



Virtually Encountering Fears. Technology-Assisted Interventions for Social Anxiety Disorder

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Summary

The entry of technology into mental health care facilitates new treatment possibilities for social anxiety disorder (SAD). The main goal of the present thesis was to contribute to the knowledge on technology-assisted interventions for SAD by providing a systematic overview of the existing literature, investigating the efficacy of existing technology-assisted interventions, developing a virtual reality exposure intervention for patients with heterogeneous social fears, examining predictors of treatment outcome, and comparing different assessment tools regarding the prediction of social anxiety in daily life.

A systematic literature search on technology-assisted interventions for SAD (Chapter 2) resulted in 37 randomized controlled trials including interventions that were grouped into internet delivered cognitive behavior therapy (ICBT), virtual reality exposure therapy (VRET), and cognitive bias modification (CBM). A meta-analysis revealed that when compared to passive control conditions, ICBT and VRET showed significant effects regarding SAD symptom improvement, whereas CBM did not lead to significant improvement, except when training was delivered in the laboratory. Relative to active control conditions, VRET showed comparable effects while ICBT demonstrated greater effects. Given the limited number of studies investigating VRET, more research on its efficacy especially in the treatment of individuals with heterogeneous social fears is desirable.

A randomized controlled trial was set up to evaluate a virtual reality exposure intervention that included extensive verbal interaction for SAD patients with heterogeneous social fears. Results revealed that we successfully simulated extensive verbal interaction in virtual reality and that VRET was an effective intervention for patients with SAD with heterogeneous social fears (Chapter 3). Patients in the VRET and exposure in vivo conditions showed significant improvement in social anxiety symptoms, duration of a speech task, perceived stress, and avoidant personality disorder related beliefs from pre to post treatment compared to a waiting-list control condition. However, VRET was inferior to exposure in vivo and only the latter led to significant improvement compared to waiting-list control group regarding fear of negative evaluation, speech performance, general anxiety, depression, and quality of life. Technological improvements might contribute to the augmentation of the efficacy of VRET for SAD in the future.

When examining whether changes in cognitions during treatment predict treatment outcome after exposure therapy, we found that changes in estimated social costs were predictive of social anxiety symptom improvement in SAD patients after both in vivo and virtual reality exposure (Chapter 4). A greater decrease of estimated social costs was associated with greater improvement of social anxiety symptoms. Neither self-focused attention nor self-efficacy were significant predictors of treatment outcome.

Enclosing cognitive components in VRET and directly targeting changes in estimated social costs might increase the efficacy of VRET for SAD.

Given that cognitive biases have been linked to SAD and may represent a risk factor for the development of this disorder and relapse after treatment, we investigated whether traditional treatments, such as exposure therapy, affect cognitive biases in patients with SAD. The examination of effects of exposure therapy on cognitive biases showed no significant difference in changes in attention bias and approach-avoidance bias from pre- to posttreatment between exposure therapy conditions (VRET and exposure in vivo) and a waiting-list control group (Chapter 5). Future research needs to explore how cognitive biases can be effectively addressed in the treatment of SAD.

We further explored the role of self-report questionnaires, behavioral assessment tasks, and implicit behavior measures as assessment tools of social anxiety (Chapter 6). Results showed that a self-report measure for fear of negative evaluation (FNE-B) significantly predicted social anxiety and experiential avoidance in daily life, whereas a

self-report measure assessing fear and avoidance in social situations (LSAS-SR) predicted experiential avoidance only. Both self-report questionnaires did not significantly predict negative social events. Neither approach-avoidance bias as assessed with the approach avoidance task nor maximum anxiety levels during an in vivo and virtual reality behavioral assessment task significantly predicted any outcome variable. Although our results support the use of self-report measures in the assessment of social anxiety, the results need to be replicated considering limitations of the present study.

By approaching technology-assisted interventions for SAD from different angles, starting with an overview of the existing research, then zooming in on virtual reality technology and mechanisms of exposure therapy, this thesis provides new insights regarding the integration of technology and traditional interventions for SAD, such as exposure therapy, and presents conclusions and implications for future research.