

Music and Sociability in Williams Syndrome:

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Introduction:

Williams syndrome (WS) is a neurogenetic disorder associated with a mild to moderate cognitive impairment and a hypersocial personality, most notably an unusually high tendency to approach and interact with strangers (Järvinen-Pasley et al., 2008). Within the WS phenotype, increased sociability is accompanied by an interesting profile of music processing. Reports of increased emotionality in response to music are largely anecdotal in the WS literature. For example, individuals with WS demonstrate a high affinity to music, including a high engagement in musical activities (Don et al., 1999; Levitin et al., 2005), which may be linked to increased activation of the amygdala to music (Levitin et al., 2003). Despite enhanced neurological responsiveness to music, individuals with WS do not necessarily demonstrate enhanced music processing abilities (e.g., Deruelle et al., 2005). Interestingly, increased emotional expressivity has been reported to extend from social interactions (e.g., Reilly et al., 2004) to the experience of music (Don et al., 1999; Levitin et al., 2005a) in WS.

For this study, Levitin et al. (2005) utilized a parental questionnaire designed to initially characterize the musical phenotype in WS; one also employed in the current study. WS individuals reported a higher degree of emotionality than Down syndrome and typical development (TD) groups when listening to music. Individuals with WS were also reported to show greater and earlier interest in music than the comparison groups, and music had a significantly greater propensity to induce sadness. These findings are interesting in light of the fact that a genetic link between musicality and sociability has been postulated (Huron, 2001). Yet, the relationship between the increased sociability and enhanced musicality (i.e., musical interest, ability, and responsiveness) is unclear. Thus, the present study sought to address this question by: (1) comparing musical and linguistic expressivity; (2) and by comparing musical and general social-emotional behaviors (approach behavior and emotion sensitivity) in WS and TD controls.

Methods:

The Salk-McGill Music Inventory Questionnaire of Music Ability and Interest and the Peabody Picture Vocabulary Test (PPVT-III) were administered to 53 individuals with WS ($M_{age}=28.93$, $SD=7.01$) and 21 TD controls ($M_{age}=27.74$, $SD=7.44$). Three questions addressing the frequency of original musical production, musical interest, and emotional expressivity to music were used from the music questionnaire. To parse the potential link between sociability and musicality, the Salk Institute Sociability Questionnaire (SISQ) was administered as a measure of social approach and emotion sensitivity. The use of language for social-emotional purposes was evaluated by the proportion of affective engagement devices (Reilly et al., 2004) used by participants when narrating a story from a picture book (Frog Where Are You?).

Results:

(1) Emotion expressivity when listening to music and the use of affective engagement devices were significantly correlated in WS ($r=.595$, $p=.004$) and TD controls ($r=.548$, $p=.019$), indicating that greater one expresses emotions to music the more one also tends to do so through language (2) Emotional responsiveness when listening to music was significantly and positively correlated with emotional sensitivity in the WS group ($r=.369$, $p=.009$), but not in the TD group ($r=-.151$, $p=.513$). This finding suggests that emotional responsiveness to music and sensitivity to the emotional states of others may be atypically associated in WS.

Discussion:

The main finding from this preliminary study suggests that in WS, emotional expressivity to music is significantly associated with socio-emotional behavior in WS but not in TD controls. In contrast, affective expression in auditory modality, i.e., music and language, were associated in both groups. These results suggest that the expression of emotion to music and through language are related. However, the result that emotional expressivity in music correlated significantly with socio-emotional behavior in WS only suggests that sociability and musicality may be more intimately related in this population than is typical. It may thus be that musical activities may provide a tool for individuals with WS to learn to socialize with others and acquire some social-emotional skills (e.g., affective expression and emotion identification).