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Charles Darwin University

## Behind the mask

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## RESEARCH REPORT

# Behind the mask: Stuttering, anxiety, and communication dynamics in the era of COVID-19

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## Abstract

**Background:** While wearing masks during the pandemic poses communication and social challenges for people in everyday life, those with social anxiety might find them plausible, aligning with contemporary cognitive theories. Social anxiety involves fearing negative assessments and holding a negative self-image. Concealing anxiety symptoms during mask use may contribute to a more positive self-perception.

**Aims:** Given that up to 60% of adults seeking stuttering treatment also meet criteria for social anxiety disorder, this study aims to investigate the complex relationship between communication freedom, self-perceived stuttering and anxiety in adults who stutter (AWS). The unique context of mandatory mask-wearing during the pandemic provides an opportunity to explore these dynamics and understand the conflicting relationships between stuttering, anxiety-related safety behaviours and the need for open communication in AWS.

**Methods and Procedures:** Twenty AWS participated in interviews, responding to open-ended questions to elucidate their affective, cognitive and behavioural experiences while wearing masks during the COVID-19 pandemic. Thematic analysis was used to identify the emerging themes and subthemes based on information-rich quotes, employing a six-phase recursive process. Various speech and anxiety-related measures were used to describe the characteristics of the study participants.

**Outcomes and Results:** Three main themes and sub-themes emerged. The first theme highlights communication challenges for AWS wearing masks, impacting verbal and nonverbal interactions. The second theme reveals AWS wearing masks to conceal stuttering cues, experiencing reduced stress. The third theme indicates that, despite the comfort in concealment, most AWS prefer speaking freely without a face mask.

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**Conclusions and Implications:** The conflict between the desire for authentic, fluent communication and the ease of hiding stuttering symptoms poses a major dilemma for AWS. According to the results of this study, most adults who stutter prioritize open communication. However, there were some individual differences. A major factor influencing their decision was their fear of negative evaluation.

#### KEYWORDS

anxiety, face masks, fear of negative evaluation, social anxiety, stuttering

#### WHAT THIS PAPER ADDS

*What is already known on the subject*

- The prevalence of social anxiety is higher among adults who stutter (AWS), possibly stemming from their prior negative experiences with stuttering. In response, AWS may adopt adaptive or maladaptive coping behaviours to manage stuttering and mitigate fears of negative evaluation. Maladaptive strategies, like avoiding certain communication situations, can diminish their satisfaction with everyday speaking situations.

*What this study adds*

- This study leveraged the mask-wearing mandate during the pandemic to explore the intricate relationship between anxiety-related symptoms and communication. While some participants saw masks as a plausible means to conceal stuttering and anxiety, most preferred open communication without the challenges posed by masks. Our findings offer additional support for the varied emotional, cognitive and behavioural responses that AWS may display in response to changes in daily life, emphasizing the individual differences within this population and highlighting that stuttering goes beyond observable speech dysfluencies.

*What are the clinical implications of this work?*

- Our study underscores the need for comprehensive therapeutic interventions addressing both the physical and cognitive-emotional aspects of stuttering in AWS. Recognizing the role of safety behaviours and self-focused attention emphasizes the importance of an integrated approach, enhancing communication efficacy and social well-being for AWS. Addressing speech fluency alone, without considering pertinent cognitive-emotional factors, falls short in providing adequate stuttering treatment.

## INTRODUCTION

Following the World Health Organization's (WHO) declaration of an international public health emergency on 30 January 2020, and subsequently, a pandemic on 11 March 2020, the adoption of wearing masks in public spaces has become a global norm aimed at mitigating the virus's trans-

mission. Although many individuals found wearing masks uncomfortable in daily activities, initial reports suggest that the discomfort associated with mask-wearing may vary among people and pose differing difficulty levels for distinct groups.

Studies have explored the impact of masks on multiple perspectives, including psychological and social

factors, with varying degrees of impact reported (Badillo-Goicoechea et al., 2021; Homans & Vroegop, 2022; Ramdani et al., 2022; Saint & Moscovitch, 2021; Ten Hulzen & Fabry, 2020). Recent reports suggest that wearing masks might have adverse effects on communication efficacy. Saunders et al. (2021) conducted a study in which participants conversed with either a masked or unmasked partner. The results indicated that face coverings negatively impact communication content, interpersonal connectedness and willingness to engage in conversation. The participants reported feeling frustrated and embarrassed when they could not communicate effectively. The effort required to communicate through a mask was described as exhausting and mentally taxing. Moreover, the study found that wearing a mask increased anxiety and stress levels for both the speaker and the listener, leading to further communication difficulties and a sense of disconnection. Wearing masks can also affect the accuracy of emotional perception, especially in older people, as they explore the mouth more than the eyes during facial emotion processing (Grainger & Henry, 2020).

However, perceptions of wearing masks are not universally unfavourable, and not everyone regards mask-wearing solely as a measure to mitigate virus infections. Cognitive theories of social anxiety (Wells et al., 1995) provides insights into why individuals with social anxiety may find wearing masks plausible and may even prefer to wear them, despite the inherent discomfort in everyday life and the ensuing communication challenges. Given that more recent studies suggest a significant risk of social anxiety disorder among adults who stutter, with up to 60% of those seeking stuttering treatment meeting the criteria for social anxiety disorder (Blumgart et al., 2010; Iverach, O'Brian, et al., 2009), the need to wear masks during the pandemic provides an opportunity to study the complex and dynamic relationship between freedom for communication, self-perceived stuttering, and anxiety in adults who stutter (AWS).

Individuals with social anxiety, including those with stuttering and social anxiety, may have valid reasons to choose mask-wearing beyond the aim of virus mitigation. At its core, social anxiety involves negative self-perception and a fear of negative evaluation (Wells et al., 1995). Social anxiety begins with the perception that someone will evaluate the individual in a social situation (Wells et al., 1995). They dread potential humiliation in front of others, resulting in an exaggerated fear of adverse consequences. Hence, mask-wearing may be viewed positively as it could prevent this cycle from restarting by covering symptoms of anxiety, such as dry mouth and stuttering behaviours. According to the cognitive model of social anxiety disorder proposed by Clark and Wells (1995), stepping into a feared situation initiates a transition toward maladaptive self-focused

attention. This preoccupation with self can hinder the ability to recall information from the social environment while promoting the recollection of self-referential information (for a comprehensive review, read Lowe et al., 2021). Therefore, socially anxious individuals may have better self-image when they cover anxiety symptoms.

Individuals with social anxiety disorder often use cognitive and behavioural strategies, such as safety behaviours, to manage their anxiety and reduce the likelihood of feared events occurring (Clark & McManus, 2002). They may worry about appearing unattractive, anxious or socially awkward due to the perceived judgement of others (Moscovitch & Huyder, 2011). Such maladaptive self-focus prevents them from observing confirming and positive feedback from audience around them. For AWS, there is direct evidence indicating that they tend to avoid positive social information during a speaking task (Lowe et al., 2012), especially when facing social evaluative threats (Bauerly, 2022), a pattern consistent with observations in individuals with social anxiety disorder (Pishyar et al., 2008). Such concerns may prompt wearing masks as a self-concealment strategy to reduce the risk of negative social evaluation.

The necessity of wearing masks amid the pandemic offers an opportunity to further explore the affective, behavioural and cognitive dimensions of stuttering. It allows us to explore the perceptions and beliefs of AWS regarding mask-wearing. Our interest lies in understanding the intricate and competing dynamics between avoidance, other safety behaviours linked to anxiety and the desire for unrestricted communication with those around AWS. We have yet to ascertain whether AWS find wearing masks to be exhausting and mentally taxing, as suggested by current studies for individuals who do not stutter. Additionally, it remains unclear if AWS view mask-wearing as an opportunity to mask their stuttering behaviours and anxiety, akin to individuals with social anxiety. Significantly, if wearing masks creates a dilemma between the desire to conceal stuttering or anxiety, the frequency of stuttering behaviours and compromised communication, we aim to explore what AWS would prioritize among these competing desires. Our investigation seeks insights into the considerations of AWS regarding mask-wearing—whether it is primarily motivated by a desire to mitigate the virus or if their minds are preoccupied with unhelpful thoughts and beliefs about stuttering, accompanied by maladaptive self-focused attention.

This study was to gain a deeper understanding of the intricate and competing dynamics among anxiety-related symptoms, the desire for communication freedom and stuttering. This insight can potentially inform clinical practices to more comprehensively address the needs of individuals who stutter.

## METHOD

### Participants

Participants were recruited from speech therapy clinics in Tehran, Iran, and through online flyers posted on the popular social media platform Instagram. To be eligible for the study, participants had to self-identify as individuals who stutter, be 18 years of age or older, and wear face masks during the COVID-19 pandemic. Their stuttering was later confirmed by an experienced speech pathologist who conducted the interview. Prior to participation, an information sheet and the consent form were sent to each participant, containing the overall goal of the research, the benefits, risks involved and the confidentiality of the responses. Recruitment of new participants was halted when data saturation was determined by researchers. This occurred when early themes contained a significant amount of specific data, and no new topics were emerging (Fusch & Ness, 2015).

### Data collection

#### Anxiety and speech-related measure

To better understand the participants' characteristics, they completed various speech and anxiety-related measures before the interview. The results were solely descriptive, not intended for quantitative analysis.

Various anxiety-related measures were administered, including the state-trait anxiety inventory (STAI: Spielberger, 1983) and brief fear of negative evaluation scale (BFNE-S: Leary, 1983). The STAI, a widely used self-report questionnaire, assesses both temporary 'state anxiety' and long-standing 'trait anxiety'. It consists of two separate 20-item scales, one for measuring state anxiety (STAI-S) and the other for trait anxiety (STAI-T).

The core feature of social anxiety is fear of negative evaluation. To measure this trait among participants, the short version of the brief fear of negative evaluation scale (BFNE-S: Leary, 1983) was utilized. The test includes a series of social interaction-related statements, and participants score how much they think each statement applies to them.

Speech-related measures included self-reported stuttering severity scores across different speaking situations (Karimi et al., 2014) and the Overall Assessment of the Speaker's Experience of Stuttering (OASES: Yaruss & Quesal, 2006). The OASES is a widely used self-report instrument assessing the speaker's experience of stuttering across multiple domains, including communication

attitudes and emotions, communication impact and participation and quality of life (Yaruss & Quesal, 2006).

Participants self-reported their usual and worst stuttering severity (SR) in four different social situations: speaking with family members, friends, at work and during a telephone conversation. They used a 9-point stuttering severity measure, where 0 means no stuttering, and 8 means the most severe stuttering a person can imagine. For each speaking situation, participants indicated how likely it was for them to avoid speaking, using three definers: never (score = 1), sometimes (score = 2) and most of the time (score = 3).

### The interviews

Data were collected through semi-structured Skype interviews with participants, who were asked a series of open-ended questions and pre-planned prompts shown in Table 1. The interviews, lasting from 30 to 60 min, were audio-recorded.

Prompt questions were posed to AWS, exploring their self-perceived stuttering severity with and without masks, self-reflections during and after stuttering moments with and without masks, beliefs regarding others' reactions to their stuttering in both scenarios, the impact of mask-wearing on daily communication and the utilization of speech fluency techniques (if applicable). Additionally, participants were asked about their preferences for mask-wearing during the mandatory and the current optional phase of mask-wearing. These inquiries aimed to uncover insights into the complex interplay among stuttering, communication and anxiety in AWS.

### Qualitative data analysis

The present study utilized thematic analysis with an inductive, data-driven approach (Braun & Clarke, 2022) to explore the experiences, viewpoints and interpretations of individuals who stutter while wearing face masks during the COVID-19 pandemic. Following the widely recognized protocol of Clarke and Braun (2021), the researchers adopted a recursive process. To gain a profound understanding of the data, each transcript was independently read twice, accompanied by note-taking and reflection. The subsequent phase involved the generation of initial codes. Researchers then convened online to discuss codes, identify emerging patterns and independently collect candidate themes and sub-themes. Themes were reviewed, refined and mapped, ensuring coherence and reflecting the dataset's meanings.



**TABLE 1** The prompt questions asked from participants during the interview.

1	<b>During the COVID pandemic, did you prefer to wear a mask when speaking or not?</b>
2	Did wearing a mask make a difference in your comfort level while speaking? If yes, how was this difference?
3	Did wearing a mask affect the severity of your stuttering? If yes, how?
4	Did wearing a mask affect the amount you spoke with others?
5	Compare your feelings in the moment of stuttering with and without a mask.
6	Compare your feelings after stuttering with and without a mask.
7	Did wearing a mask make a change in your stress level when speaking? If yes, how?
8	Did wearing a mask affect the number of blocks you experienced?
9	Can you compare using fluency techniques (if applicable) with and without a mask?
10	Did you feel that wearing a mask caused others to treat you differently? If yes, what kind of change did you notice?
11	Now, considering that wearing a mask is not as common, do you still prefer to wear one? If yes, why?

Researchers explained each theme's content and scope, identified relevant sub-themes and thoroughly examined major themes. The analysis concluded when no additional themes emerged. Finally, vivid extracts capturing the essence of the participants' experiences with face masks were selected to address the study's research questions. This rigorous, iterative approach ensured a comprehensive understanding of the data, producing themes that accurately reflected participants' narratives about their experiences during the pandemic.

### Credibility

Several steps were taken to increase the validity of the results. Before the interviews and throughout the study, as different themes arose from the analyses, the authors' biases regarding stuttering, mask-wearing, social anxiety and the anticipated results were examined. It was recommended that all researchers who participated in the interviews and transcriptions set aside any anticipation and expectation they may have about themes and phenomena of interest. All the researchers had experience with stuttering as well as qualitative research. The authors worked collaboratively to create the codes that eventually evolved into the themes that are explained in the result section.

### Positionality

The first author is a university lecturer, certified speech-language pathologist and is not a person who stutters. The second author is a doctoral student and a person who stutters, the third author is also a doctoral student and is not a person who stutters. All the authors have experience working with adults who stutter with various degrees of social anxiety, which motivates their interest in investigating the dynamic of stuttering, anxiety and communication.

## RESULTS

The participants' ages ranged from 23 to 55 years (Mean: 33.2 and SD: 7.14), comprising 6 females and 14 males.

### Participants performance in stuttering and anxiety-related measures

The study participant reported the mean SR scores of 2.8 and 4.7 for their usual and worst stuttering severity, respectively. Furthermore, on average, participants reported a score of 2 out of 3 for self-reported avoidance behaviours in various speaking situations, indicating a moderate tendency to avoid situations where stuttering might occur.

In terms of the effect of stuttering on their lives based on the results obtained from OASES, 30% reported a mild to moderate impact, 25% experienced a moderate impact, 35% indicated a moderate to severe impact and 10% reported a severe impact.

The participants' anxiety was measured using the STAI-S, STAI-T and BFNE-S measure. STAI-S suggested that 15% of the study participants had mild-moderate anxiety and 85% of them experienced a moderate anxiety. Results obtained from the STAI-T were similar and indicated that 20% of study participants reported mild-moderate anxiety and 80% experienced moderate anxiety. BFNE-S suggested notable fears of negative evaluation by others in our study participants, as 70% of the study participants experienced a moderate level of anxiety while the other 30% experienced severe anxiety, as can be seen in Table 2.

### The qualitative analysis

The semi-structured interviews with our 20 participants suggested three main themes and some sub-themes. The identified themes were (1) barriers to effective

TABLE 2 Participant demographics.

Participant	Gender	Age	OASES	STAI-S	STAI-T	BFNE-S	Mean highest SR	Mean usual SR	Avoidance
1	M	38	Moderate	Moderate	Moderate	Severe	5	2	2
2	M	>35	Moderate-severe	Moderate	Moderate	Moderate	7	2.75	2
3	M	33	Moderate-severe	Moderate	Moderate	Moderate	5.5	2.75	2.5
4	F	>35	Moderate	Moderate	Moderate	Moderate	3.25	2	1.5
5	M	23	Moderate-severe	Moderate	Moderate	Moderate	3.5	1.25	2
6	M	>35	Moderate	Moderate	Moderate	Moderate	4.5	2.25	1.75
7	M	>35	Severe	Moderate	Moderate	Severe	4	1	2.5
8	M	>35	Moderate-severe	Moderate	Mild-moderate	Severe	5.25	3.75	2.25
9	M	>35	Mild-moderate	Moderate	Moderate	Moderate	5	2	1.25
10	F	32	Severe	Moderate	Moderate	Moderate	7.25	6.25	2.75
11	F	>35	Moderate	Mild-moderate	Mild-moderate	Moderate	5.75	3	2.5
12	F	>35	Moderate-severe	Moderate	Mild-moderate	Moderate	3.75	4.5	1.75
13	F	25	Moderate-severe	Moderate	Moderate	Moderate	4	3	2
14	M	32	Mild-moderate	Moderate	Moderate	Severe	5.75	4	1.5
15	M	25	Mild-moderate	Moderate	Moderate	Moderate	6	4	2
16	M	34	Moderate	Moderate	Moderate	Severe	5	3	2.5
17	M	26	Moderate-severe	Mild-moderate	Moderate	Severe	5.75	3.75	2.5
18	M	55	Mild-oderate	Moderate	Moderate	Moderate	4	2	1
19	F	30	Mild-moderate	Mild-Moderate	Mild-moderate	Moderate	3.5	2	3
20	M	23	Mild-moderate	moderate	Moderate	Moderate	2	2	1

Age is presented in years. Categories of “>35” indicate participants older than 35 years. Abbreviations: BFNE-S, Brief Fear of Negative Evaluation Scale; OASES, Overall Assessment of the Speaker’s Experience of Stuttering; Mean SR, mean stuttering severity rating; STAI-S, State-Trait Anxiety Inventory-State; STAI-T, State-Trait Anxiety Inventory-Trait.

communication, (2) speech in shadow, and (3) unmasked speech.

### Theme 1: Barriers to effective communication

This theme explores the difficulties people encounter in communicating while wearing masks. Nineteen participants out of our 20 study participants reported that masks interfered with their ability to communicate effectively. The negative impact of wearing mask goes beyond its notorious effects on interpersonal communication and was believed to affect stuttering severity as well. Participants highlighted various ways in which masks complicate communication, as indicated in the following sub-themes.

#### *Subtheme 1: Interpersonal communication*

The participants provided a multifaceted account of how wearing masks affected their interpersonal communication experiences. They explored the specific challenges faced while attempting to convey verbal messages with a mask on. They observed that masks often resulted in

muffled soft voices causing listeners to request clarifications or repetitions of statements frequently.

- P12: “Face mask was an obstacle for talking, I had to talk louder, and this made me feel stressed. Especially when they didn’t understand me and asked me to say that again”.
- P4: “I can say that it was difficult...because I felt that they couldn’t hear me and I had to put more pressure to speak...and it’s hard to breathe and speak loudly behind the mask”.

In addition to the verbal hindrances, the participants also underscored the importance of non-verbal communication cues, often obscured by the mask. They pointed out that masks concealed a substantial portion of their facial expressions, especially those around the mouth and jaw area, leading to incomplete communication. The absence of these non-verbal cues was perceived to diminish the richness of their interactions.

- P13: “When there is a mask on my face, people do not know I am stuck. They do not know I am not answering them

*because I have a block. I could see their faces change, and they wondered what had happened to me. It made me feel bad. I mean, I prefer them to see my blocks at that moment so they would not be surprised by my silence”.*

- P10: *“Because the listener can’t see my face and body language, I felt it was more difficult to communicate”.*

Also, there were occasions in which wearing masks elicited unacceptable and unfavourable behaviours from audiences.

- P15: *“I remember once when I wanted to talk to the pharmacy manager, he thought I was deaf and dumb and started talking to me with sign language, and it was very funny. He was communicating to me with signs!”*

### *Subtheme 2: Self-perceived fluency*

Participants shared that wearing masks significantly impacted their perception of their ability to speak fluently. Many participants, not all, observed a noticeable increase in the severity of their stuttering when they wore a mask. They provided detailed accounts of their experiences, explaining how the presence of the mask seemed to interfere with their speech fluency directly.

- P16: *“With the mask, my stuttering became more severe”.*
- P15: *“It was much more intense. Not only could no one see my lips as I grappled and strained to speak fluently, but I also found myself gasping for breath”.*

The participants highlighted the challenge of breathing comfortably while wearing masks. This issue was frequently brought up, highlighting how the restricted air-flow significantly impacts verbal communication. Many participants expressed that the difficulty in breathing not only made conversations more physically taxing but also affected their ability to speak smoothly and confidently.

- P4: *“due to difficulties in breathing when I had a mask, I was not able to speak well”.*
- P20: *“I could not breathe well when I wore masks”.*

Moreover, participants indicated that the mask impacted their ability to utilize established enhancing fluency techniques and methods. They elaborated on how the mask affected the application of these techniques during speech. Wearing masks complicates the effective use of fluency techniques for some individuals, yet some participants expressed that it provided a sense of concealment, making it feasible for them to hide the fact that they were using such techniques from society.

- P3: *“I knew it was more difficult to use techniques with a mask... I can’t fully explain why, but it’s probably related*

*to the same breathing... Well, breathing is more difficult with a mask”.*

- P4: *“I said that wearing a mask and talking outside was stressing me so that I could not breathe well... that’s why I couldn’t focus well on those techniques... it’s easier to do the techniques without a mask”.*
- P7: *“It would be easier for me... because it is not easy to follow these methods and sometimes, they are new to people, and they may make fun of them. When I wanted to practice the techniques with my friends, they made fun of me... wearing the mask gave me peace of mind that I could use the techniques”.*

## Theme 2: Speech in shadows

Participants reflected on the multifaceted impact of face masks on their stuttering experiences, highlighting the concealment benefits. AWS demonstrated a heightened apprehension of how others might perceive them and their stuttering. Their concerns extended to the unease about their outward appearance and the potential judgments from those around them. The participants experienced stress related to how they were being perceived, and it seemed as though a significant portion of their cognitive and emotional resources were dedicated to those unhelpful thoughts and beliefs. In essence, speech took a backseat, overshadowed by the emotional and cognitive challenges they faced in social interactions.

Several participants noted that they wore masks not just for health protection but also as a means to conceal facial indicators of stuttering behaviours, such as blocks. Due to this concealment, most of them said they felt better and experienced less stress.

- P1: *“The negative emotions were less with the mask... because it could hide blocks”.*

*“I don’t like anyone to see my face and mouth when I’m blocked, so my stress was less obvious behind the mask”.*

- P3: *“When I was wearing a mask, secondary behaviours of my stuttering could not be seen. So, I felt better. It means that I was stuttering more easily”.*

*“By covering the movements of my mouth, my stress is reduced. I can’t say it was too much, but the stress was a little less”.*

- P4: *“When you wear the mask, it covers the trembling of the mouth when stuttering... because of this, I can say that it was good that the other person didn’t notice that I was stuck... those negative feelings were less”.*



- P5: “So I think I feel better, and the blocks are less visible and the self-confidence in speaking increases”.
- P13: “Maybe because of what I said, it felt better after stuttering and now it didn’t show much, and the others maybe didn’t realize that there was a block here, maybe my stress was a little less, I think”.

Only one participant in this study reported a higher level of stress while speaking with masks. This participant, who had a high score in STAI and BFNE-S measures, linked his higher stress to the efforts needed for him to find out how to speak appropriately while wearing a mask.

- P16: “I think it made me more stressed because I was thinking a lot about how I should talk while wearing a mask, which made me more stressed”.

However, the results of BFNE-S could not solely predict the relationship between masks wearing and the participants perceived stress of stuttering, as other five study participants who similarly had high BFNE-S scores reported lower stress while speaking with masks. Interestingly, a participant with recent stuttering therapy experience shared nuanced reflections on his intricate and competing emotions and beliefs in this regard. He reported mixed emotions, indicating that while using the mask to cover their stuttering did offer a sense of relief, feelings of guilt also accompanied it.

- P11: “Face masks helped me to hide my blocks and I liked it. But the mask was a kind of avoidance. I thought to myself that I was deepening my fear by doing this, which made me feel bad”.

Also, the analysis of the interviews revealed that participants believe wearing a mask influences the evaluation by observers. The majority felt that masks created a positive impression, as stuttering behaviours were not noticeable when masks were worn.

- P10: “If I stuttered, he would say ‘Speak louder’, and the audience would attribute the sound to the mask rather than the stuttering. As a result, his behaviour wouldn’t change because he didn’t witness my stuttering, and it seemed he didn’t understand that I was experiencing stuttering. Overall, it was as if he had no reaction to my stuttering, and his behaviour was much better in this regard”.
- P7: “As if they didn’t notice the blocks, their reaction was better. They don’t act like someone who stutters anymore”.
- P9: “When I wore a mask, they didn’t understand that I stuttered, and they treated me normally and I was not judged”.

### Theme 3: Speaking unmasked

Most participants (n = 17) reported that, although they wore masks during the mandatory phase of the pandemic mostly for health reasons, they now choose not to wear them anymore when it is optional. They acknowledged that masks could hide their stuttering, which was pleasant. However, they believe they can speak and communicate more easily without masks. Indeed, they preferred to speak openly and freely, even though they could no longer derive the benefits of concealing their stuttering and anxiety that they used to enjoy.

- P1: “Yes, I would have preferred to wear a mask because of COVID. ... Although it covers my blocks, I speak much better without a mask. I prefer not to have a mask now”.
- P4: “Nevertheless, I prefer not to wear a mask and speak more easily. ... even with stuttering”.
- P12: “An obstacle has been removed, freeing my mind and my oxygen”.

Even in the mandatory phase of mask-wearing, a few participants reported that they were reluctant to wear masks due to communication challenges it introduced to them.

- P6: “No, I preferred not to wear masks because it severely affected my speaking. When it was on my face, it increased my stuttering by 30–40%”.
- P19: “Yeah. I always remember that there was a challenge with my employer for not wearing a mask”.

Still, three participants opted to wear masks to conceal their stuttering even in the optional phase of mask-wearing. All these participants had high scores in the BFNE-S questionnaire.

- P7: “I prefer to wear it because it reduces my stress and makes it easier for me to talk. It makes me feel better, especially in meetings with managers and situations like this, and I prefer wearing a mask”.
- P17: “In some places, yes. I feel that if I wear mask, I can perform speech exercises and voluntarily stuttering”.

## DISCUSSION

This study aimed to explore the experiences of AWS wearing masks during the pandemic to gain a better understanding of the intricate and competing relationship between anxiety-related symptoms, communication, and stuttering. While there appears to be a current consensus

that the prevalence of social anxiety is higher in AWS (Bloodstein et al., 2021), the relationship between communication, anxiety and stuttering is inherently complex. AWS may undergo distinct life experiences due to their stuttering compared to those without a stutter, influencing their perspectives on people around them and shaping their feelings and self-beliefs, which may impact their behaviours (Jokar et al., 2023; Tichenor & Yaruss, 2018). Changes in typical living situations, as observed during the COVID-19 era, present additional opportunities to analyse the intricate dynamics between these factors in individuals who stutter.

Similar to current reports for people who do not stutter (Saunders et al., 2021), most AWS in this study reported that stuttering negatively affected their everyday communication in different ways. It affected both verbal and non-verbal communication, prohibited the audience's understanding of AWS's messages on some occasions and eventually led to frequent requests for clarification and repetition. Many AWS found wearing masks a communication barrier regardless of an increase, decrease or no change in self-perceived stuttering severity.

Although most AWS believed wearing masks increased their stuttering severity and prevented them from using their fluency techniques, some others believed it did not affect their frequency of stuttering or even improved it to some extent. Most participants believed that it was more challenging for them to breathe, speak and use fluency techniques while they wore masks; however, some reported that wearing masks concealed their faces from the eyes of audiences and made it emotionally easier for them to use the techniques. Therefore, some participants reported that they used their techniques more often when they wore masks as they had no concerns about what other people might think about them.

Although we found some common themes in this study, there were some individual differences in our participants' responses. Such differences are primarily influenced by AWS's cognitive evaluation of stuttering (Plexico et al., 2019) and external factors, including available social support (Nang et al., 2019). In response to stuttering and any anxiety related to that, AWS might choose either adaptive and constructive strategies, such as positive reframing, planning, humour and acceptance, or more maladaptive reactions, including denial, disengagement, self-distraction, avoidance and self-blame (Azarinfar et al., 2022; Plexico et al., 2019). AWS are reported to frequently use safety behaviours such as avoiding difficult words, mentally rehearsing sentences before saying them, keeping answers brief and choosing safe or easy people to talk to in socially threatening situations (Azarinfar et al., 2022; Lowe et al., 2017). Wearing masks might act as a safety behaviour to hide and avoid stuttering by speaking less when the person is concerned that they might stutter.

The utilization of safety behaviours might represent an acquired process that develops over years of speaking while dealing with stuttering and cognitive assumptions that trigger concern in AWS about threatening events, prompting efforts to alleviate their anxiety and fear (Crichton-Smith, 2002).

Using such safety behaviours provides temporary relief from anxiety but may maintain social anxiety over the long term (Moscovitch & Huyder, 2011). That is because when a person employs safety behaviours, such as avoiding conversation or social situations, they may attribute the absence of feared outcomes to these safety behaviours. This can perpetuate their unhelpful beliefs about the feared situation, as there is no opportunity to test and challenge the biased thoughts and beliefs (Lowe et al., 2021). Furthermore, the utilization of safety behaviours can strain attentional resources, impacting performance in social interactions. This, in turn, reinforces anxieties and beliefs, contributing to a cycle where the avoidance of social engagement heightens the risk of negative self-perceptions and external evaluations (Wells et al., 1995).

Many participants in our study felt good about wearing masks as it covered the self-perceived mumbling appearance of their face. It is not uncommon in people with social anxiety to have maladaptive self-focused attention with more attention to negative personal and environmental feedback.

The participants answer to the interview questions complemented their responses to the anxiety-related measures of STAI, BFNE-S and avoidance, and indicated frequent unhelpful thoughts and beliefs about stuttering, concerns about the negative evaluation by others and maladaptive self-focused attention which are core features of social anxiety in the study participants. Although three participants with high BFNE scores found mask-wearing helpful for managing social anxiety and preferred to continue wearing masks, there were three other participants with similarly high BFNE scores who did not wish to continue mask-wearing. This divergence highlights the complexity of social anxiety and stuttering. Factors such as individual coping mechanisms, previous experiences with stuttering and levels of social support may influence these differing attitudes. For instance, those who preferred to wear masks might have found the concealment of stuttering behaviours reassuring, while others might have prioritized the desire for open and unrestricted communication despite the risk of negative evaluation.

Excessive self-focused attention and unhelpful thoughts and beliefs can further strain attentional resources, potentially explaining why participants with anxiety-related disorders struggled to sustain speech treatment outcomes (Iverach, Jones, et al., 2009). Alm (2014) proposes that cognitive processes can disrupt speech fluency in social contexts. Social cognition encompasses self-perceptions

and expectations about how one should behave, especially when individuals are concerned about stuttering (Alm, 2014). The level of social cognition related to stuttering is theorized to be influenced by factors such as the significance and potential outcomes of a situation, the risk of stuttering and uncertainty about the most appropriate course of action.

Our interviews with AWS confirmed that wearing masks negatively impacted their interpersonal communication. Simultaneously, it resulted in some favourable affective and cognitive outcomes, such as reduced concerns about negative evaluations by others and improved feelings about their appearance through the ability to conceal their stuttering and fluency techniques. On one hand, masks function as a subtle shield, obscuring the outward signs of stuttering and providing a sense of solace from the anxiety and societal scrutiny often associated with these behaviours. Nevertheless, this concealment imposes a significant cost, disrupting speech and hindering essential non-verbal communication elements, such as facial expressions, critical for effective interaction. This duality exposes a central quandary for AWS—the tension between the pursuit of fluent and genuine communication and the comfort derived from masking their stuttering symptoms.

The interaction between these two competing desires was tested by asking individuals whether they would continue wearing masks now, given that mask-wearing is optional, and only some people continue to wear them for various reasons. Most participants (17 out of 20) preferred free communication over concealing their stuttering and preferred not wearing masks in the future and have a free and open communication with other people. Still, three participants opted wearing masks solely to hide their stuttering from the audience. All these three participants had high BFNE-S scores which is indicative of their fear of being evaluated negatively by others.

For clients who had undergone previous or current stuttering treatment focusing on stuttering modification approaches (Van Riper, 1973), the interaction between the desires to conceal stuttering and communicate freely became even more complex. For example, one of our participants reported feeling guilty, acknowledging that safety behaviours would not be helpful over time, yet still finding some satisfaction in hiding his stuttering from the audience.

This result aligns with a prior study that indicated avoidance and unhelpful thoughts and beliefs about stuttering, unlike percentage of syllables stuttered, are significantly correlated with the satisfaction of AWS regarding their communication in everyday life (Karimi et al., 2018). This could be a reason why most AWS in this study expressed a preference against wearing masks in the future, opting for improved communication and reduced avoidance behaviours.

In conclusion, our study emphasizes the necessity for therapeutic interventions addressing both the physical manifestations of stuttering and the cognitive-emotional patterns contributing to social anxiety in AWS. Recognizing the role of safety behaviours and self-focused attention in perpetuating social anxiety underscores the importance of an integrated therapeutic approach. By concurrently addressing speech fluency and cognitive-emotional aspects, we can offer comprehensive support and effective interventions, enhancing overall communication efficacy and social well-being for AWS.

Simplifying stuttering treatment by solely focusing on stuttering behaviour and disregarding pertinent factors is inadequate. The evolving evidence, especially in the context of life changes such as those experienced during the pandemic, emphasizes the need for personalized stuttering treatments tailored to the individual needs of each AWS.

Speech pathologists should prioritize comprehensive assessments, including safety behaviours, avoidance and BFNE-S, to gain a nuanced understanding of each client. This approach allows for the development of tailored and effective stuttering treatment programs that address the unique challenges and requirements of individuals who stutter.

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## CONFLICT OF INTEREST STATEMENT

All authors certify the absence of any conflicts of interest, including specific financial interests, relationships and affiliations relevant to the subject of this paper.

## DATA AVAILABILITY STATEMENT

The data supporting the findings of this study are available from the corresponding author upon reasonable request.

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