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Mood state sub-types in adults who stutter: A prospective study

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ABSTRACT

Purpose: Many adults who stutter have elevated negative mood states like anxiety and depressive mood. Little is known about how mood states change over time. The purpose of this study was to determine the trajectories or sub-types of mood states in adults who stutter over a 6 month period, and establish factors that contribute to these sub-types.

Method: Participants included 129 adults who stutter who completed an assessment regimen at baseline, including a measure of mood states (Symptom Checklist-90-Revised). Three mood states were assessed (interpersonal sensitivity or IS, depressive mood and anxiety) once a month over 6 months. Latent class growth mixture modeling was used to establish trajectories of change in these mood states over time. Logistic regression was then used to determine factors assessed at baseline that contribute to the IS trajectories.

Results: Three-class trajectory models were accepted as the best fit for IS, depressive mood and anxiety mood sub-types. Stable and normal mood state sub-types were found, incorporating around 60% of participants. Up to 40% belonged to sub-types comprising elevated levels of negative mood states. The logistic regression was conducted only with the IS domain, and revealed four factors that significantly contributed to IS mood sub-types. Those with low perceived control, low vitality, elevated social fears and being female were more likely to belong to elevated IS classes.

Conclusions: This research revealed mood sub-types in adults who stutter, providing direction for the treatment of stuttering. Clarification of how much stuttering influences mood sub-types versus pre-existing mood is required.

1. Introduction

Evidence suggests that persistent developmental stuttering has a neurological deficit cause (e.g. abnormal left hemisphere neural activity) with genetic origins (Ingham, Ingham, Euler, & Neuman, 2017; Kell, Neumann, Behrens, von Gudenberg, & Giraud, 2017). This conclusion is also supported by the lack of convincing evidence suggesting stuttering is caused by psychogenic factors (Craig & Tran, 2014). However, while anxiety or emotional conflicts are unlikely to be instrumental factors causing stuttering, by late adolescence and adulthood, the struggle of living with this disorder will have resulted in significant psychological distress in many people who stutter (Blood, Boyle, Blood, & Nalesnik, 2010; Craig, Blumgart, & Tran, 2015; Craig, Hancock, Tran, Craig, & Peters, 2003; Craig & Tran, 2014; Iverach & Rapee,2014; Tran, Blumgart, & Craig, 2011). Psychological distress refers to unpleasant mood states or conditions, including a range of symptoms usually experienced as upsetting and disturbing, including elevated anxiety, anger and depressive mood (Craig et al., 2016). A mood state is defined in this paper as a chronic or transitory psychological state

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experienced as a feeling or emotion (e.g. anxiety, happiness) that influences function and wellbeing (Tran et al., 2011). Mood states were studied in adults with persistent developmental stuttering, with comparisons made to non-stuttering adults with a similar age and level of education. The adults who stuttered had significantly and clinically elevated negative mood states compared to the controls. Medium to large effect sizes between the two groups were found for anxiety and interpersonal sensitivity, while medium effect sizes were found for domains such as somatization and depressive mood (Tran et al., 2011). These mood domains are composed of core negative mood state symptomatology, and the elevated levels are best understood as a consequence of heightened social anxiety and sensitivity (Craig & Tran, 2006; Iverach & Rapee, 2014; Tran et al., 2011). Social stereotypes of stuttering, for example, people who stutter are shy and reclusive, reflect this risk of elevated mood states like anxiety and depressive mood (Craig, Tran, & Craig, 2003).

Meta-analyses provide a high level of evidence in science (O'Rourke and Detsky, 1989). Findings from a recent meta-analysis (Craig & Tran, 2014) that examined trait and social anxiety in 19 studies involving over 1,268 adults who stuttered with comparisons to 1,678 adults who did not stutter, concluded that persistent developmental stuttering is associated with abnormally elevated trait and social anxiety, with evidence suggesting this is associated with risk of social anxiety disorder (Blumgart, Tran, & Craig, 2010a; Craig and Tran, 2006; Ezrati-Vinacour and Levin, 2004; Kraaimaat et al., 2002; Mulcahy, Hennessey, Beilby, & Byrnes, 2008) and reduced quality of life (Craig, Blumgart, & Tran, 2009; Koedoot, Bouwmans, Franken, & Stolk, 2011; Yaruss, 2010). Other problems include pessimistic and helpless thinking (as opposed to optimistic resilient thinking) and reduced access to social support due to avoidance (Blumgart, Tran, & Craig, 2014; Craig, Blumgart, & Tran, 2011). Furthermore, recent research concluded that self-efficacy and social support perform a protective influence, that is, over time, these factors buffer or cushion the adversity associated with stuttering (Craig et al., 2015). Notably, socio-demographic factors have rarely been found to contribute significantly to the change in mood states over time (Craig et al., 2015).

1.1. Mood state sub-types

The problem of elevated negative mood states in those with persistent developmental stuttering requires further investigation. In a comprehensive review of the epidemiology of stuttering, Yairi and Ambrose (2013) systematically discussed research that attempted to distinguish sub-types of stuttering. They concluded there is reasonable evidence that sub-types exist, such as persistent versus recovered stuttering (Yairi & Ambrose, 2013), and if this is the case, then clinical interventions should be designed and applied with these sub-types in mind. Negative mood sub-types have been identified in people with neurological injury (Bonanno, Kennedy, Galatzer-Levy, Lude, & Elfström, 2012). Likewise, there is a need to investigate whether sub-types of mood states exist in adults with persistent developmental stuttering, and clarifying this question may lead to improved clinical interventions. In contrast to normal mood, unstable mood would be characterized by symptoms associated with elevated psychological distress as defined above. A judicious clinical decision may involve primarily treating stuttering symptomatology in those identified as having a stable normal mood trajectory, while stuttering behavior and negative or unstable mood (e.g. social anxiety) should both be the primary object of treatment in those identified with an unstable mood trajectory (Craig & Tran, 2006).

1.2. Mood state trajectories

To identify inter-individual (between people) and intra-individual (within an individual) mood state classes, longitudinal and repeated measures data is required that can be subjected to trajectory analyses. Some conventional approaches to describing change over time, such as repeated measures analysis of covariance, assume homogeneity across levels of the between-subjects factors and covariates (Reinecke & Seddig, 2011). These more traditional approaches also assume that covariates influence all individuals in the population similarly (Jung & Wickrama, 2008). However, an alternative approach, structural equation methodology called latent growth curve modelling (LGCM), determines different classes/trajectories of individuals around different mean growth curves (Muthén & Muthén, 2000; Nagin & Odgers, 2010; Reinecke & Seddig,2011). This approach is applicable when analyzing populations that are hypothesized to be composed of distinct sub-populations, for instance, those that have stable elevated negative mood versus those who have stable normal mood. Latent growth mixture modelling (LGMM) is an expansion of growth curve modelling (Nagin & Odgers, 2010) that employs statistical models designed to analyze data composed of a mixture of two or more homogenous groups. LGMM trajectory research has been successfully applied to a range of disorders, for example, in people with severe neurological injury (Bonanno et al., 2012; Guest et al., 2015) and adults who have experienced trauma (Orcutt, Bonanno, Hannan, & Miron, 2014). Bonanno et al. (2012) and Guest et al. (2015) investigated trajectories of mood and resilience respectively following spinal cord injury. Four distinct classes were isolated that included (i) those displaying stable mood/resilience over time; (ii) those showing improving mood/resilience over time; (iii) those showing a worsening of mood/resilience over time, and (iv) those with chronically elevated depressive mood/poor resilience.

1.3. Purpose, aims and hypotheses

The purpose and aim of this study was to investigate sub-types of mood states in adults who stutter. To achieve this, prospective research was conducted over a 5-6 month period from which trajectories of mood states (domains included interpersonal sensitivity, anxiety and depressive mood) in adults who stutter could be determined. Change in a range of mood states rather than a single state like anxiety was investigated, as this provides a greater perspective of change over time in the participants' emotional status. A second aim involved determining factors that predict mood state class membership. It was hypothesized that distinct mood sub-types