

## Autism and Regulation of Hypersensitivity

### Background:

Prof. Dr. Stephen Porges has described in his polyvagal theory how stress reactions of the autonomic nervous system (in mammals and humans) influence social behaviour. So far, the relief of hypersensitivity in autistic people has not been achieved by therapeutic approaches that directly aim at stabilizing and relieving the processing of stimuli and the regulation of perception of affected persons. Here, the '*Safe and Sound Protocol*' developed by Stephen Porges offers possibilities for intervention through frequency-modulated music to be heard via headphones. There are already 2 studies on the predecessor of the SSP in the field of autism spectrum. The present study is the first study to assess SSP effects on visual, tactile, digestive, and selective eating domains as well as the first autism specific German study.

**Methods:** Using specifically processed common popular music, the frequency bands of the human prosody (speech melody) are particularly emphasized and frequencies not belonging to this range in the bass and treble range are filtered out. The music is heard via high-quality headphones and acts via the cranial nerves V and VII on the musculus Stapedius of the middle ear. The hearing of the music takes place on 5 consecutive days (60 minutes each) and is accompanied by therapists trained for the Safe and Sound Protocol (providing gently motivating and responding interactions). In our study (with 37 children, adolescents and adults on the autism spectrum), a progress protocol of sensory sensitivity was created using evaluation sheets (BBC Sensory Scales with 50 questions) and analyzed using *linear mixed effects models*. Participants in the study showed improved auditory hyper- and hyposensitivities, visual hypersensitivities, tactile sensitivities, social touch aversion (at week 1 post only), and digestive problems. Therapists also observed a greater mobility of reaction patterns following the SSP, which no longer occurred only as "fixed" stimulus responses. Four weeks after the intervention there was a decrease in selective eating.

**Conclusions:** The SSP seems to us to be an effective and low-threshold therapeutic approach to work with autistic people in the sense of a 'co-regulation' of the nervous system via a stabilisation of the perception system (auditory and subsequently via the vagus nerves also visually, tactile, respiratory and digestive) working via "neuroception" (carried out musically and interactively).

**Outlook / Limits:** The approach to achieve (emotionally calming as well as activating) co-regulation of communicative interaction through (musically stimulated) calming of the perceptual system, which is jointly achieved in the therapy setting, is, despite all the simplicity of the therapeutic method "listening to music", quite complex and requires a high degree of therapeutic skill on the part of the therapists involved. It revolves around the ability to maintain non-verbal contact via gesture and mimicry in the presence of the therapist and to absorb and reflect the inner state of the client in a relaxed ("co-regulatory") way. The "fine vibrations" of interactive communication are likely to play a major role here. The BBC Sensory Scales do not provide any information about behavioural changes. To document those we have introduced an additional questionnaire after the 1st week of therapy. For further studies we consider this aspect an important question. The feedback from parents and participating adults in this regard was in part very positive, so that it can be said that relief at the sensory level enables improvements in communicative behaviour. The social environment of the study participants did not receive detailed explanation about the background and effectiveness of the SSP. In some participants there were clearly positive behavioural changes, which decreased again after completion of the SSP. Here we see an important connection that should be investigated further.