymia literature (Taylor et al., 1997; Lane et al., 2015).

This processing style is marked by difficulty identifying, differentiating, and verbalizing emotions, often leading individuals to interpret internal states in concrete, somatic terms. Rather than experiencing sadness or emotional tension as a depressive affect, individuals with high alexithymia may feel bodily discomfort, fatigue, gastrointestinal distress, or other physical symptoms. As a result, emotional arousal is frequently misattributed to physical symptoms rather than recognized as a psychological experience (Bird & Cook, 2013; Trevisan et al., 2021). This pattern is particularly interesting when compared to individuals who stutter, who often demonstrate heightened self-awareness and emotional sensitivity, including increased tendencies toward rumination and self-focused attention (Boyle et al., 2023). Our findings suggest that individuals with cluttering, in contrast, may experience lower emotional insight, consistent with a blunted or externally oriented cognitive style often described in alexithymia (Lane & Schwartz, 1987).

If supported by future research, these findings may position cluttering within a broader framework of neurocognitive-emotional dysregulation, where deficits in emotional processing, not just speech-motor control, contribute to the disorder's psychosocial profile. This view may help explain why cluttering is often accompanied by heightened anxiety and somatic complaints, but relatively lower self-reported depressive symptoms: the emotional experience is present, but not fully integrated or consciously accessible.

4.3. Attention skills of individuals with cluttering

Our findings reveal a high prevalence of ADHD symptoms among individuals with cluttering, supporting the hypothesis that attentional deficits may underlie or exacerbate fluency difficulties in this population. Cluttering shares several behavioral and cognitive features with ADHD (Louis & Myers, 1995; op 't Op & Hof, 2009), for example, both conditions are associated with challenges in phonemic verbal fluency, a task demanding cognitive flexibility and sustained attention (Andreou & Trott, 2013).

Alm (2011) proposes that clutterers with attentional difficulties may represent a distinct subgroup within the ADHD spectrum, emphasizing that their attentional deficits may differ qualitatively from those seen in typical ADHD. This distinction is echoed by Gosselin and Ward (2019), who argue for the integration of attention-focused assessment tools in the evaluation of cluttering. Such tools can help clinicians better differentiate between cluttering, stuttering, and co-occurring ADHD, especially given the diagnostic complexity and symptom overlap.

The coexistence of elevated ADHD symptoms and trait anxiety, as observed in our sample, further highlights the multifaceted

challenges faced by individuals with cluttering. This unique combination of emotional vulnerability and attentional dysregulation may significantly impair not only speech fluency but also language organization, social communication, and academic functioning.

4.4. Clinical implications

Despite growing recognition of its impact, cluttering remains underexplored in terms of its psychological and emotional dimensions, especially in comparison to stuttering. While a small but growing body of literature has begun to examine affective and cognitive aspects of cluttering, this remains a relatively underdeveloped area of research compared to the extensive work conducted on stuttering. The current study offers one of the first examinations of well-being among individuals with clinically confirmed cluttering, revealing a unique emotional and attentional profile distinct from both the general population and from individuals with stuttering. These insights advocate for a more holistic and personalized clinical approach to cluttering, one that not only targets fluency (i.e., traditional speech-focused intervention) but also supports emotional insight, attentional control, and overall psychological functioning.

Based on our findings, as part of clinical evaluation, we recommend integrating routine screening for anxiety, somatic symptoms, alexithymia, and emotional processing deficits into the assessment of individuals with cluttering. Screening for ADHD symptoms and executive functioning challenges should also be included. These evaluations can provide a clearer understanding of the client's emotional-cognitive profile and help tailor treatment to individual needs.

In therapy, SLPs are encouraged to incorporate emotion-focused techniques, such as emotional literacy training to improve recognition and labeling of emotions, psychoeducation on the mind-body connection and how emotional distress may present somatically, and body-focused therapies, including mindfulness-based stress reduction (MBSR), somatic experiencing, or Acceptance and Commitment Therapy (ACT), to help clients process emotions non-verbally. Therapy may also include interventions targeting attention, cognitive flexibility, and self-monitoring. By addressing the non-verbalized emotional distress, recognizing the role of somatic symptoms, and integrating cognitive-behavioral and mindfulness-based techniques, clinicians can improve therapeutic outcomes and enhance quality of life for individuals who clutter.

Effective intervention for cluttering should integrate the affective, cognitive, and social-pragmatic aspects of communication. As emphasized by Reichel (2010) and Scaler Scott et al. (2022), therapy should foster self-awareness, support emotional acceptance, and target self-monitoring and planning skills. Interventions may include strategies for enhancing emotional regulation, reducing social anxiety, and improving pragmatic competence through role-play, feedback, and narrative organization tasks. Incorporating techniques such as video feedback, mindfulness, and executive functioning support can help individuals manage disorganized speech, improve communicative clarity, and increase confidence. Ultimately, treatment should be individualized and functional, integrating emotional, cognitive, and linguistic components to empower individuals with cluttering to communicate more effectively and meaningfully in daily life.

Unfortunately, global surveys indicate that only 30 % of SLPs are familiar with cluttering, with limited knowledge about its symptoms, assessment, and treatment (Reichel & Bakker, 2009; Reichel et al., 2014). Many SLPs report low confidence in diagnosing and treating cluttering, often struggling to differentiate it from stuttering and lacking experience with appropriate therapeutic techniques. These challenges stem from minimal coverage of cluttering in academic curricula, insufficient clinical exposure, and a scarcity of accessible resources (Reichel & Draguns, 2011). The current findings contribute to addressing this gap by providing new insights into the psychological and cognitive dimensions of cluttering, which is associated with reduced emotional awareness and hence appears to significantly differ from stuttering. These insights may inform more comprehensive diagnostic frameworks and tailored therapeutic approaches.

4.5. Limitations and future directions

Despite its contributions, this study has several limitations. First, diagnostic prevalence estimates for ADHD and Alexithymia were derived using established screening thresholds, namely, endorsement of nine or more clinically significant items on the ASRS-v1.1 (Chaulagain et al., 2023; Kessler et al., 2005) and a TAS-20 total score exceeding 60 (Ricciardi et al., 2015). It is important to note that these tools serve as screening instruments rather than formal diagnostic assessments; therefore, the reported rates should be interpreted with caution. Second, the reliance on self-report questionnaires of mental well-being, emotional-cognitive processing, and ADHD symptoms may introduce biases, and the small sample size limits generalizability. Future research should examine the relationships between these indices in larger, more diverse samples. In addition, while all participants had been diagnosed by certified SLPs, cluttering severity was not rated by the diagnosing clinician nor assessed through objective speech measures as part of this study. Instead, severity was self-evaluated by participants. Although self-perception of cluttering severity provides valuable insight into how cluttering is experienced, we recognize that incorporating SLP-rated severity and standardized speech samples would strengthen future research. We therefore recommend that upcoming studies include perceptual or acoustic analyses to more accurately gauge cluttering severity and its relation to emotional and cognitive variables.

Longitudinal studies assessing the impact of interventions designed to enhance well-being are also necessary. A promising avenue for investigation is the role of psychological flexibility and emotional regulation as potential targets for improving well-being in individuals who clutter. Importantly, psychological flexibility was found to be intact in this study, indicating its potential beneficial role in supporting well-being within this group. This may be addressed in future studies. Additionally, cultural and linguistic factors influencing cluttering and its psychosocial effects should be further explored.

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CRediT authorship contribution statement

Yasmin Horev Nahum: Writing – review & editing, Project administration, Data curation. **Gil Zukerman:** Writing – review & editing, Writing – original draft, Validation, Formal analysis, Conceptualization. **Michal Icht:** Writing – review & editing, Writing – original draft, Supervision, Methodology, Conceptualization.

Declaration of Competing Interest

The authors declare the following financial interests/personal relationships which may be considered as potential competing interests: N/A If there are other authors, they declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

Data availability

Data will be made available on request.

References

- Aldao, A., Nolen-Hoeksema, S., & Schweizer, S. (2010). Emotion-regulation strategies across psychopathology: a meta-analytic review. *Clinical Psychology Review*, 30(2), 217–237.
- Alm, P. A. (2011). Cluttering: a neurological perspective. In D. Ward, & K. Scaler Scott (Eds.), *Cluttering: A handbook of Research, Intervention and Education* (pp. 3–28). East Sussex: Psychology Press.
- Andreou, G., & Trott, K. (2013). Verbal fluency in adults diagnosed with attention-deficit hyperactivity disorder (ADHD) in childhood. *ADHD Attention Deficit and Hyperactivity Disorders*, 5, 343–351.
- 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(1), 23–32.
- Barnes, L. L., Harp, D., & Jung, W. S. (2002). Reliability generalization of scores on the Spielberger state-trait anxiety inventory. *Educational and psychological Measurement*, 62(4), 603–618.
- Beck, A. T., Steer, R. A., & Brown, G. K. (1996). *Manual for the Beck Depression Inventory-II*. San Antonio, TX: Psychological Corporation.
- Beilby, J. M., & Yaruss, J. S. (2018). *Acceptance and Commitment Therapy for stuttering Disorders More than fluency: The Social, emotional, and Cognitive dimensions of stuttering*. 111, 129.
- Ben-Itzhak, S., Bluvstein, I., & Maor, M. (2014). The Psychological Flexibility Questionnaire (PFQ): development, reliability and validity. *WebmedCentral Psychology*, 5(4). WMC004606.
- Bird, G., & Cook, R. (2013). Mixed emotions: the contribution of alexithymia to the emotional symptoms of autism. *Translational Psychiatry*, 3(7), Article e285.
- Briley, P. M., Gerlach, H., & Jacobs, M. M. (2021). Relationships between stuttering, depression, and suicidal ideation in young adults: accounting for gender differences. *Journal of Fluency Disorders*, 67, Article 105820.
- Bond, F. W., Hayes, S. C., Baer, R. A., Carpenter, K. M., Guenole, N., Orcutt, H. K., Waltz, T., & Zettle, R. D. (2011). Preliminary psychometric properties of the Acceptance and Action Questionnaire-II: a revised measure of psychological flexibility and experiential avoidance. *Behavior Therapy*, 42(4), 676–688.
- Boyle, M. P., Cheyney, M. R., & Rosen, A. L. (2023). Self-stigma of stuttering: Implications for communicative participation and mental health. *Journal of Speech, Language, and Hearing Research*, 66(9), 3328–3345.
- Cangi, M. E., & Erim, A. (2021). Comparison of children who do and do not stutter regarding dimensions of temperament, aspects of attention-deficit hyperactivity disorder and anxiety types. *Turkish Psychological Counseling and Guidance Journal*, 11(61), 263–279.
- Chaulagain, A., Lyhmann, I., Halmøy, A., Widding-Havneraas, T., Nytingnes, O., Bjelland, I., & Mykletun, A. (2023). A systematic meta-review of systematic reviews on attention deficit hyperactivity disorder. *European Psychiatry*, 66(1), Article e90.
- Craig, A., Blumgart, E., & Tran, Y. (2009). The impact of stuttering on the quality of life in adults who stutter. *Journal of Fluency Disorders*, 34, 61–71.
- Daly, D. A., & Cantrell, R. P. (2006). Cluttering: Characteristics labelled as diagnostically significant by 60 fluency experts. In *6th IFA World Congress on Disorders of Fluency, Dublin, Ireland*.
- Dennis, C.-L., Coghlan, M., & Vigod, S. (2013). Can we identify mothers at-risk for postpartum anxiety in the immediate postpartum period using the State-Trait Anxiety Inventory? *Journal of Affective Disorders*, 150(3), 1217–1220.
- Dozois, D. J. A., Dobson, K. S., & Ahnberg, J. L. (1998). A psychometric evaluation of the Beck Depression Inventory-II. *Psychological Assessment*, 10(2), 83–89.
- Eggers, K., De Nil, L. F., & Van den Bergh, B. R. (2012). The efficiency of attentional networks in children who stutter. *Journal of Speech, Language, and Hearing Research*, 55(4), 946–959.
- Eichorn, N., & Pirutinsky, S. (2021). Cognitive flexibility and effortful control in school-age children with and without stuttering disorders. *Journal of Speech, Language, and Hearing Research*, 64(3), 823–838.
- Engelen, M. M., Franken, M. C. J., Stipdonk, L. W., Horton, S. E., Jackson, V. E., Reilly, S., & Eising, E. (2024). The Association Between Stuttering Burden and Psychosocial Aspects of Life in Adults. *Journal of Speech, Language, and Hearing Research*, 67(5), 1385–1399.
- Ezrati-Vinacour, R., & Levin, I. (2004). The relationship between anxiety and stuttering: a multidimensional approach. *Journal of Fluency Disorders*, 29(2), 135–148.
- Franz, M., Popp, K., Schaefer, R., Sitte, W., Schneider, C., Hardt, J., Decker, O., & Braehler, E. (2008). Alexithymia in the German general population. *Social Psychiatry and Psychiatric Epidemiology*, 43(1), 54–62.
- Garnett, E. O., & St. Louis, K. O. (2014). *Verbal Time estimation in cluttering Contemporary Issues in Communication Science and Disorders*, 41(Fall), 196–209.
- Ghadampour, E., Nazarpour Samsami, P., Amraei, B., Padervand, H., & Soore, H. (2019). Compare cognitive flexibility, cognitive avoidance and alexithymia in male students with and without stuttering disorders. *Shenakht Journal of Psychology and Psychiatry*, 6(5), 41–54.
- Gierk, B., Kohlmann, S., Kroenke, K., Spangenberg, L., Zenger, M., Brähler, E., & Löwe, B. (2014). The Somatic Symptom Scale–8 (SSS-8): a brief measure of somatic symptom burden. *JAMA Internal Medicine*, 174(3), 399–407.
- Giuffre, L. A., & Scaler Scott, K. (2025). Life impact of cluttering: the adult perspective. *American Journal of Speech-Language Pathology*, 1–13.
- Góral-Pórola, J., Zielińska, J., Jastrzebowska, G., & Tarkowski, Z. (2016). Cluttering: Specific Communication Disorder. *Acta Neuropsychologica*, 14(1).
- Gosselin, E., & Ward, D. (2019). Attention performance in people who clutter: a pilot study. *Perspectives of the ASHA Special Interest Groups*, 4(6), 1581–1588.
- Hart, A. K., Breen, L. J., Hennessey, N. W., & Beilby, J. M. (2024). Evaluation of an integrated fluency and acceptance and commitment therapy intervention for adolescents and adults who stutter. *Journal of Speech, Language, and Hearing Research*, 1–17.

- Hayes, S. C., Luoma, J. B., Bond, F. W., Masuda, A., & Lillis, J. (2006). Acceptance and commitment therapy: model, processes and outcomes. *Behavior Therapy*, 37(1), 1–10.
- Icht, M., Zukerman, G., Zigdon, A., & Korn, L. (2023). There is more to cluttering than meets the eye: the prevalence of cluttering and association with psychological well-being indices in an undergraduate sample. *International Journal of Language Communication Disorders*, 58(6), 2022–2032.
- Iverach, L., O'Brian, S., Jones, M., Block, S., Lincoln, M., Harrison, E., & Onslow, M. (2009). Prevalence of anxiety disorders among adults seeking speech therapy for stuttering. *Journal of Anxiety Disorders*, 23(7), 928–934.
- Iverach, L., & Rapee, R. M. (2014). Social anxiety disorder and stuttering: current status and future directions. *Journal of Fluency Disorders*, 40, 69–82.
- Kashdan, T. B., & Rottenberg, J. (2010). Psychological flexibility as a fundamental aspect of health. *Clinical Psychology Review*, 30(7), 865–878.
- Kessler, R. C., Adler, L., Ames, M., Demler, O., Faraone, S., Hiripi, E., Howes, M. J., Jin, R., Secnik, K., Spencer, T., Ustun, T. B., & Walters, E. E. (2005). The World Health Organization Adult ADHD Self-Report Scale (ASRS): a short screening scale for use in the general population. *Psychological Medicine*, 35(2), 245–256.
- Kooiman, C. G., Spinhoven, P., & Trijsburg, R. W. (2002). The assessment of alexithymia: a critical review of the literature and a psychometric study of the Toronto Alexithymia Scale-20. *Journal of Psychosomatic Research*, 53(6), 1083–1090.
- Levav, I., Kohn, R., Goldberg, R., Laor, N., Zilka, D., & Ponizovsky, A. (2007). Common mental disorders and service utilization: a national Israeli study. *Israel Journal of Psychiatry and Related Sciences*, 44(4), 273–280.
- Lane, R. D., & Schwartz, G. E. (1987). Levels of emotional awareness: a cognitive-developmental theory and its application to psychopathology. *American Journal of Psychiatry*, 144(2), 133–143.
- Lane, R. D., Weihs, K. L., Herring, A., Hishaw, A., & Smith, R. (2015). Affective agnosia: Expansion of the alexithymia construct and a new opportunity to integrate and extend Freud's legacy. *Neuroscience Biobehavioral Reviews*, 55, 594–611.
- Lanouette, E. B. (2011). Intervention strategies for cluttering disorders. In D. Ward, & K. Scaler Scott (Eds.), *Cluttering: A Handbook of Research, Intervention and Education* (pp. 175–197). East Sussex: Psychology Press.
- Levant, R. F., Parent, M. C., Ling, S., & Borgogna, N. C. (2022). Variance composition, reliability, validity, and measurement invariance of the Toronto Alexithymia Scale-20 in nonclinical samples. *Psychology of Men Masculinities*, 23(1), 133.
- Livingstone-Pountney, J., & Mitrevski, E. (2019). Critical Review: Is there a relationship between stuttering and depression in disfluent adolescents and adults? *An electronic literature*, Western University.
- Louis, K. O. S., & Myers, F. L. (1995). Clinical management of cluttering. *Language, Speech, and Hearing Services in Schools*, 26(2), 187–195.
- Mama, Y., & Icht, M. (2019). Production effect in adults with ADHD with and without methylphenidate (MPH): vocalization improves verbal learning. *Journal of the International Neuropsychological Society*, 25(2), 230–235.
- Manor, I., Roitman, A., Weizman, A., & Kotler, M. (2012). Validation of the Hebrew version of the Adult ADHD Self-Report Scale (ASRS) in Israeli population samples. Presented at the ISRAEL Society for ADHD Research Conference, Tel Aviv, ISRAEL.
- Mennin, D. S., Holaway, R. M., Fresco, D. M., Moore, M. T., & Heimberg, R. G. (2005). Delineating components of emotion and its dysregulation in anxiety and mood psychopathology. *Behavior Therapy*, 36(2), 107–116.
- Mongia, M., Gupta, A. K., Vijay, A., & Sadhu, R. (2019). Management of stuttering using cognitive behavior therapy and mindfulness meditation. *Industrial Psychiatry Journal*, 28(1), 4–12.
- Myers, F. (2011). Treatment of cluttering: a cognitive-behavioral approach centered on rate control. In D. Ward, & K. Scaler Scott (Eds.), *Cluttering: A Handbook of Research, Intervention and Education* (pp. 152–174). East Sussex: Psychology Press.
- Myers, F. L. (2007). Primacy of self-awareness and the modulation of rate in the treatment of cluttering. *World Conference on Cluttering*, 108.
- Nemiah, J. C., Freyberger, H. J., & Sifneos, P. E. (1976). Alexithymia: a view of the psychosomatic process. In O. W. Hill (Ed.), *Modern Trends in Psychosomatic Medicine* (pp. 430–439). London, England: Butterworths.
- Op, 'T., & Hof, Y. (2009). *cluttering identified: Differential diagnostics between cluttering, stuttering and Speech impairment Related to Learning disability*. (<https://dspace.library.uu.nl/handle/1874/36694>).
- Parker, J. D. A., Taylor, G. J., & Bagby, R. M. (2003). The 20-Item Toronto Alexithymia Scale: III. Reliability and factorial validity in a community population. *Journal of Psychosomatic Research*, 55(3), 269–275.
- Paphiti, M., Jansson-Verkasalo, E., & Eggers, K. (2022). Complex response inhibition and cognitive flexibility in school-aged Cypriot-Greek-speaking children who stutter. *Frontiers in Psychology*, 13, Article 991138.
- Paphiti, M., Talias, M. A., & Eggers, K. (2024). Inhibitory control, cognitive flexibility, and the production of disfluencies in children who do and do not stutter. *American Journal of Speech-Language Pathology*, 33(3), 1420–1431.
- Polk, K. L., Schoendorff, B., Webster, M., & Olaz, F. O. (2016). *The Essential Guide to the ACT Matrix: A Step-by-Step Approach to using the ACT Matrix Model in Clinical Practice*. New Harbinger Publications.
- Reichel, I. K. (2010). Treating the person who clutters and stutters. In K. Bakker, L. Raphael, & F. Myers (Eds.), *Proceedings of the First World Conference on Cluttering* (pp. 99–108). Katarino, Bulgaria: International Cluttering Association.
- Reichel, I. K., Ademola-Sokoya, G., Bakhtiar, M., Barrett, H., Bona, J., Busto-Marolt, L., & Yasin, S. A. (2014). Frontiers of cluttering across continents: research, clinical practices, self-help, and professional preparation. *Perspectives on Global Issues in Communication Sciences and Related Disorders*, 4(2), 42–50.
- Reichel, I. K., & Bakker, K. (2009). Global landscape of cluttering. *Perspectives on Fluency and Fluency Disorders*, 19(2), 62–66.
- Reichel, I. K., & Draguns, J. G. (2011). International perspectives on perceiving, identifying, and managing cluttering. In D. Ward, & K. Scaler Scott (Eds.), *Cluttering: A handbook of Research, Intervention and Education* (pp. 263–279). Psychology Press.
- Reichel, I. K., & St. Louis, K. O. (2007). Mitigating negative stereotyping of stuttering in a fluency disorders class. *Research, Treatment, and self-Help in Fluency disorders: New Horizons*, 236–243.
- Ricciardi, L., Demartini, B., Fotopoulou, A., & Edwards, M. J. (2015). Alexithymia in neurological disease: a review. *The Journal of Neuropsychiatry and Clinical neurosciences*, 27(3), 179–187.
- Roelofs, J., van Breukelen, G., de Graaf, L. E., Beck, A. T., Arntz, A., & Huibers, M. J. H. (2013). Norms for the Beck Depression Inventory (BDI-II) in a large Dutch community sample. *Journal of Psychopathology and Behavioral Assessment*, 35(1), 93–98.
- Scaler Scott, K. (2017). Stuttering and cluttering. *Research in Clinical Pragmatics*, 471–490.
- Scaler Scott, K., Sønderud, H., & Reichel, I. (2022). Cluttering: etiology, symptomatology, identification, and treatment. In P. Zebrowski, J. Anderson, & E. Conture (Eds.), *Stuttering: Characteristics, Assessment, and Treatment* (4th ed.). New York, N.Y.: Thieme Medical Publishers.
- Sifneos, P. E. (1973). The prevalence of 'alexithymic' characteristics in psychosomatic patients. *Psychotherapy and Psychosomatics*, 22(2), 255–262.
- Siman-Tov, A., & Podlipsky, I. (2019). Preliminary application of the SSS-8 Hebrew translation in psychosomatic clinic populations. *Unpublished manuscript*, Tel HaShomer Medical Center.
- Solomon, Z., Mikulincer, M., & Hobfoll, S. E. (1988). Effects of social support and battle intensity on loneliness and breakdown during combat. *Journal of Personality and Social Psychology*, 55(3), 513–524.
- Spielberger, C. D., Gorsuch, R. L., Lushene, P. R., Vagg, P. R., & Jacobs, G. A. (1983). *Manual for the State-Trait Anxiety Inventory*. Consulting Psychologists Press.
- St. Louis, K. O., Coskun, M., Ozdemir, S., Topbas, S., Goranova, E., & Filatova, Y. (2007, May). Public attitudes toward cluttering and stuttering: USA, Turkey, Bulgaria, and Russia. *World Conference on Cluttering*, 190.
- St. Louis, K. O., Raphael, L. J., Myers, F. L., & Bakker, K. (2003). Cluttering updated. *The ASHA Leader*, 8(21), 4–22.
- St. Louis, K. O. S., & Schulte, K. (2011). Defining cluttering: the lowest common denominator. In D. Ward, & K. Scaler Scott (Eds.), *Cluttering: A Handbook of Research, Intervention and Education* (pp. 233–253). East Sussex: Psychology Press.
- Taylor, G. J., Bagby, R. M., & Parker, J. D. A. (1997). *Disorders of Affect Regulation: Alexithymia in Medical and Psychiatric Illness*. Cambridge University Press.
- Taylor, G. J., Bagby, R. M., & Parker, J. D. A. (2003). The 20-Item Toronto Alexithymia Scale IV: Reliability and factorial validity in different languages and cultures. *Journal of Psychosomatic Research*, 55(3), 277–283.

- Trevisan, D. A., Altschuler, M. R., Bagdasarov, A., Carlos, C., Duan, S., Hamo, E., & McPartland, J. C. (2021). The prevalence of alexithymia in autism spectrum disorder: a systematic review and meta-analysis. *European Psychiatry*, 64(1), Article e8.
- Tumanova, V., Woods, C., & Razza, R. (2020). The role of behavioral inhibition for conversational speech and language characteristics of preschool-age children who stutter. *American Journal of Speech-Language Pathology*, 29(2), 638–651.
- van Zaalen, Y., & Reichel, I. K. (2014). Cluttering treatment: theoretical considerations and intervention planning. *Perspectives on Global issues in Communication Sciences and Related Disorders*, 4(2), 57–62.
- van Zaalen, Y., & Strangis, D. (2022). An adolescent confronted with cluttering: the story of Johan. *Perspectives of the ASHA Special Interest Groups*, 7(5), 1357–1369.
- Ward, D. (2006). *Stuttering and Cluttering. Frameworks for Understanding and Treatment*. East Sussex: Psychology Press.
- Ward, D., St. Louis, K. O., Alhaidary, T., & Nothard, S. (2015). The neurological underpinnings of cluttering: some initial findings. *Clinical Linguistics Phonetics*, 29(5), 375–397.
- Zohar, A. H., & Mikulincer, M. (2004). Alexithymia and health behaviors in Israeli adults. *Israel Journal of Psychiatry and Related Sciences*, 41(1), 50–56.
- Zukerman, G., Maor, M., Reichard, T., & Ben-Itzhak, S. (2023). Does older mean flexible? Psychological flexibility and illness cognitions in chronic medical conditions—the moderating effect of age. *Psychology, Health Medicine*, 28(7), 1844–1860.
- Zukerman, G., Icht, M., Zigdon, A., & Korn, L. (2024). Self-efficacy's impact on well-being indices in students self-identifying with cluttering characteristics. *Journal of Communication Disorders*, 112, Article 106469.

Yasmin Horev Nahum is a licensed Speech-Language Pathologist with over seven years of clinical experience, specializing in fluency, articulation, voice, and oral-motor function. She is currently a doctoral candidate in Communication Disorders at Ariel University, where her research focuses on the emotional and cognitive dimensions of cluttering.

Dr. Gil Zukerman is a senior lecturer and clinical psychologist at Ariel University's Department of Communication Disorders. He holds a Ph.D. in Brain Sciences and specializes in cognitive-emotional functioning, attention, trauma, and fluency disorders. His research spans clinical psychology, psychophysiology, and communication disorders. Dr. Zukerman integrates his academic expertise with clinical practice, advancing interdisciplinary approaches to assessment and intervention.

Prof. Michal Icht is an associate professor and head of the Department of Communication Disorders at Ariel University, Israel. A licensed speech-language pathologist and audiologist, she specializes in fluency and voice disorders, speech intelligibility, and cognitive-emotional aspects of communication. Her interdisciplinary research integrates clinical practice with cognitive science, and she has published extensively on fluency, memory, emotional speech processing, and developmental disorders.