Beliefs and Behavioural Intentions Towards Pharmacotherapy for Stuttering: A Survey of Adults Who Stutter

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Abstract

Purpose

Although considerable efforts have been made to investigate the effectiveness of pharmacological treatments for stuttering, little is known about how the stuttering community perceives these treatments. This study aimed to assess and quantify beliefs regarding pharmacotherapy for adults who stutter and to establish whether behavioural intentions to undertake treatment were related to these beliefs.

Method

An adapted version of the Beliefs about Medicine Questionnaire was completed by adults who stutter. Participants also reported perceptions of their stuttering including its overall impact, ratings of previous speech therapy, and behavioural intentions to initiate pharmacotherapy and speech therapy in future.

Results

Necessity and concern beliefs were distributed widely across the sample and in a pattern indicating a relatively balanced perception of the benefits and costs of medication prescribed specifically for stuttering. Of the study's measures, the necessity-concerns differential most strongly predicted the behavioural intention to initiate pharmacotherapy. The overall impact of stuttering predicted intentions to seek both pharmacotherapy and speech therapy. Participants reported the likelihood of pursuing pharmacotherapy and speech therapy in equal measure.

Conclusions

The theoretical model of medication representations appears to be a useful framework for understanding the beliefs of adults who stutter towards the medical treatment of their disorder. The findings of this study may be of interest to clinicians and researchers working in the field of stuttering treatment and to people who stutter considering pharmacotherapy.

1. Introduction

Stuttering is a fluency disorder characterised by prolongations, repetitions and blocking of speech. These surface behavioural features are typically accompanied by private affective and cognitive reactions to the experience of being unable to speak fluently and to listener responses to stuttering (Bloodstein & Bernstein Ratner, 2008). Numerous studies confirm assumptions that stuttering can limit the speaker's ability to participate in daily communication activities (Sheehan, 1975; Yaruss & Quesal, 2006), that stuttering negatively impacts upon quality of life in terms of social, emotional and mental functioning (Craig, Blumgart & Tran, 2009), and that the disorder can hinder educational and occupational attainment (Daniels, Gabel & Hughes, 2012; Klompass & Ross, 2004).

The onset of stuttering occurs most often during childhood, between the ages of 2 and 5. Traditional estimates of incidence and prevalence are around 5% and 1% respectively, though in light of recent evidence, Yairi and Ambrose (2013) suggest there may be a case for revising these percentage estimates. Nevertheless, the marked difference between incidence and prevalence figures reflects the fact that most children who stutter recover either with or without treatment (Dworzynski et al., 2007; Mansson, 2000). For stutterers whose disorder persists through adolescence and into adulthood, however, the prospects of recovery diminish dramatically.

Historically, the principal treatment for stuttering has been speech therapy, and approaches vary widely both in their theoretical grounding and in the extent to which they aim to ameliorate specific behavioural, affective and cognitive aspects of the

disorder. Approaches for young children involve parents in the therapy and can be classified as either *indirect* or *direct* in nature. The former seeks the general reduction of communicative demands on the child in line with their existing capacities for fluency, while the latter employs operant conditioning principles, primarily positive reinforcement, to facilitate fluent speech (de Sonneville-Koedoot, Stolk, Rietveld & Franken, 2015). For adults who stutter, two broad categories of speech therapy exist. The first, known as *stuttering modification*, uses avoidance reduction, desensitisation, gradual modification of stuttering behaviour, and alteration of feelings and thoughts towards stuttering, and places little emphasis on fluency as a direct objective. By contrast, the second approach, termed *fluency shaping*, aims explicitly to establish speech that is free of stuttering by means of behavioural principles, and pays less attention to the emotions and attitudes accompanying stuttering. A third category of speech therapy seeks to integrate *stuttering modification* and *fluency shaping* (Blomgren, 2013; Guitar, 2013; Manning, 2010).

Achieving a clear picture on the effectiveness of speech therapy for stuttering has long been a challenge for researchers, clinicians and consumers. As indicated above, there remains a lack of consensus amongst professionals as to the most effective speech therapy for children and adults who stutter. Consequently, there is disagreement about the criteria for satisfactory therapy, about the nature of, and indeed the existence of, therapeutic phenomena such as the "establishment" of fluency within the clinic and "transfer" of fluency beyond it (Sheehan, 1979), and about the most appropriate means of measuring therapeutic outcomes (Guntupalli, Kalinowski & Saltuklaroglu, 2006; Quesal,

Yaruss & Molt, 2004; St Louis, 2006). As a rule, outcomes for standardised, behaviourally-oriented treatments have been published more often than those for individualised, psychosocially-oriented treatments. While systematic reviews have concluded that speech therapy for stuttering can be effective in reducing observable stuttering behaviour and in improving social, affective and cognitive aspects of stuttering for specific periods (e.g., Bothe, Davidow, Bramlett & Ingham, 2006), the longer-term maintenance of therapeutic gains continues to be a major issue for adults who stutter. Due to long reinforcement histories with their stuttering, advanced or "confirmed" people who stutter face significant challenges in speech therapy, and relapse during or following treatment is commonplace (Bloodstein & Bernstein Ratner, 2008; Craig, 1998; DiLollo, Neimeyer & Manning, 2002). It is understandable then that researchers, clinicians and people who stutter have looked beyond speech therapy for alternative treatments.

Among a number of modern alternatives are pharmacological treatments of stuttering. These have a shorter history in comparison with speech therapy, with the earliest published research into medication for stuttering, using stimulants and sedatives, dating back to the 1950s (Brady, 1991; Van Riper, 1973). Early pharmacological investigations of dopamine antagonists such as haloperidol, used in the treatment of psychosis, have shown improvements in the speech fluency of adults who stutter, but due to risks of impaired motor function such as tardive dyskinesia, have not been commonly prescribed (Ludlow, 2006). Newer-generation dopamine-blocking agents such as risperidone and olanzapine, tested in randomised, double-blind, placebo-controlled studies, have also shown to relieve behavioural symptoms of stuttering and to pose fewer motor dysfunction

risks, although other side effects such as weight gain and sedation are sometimes experienced (Maguire, Riley, Franklin & Gumusaneli, 2010).

Adverse side effects associated with medications decrease their tolerability, often cause patients to discontinue treatment and so increase the likelihood of relapse. Hence, regardless of the disorder, researchers are keen to develop medications which have good tolerability profiles. Pagoclone, originally developed to treat anxiety, is one such medication and is the first to be tested through the U.S. Food and Drug Administration process as a potential treatment for stuttering. In a double-blind, placebo controlled study with open label extension, pagoclone was found to reduce stuttering symptoms in 55% of the patients in the active medication group, was tolerated well and had high levels of patient satisfaction (Maguire et al., 2010). Notably, pagoclone, a selective GABA-A partial agonist, was shown to markedly reduce social anxiety, an effect not often associated with dopamine antagonist medications. Another relatively well tolerated medication, used in the treatment of bipolar disorder and schizophrenia, is asenapine. Its effects on developmental stuttering have been examined in three case studies. In these, asenapine was clinically observed to improve the fluency of adults who stutter (Maguire, Franklin & Kirsten, 2011). In a more recent preliminary investigation, lurasidone, another antipsychotic dopamine antagonist, was shown to reduce stuttering symptoms in a sample of patients who stutter (Charoensook & Maguire, 2017).

To the authors' knowledge, at the time of writing, no drug has been formally approved for market as a treatment for stuttering. Therefore, prescription of medications for the

disorder occurs presently in an "off-label" fashion. At the same time, data from neuroscientific research are increasing the understanding of the possible physiological basis of stuttering (e.g., Connally, Ward, Howell & Watkins, 2014; Ingham, Grafton, Bothe & Ingham, 2012; Sengupta et al., 2017). There is also an impetus to continue research on the efficacy of pharmacological therapies. Noting the methodological limitations of some studies to date, it has been argued that ongoing research should seek to be as rigorous as possible, employing large, carefully selected participant samples in randomised controlled trials, and using a range of outcome measures. A further recommendation is that the effects of pharmacological treatments are studied in comparison and in combination with those of speech therapy (Bothe, Davidow, Bramlett, Franic & Ingham, 2006; Maguire et al., 2010).

On the consumer side, anecdotal indications suggest that there is a strong desire among some people who stutter for an effective pharmacological treatment, i.e., one designed and approved specifically for stuttering (Maguire & Wither, 2010; McCauley & Guitar, 2010; Miller, 2016). The present study puts this proposition to the test, empirically, by examining a range of stuttering-related factors which may influence people who stutter to consider a medical treatment, whilst taking into account that people make rather complicated decisions about medication based on its perceived health risks and benefits.

According to Horne's (1997, 2003) theoretical model of medication representations, people hold key beliefs towards their health conditions and the medical treatments prescribed for these. Beliefs towards a specific treatment can focus on both its *necessity*

in maintaining a person's health, and also on the *concerns* a person may have towards a medicine's adverse effects. Thus, the model recognises that individuals differ from each other in their perceptions of personal need for prescribed medicines, i.e., some people will doubt the necessity of a medicine in maintaining or improving their current health. The model also holds that people differ in their sensitivity to the negative consequences, i.e., side effects that frequently accompany medication use.

This necessity-concerns framework underlies the Beliefs About Medication Questionnaire (BMQ; Horne, Weinman & Hankins 1999), a validated instrument designed to quantify patients' and prospective patients' cognitive and affective representations of medication. It is assumed that individuals weigh up the perceived costs of taking a specific medication with the perceived benefits. In some cases, individuals will conclude that the benefits outweigh the costs and so will hold a generally positive belief towards their medication. In other cases, individuals will perceive a greater cost than benefit and this will result in a negative belief. Data from the questionnaire allow clinicians and researchers to understand the distribution of beliefs about the *necessity* of prescribed medication and *concerns* about taking it among specific patient groups.

The BMQ has been used to assess medication beliefs in a range of different chronic illness groups. For example, Aikens, Nease, Nau, Klinkman and Schwenk (2005) investigated the mental representations of patients with major depressive disorder in relation to the patients' adherence to antidepressant medication. They found that patients varied widely according to perceived need for their medication, perceptions of their

medication's harmfulness, and self-reported adherence to their medication. Similarly, Menckeberg et al. (2008) assessed asthma patients' necessity beliefs and concerns about their personal use of inhaled corticosteroids and found that these correlated with self-reported adherence to the medication and actual adherence as indicated objectively by pharmacy dispensing records. In both of these studies, participants were categorised as either low or high on the BMQ's *necessity* and *concern* scales enabling them to be classified overall as belonging to one of four attitudinal groups: accepting (high necessity, low concerns), ambivalent (high necessity, high concerns), indifferent (low necessity, low concerns), and skeptical (low necessity, high concerns). Adherence to medication was highest in the accepting and ambivalent groups, and lowest in the indifferent and skeptical participants. (For a meta-analytic review of the application of the necessity-concerns framework to a range of illnesses such as coronary heart disease, kidney disease, schizophrenia, and HIV/AIDS, see Horne, Chapman, Parham, Freemantle, Forbes and Cooper, 2013).

Borrowing from Horne's (2003) theoretical model of medication representations, the present study aimed to assess the balance between necessity and harmfulness beliefs towards pharmacological treatments for stuttering within a sample of adults who stutter. The study also sought to examine how likely adults who stutter would be to initiate a pharmacological treatment for their disorder, speech therapy for their stuttering, and what specific factors (e.g., severity, past therapy experiences) would influence their future stuttering treatment decisions. Participants were invited to complete an anonymous online survey comprising demographic questions, their cognitive and affective representations

towards medications for stuttering, the disorder's impact on their day-to-day lives, and their possible behavioural intentions towards medications for stuttering. It was expected that the strongest behavioural intentions to seek treatment would be significantly related to the BMQ's necessity-concerns differential, the perceived impact of stuttering on participants' lives, and its perceived severity.

2. Method

2.1 Participants

This study received ethical approval from the School of Psychological Sciences and Health Ethics Committee at the University of Strathclyde, and was conducted in accordance with the University's Code of Practice on Investigations Involving Human Beings. Informed consent was sought from participants prior to their commencement of the study. Inclusion criteria for participation in the study were twofold: participants should be a person who stutters, and aged between 18 and 65 years. Thus, participants were self-identifying adults who stutter. Two hundred and thirty four male and female individuals completed the online survey. Responses from 4 individuals were excluded because they were younger than 18, and data from a further 4 respondents were excluded as they were incomplete, leaving a total sample of 226. Respondents were from the United Kingdom (59.73%), United States (17.26%), Ireland (7.52%), and Canada (4.42%); the remaining participants (11.07%) were from various countries within Europe, Oceania, South America, Asia and Africa. Further demographic information relating to the respondents is shown in Table 1 and demonstrates that the sample was relatively diverse with respect to age and gender as well as marital, parental and employment status.

While the vast majority of the sample had previous experience with speech therapy for stuttering, few reported experience with prescribed medication for stuttering.

2.2 Materials

The survey incorporated three published measures and each of these is described below. In addition, respondents were asked to indicate the country they lived in, their age of stuttering onset, and number of different speech therapy experiences. Perceived success with speech therapy (where appropriate) was rated on a 9-point Likert scale with 1 being Very Low and 9 Very High. Respondents specified whether or not they had ever taken prescribed medication specifically for their stuttering, and for other medical conditions which may have affected their stuttering. They also indicated whether or not they were presently taking medication for stuttering, mental illness (e.g., depression, anxiety), or a serious physical condition (e.g., diabetes, high blood pressure, heart disease). Finally, at the end of the survey, respondents were invited to rate the likelihood that they would (i) seek a drug treatment for their stuttering in the future, and (ii) seek speech therapy for their stuttering in the future.

2.2.1 Beliefs about Medicines Questionnaire (BMQ; Horne, Weinman & Hankins, 1999)

The BMQ is a two section questionnaire designed to assess the cognitive representation of medication use. The BMQ-General comprises eight items and measures beliefs about the harmfulness of medicines and their overuse in general. Items measuring *harm* include "Medicines do more harm than good" and items measuring *overuse* include "Doctors place too much trust on medicines". The BMQ-Specific has 11 items and quantifies personal beliefs about the necessity of prescribed medicine and personal concerns about

taking medication for specific disorders. This section of the BMQ was adapted for the purposes of the present study and was preceded with the reference statement "We would like to ask you about your personal views about medicines which could be prescribed for your stuttering". Items measuring *necessity* included "My ability to speak without stuttering, in the short term, would depend upon these medicines" and "Without these medicines, I would stutter a lot". Items measuring *concerns* included "Having to take these medicines would worry me" and "I would sometimes worry about becoming too dependent on these medicines". All responses on the questionnaire are scored on a 5-point scale from 1 (Strongly disagree) to 5 (Strongly agree) and summed to produce totals for each subscale. It is assumed that individuals weigh up the perceived costs of taking medication with the perceived benefits. In some cases, individuals will conclude that the benefits outweigh the costs and so will hold a generally positive attitude towards medication. In other cases, individuals will perceive a greater cost than benefit and this will result in a negative attitude. The BMQ allows this attitude to be represented numerically by calculating the difference between necessity and concern scores. The resulting measure is the necessity-concerns differential. The BMQ's reliability, criterion-related and discriminant validity has previously been demonstrated for a number of chronic illness groups.

2.2.2 Overall Assessment of the Speaker's Experience of Stuttering (OASES; Yaruss & Quesal, 2008)

The OASES is a 100-item self-report instrument measuring the overall impact of stuttering on a person's life. It comprises four subscales: general information, reactions to stuttering, communication in daily situations, and quality of life. Responses are recorded

on a 5-point scale with higher scores indicating greater negative impact of stuttering. Respondents are free to skip items that do not apply to them (e.g., individuals not currently employed can skip items relating to how much stuttering interferes with aspects of their working life). The OASES yields a numerical impact score for each subscale, a total impact score and an associated overall impact rating (mild to severe) for each respondent. The instrument has been shown to have strong internal consistency reliability, test-retest reliability, content validity, and construct validity.

2.2.3 Subjective Screening of Stuttering (SSS research edition; Riley, Riley & Maguire, 2004)

The three subscales of the SSS measure perceived stuttering severity, locus of control of stuttering behaviour, and avoidance from the perspective of the person who stutters. Across 22 items, respondents rate these distinct aspects of the stuttering experience with different audiences (close friend, authority figure, telephone) during the past week on a 9-point scale. For example, on the item 'How would you score your speech with the following audiences during the last week?' the response scale ranges from 1 (Relatively fluent) to 9 (Severe stuttering). Items relating to experiences with a close friend are included for comparison purposes, but are not scored due to usually being less representative of stuttering difficulty. The present study employed the severity (4 items) and locus of control (9 items) scales. Scores are calculated by summing the ratings for the relevant items in each subscale. Higher scores represent greater severity and greater external locus of control. Authors of the SSS report reasonable content and criterion-related validity for the instrument.

2.3 Procedure

The study was a web-based survey. Web surveys have some advantages over traditional survey methods with respect to reducing cost, simplifying the process of data collection and data inputting, accessing hard-to-reach populations, and enabling respondents to remain anonymous (Alessi & Martin, 2010; Hash & Spencer, 2009; Temple & Brown, 2012). The study was promoted via announcements on the websites, and associated social media sites, of the following national stuttering self-help organisations: British Stammering Association, National Stuttering Association, Irish Stammering Association, Canadian Stuttering Association, and British Columbia Association of People Who Stutter. In addition, invitations to complete the survey were distributed by email to local stammering support groups within the UK and to the email mailing list of the National Stuttering Association. The survey was accessed via a direct web link. Respondents were first presented with information on the purposes of the study and the survey's content. In the interests of candour and validity, responses were anonymous. Upon completion of the survey, respondents were presented with a written debrief and thanked for their participation.

2.4 Data analyses

Descriptive (mean, standard deviation, range) and frequency statistics were calculated for each of the survey's measures. The internal consistency of the BMQ, OASES, and SSS subbscales were assessed by means of Cronbach's alpha. Pearson's r correlation coefficients were computed for all key variables and multivariate regression analyses were conducted to examine which of the study's factors best predicted the intention to

undertake pharmacological treatment and speech therapy. Each participant was categorised as accepting, indifferent, skeptical, or ambivalent towards pharmacotherapy for stuttering according to their necessity and concern scores on the BMQ-Specific. The differences in behavioural intentions between these groups were assessed using a one-way between-subjects ANOVA and Bonferroni post-hoc tests. Lastly, a paired *t*-test was used to examine the relative strength of behavioural intentions towards pharmacotherapy and speech therapy within the survey's sample.

3. Results

The mean scores for impact of stuttering, severity, locus of control and medication beliefs are presented in Table 1. Also presented are speech therapy success ratings and ratings for the likelihood of seeking drug treatment and speech therapy for stuttering in future. The frequency distributions of OASES impact ratings are comparable to those in Yaruss and Quesal's (2008) standardisation sample (N=173).

Cronbach's alpha coefficients for the four OASES subscales were >.90. The alpha coefficients for the severity and locus of control subscales of the SSS were .86 and .93 respectively. The coefficients for the BMQ harm and overuse subscales were .74 and .78 respectively, and for the BMQ necessity and concern scales were .85 and .80. These figures indicate high internal reliability within each of the study's published measures.

Table 2 shows the correlations between the study's various measures. Age correlated negatively with impact, severity, locus of control and the likelihood of seeking speech

therapy. As age increased, the likelihood of seeking speech therapy for stuttering decreased. Rated success with previous speech therapy correlated negatively with impact, severity, locus of control, necessity and the likelihood of seeking drug treatment. As speech therapy success ratings increased, the likelihood of seeking drug treatment decreased. Impact of stuttering, severity, and locus of control correlated positively with each other, and these three measures all correlated positively with the likelihood of seeking both types of treatment. Necessity correlated positively with the likelihood of seeking drug treatment.

A multiple linear regression analysis was used to test if the rated success of previous speech therapy, impact of stuttering, severity, locus of control, and necessity-concern differential would predict the likelihood of seeking a drug treatment in future. The overall model was significant: adjusted R^2= .41, F(5, 194) = 28.47, p <.001. Both the impact of stuttering (B=.69, SE_B=.26, β=.26, p =.008) and the necessity-concern differential (B=.13, SE_B=.02, β=.45, p <.001) significantly predicted likelihood of seeking a drug treatment. None of the other variables, rated success of previous speech therapy (p = .17), severity (p = .40), or locus of control (p = .49) significantly predicted likelihood of seeking a drug treatment.

A further regression was run to test if the same variables would predict the likelihood of seeking speech therapy. Again, the overall model was significant: adjusted R^2= .10, F(5, 194) = 5.48, p <.001. Both the rated success of previous speech therapy (B=.20, SE_B=.07, β=.23, p =.004) and the impact of stuttering (B=.67, SE_B=.30, β=.27, p =.03) significantly

predicted likelihood of seeking speech therapy. None of the other variables, severity ($p = .06$), locus of control ($p = .85$), or necessity-concern differential ($p = .09$) significantly predicted likelihood of seeking speech therapy.

The necessity and concern dimensions were split at the scale midpoints creating four belief groups within the sample of participants: accepting (high necessity, low concerns, n = 36), indifferent (low necessity, low concerns, n = 62), skeptical (low necessity, high concerns, n = 75), and ambivalent (high necessity, high concerns, n = 53). As confirmed by a χ^2 test of goodness-of-fit, participants were not equally distributed across the four groups, χ^2 (3, n = 226) = 14.25, $p = .003$. The belief groups are presented in Figure 1.

A one-way between-subjects ANOVA showed that likelihood of seeking a drug treatment varied significantly by belief group: $F(3,222) = 23.43$, $p < .001$, $\eta^2_p = .24$. Bonferroni post-hoc tests indicated that the accepting group had significantly higher ratings than each of the other three groups ($p = .02$ or smaller). Ambivalent and indifferent participants were significantly more likely to seek a drug treatment than skeptical participants ($p < .001$). There was no significant difference between the ambivalent and indifferent groups. Figure 2 illustrates these effects.

A paired t-test showed there was no significant difference between ratings of the likelihood of seeking a drug treatment and seeking speech therapy in future: $t = 0.39$, df = 225, $p = .70$, two-tailed.

4. Discussion

A key aim of the present study was to quantify the cognitive and affective representations of adults who stutter regarding pharmacotherapy for their disorder. Data from the BMQ indicate that adults who stutter share typical beliefs about medications in general, i.e., beliefs about harmfulness and overprescription that are consistent with those of patients with other chronic disorders (e.g., Menckeberg et al., 2008). There is nothing in these data to suggest that adults who stutter are particularly distinctive in their general beliefs towards medicines. Of primary interest in the present study, however, are data from the BMQ on necessity and concerns regarding medicines specifically prescribed for stuttering.

The necessity-concerns differential is the difference between the necessity and concerns scores (with a possible range of -20 to 20) and is intended to represent the outcome of cost-benefit analyses that people perform with respect to medication for a specific disorder. Positive scores indicate that patients perceive the benefits of their medication to outweigh the costs; negative scores result where patients perceive greater cost than benefit (Horne & Weinman, 1999). In the present study, the mean necessity-concerns differential was midway between the two extremes (mean=-2.33), and only marginally negative suggesting that, overall, beliefs towards the benefits and costs of medication for stuttering were quite evenly balanced.

A further aim of this study was to assess the behavioural intentions of adults who stutter towards the uptake of pharmacological treatments and speech therapy for stuttering in the

future. The vast majority of participants in the present study, almost 90%, had previous experience of speech therapy for stuttering, reported modest levels of success with this treatment option, and reported a considerable negative impact of stuttering on their lives. Given these experiences and given that stuttering in adulthood can be resistant to change and therapeutic gains within speech therapy can be prone to the dynamics of relapse (Bloodstein & Bernstein Ratner, 2008), it follows that adults who stutter may be open to alternative treatments, including pharmacotherapy (McCauley & Guitar, 2010). This proposition appears to be borne out by the results: within the present sample, behavioural intentions to undertake pharmacotherapy were as strong as those to initiate the more established option of speech therapy.

It was hypothesised that behavioural intentions to seek pharmacotherapy in future would be predicted by the perceived impact of stuttering on participants' lives, self-reported severity, locus of control, and the necessity-concerns differential. Consistent with this prediction, both the overall impact of stuttering and the necessity-concerns differential significantly predicted the likelihood of seeking a drug treatment. Of these two measures, the necessity-concerns differential was the strongest predictor. These findings indicate that negative experiences of the stuttering disorder, those involving cognitive and affective reactions to stuttering, daily communication difficulties and decreased quality of life, i.e., those beyond the observable aspects of speech fluency, are likely to be factors motivating individuals who stutter to pursue a pharmacological treatment. These findings also suggest that medication beliefs, those reflecting the balance of perceived benefits and perceived risks of medication for stuttering are predictive of intentions to seek

treatment. More specifically, cost-benefit analyses are most strongly related to behavioural intentions to pursue pharmacotherapy where the former result in appraisals in which the benefits of the medication for stuttering are perceived to outweigh the costs.

The latter result is consistent with previous research investigating the relationship between medication beliefs and the uptake of medical treatments in a range of conditions. For example, necessity beliefs and concerns have been found to predict the uptake of highly active antiretroviral therapy in HIV patients as well as subsequent adherence to the medicine (Horne, Cooper, Gellaitry, Leake Date & Fisher, 2007). The present findings are also in line with those of earlier studies which found that injecting and smoking drug users who perceived a need for drug abuse treatment had a greater likelihood of entering such treatment (Siegal, Falck, Wang & Carlson, 2002; Zule & Desmond, 2000).

Significant differences between the accepting, indifferent, ambivalent, and skeptical beliefs groups were found for the behavioural intention to seek pharmacotherapy for stuttering. As might be expected, participants in the accepting group were most likely, and participants in the skeptical group least likely, to seek a drug treatment. This is a further indication that beliefs about medications for stuttering vary considerably within the stuttering population and that these seem to be directly associated with subsequent decisions about treatment. As noted previously, a similar pattern of results has been found in studies investigating adherence to medical treatments in samples of patients with major depressive disorder and asthma (Aikens et al., 2005; Menckeberg et al., 2008).

The self-reported overall impact of stuttering on the participants' lives, as measured by the OASES instrument, predicted the behavioural intention to seek speech therapy for stuttering in the future, as well as pharmacotherapy. This suggests that functional communication difficulties, unseen aspects of the stuttering disorder, and quality of life issues are motivating factors for stuttering therapy more generally, and not just for one or other treatment option. The other factor predicting the intention to seek speech therapy, though not pharmacotherapy, in the present sample, was the rated success of previous speech therapy. This finding would tend to suggest that some adults who stutter recognise the successful management of stuttering as a long-term process, one which may require a return to the clinic for follow-up therapy (Manning, 2010).

A methodological limitation to this study is that participants' behavioural intentions towards future stuttering treatment were assessed rather than their actual behaviour. On the basis of the available data, it is not possible to determine the extent to which the expressed intentions would result in subsequent behaviour, i.e., the initiation of pharmacotherapy or speech therapy, and this limits the conclusions that can be drawn. However, a large body of social psychological theory and research has informed our understanding of the intentions-behaviour relationship sufficiently to enable a reasoned prediction of behaviour in the present case assuming certain conditions are met.

According to the theory of planned behaviour (Ajzen, 1991), the strength of a person's intention to perform a specific behaviour is contingent upon their attitude toward the behaviour, perceived social pressure to engage in the behaviour, and the person's

perception of their ability to perform the behaviour. Where attitudes and subjective norms are favourable, and perceived behavioural control is strong, intentions to perform the behaviour in question should be strong, and where a person has a sufficient degree of *actual* control over the behaviour, intentions should lead to behaviour. This theory has much empirical support. In a meta-analysis of 185 correlational studies, it was found to explain 27% of the variance in behaviour and intentions were found to be reliably associated with behaviour (Armitage & Conner, 2001). A further review of experimental evidence concluded that intention-behaviour relations are often more modest than earlier research assumed and are strongest where people have control over their behaviour (Webb & Sheeran, 2006). Overall then, applied to the case of individuals seeking stuttering treatment, based on prior research, we might assume that if a person holds a positive attitude towards a specific stuttering treatment, if subjective norms relating to the treatment are favourable, and the person has volitional control over treatment initiation, then they should initiate the treatment.

Implicit within the present study's procedure is that speech therapy and pharmacotherapy for stuttering are mutually exclusive treatment options. While this has tended to have been the case historically, an emerging possibility is that speech and language pathologists might work collaboratively with physicians in offering people who stutter a treatment combining both therapies. Multidisciplinary and interdisciplinary team working within medicine and rehabilitation have a considerable history (Rokusek, 1995) and speech and language pathologists already work in such a fashion with allied health professionals and family members (e.g., Farneti & Consolmagno, 2007; Shapiro, 1999).

In a collaborative approach to stuttering, therapy would be tailored to the individual needs of the adult clients. The speech and language pathologist would apply their expertise as usual to speech assessment and the management of stuttering behaviours and emotional reactions. A neurologist or psychiatrist would make decisions about appropriate medications for the reduction of stuttering, taking into account physical comorbidities and accompanying medications and/or recreational drugs which might impair stuttering treatment, and would monitor for possible side effects of the prescribed medication. It is argued that a psychiatrist might offer additional expertise in terms of cognitive behavioural therapy (Ludlow, 2006; Maguire et al., 2010; Maguire, Yeh & Ito, 2012).

4.1 Conclusion

To the authors' knowledge, this is the first study to systematically investigate how members of the stuttering community perceive pharmacotherapy, an emerging intervention for the disorder of stuttering, and what personal factors might motivate pursuit of this treatment. Following previous research with patients across a range of chronic conditions, Horne's (2003) theoretical model of medication representations was used to explore differences between adults who stutter in their beliefs about medication for their disorder. It was shown that the necessity-concerns framework and data from the BMQ-Specific can provide clinicians and researchers working with adults who stutter an explanatory model for understanding their cognitive and affective representations regarding pharmacotherapy and their behavioural intentions to seek such treatment. The BMQ-Specific may also be a means of predicting subsequent uptake and adherence

behaviours in people who stutter, an idea that could be tested in future research. Knowledge that a prospective patient is accepting, indifferent, ambivalent or skeptical towards a specific medication for stuttering could usefully inform pre-treatment consultations and enhance communication and co-operation between patients and practitioners. The findings of this study also show that the OASES, an instrument designed to measure the entirety of the stuttering experience, may have utility in predicting the behaviour of people who stutter considering a medical treatment for stuttering. Building on the present study, further research could assess the attitudes of people who stutter towards a combined approach of speech therapy and pharmacotherapy, an approach that may prove to be more attractive to consumers than either therapy alone.

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Table 1. Demographic information for respondents (N=226) and descriptive statistics for survey measures.

Demographic information	
Age in years	
Mean (SD), range	35.65 (12.57) 18-65
Sex (male), %	65.04
Married (or with significant other), %	49.11
Children, %	33.19
Currently employed, %	76.11
Stuttering characteristics	
Onset age of stuttering in years	
Mean (SD), range	5.25 (3.08) 0-17
OASES total mean (SD)	2.96 (0.70)
OASES impact ratings, %	
Mild	2.21
Mild/Moderate	13.72
Moderate	34.51
Moderate/Severe	36.73
Severe	12.83
Subjective Screening of Stuttering (SSS)	
Severity, mean (SD)	14.20 (5.59)
Locus of control, mean (SD)	30.62 (13.21)
Speech therapy experiences	
Previous speech therapy experience, %	88.5
Currently receiving speech therapy, %	13
No. of speech therapy experiences	
Mean (SD), range	3.08 (1.99) 1-15
Speech therapy success ratings	
Mean (SD), range	4.07 (2.13) 1-9
Medication experiences and beliefs	
Previous stuttering medication experience, %	6.64
Presently taking medication, %	
for stuttering	2.21
for mental illness	16.37
for serious physical condition	11.50
Beliefs about Medication Questionnaire (BMQ)	
General-Overuse, mean (SD)	11.80 (3.34)
General-Harm, mean (SD)	9.42 (2.93)
Specific-Necessity, mean (SD)	12.69 (4.15)
Specific-Concerns, mean (SD)	15.03 (4.46)
Necessity-concerns differential, mean (SD)	-2.33 (6.45)
Likelihood of seeking treatment for stuttering	
Drug treatment, mean (SD)	4.13 (1.89)
Speech therapy, mean (SD)	4.07 (1.77)

OASES = Overall Assessment of the Speaker's Experience of Stuttering

Table 2. Pearson's *r* correlations.

|	2	3	4	5	6	7	8	9	10
1. Age	.170*	-.013	-.227**	-.151*	-.245***	-.042	.004	-.089	-.326***
2. Number of speech therapy experiences	-	.002	-.058	.118	-.017	.001	.060	.057	-.152*
3. Rated success of speech therapy	-	-	-.515***	-.234**	-.241**	-.314***	.122	-.350***	.091
4. Impact of stuttering	-	-	-	.637***	.724***	.526***	-.145*	.499***	.253***
5. Severity	-	-	-	-	.733***	.355***	-.182**	.341***	.263***
6. Locus of control	-	-	-	-	-	.409***	-.191**	.349***	.234***
7. Necessity	-	-	-	-	-	-	-.120	.478***	.126
8. Concerns	-	-	-	-	-	-	-	-.398***	.104
9. Reported likelihood of drugs	-	-	-	-	-	-	-	-	.153*
10. Reported likelihood of speech therapy	-	-	-	-	-	-	-	-	-

*$p < .05$, **$p < .01$, ***$p < .001$
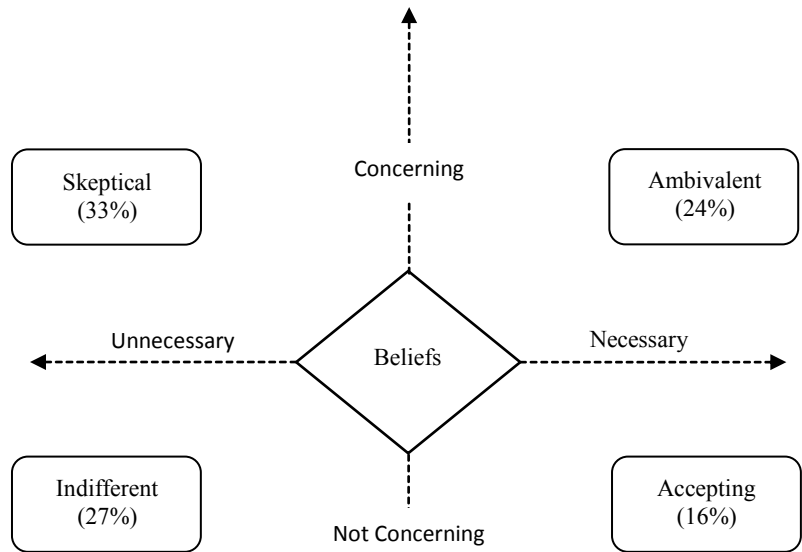
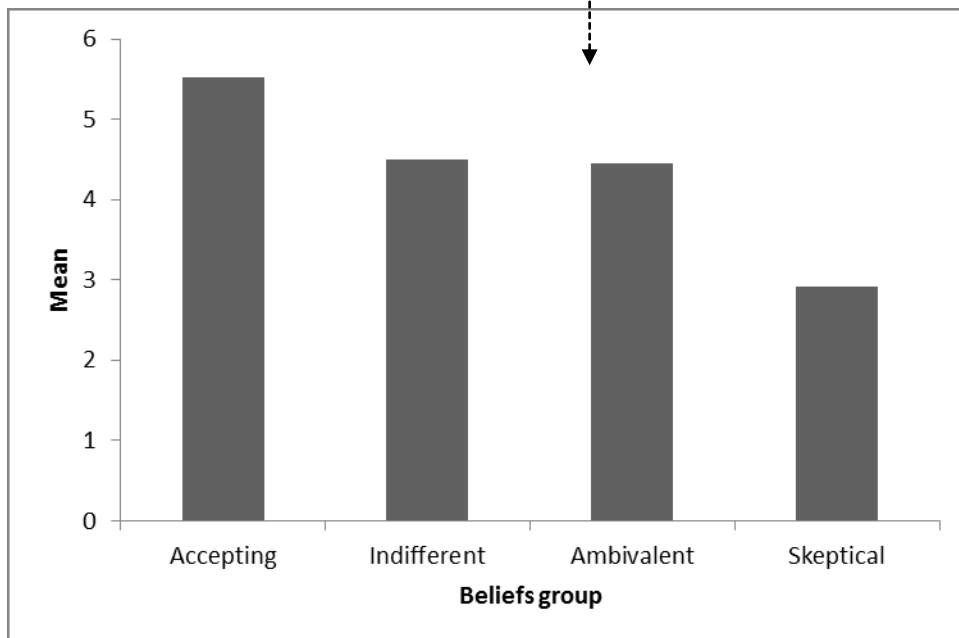**Figure 1.** Medication for stuttering beliefs groups (percentage of sample in parentheses).

Figure 2. Likelihood of seeking a drug treatment for stuttering by beliefs group.