

Self-inefficacy's impact on well-being indices in students self-identifying with cluttering characteristics

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ABSTRACT

Introduction: Cluttering, a fluency disorder characterized by fast and irregular speech patterns, receives relatively limited research attention. Consequently, the association between cluttering and measures of well-being remains unexplored. In contrast, stuttering, another fluency disorder, has been associated with anxiety and depression. The present study examines whether an individual's experience of cluttering characteristics is related to alterations in both positive and negative measures of well-being. To achieve this, we assessed the relationship between Self-Identified Cluttering Characteristics (SICC) and measures of well-being in a sizeable sample of 1201 university students. Our main objective was to explore the potential impact of self-inefficacy on the association between SICC and well-being.

Methods: Consistent with prior research, participants identified themselves as having cluttering characteristics (SICC) or no-cluttering characteristics (SINCC) based on a verbal and written explanation of the disorder. They also completed questionnaires on psychological well-being indices and self-inefficacy.

Results: In total, 276 respondents identified themselves as having cluttering characteristics. In regression models, both SICC and self-inefficacy were predictive of greater negative well-being, increased depressive symptoms, and heightened psychosomatic symptoms. Interestingly, ADHD diagnosis was associated with less negative well-being. Positive well-being indicators (positive future orientation and subjective happiness) were solely predicted by self-inefficacy. Supporting these findings, supplementary regressions including only 56 SICC participants who reported being treated for cluttering yielded similar results. Utilizing Hayes's PROCESS computational procedures to test moderation revealed that self-inefficacy significantly moderated the association between SICC and negative well-being (depressive symptoms) as well as the association between SICC and positive well-being (positive future orientation).

Conclusions: The findings underscore alterations in well-being among individuals who identify themselves as experiencing cluttering characteristics. Primarily, heightened negative well-being was noted in those with SICC, yet individual self-inefficacy reports mitigated this effect. Overall, SICC exacerbates negative well-being rather than diminishing positive well-being. These findings point to the importance of integrating mental health assessment and intervention into clinical practice for individuals with cluttering symptoms and the potential benefits of interventions targeting self-inefficacy to improve overall well-being in this population.

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1. Introduction

Cluttering is a fluency disorder characterized by rapid and irregular speech (i.e., uneven pacing), poor speech organization, and articulation difficulties (St. Louis & Schulte, 2011). Cluttering often co-exists with stuttering (Bona, 2019; Myers et al., 2012), and may co-occur with other disorders, including autism without intellectual disability (Scaler Scott & Ward, 2008; Scott, 2017;) and attention deficit hyperactivity disorder (ADHD; Alm, 2011; Gosselin, & Ward, 2019; St. Louis, Myers, Bakker, & Raphael, 2007), leading to pragmatic difficulties related to social rules knowledge or impulse control. These co-occurring disorders can impact the individual's ability to engage effectively in social interactions, highlighting the importance of recognizing and addressing cluttering in the context of these additional challenges. Indeed, cluttering can significantly impact an individual's life; it has been proposed that those experiencing cluttering may exhibit similar emotional, behavioral, and cognitive reactions to individuals with stuttering, including communication avoidance, anxiety, and negative attitudes toward communication (Scaler Scott & St. Louis, 2011).

There's a scarcity of previous studies that have examined the prevalence of cluttering, and their findings are inconsistent. Research that employed validated instruments like the Predictive Cluttering Inventory (PCI; Daly, 2006), coupled with clinical assessments, or investigations relying on ICD-10 diagnoses from patients' medical records, typically report a prevalence rate ranging from 1% to 1.2 % in the general population (Sommer et al., 2021; van Zaalen & Riechel, 2017). Interestingly, several researchers argued that the PCI lacks both sensitivity and specificity for detecting possible cluttering, leading to modifications aimed at enhancing its sensitivity (van Zaalen, Wijnen, & Dejonckere, 2009). van Zaalen et al. (2009) suggested that the revised tool can aid clinicians in identifying possible cluttering symptoms and determine if further evaluation using another more in-depth battery is warranted.

Other studies have investigated individuals' ability to identify their own cluttering as an indirect approach to estimating prevalence. Utilizing self-identified cluttering frequently yields higher estimates, with reported rates of cluttering prevalence based on self-reports being 9 % among university students (Blanchet et al., 2015). In another study, cluttering prevalence varied across nations, ranging from 1.2 % in Russia to 9 % in Turkey (St. Louis et al., 2010).

One possible explanation for this variability is that while many individuals may not fully meet the diagnostic criteria for cluttering, they still exhibit symptoms to some extent, leading them to identify themselves as having cluttering tendencies or characteristics. This phenomenon is reminiscent of other conditions, such as Post Traumatic Stress Disorder (PTSD), where subclinical forms (those partially meeting PTSD criteria) are also linked with distress and functional impairment (Korte et al., 2016).

Another factor contributing to the variation in reported cluttering prevalence could stem from the general public's limited awareness of cluttering, potentially resulting in underreporting and underdiagnosis of the condition (Scaler Scott & St. Louis, 2011). Individuals may not perceive their cluttering behaviors in their daily lives but could recognize the condition when presented with a formal definition or context.

The current study is a follow-up to a previous study (Icht et al., 2023) using the same data. The primary goal of this study is to explore well-being indicators in individuals who self-identify as having cluttering characteristics (SICC). By utilizing self-identification criteria for cluttering symptoms, the research aims to include individuals who may not meet the full diagnostic criteria for cluttering as defined by professionals but still face challenges and difficulties associated with the condition. In a previous study (Icht et al., 2023), SICC was associated with mental distress. The current study aims to build on these findings by further investigating the specific impact of self-(in)efficacy on the positive and negative well-being indices in this population, providing deeper insights into the mechanisms that may mitigate or exacerbate the challenges faced by those who self-identified with clutterers characteristics. We acknowledge that relying solely on self-reports may lead to inflated prevalence estimates (e.g., Blanchet et al., 2015); however, this approach allows us to gain insights into the potential mental health challenges faced by individuals who perceive themselves to have cluttering symptoms/characteristics.

1.1. Fluency disorders and psychological well-being

Psychological well-being encompasses various dimensions that reflect the subjective elements of one's quality of life. These dimensions include positive psychological states like life satisfaction, positive emotions, self-fulfillment, and optimal psychological performance, along with negative indicators such as distress and negative emotions (Diener et al., 2017; Karademas, 2007).

Little is known about well-being among people with cluttering (Scaler Scott & St. Louis, 2011), though some researchers suggest that overall well-being is lower among individuals with speech disorders (Wren et al., 2023). Recently, in a preliminary study for the current research (using the same data set), a large sample of undergraduates completed a questionnaire with a lay definition of cluttering and identified themselves as exhibiting cluttering characteristics (SICC; Icht et al., 2023). SICC was linked to lower psychological well-being, evidenced by higher levels of psychosomatic symptoms, depressive symptoms, and stress, along with lower self-esteem and subjective happiness relative to self-identification as not having cluttering symptoms. Thus, it appears that the subjective feeling of cluttering symptoms/characteristics may affect emotional and social functioning in various aspects of everyday life. These findings prompted the current study.

Of note, while cluttering's impact on well-being has received minimal attention, the link between stuttering and well-being is extensively researched. Studies consistently associate stuttering with increased stress (Dits, 2014) and anxiety levels (Iverach et al., 2011). Furthermore, individuals who stutter exhibit higher levels of trait and social anxiety (Alm & Risberg, 2007; Mulcahy et al., 2008) alongside reduced quality of life (Craig et al., 2009; Craig et al., 2011).

An important factor related to cluttering and well-being may be the individual's *self-efficacy* (Carter et al., 2019; Craig et al., 2009). Following Bandura's social cognitive theory, self-efficacy was conceptualized as the individual's confidence in their abilities to successfully execute actions and command self-change (Bandura, 1977; Boyle, 2018). In stuttering, which was associated with lower

levels of well-being (Boyle, 2013; Türkili, Türkili, & Aydın, 2022), self-efficacy was found to be a robust predictor of higher quality of life (Carter et al., 2017) as well as a predictor of communicative participation (Boyle, Beita-Ell, Milewski, & Fearon, 2018). A greater sense of self-efficacy was found to distinguish between people with stuttering with low levels of psychopathology versus people with stuttering with high levels of psychopathology, leading the authors to suggest that self-efficacy constitutes a protecting factor against the adversity of chronic stuttering (Craig et al., 2011). Self-inefficacy (i.e., low self-efficacy) may lead to avoidance, hindering daily interactions, while high self-efficacy mitigates avoidance, safeguarding communication abilities (Carter et al., 2017).

1.2. The current study

Experiencing symptoms of a fluency disorder like cluttering could influence overall well-being. Yet, studies indicate that personal factors such as perceived self-efficacy might moderate this impact. Previous studies on stuttering have highlighted associations with increased stress, anxiety, and reduced quality of life, and self-efficacy, providing a valuable foundation for investigating these factors in individuals with cluttering characteristics. Although cluttering and stuttering are distinct fluency disorders with different speech disruption patterns and awareness levels, they both significantly impact communication and psychological well-being. The current study aims to investigate the relationships between an individual's perception of experiencing (currently or in the past) noticeable fluency difficulties associated with cluttering (SICC), self-inefficacy, and well-being. Given previous research linking language impairments to heightened susceptibility to certain concurrent conditions, particularly attention deficits (Ofoe et al., 2018; Redmonda, 2016; Singer et al., 2020) and Autism (Scaler Scott et al., 2014), we also examined the impact of ADHD and Autism diagnoses on well-being indices.

We suggest that individuals self-identifying as having cluttering characteristics may experience reduced positive well-being and heightened negative well-being compared to their peers, and that self-inefficacy would moderate these relationships. Considering the low public awareness of cluttering, employing self-identification allows us to include individuals experiencing fluency difficulties attributable to cluttering, even if they do not meet the formal diagnostic criteria for the condition. This approach allows for the recruitment of a sizable study cohort (for a similar procedure, see: Icht et al., 2023; St. Louis et al., 2010).

Table 1
Demographic data.

Variable	Self-identified no-cluttering characteristics (SINCC)	Self-identified cluttering characteristics (SICC)
Mean Age (SD)*	25.73 (5.26)	25.01 (3.25)
Gender*		
Female	492	124
Male	433	152
Total		
Mother educational level *		
High school	315	101
Some College	35	6
Bachelor's	251	71
Master's or higher	276	84
Income level		
Below average	149	59
Average	366	106
Above average	389	103
ADHD diagnosis**		
Yes	178	96
No	657	153
Did not answer	90	27
Autism diagnosis		
Yes	4	2
No	819	234
Did not answer	102	40
Methylphenidate/Amphetamine**		
Yes	210	107
No	597	125
Did not answer	118*	44
SLP therapy for cluttering**		
Yes	0	56
No	0	207
Did not answered	925	13
Faculty**		
Faculty of health sciences	314	81
Medical school	44	6
Faculty of engineering	179	80
Faculty of social sciences	245	58
Faculty of natural sciences	109	45

* $p < .05$

** $p < .01$

2. Method

This study was conducted in Ariel University (Israel) as part of a broader research project exploring undergraduates' emotional, social, and physical well-being, using data from a structured, anonymous questionnaire (Jessor's personal and social development survey at Colorado University; Jessor, Turbin, & Costa, 2003). IRB approval was received from the institutional ethics committee.

2.1. Participants

Participants were 1201 Israeli undergraduates, Hebrew-speaking (Mean age = 25.56 years, SD = 4.90 years, 51.2 % females; Note, due to unbalanced gender distribution in the sample, weighting procedures for gender were applied to match a gender ratio of 50–50, using IBM statistics SPSS-25). Commuter (off-campus) students from various faculties in Ariel University, a medium-sized public university, participated (the School of Health Sciences, the School of Medicine, the School of Communication, the Faculty of Engineering, the Faculty of Social Sciences and Humanities, and the Faculty of Natural Sciences).

2.2. Self-identification of cluttering characteristics

All participants were presented with a lay definition of cluttering: "Cluttering is a speech problem in which a person's speech is either too fast, too jerky, or both. Most people who clutter seem to run their words or sentences together, and they often have many more fillers, hesitations, revisions, or other breaks in their speech than normal speakers do. Their speech sounds "cluttered" as though they do not have a clear idea of what they want to say, and they are often not aware that they have a speech problem" (St. Louis et al., 2010). This original English definition was translated into Hebrew by a bilingual speech-language pathologist (SLP) and reviewed by three additional bilingual experts. The Hebrew version was then back-translated into English by an independent translator, and discrepancies were resolved by comparing it to the original. To validate the translated definition, five Hebrew-speaking SLPs reviewed it for clarity and comprehensibility. Based on their feedback, minor adjustments were made to enhance precision and readability.

Then, participants were requested to specify whether they currently identify themselves as experiencing cluttering symptoms/characteristics or have experienced them in the past (1. No; 2. Yes). Note, that research on recovery from childhood or adolescent cluttering is limited, but literature shows high spontaneous recovery rates from stuttering (e.g., Sheehan & Martyn, 1966). To avoid missing cases of recovery, we included the phrase "in the past" in the self-identification question for cluttering characteristics. In case participants answered positively, they were asked to indicate at which age cluttering characteristics occurred, and whether or not they were treated for cluttering by a Speech Language Pathologist (SLP; 1. I have never had a cluttering problem; 2. I am not being treated and have not been treated by a SLP for cluttering; 3. Yes, I was treated/I am currently being treated by a SLP for cluttering). Student demographics are depicted in Table 1.

2.3. Procedure

The survey questionnaires were administered online (between May 2022 to June 2022). A research assistant entered the classes during lessons within the academic curriculum, explained the study and its goals, and offered participation. The questionnaires were to be completed in the last ten minutes of the lesson. Students who gave their written consent were informed that they were not obligated to participate or answer all questions and received a link to the web-based questionnaire (using the Qualtrics platform). They could complete the survey on their mobile phones, personal computers, or tablets, and a printed version was also available on demand.

2.4. Research variables

2.4.1. Self-efficacy

Five items (taken from Jessor et al., 2003) were used to tap self-efficacy. Participants were asked to evaluate their ability to get along with other people, their ability to make important decisions regarding their lives, cope with disappointment and failure, be competent in academic challenges, and their overall content with themselves. Since higher scores in this measure indicate a lower sense of self-efficacy, the current measure is referred to as "Self-Inefficacy". An acceptable level of internal consistency for the self-inefficacy items was found (α = 0.70).

Negative well-being indices.

2.4.2. Depression

Four items taken from the Beck Depression Inventory-II (Beck et al., 1996) were used. The BDI-II is a widely used 21-item tool to assess depression; high reliability and validity were reported before (Beck et al., 1996). An acceptable level of internal consistency for the 4 items used in this study was observed (α = 0.73). According to previous research (Karademas, 2007), depression served as a measure for assessing negative aspects of well-being.

2.4.3. Psychosomatic symptoms (Ravens-Sieberer et al., 2008)

Eight items measuring the daily frequency of Psychosomatic symptoms (e.g., headache, stomachache, nervousness) were used. These items were taken from the Health Behavior in School-aged Children (HBSC) symptom checklist and were utilized in previous research to examine psychosomatic symptoms among adolescents and adults (Ravens-Sieberer et al., 2008; Zukerman et al., 2017).

High internal consistency for the psychosomatic item was observed ($\alpha = 0.85$). Psychosomatic Symptoms were associated with depression (Giannotta et al., 2022) and were used as an indicator of negative well-being.

Positive well-being indices.

2.4.4. Subjective happiness scale (SHS, Lyubomirsky et al., 2005)

This tool was developed to assess global and enduring aspects of subjective happiness (Lyubomirsky et al., 2005; Parackal, 2015). A pair of seven-point Likert scale items tap the individual's extent of happiness in general and in comparison to others, while an additional two items describe happy/unhappy people and ask the respondents to state to what extent these descriptions fit them ($\alpha = 0.70$ for the subjective happiness items in the study sample). Subjective Happiness, representing positive affect, was used as a positive aspect of well-being components (Karademas, 2007).

2.4.5. Positive future orientation

Six items on a five-point Likert scale were used to examine the individual's positive future orientation. Participants were asked to rate the odds for positive outcomes in their future ("you will successfully graduate from the university", "you will have a fulfilling vocation"). These items were adapted from Jessor's personal and social development survey at Colorado University (Jessor, Turbin, & Costa, 2003). Positive future orientation was conceptualized as comprising cognitive (amount of thought about the future) and affective components referring to the sense of control regarding future outcomes (Trommsdorff, 1983). This construct has also been associated with health and well-being (Fakkel et al., 2023). The internal consistency of the six items used in this study was high ($\alpha = 0.82$). Positive future orientation was used as an index of positive well-being (Karamdemas, 2007).

2.4.6. Attentional deficit hyperactivity disorder (ADHD) diagnosis

Participants were requested to indicate whether they had ever been diagnosed with ADHD by a physician in the past (yes/no).

2.4.7. Use of methylphenidate or amphetamine

Participants were requested to indicate whether they ever used prescribed Methylphenidate or Amphetamine (yes/no).

2.4.8. Autism spectrum disorder (ASD) diagnosis

Participants were requested to indicate whether they had ever been diagnosed with Autism by a physician in the past (yes/no).

2.4.9. Additional factors

Participants were also asked to indicate if they had been diagnosed with conditions such as diabetes, arthritis, asthma, or any other disability. The incidence of these conditions among SICC participants was very low (ranging from 1 %–4 %). Chi-square analyses revealed no significant differences between SICC and SINCC, so no further analysis of these factors was conducted, and they were not included in the following Results or Discussion sections.

2.5. Data analysis

Analyses were conducted using IBM SPSS Statistics for Windows, Version 22.0. Armonk, NY: IBM Corp. Cronbach's Alpha was used to evaluate Internal consistency. Independent *t*-tests and chi-square analyses were used to evaluate group differences (SICC vs. SINCC) in demographic variables. All the study's outcome variables were evaluated for normality in accordance with Kim (2013). Four linear regression analyses were conducted to test the contribution of SICC/SINCC and self-inefficacy to the variance in well-being outcomes. Gender and Age were entered in the first step. SICC/SINCC and Self-inefficacy were entered in the second step, as well as the diagnosis of ADHD, the use of Methylphenidate/ Amphetamine, and the diagnosis of Autism as control variables. The interaction of SICC/SINCC and self-inefficacy was entered in a stepwise manner (to ascertain that only significant interaction would be included in the regression equation), in the third step. Outcomes were levels of depression, subjective happiness, positive future orientation, and psychosomatic symptoms, respectively. Analyses were conducted following Dawson (2014). The moderation effect of Self-inefficacy on the association between cluttering characteristics and well-being indices was conducted using the PROCESS 4.1 computational procedures (Hayes, 2022; Hayes & Matthes, 2009). Hayes' moderation analysis is a statistical technique used to examine how the relationship between two variables changes at different levels of a third variable (the moderator). It helps determine if the effect of an independent variable on a dependent variable varies depending on the moderator's value. This method is often used in social sciences to explore complex interactions between variables.

To further substantiate our findings, regression analyses were carried out twice. Initially, the analyses encompassed the entire participant sample, individuals who either self-identified as having cluttering characteristics (SICC) or no-cluttering characteristics (SINCC). Subsequently, we narrowed the focus to compare a subset of 56 participants who self-identified as having cluttering characteristics and reported receiving speech therapy for cluttering (SICC+SLP), with the SINCC participants. These subsequent analyses excluded SICC individuals who did not report undergoing SLP therapy. The results of these subsequent analyses are detailed in Appendix A. Remarkably, both sets of analyses yielded similar results, affirming the earlier analyses and the impact of SICC and self-inefficacy on well-being. Consequently, the results encompassing the entire sample are presented in the following Results section.

Table 2

Linear regression analysis of outcome variables.

Outcome variable		B	SE	β	R^2	ΔR^2
Depressive symptoms (BDI-II)	Step 1				.00	.00
	Gender	-0.01	.02	-0.02		
	Age	-0.02	.01	-0.06		
	Step 2				.29**	.30**
	Gender	-0.03	.01	-0.04		
	Age	-0.00	.00	-0.02		
	SICC/SINCC	.07	.02	.10		
	Self-Inefficacy **	.16	.00	.49		
	ADHD diagnosis*	-0.05	.02	-0.07		
	Autism diagnosis	-0.10	.10	-0.02		
	Methylphenidate/Amphetamine	.02	.02	.03		
	Step 3				.006*	.30**
	Gender	-0.02	.01	-0.04		
	Age	-0.00	.00	-0.02		
	SICC/SINCC **	.06	.02	.07		
	Self-Inefficacy**	.08	.02	.26		
	SICC/SINCC * Self-Inefficacy **	.06	.02	.24		
	ADHD diagnosis*	-0.05	.02	-0.07		
	Autism diagnosis	-0.08	.10	-0.02		
	Methylphenidate/Amphetamine	.02	.02	.03		
PFO	Step 1				.00	.00
	Gender	.17	.24	.04		
	Age	.01	.13	.00		
	Step 2				.23**	.23**
	Gender	.2	.13	.06		
	Age	-0.11	.11	-0.03		
	SICC/SINCC	.02	.27	.00		
	Self-Inefficacy **	-1.66	.11	-0.482		
	ADHD diagnosis	.43	.31	.05		
	Autism diagnosis	.66	1.26	.01		
	Methylphenidate/Amphetamine	.13	.29	.01		
	Step 3				.005*	.24**
	Gender	.38	.22	.05		
	Age	-1.06	.11	-0.02		
	SICC/SINCC	.22	.28	.02		
	Self-Inefficacy**	-0.90	.34	-0.26		
	SICC/SINCCX Self-Inefficacy *	-0.63	.26	-0.24		
	ADHD diagnosis	.42	.31	.05		
	Autism diagnosis	.44	1.26	.01		
	Methylphenidate/Amphetamine	.13	.29	.01		
Subjective happiness	Step 1				.01	.01*
	Gender *	.85	.34	.09		
	Age	.24	.18	.05		
	Step 2				.27**	.28**
	Sex**	1.13	.29	.12		
	Age	.08	.16	.01		
	SICC/SINCC	-0.51	.36	-0.04		
	Self-Inefficacy**	-2.30	.15	-0.51		
	ADHD diagnosis	.06	.43	.00		
	Autism diagnosis	.03	2.23	.00		
Psychosomatic symptoms	Methylphenidate/Amphetamine	.05	.40	.00		
	Step 1				.11**	.11**
	Gender **	4.44	.44	.31		
	Age	-0.50	.23	-0.06		
	Step 2				.17**	.29**
	Gender **	4.27	.40	.03		
	Age	-0.27	.21	-0.03		
	SICC/SINCC	1.98	.49	.11		
	Self-Inefficacy **	2.44	.20	.34		
	ADHD diagnosis*	-1.29	.50	-0.07		
	Autism diagnosis	3.10	2.36	.03		
	Methylphenidate/Amphetamine*	1.27	.53	.07		

Note. BDI II – Back Depression Inventory-II; PFO – Positive Future orientation; SICC – Self-Identified Cluttering Characteristics; SINCC - Self-Identified No Cluttering Characteristics

* $p < .05$

** $p < .01$

3. Results

Out of the entire sample (1201), 276 participants (22.98 %) self-identified as having cluttering characteristics (SICC). Among those, 56 (20.2 %) reported being treated by an SLP for cluttering (SICC+SLP; see Table 1). Significant group differences were found in Age, $t(729.48) = 2.70, p < .001$, the distribution of Sex, $\chi^2(1, 1201) = 5.80, p < .00$, ADHD diagnosis, $\chi^2(1, 1084) = 0.17, p < .00$, use of Methylphenidate/ Amphetamine, $\chi^2(1, 1039) = 34.33, p < .00$, reporting on speech therapy for cluttering, $\chi^2(2, 1202) = 124.23, p < .00$, and Faculty, $\chi^2(5, 1161) = 19.63, p < .00$.

As a first step, to achieve normal distribution, BDI-II scores (depression) were square-root transformed (Hamasha et al., 2022). All other study outcomes were normally distributed (Kim, 2013). No multicollinearity was observed between the study's independent variables (all VIF < 2.0).

As a second step, four regression analyses were conducted for each outcome variable. The results of these analyses are presented in Table 2. Reviewing Table 2 reveals the following findings: The first regression analysis for depression (negative well-being) indicated a significant model, predicting 30% of the variance in BDI-II score; SICC, Self-Inefficacy, and the interaction of SICC and Self-Inefficacy were associated with reporting more depressive symptoms, while ADHD diagnosis was associated with reporting lower depressive symptoms.

The second regression analysis for Positive Future Orientation (positive well-being) indicated a significant model, predicting 24 % in the variance in this variable; Self-Inefficacy and the interaction of SICC with Self-Inefficacy were associated with lower Positive Future Orientation.

The third regression analysis for Subjective Happiness (positive well-being) accounted for 28 % of the variance in this variable; female gender was associated with more Subjective Happiness, while Self-Inefficacy was associated with less Subjective Happiness.

Finally, the results of the fourth regression analysis, for Psychosomatic Symptoms (negative well-being), yielded 29 % of the variance in this variable; female gender, SICC, and Self-Inefficacy significantly predicted more Psychosomatic symptoms while ADHD diagnosis was associated with reporting less psychosomatic symptoms.

Next, Hayes's process regression procedure was used to assess the moderation effects of Self-Inefficacy on the association between SICC and positive/negative well-being indices. This analysis indicated the following findings: (a) a significant ($p < .001$) moderation of Self-Inefficacy on the effect of SICC on depression reporting (BDI-II scores) was evident. Self-Inefficacy was associated with a higher effect of SICC on depressive symptoms (see Fig. 1, plots are presented per the results of the moderation analysis), and (b) a significant moderation ($p < .001$) of Self-Inefficacy on the effect of SICC on Positive Future Orientation was also observed. Self-Inefficacy was associated with a higher effect of SICC on Positive Future Orientation (See Fig. 2, plots are presented per the results of the moderation analysis).

4. Discussion

This study examined the impact of self-identified cluttering characteristics (SICC), which represents an individual's subjective perception of this relatively unfamiliar fluency difficulty, on their well-being, encompassing diverse aspects of quality of life (Diener et al., 2017). The literature posits that experiencing fluency disorders like stuttering or cluttering can hinder effective communication, potentially impacting social interactions and relationships, thus leading to feelings of isolation, loneliness, increased levels of anxiety in the social context, and depression (Briley et al., 2021; Giuffre, 2022; Logan, 2020; Menzies et al., 2009; Reichel, 2010; Ward, 2008). The current study's findings align with - and contribute to - previous research and indicate that changes in well-being are noticeable

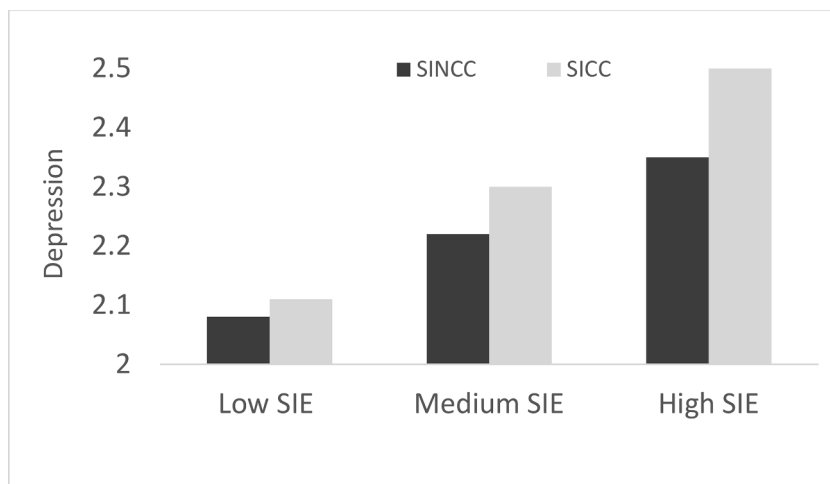


Fig. 1. The association of group affiliation (SIC - Self-Identified Cluttering Characteristics, vs. SINCC - Self-Identified No-Cluttering Characteristics) and depressive symptoms as a function of Self-Inefficacy (SIE). Medium SIE= mean SIE values; Low SIE $\leq$ mean-1SD, and High SIE $\geq$ mean + 1SD.

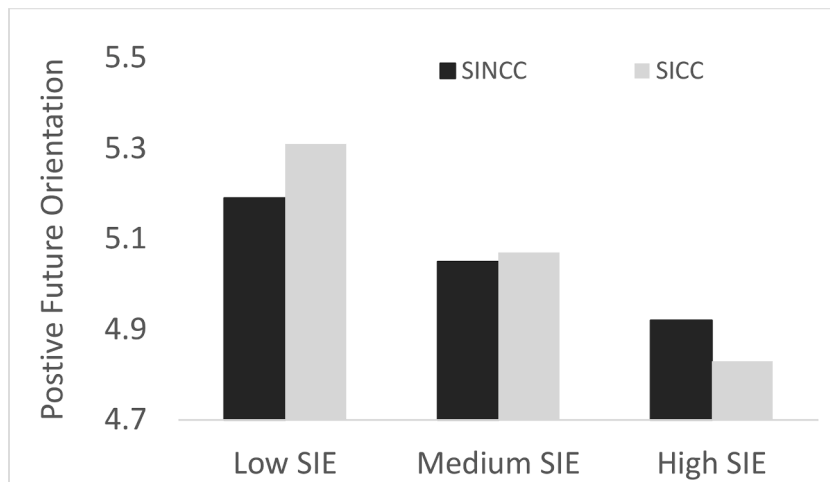


Fig. 2. The association of group affiliation (SICC - Self-Identified Cluttering Characteristics, vs. SINCC - Self-Identified No-Cluttering Characteristics) and Positive Future Orientation as a function of Self-Efficacy (SIE). Medium SIE = mean SIE values; Low SIE $\leq$ mean - 1SD, and High SIE $\geq$ mean + 1SD.

among individuals who identify themselves as having cluttering characteristics. SICC was found to be significantly linked to increased depressive symptoms, heightened psychosomatic symptoms, and diminished positive future orientation.

4.1. The moderating effects of self-inefficacy on well-being indices

The current findings highlight the impact of self-inefficacy that significantly predicted both negative well-being indices (i.e., depressive and psychosomatic symptoms) and positive well-being indices (i.e., positive future orientation, subjective happiness). Self-efficacy, Bandura's construct representing the individual's perception regarding one's ability to accomplish goals when in the face of adversity (Bandura, 1977), has been previously associated with well-being in various academic and vocational settings (Milam et al., 2019; Wang et al., 2022). Self-efficacy has also been linked to well-being among individuals with chronic medical conditions (Barlow et al., 2002; Chen et al., 2022; Selzler et al., 2020; White et al., 2019) and those with mental health diagnoses (Rippon et al., 2022). In the current study, self-efficacy was measured inversely as self-inefficacy, with higher self-inefficacy scores indicating lower self-efficacy.

Our findings stress the role of self-inefficacy in moderating the relationship between SICC and well-being, aligning with our hypothesis. While participants in the SICC group exhibited increased depressive symptoms and a more pessimistic outlook on the future (lower positive future orientation), these impacts were more pronounced among those with higher self-inefficacy. Consequently, self-inefficacy was identified as a vulnerability factor, mitigating the negative effects of SICC on well-being indices.

Various conceptual frameworks have been used to elucidate the moderating effects of self-inefficacy. According to social cognitive theory, self-inefficacy (lower self-efficacy) could lead to feelings of depression due to a misalignment between aspirations and perceived capabilities (Bandura et al., 1999). Consequently, it is plausible that SICC participants felt hindered by this impediment in achieving their potential across academic, vocational, and social domains. This mechanism could also account for their pessimistic outlook on the future (low positive future orientation).

Another perspective, drawn from studies in the field of stuttering, suggests that higher self-efficacy might mitigate the adverse effects of speech difficulties by fostering a sense of mastery and facilitating more effective coping with life challenges (Craig et al., 2011). Alternatively, it could amplify the impact of motivational factors, such as social support, on indices of well-being (Al-Dwaikat et al., 2021; Liu et al., 2018; Rippon et al., 2022). It is possible that among SICC participants, self-inefficacy diminished the positive impact of these factors. Future studies should examine these hypotheses.

In this study, self-inefficacy showed a direct association with all aspects of well-being, encompassing both positive and negative dimensions, whereas SICC was directly linked solely to negative well-being outcomes. Although negative and positive well-being indices are typically viewed as components of a cohesive construct representing optimal psychological functioning (Ryan & Deci, 2001), there seems to be a degree of autonomy between these aspects (Huppert & Whittington, 2003; Karademas, 2007). Hence, it appears that SICC primarily exacerbates negative well-being rather than diminishing positive well-being.

4.2. Self-identification of cluttering characteristics and ADHD diagnoses

Compared to individuals who self-identified as having no-cluttering characteristics (SINCC), SICC reported more ADHD diagnoses. This finding corroborates previous studies indicating attentional difficulties among those with fluency disorders and language impairments (Ofuo et al., 2018; Redmonda, 2016; Singer et al., 2020). Interestingly, and in contrast to prior studies (e.g., Wu et al., 2021),

ADHD diagnosis was associated with fewer depressive symptoms and fewer psychosomatic complaints. One possible explanation is that being aware of an ADHD diagnosis could enhance acceptance of one's challenges, including speech impediments, ultimately improving indices of well-being. Further research is needed to validate this finding.

4.3. Evaluating self-identification in cluttering research: benefits and limitations

In this pioneering study, self-identification criteria for cluttering characteristics were employed, targeting individuals experiencing challenges akin to cluttering. Assessing participants through self-identification may provide information on individuals who do not necessarily meet full diagnostic criteria as defined by professionals but experience sustainable distress due to cluttering. Significantly, self-identification has gained popularity recently and has been linked to behavior that involves seeking assistance for various problems, particularly in the case of self-identified mental disorders (Evans-Lacko et al., 2019; Narendorf et al., 2023).

Since cluttering characteristics were determined by self-identification, the current findings primarily pertain to subjective self-perceptions among students, rather than diagnosed cases of cluttering. However, the consistent findings across both regression analyses, one involving the entire sample (as outlined in the Results section) and the other conducted with SICC+SLP and SINCC participants (detailed in Appendix A), provide additional support for the accuracy of this study's portrayal of well-being alterations among individuals with cluttering. More studies conducted with formally diagnosed clutterers are needed to validate these findings.

4.4. Caveats and future directions

Using self-identification questionnaires, while common in psychological and medical research, has inherent limitations, including the potential for both under- and overestimation. Despite these limitations, self-report measures are widely used due to their practicality, especially in large-scale studies like the current one. To minimize misidentification as much as possible, we emphasized clarity in the written descriptions of cluttering characteristics. The similarity between the overall sample results and those who reported specifically being treated by SLPs for cluttering suggests that our findings are relevant to individuals diagnosed with cluttering.

Given the high co-occurrence of stuttering and cluttering (e.g., Bona, 2019; Myers et al., 2012), it is plausible that some participants may have experienced both disorders. However, given the familiarity of stuttering within the general population (Van Borsel, Verniers & Bouvry, 1999), we believe that self-identification among undergraduates, a group that may be more aware of their speech patterns due to the academic environment, is likely to be accurate. The overall sample may include individuals with cluttering symptoms that do not meet formal diagnostic criteria (as well as those with other related fluency disorders, such as stuttering). We recommend future research to include more detailed assessments and more objective diagnostic criteria to differentiate between cluttering and stuttering more accurately.

Our findings on well-being measures might reflect broader processes and a general tendency among those with fluency disorders. Recent studies on large populations of children and adolescents indicate that speech and language impairments are positively associated with higher rates of anxiety and depressive disorders (Lee et al., 2020; Wren et al., 2023). These findings imply that dealing with speech and fluency impairments, regardless of the specific diagnosis, leads to reduced well-being. Future studies should also consider including language background as a control variable to address the co-occurrence of cluttering and other speech and language difficulties (e.g., articulation, voice) as a potential confound. Note, however, that our sample comprised university students, a relatively educated sample likely to understand the distinctions between different speech disorders.

Well-being indices were also gauged using self-report questionnaires, and for some indices, shortened versions of commonly used tools were used (yet all demonstrating appropriate internal consistency). Finally, note that while the regression well-being models indicated a substantial overall contribution to the variance in well-being indices (24 % to 30 %), the interaction of SICC and self-inefficacy usually added a relatively modest (though significant) addition to the overall explained variance.

We endeavored to statistically control for confounding variables, including ADHD/Autism diagnoses and Methylphenidate use. Nevertheless, the potential influence of other unexamined confounding factors cannot be excluded. Future research is recommended to investigate the impact of additional variables on the well-being of individuals with cluttering.

4.5. Summary and clinical implications

Our findings highlight the importance of considering self-inefficacy in individuals with cluttering characteristics and its impact on well-being. While the findings of this study were derived from a sample of university students who identified themselves as experiencing cluttering symptoms, they could hold significant implications for individuals clinically diagnosed with cluttering, particularly concerning the moderating effects of self-inefficacy on the adverse impact of cluttering on well-being.

The primary objective of this study was to assess well-being indices among SICC participants. The congruence between the overall sample results and those specifically treated by SLP for cluttering suggests that our findings are pertinent to individuals diagnosed with cluttering. The overall sample may encompass individuals exhibiting cluttering symptoms that do not meet formal diagnostic criteria, as well as those with other related fluency disorders, such as stuttering. Our results on well-being measures may reflect broader processes and general tendencies among individuals with fluency disorders. Recent studies involving large cohorts of children and adolescents have shown that speech and language impairments are positively correlated with elevated rates of anxiety and depressive disorders (Lee et al., 2019; Wren et al., 2022). These findings imply that managing speech and fluency impairments, irrespective of the specific diagnosis, is associated with diminished well-being.

We advocate for integrating mental health assessments and interventions in clinical practice for individuals with cluttering

symptoms and cluttering. In stuttering research, a related fluency disorder, self-efficacy has emerged as a crucial factor that can enhance treatment outcomes and bolster the individual's resilience (Bray et al., 2003; Craig et al., 2011; Langevin et al., 2006). Therefore, the present results, which indicate a potential link between cluttering symptoms and diminished well-being, imply the positive impact of interventions designed to bolster self-efficacy (or reduce self-inefficacy) among individuals experiencing cluttering.

Given their preliminary nature, these findings warrant validation in future research endeavors. If confirmed, the incorporation of interventions aimed at enhancing self-efficacy (e.g., those derived from the cognitive-behavioral paradigm targeting self-efficacy; Carter et al., 2019; Freud, Zukerman, & Icht, 2021) alongside conventional cluttering therapies (such as techniques facilitating speech rate regulation, like increased pausing; Scaler Scott & Ward, 2013) should be considered.

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Data availability

Data will be made available on request.

CRedit authorship contribution statement

Gil Zukerman: Writing – original draft. **Michal Icht:** Writing – review & editing. **Avi Zigdon:** Data curation. **Liat Korn:** Formal analysis, Data curation.

Declaration of competing interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

Supplementary materials

Supplementary material associated with this article can be found, in the online version, at [doi:10.1016/j.jcomdis.2024.106469](https://doi.org/10.1016/j.jcomdis.2024.106469).

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