Effects of using strategies on the level of presentation anxiety in university students

Sina Frerichs

Department of Positive Clinical Psychology and Technology

Faculty of Behavioural, Management and Social Sciences

University of Twente

Examination committee

Jenny Pouls

Mirjam Radstaak

July 4, 2022

Abstract

Background. Experiencing feelings of anxiety while presenting something in front of an audience is common in society. The experienced anxiety can be assigned to internal factors, such as negative thoughts. The aim was to research the effect applying strategies has on the level of presentation anxiety in university students during the state of presenting.

Method. The dependent variable is level of presentation anxiety. The independent variables are walking around, short break, positive visualisation, smiling, positive self-talk, and sensation shift (H1-H6). A mixed methods design was used. The sample entailed university students ($N = 47$), aged 18 to 31 years ($M = 21.75$; $SD = 2.39$). Data was collected using a questionnaire comprising six self-developed items, one to measure each hypothesis, an open question asking about additional strategies students have applied, as well as the PRPSA scale, aiming at measuring the level of presentation anxiety. For the analysis, multiple regression analysis and an independent sample t-test were used.

Results. All strategies together are significantly associated with the level of presentation anxiety. Sensation shift is significantly associated with the level of presentation anxiety. No significant findings for walking around, short break, positive visualisation, smiling, and positive self-talk on the level of presentation anxiety were found. No group differences between using (no) additional strategies in relation to the level of presentation anxiety were found.

Conclusion. The insignificant of H1-H5 findings were unexpected as the concepts had shown their success in other settings before. However, the findings provide new directions to follow in research.

Introduction

Being part of society unavoidably leads to presenting something in front of an audience. It can be as small as participating in class while going to school, or as big as defending findings in an academic setting, when pursuing a career in such setting. Experiencing anxiety before presenting in front of an audience is a common phenomenon, especially amongst students in an academic setting (Eysenck, 2007). Since the majority of students is facing presentations multiple times during their academic career, their perceived level of anxiety during such presentations can have an immense impact on the extent to which those are successful (APA, 2013; Sanders and Sander, 2007).

Anxiety itself is a fear response to a challenging situation and the extent to which one experiences it differs depending on the individual (Eysenck, 2017). Individuals who are experiencing anxiety are fearful of social interactions that incorporate the possibility of being scrutinized by a group of people, such as audience to present in front of (APA, 2013; Eysenck, 2007). Their anxious response to such a situation is triggered by their underlying fear of performing negatively (APA, 2013). They expect that this will lead to a negative evaluation, reinforcing feelings of humiliation or embarrassment. The individual fears that one negative step will lead to another and in the end will result in being ostracised by their peers (APA, 2013; Eysenck, 2007).

Research conducted by Wong and Rapee (2016) further underlines the impact the social environment, such as peers play in the development of presentation anxiety. Moreover, they stated the level of anxiety finds its origin in an individual's past. Tendencies for higher levels of anxiety can be inherited or impacted, amongst others, by parents and peers from past academic performances. This is in line with Sanders and Sander's (2007) findings of a correlation between past academic success in university students and their perceived confidence (ability for future performances) in future success. The more students view the experience of a presentation in the past as positive, the less those students tend to worry and the more capable they feel regarding their performance (Sanders and Sander, 2007). Especially when focusing on presenting in front of an audience, they defined a positive experience as the individual feeling capable of managing the presentation, a low need to ask their teacher for support, alongside a low urge to complain about the presentation beforehand to others. Summarising, past experiences determine future levels of presentation anxiety in students. However, a negative presentation experience reinforces the students' level of presentation anxiety and for

the majority of the cases those intense negative feelings and perceived threat are out of proportion (APA, 2013). However, getting caught up in one's own thoughts during a presentation is hindering oneself from a successful performance since it can lead to a vicious cycle of negative thought (Eysenck, 2007). Therefore, focusing on possible strategies that are helping students to shifting away from them to be present in the moment of presenting can be of great support.

Presentation anxiety as a fear response can reinforce physical and cognitive symptoms (Eysenck, 2007; Westenberg et al., 2009; Steptoe & Vögele 1992). When the physical response is triggered, the body releases the same set of hormones as when an individual experiences excitement. This indicates that the level of anxiety is linked to the way an individual interprets their bodily arousal. Moreover, physical symptoms, such as nervousness, a rapid heartbeat, sweaty palms, shortness of breath, and a high blood pressure are likely to appear (Westenberg et al., 2009; Steptoe & Vögele 1992). Contrastingly, the cognitive response triggers negative thought processes that lead to worrying about the presentation, such as increased thinking about one's own performance, fear of negative evaluation by their peers and expected negative outcomes. (Eysenck, 2007). In addition, having experienced presentations in the past that have led to an undesired outcome can further reinforce a strong fear response (Sanders and Sander, 2007).

On top of that, a differentiation between internal and external factors influencing the students' performance in the field of presentation anxiety is made (Kishida et al., 2022; Wechsler et al., 2021). Internal factors are of cognitive nature and describe negative recurring thoughts hindering the individual from presenting successfully, whereas external factors are of non-social (e.g., objects) and social (e.g., the audience) nature (Eysenck, 2007; Kishida et al., 2022; Wechsler et al., 2021). The accompanying anxiety response during a presentation can occur before, during, or after a presentation and since anxiety itself is classified as a cognitive process, it is counted as an internal factor (Westenberg et al., 2009). Furthermore, Kishida et al.'s (2022) findings stated that the strategy of being sufficiently prepared decreased the students' level of anxiety prior to presenting and made it easier for them to regulate their focus back to the task at hand. The results underlined the importance of practice and how it positively impacts the students' cognitive processes regarding presentations. Results found, amongst others, by Carl et al. (2019), Emmelkamp et al. (2020), and Wechsler et al. (2021), presented similar findings of keeping the state before a presentation in focus, leaving the state during a presentation under researched.

According to findings from Wechsler et al. (2021), they justify the need for a shift from self-focus to an external one by stating that an increased self-focus leads to being overly aware of one's anxiety which in turn increases the perceived anxiety about the upcoming presentation. Although preventative strategies have been researched, they lack to provide insight on the students' cognitive processes during the presentation. Furthermore, in-depth information on how students who are in the process of presenting can shift their self-focus towards external factors are not researched yet.

The strategies of practice and preparation one can do before a presentation have shown to be successful in helping students to manage their anxiety response before a presentation by the means of exposure therapy. Exposure therapy, which has shown its success many times before (e.g., Carl et al., 2019; Emmelkamp et al., 2020; Kishida et al., 2022; Wechsler et al., 2021), can be too much of a step for individuals with a high level of presentation anxiety. It seems to primarily reduce avoidance of the challenging situation (Kishida et al., 2022) and does not address what one can do during a presentation to reduce anxiety. The state of handling presentation anxiety during a presentation has rarely been touched by research, leaving a research gap. Therefore, this study aims at examining whether the strategies that can be used during a presentation, that is walking around, short break, positive visualisation, smiling, positive self-talk, sensation shift, and additional strategies can reduce presentation anxiety. Those strategies, when applied by students during a presentation are expected to play a supporting role in them overcoming their anxiety to present. In order to realise that the following research question (RQ) has been formulated: To what extent does applying strategies decrease the presentation anxiety of university students during the state of presenting? To examine the topic in-depth, the following fields and corresponding hypotheses are introduced:

Walking around

Often feelings of anxiety are accompanied by physical arousal such as tensed muscles which reinforce the individual's level of anxiety (Conrad & Roth, 2007). In order to relax the muscles and by that decrease the anxiety response of the body, progressive muscle relaxation (therapy) has proven its success. According to findings from Jacobson (1938), the relaxation of muscles inevitably leads to a relaxed mind. Furthermore, his research indicated that the higher the level of anxiety in an individual, the stronger the muscle tension. Moreover, physical exercise is an effective approach to reduce anxiety, especially when the exercise is walking as this reinforces the body to release endorphins (Mirdha & Mirsha, 2015; Voinea, 2007).

Concludingly, walking around is a successful way of relaxing muscle to reduce a high level of anxiety. Since findings support the effects of walking on relaxing muscles are not further examined in the context of presenting in front of an audience, this results in the following hypothesis: H1: Walking around during a presentation will have a positive influence on the students' level of presentation anxiety.

Short break

According to Epstein (1999), practicing mindfulness is about being present in the situations one experiences and reflecting on them in the moment, while being aware of one's ongoing thoughts, bodily sensations and performed actions. The mindful practice aims at the acceptance of one's own physical and mental processes in a non-judgemental way when performing tasks on a daily basis. One layer of mindfulness describes being aware of the moment and one's state of mind in it, followed by taking a break to manage anxious thoughts. Findings from Irving et al. (2009), support the beneficial effect of mindfulness on the physical and mental health in the context of anxiety. In line with that is the mindfulness-based stress reduction (MBSR) theory which successfully treats various illnesses such as anxiety (Kabat-Zinn, 2003). One of MBSRs techniques is mindfulness meditation, which focuses on being present in the moment and was chosen since it has proven its success in reducing anxiety in multiple studies (Niazi & Niazi, 2011; Epstein, 1999). This results in the following hypothesis: H2: Taking a break during a presentation will positively impact the students' level of anxiety.

Positive visualisation

Mental imagery is a mental skill often reported to be used as a mental exercise task (Hausenblas, et al., 1999). According to Giacobbi et al. (2003), imagery entails visualising a certain outcome (being goal oriented) regarding motivational and cognitive aspects, meaning to generally improve one's own performance (Gammage et al., 2000; Hausenblas et al., 1999). This includes energy imagery which describes the visualisation of images that are related to a certain (set of) feelings leading to an increase in motivation (energy) to continue. Visualising positive future outcomes are said to lead to a relief from stressful thoughts, which decreases the level of anxiety (Giacobbi et al., 2003). The amount of imagery used is related to future behaviour, such as the future level of success and failure, as reported by Gammage et al. (2000). This results in the following hypothesis: H3: Visualising a positive continuation of the presentation will decrease the students' level of presentation anxiety.

Smiling

The facial feedback hypothesis (FFH) finds its origin in Darwin and James' theories. Darwin (1965) stated that the extent to which an individual experiences an emotion can be regulated by enhancing or inhibiting said expression. James (1890) suggested that the perception of feelings is subjective and can be traced back to bodily changes, such as a change in facial expressions. However, both argued that facial movement influences emotional experience of individuals. Moreover, Kleinke et al. (1998) state, that facial expressions can be positive and negative. Positive ones lead to an increase of the individual's mood, whereas negative ones are decreasing the mood. Smiling is considered a positive facial expression: When smiling during a presentation, the audience is expected to respond by smile back which then leads to an increase in the presenter's mood and a decrease in anxiety. This results in the following hypothesis: H4: Smiling while holding a presentation will decrease the student's level of presentation anxiety.

Positive self-talk

Self-talk is a mental skill where an individual is consciously repeating statements to themselves without speaking out loud. Further, it was defined as "an internal dialogue [in which] the individual interprets feelings and perceptions, regulates and changes evaluations and convictions, and gives him/herself instructions and reinforcement" by Hackfort and Schwenkmezger (1993) (p. 355). The nature of self-talk can be either positive or negative. Nevertheless, research findings about that topic have been contradicting whether positive self-talk (Van Raalte et al., 1995; Gammage et al, 2001) or negative self-talk (Highlen & Bennett, 1983) has a greater effect on the performance or if there is no difference in effect at all (Dagrou et al., 1991). Since more research findings about the success of positive self-talk are available, the emphasis of this study was placed in using positive self-talk to calm one's anxious feelings during a presentation. This results in the following hypothesis: H5: Using positive-self talk during a presentation will positively impact the students' level of presentation anxiety.

Sensation shift

Often when individuals are experiencing anxiety it is accompanied by bodily sensations, such as racing heart, high blood pressure, shortness of breath and sweaty hands (Steptoe & Vögele 1992). In order to distract the mind from possible recurring though processes an individual can attempt to shift the sensation. When actively trying to regulate said sensations, those attempts can work as distractions from anxious thoughts leading to lower anxiety (Kalisch

et al. 2009; Gagne & Toye, 1994). Distractions can either be self-generated or triggered by internal or external stimuli, whereas bodily sensations are belonging internally (Wegener, 1994). However, an individual who wants to perform self-distraction cannot simply follow any stimuli given in that situation. They have to actively choose another stimuli to follow. This sensation shift can be done by (physically) touching another part of the body. Findings reported by Gagne & Toye, 1994 stated that their patients reported a significant reduction of their perceived level of anxiety after using the technique of shifting sensation by touch. This results in the following hypothesis: H6: Shifting sensation when faced with rotating thoughts during a presentation will decrease the students' level of presentation anxiety.

When looking at the strategies named above, it became clear that they are quite diverse but still effective in decreasing the level of anxiety. Since it cannot be implied that using any strategy is better than using none, an explorative analysis is conducted to see which other strategies were used by students and whether they influenced presentation anxiety. The more actively one applies strategies to decrease their presentation anxiety, the more relaxed the person is expected to be while presenting. According to findings of Kelly et al. (2008), when facing anxiety individuals show differences in responding to it and they have different coping styles. A positive coping style is indicated by approaching the problem or emotion in order to improve the situation. Furthermore, it is stated that a negative coping behaviour is leading to a higher level of anxiety. Someone's coping behaviour, which can be problem-focused or emotion-focused, plays a crucial role in the way they handle their experienced anxiety (Carver et al., 1989; Kelly et al., 2008). Since an emotion-focused coping style is shown to be less effective and in fact tends to increase the level of anxiety experienced, the focus will lie on the more successful approach of problem-focused behaviour (Ben-Zur, 2009; Kelly et al., 2008; Carver et al., 1989). A problem-focused coping style incorporates active coping, describing the use of behaviour and cognition to manage the anxiety causing situation. The connection between the multiple strategies is that they indicate a way of active coping by being applied during a presentation in order to decreasing presentation.

Methods
Design
This study intents to measure to what extent applying strategies, which support students to shift their anxious thoughts during a presentation to the present situation, have an influence

on the students' level of presentation anxiety. The dependent variable (DV) is level of presentation anxiety. The independent variables (IV) are walking around, short break, positive visualisation, smiling, positive self-talk, and sensation shift. The study is following a mixed methods design, meaning both quantitative and qualitative data has been collected. Primary data is used.

Participants

The study was conducted in April 2022 with a sample size of 56. The ethical approval was granted by the Ethics committee of the faculty of Behaviour, Management, and Social Science of the University of Twente. The researcher used convenience sampling alongside snowballing. Each participant had to meet the requirement of being 18 years old or older, must be a student at a university who has performed in front of an audience in the past and must speak English. In total, nine participants had to be excluded due to missing data in the questionnaire leading to a final sample size of 47. The final sample is comprised of 57.4% female, 38.3% male and 4.3% non-binary / third gender. The ages ranged from 18 to 31 ($M =$ 21.75; $SD =$ 2.39), with the highest density in the age of 20. The vast majority indicated to be a Bachelor student (82.9%). 12.8% stated to be a Master student and 4.3% of the participants are students but selected the option "other". The most commonly represented nationality was German (46.8%), followed by 27.7% of other nationalities and 25.5% were Dutch. The majority of the sample indicated to not study in their native language (87.2%). 86.1% of the sample stated to not present in their mother tongue.

Materials

The questionnaire was developed using the website Qualtrics.^{xm} (Appendix A-F). It entails demographic questions, statements about strategies applied during past presentations and a speech anxiety scale.

Demographics

To get a better understanding of the characteristics comprising the sample, seven demographic questions were asked (Appendix B). Those questions covered the following topics: gender, age, nationality, year of study, country of study, study in native language, present in native language.

Walking around (H1)

To assess walking around during a presentation, the following item was used: I have walked around during presenting. Answers were scored used a 5-point Likert scale with answer categories ranging from 1 = never to 5 = always.

Short break (H2)

To assess walking around during a presentation, the following item was used: I have done a (short) breathing exercise to centre myself. Answers were scored used a 5-point Likert scale with answer categories ranging from 1 = never to 5 = always.

Positive visualisation (H3)

To assess walking around during a presentation, the following item was used: I have positively visualised the continuation of the presentation. Answers were scored used a 5-point Likert scale with answer categories ranging from 1 = never to 5 = always.

Smiling (H4)

To assess walking around during a presentation, the following item was used: I have started smiling during the presentation. Answers were scored used a 5-point Likert scale with answer categories ranging from 1 = never to 5 = always.

Self-talk (H5)

To assess walking around during a presentation, the following item was used: I have used positive self-talk. Answers were scored used a 5-point Likert scale with answer categories ranging from 1 = never to 5 = always.

Sensation shift (H6)

To assess walking around during a presentation, the following item was used: I have bit my tongue/cheek to shift from rotating thoughts to a different sensation. Answers were scored used a 5-point Likert scale with answer categories ranging from 1 = never to 5 = always.

Additional strategies

To explore which other strategies were used by students during presenting, the following open question was formulated: If there are any other strategies you are using, please share them below. The provided text field could be filled with as many strategies as the students could think of.

Presentation Anxiety

In order to measure the participants general level of presentation anxiety (DV) McCroskey's (1970) Personal Report of Public Speaking Anxiety (PRPSA) has been used. His scale comprises 34 different items covering every aspect of speech anxiety and is measured on a 5-point Likert scale. An example is Item 7, stating "Although I am nervous just before starting a speech, I soon settle down after starting and feel calm and comfortable." The questionnaire was measured using a 5-point Likert scale (1 = strongly disagree; 5 = strongly agree). For the sake of this study, the word "speech" in the phrasing of the items has been adjusted to "presentation" or "present" in the final version of the questionnaire. The PRPSA is a validated questionnaire (Mörtberg et al., 2018). In the present study the questionnaire had an excellent internal consistency (34 items; α = .94).

Procedure

The participants were able to access the questionnaire through SONA, an internal website of the University of Twente, which connects students with studies conducted by fellow students. After the participants signed up, they received an automatically sent e-mail from the website that entailed the link to the questionnaire. The duration of filling in the questionnaire was expected to be approximately 20 minutes. First the participants were introduced to the study's topic, educated about their rights as a participant and informed that by continuing by clicking the arrow on the bottom of the page they give informed consent, and the study starts. Followingly, the participants were asked to fill in seven demographic questions. Next, the participants were informed that presenting in front of and audience can increase students' level of presentation anxiety. Next, they were asked to rate the extent to which they have applied the six given statements about using strategies *during* past presentations in front of an audience. During was underlined in order to maintain the focus of the participants on this state of presenting. After being forwarded to the next page, each participant had the option to share as many additional strategies as they remembered to have used in the past in an open text field. Further, they were asked to answer the 34 items of the PRPSA. Afterwards, the participants were debriefed (thanking the participants for their part taking in the study and assured that the data has been saved, alongside providing contact information from the researcher and the BMS Ethics Committee again). By clicking the arrow on the bottom of the page 0.25 SONA credits were automatically granted and added to their account.

Data analysis

To be able to analyse the data collected by the questionnaire, IBM's statistic software SPSS (Statistical Package for Social Sciences Version 27) was used.

The first section of the data analysis focuses on descriptive statistics. To begin with, means and standard deviations, alongside the correlations are calculated for the independent variables (IV) and dependent variable (DV). The data is normally distributed and the assumptions of linearity, homogeneity of variance alongside the independence and equal variance of residuals were met by the variables.

The second section of the data analysis is assessing the relationship between the different applied strategies and the students' level of presentation anxiety (H1-H6). The items of the PRPSA were scored and the resulting raw scores were used for the continuation of the analysis. A *multiple linear regression* analysis was conducted to examine the extent to which the six strategies walking around, short break, positive visualisation, smiling, positive self-talk, and sensation shift predict the presentation anxiety score.

The final part of the data analysis focuses on assessing if students who apply no additional strategies have a higher level of presentation anxiety than students who do. For that the sample was divided into two groups based on how the students answered the open question about whether they were using additional strategies or not: *Applying additional strategies* and *applying no additional strategies*. Students who used one or more additional strategies were coded as 0, whereas no answer or an answer that did not match the question was coded as 1. Followingly, an *independent sample t-test* was conducted in order to examine the differences in the means of both groups in relation to their level of presentation anxiety. Furthermore, open coding was carried out in order to code the answers.

Results

The descriptive statistics and correlations of the IVs walking around, short break, positive visualisation, smiling, positive self-talk and sensation shift alongside the DV presentation anxiety are displayed in Table 1.

Table 1

Descriptive Statistics and Correlations for the variables

Variable	M	SD	1	2	3	4	5	6	7
1. walking around	2.87	1.17	-						

	M	SD	1	2	3	4	5	6	7
2. short break	2.98	1.23	.10	-					
3. positive visualisation	3.13	1.30	.25	.04	-				
4. smiling	3.87	1.15	.31*	.01	.45*	-			
5. positive self-talk	2.66	1.26	.03	.17	.32	.33*	-		
6. sensation shift	2.11	1.31	-.03	.31*	-.27	-.05	0.20	-	
7. presentation anxiety	103.55	25.55	-.34*	.16	-.26	-.26	.21	.52**	-

* $p < .05$

** $p < .01$

The outcomes of the regression analysis showed that the strategies explained a significant amount of variance in presentation anxiety ($F(6, 40) = 5.02$, $p = .001$, $R^2 = .43$). The strategy sensation shift significantly predicted presentation anxiety whereas walking around, short break, positive visualisation, smiling and positive self-talk were not significantly associated with presentation anxiety. Table 2 displays the individual p-values of the hypotheses. Therefore, H6 is accepted and hypotheses H1-H5 are rejected. However, H1 was almost significant ($p = .055$).

Table 2

Coefficients for hypotheses 1-6 and their corresponding p-values

Hypothesis	Unstandardized B	Standardized coefficients Beta	t	p-value
H1: walking around	-5,54	-0.25	-1.78	.055
H2: short break	0.27	0.01	0.10	.920
H3: positive visualisation	-1.14	-0.06	-0.39	.679
H4: smiling	-4.52	-0.20	-1.44	.157
H5: positive self-talk	4.31	0.21	1.55	.130
H6: sensation shift	8.63	0.44	3.22	.003

Lastly, the results of the t-test revealed that there was no significant difference ($t(45) = .39$, $p = .700$) between participants who were using additional strategies ($M = 106.56$, $SD = 25.66$), and participants who were not using additional strategies ($M = 102.84$, $SD = 25.82$). The frequencies of those additional strategies are displayed in Table 3.

Table 3

Frequency table of the additional strategies provided by the participants (N = 20).

Code	Description	Example	Frequency
Safe space (*n* = 4)	The presence of friends or familiar/friendly faces creates a relaxing and calm space for the presenter.	Participant 25: *"I keep eye contact with friends or if I do not know anyone, with friendly faces to decrease my anxiety."*	20%
Flashcards (*n* = 3)	Bringing notes to the presentation to either read from or keep as a safety net during the presentation.	Participant 47: *"[…] I take with me a piece of paper with notes about every slide, […]."*	15%
Fidgeting hands (*n* = 3)	Moving hand or holding something with them during the presentation	Participant 23: *"Hand gestures to avoid tension/shaking."*	15%
Other (*n* = 2)	Miscellaneous strategies that were only mentioned once.	Participant 35: *"Micro dosing with psilocybin."*	10%
Strategies before (*n* = 8)	Strategies that students use before their presentation.	Participant 6: *"Just rehearsing a few times before."*	40%

Discussion

      This study aimed at examining the effect applying strategies, which support students to shift their anxious thoughts during a presentation to the present situation, has on the level of presentation anxiety of students. Summing the applied strategies showed a significant association with the students' level of presentation anxiety. Moreover, examining the strategies individually resulted in five non-significant associations (H1-H5) as well as one significant one, namely sensation shift (H6). Therefore, only H6 can be accounted for predicting the level of presentation anxiety. Furthermore, the findings do not show an association between applying (no) additional strategies and the overall presentation anxiety score.

The research findings presented a significant effect for sensation shift, meaning shifting sensations during a presentation is decreasing the level of presentation anxiety (H6). This is in line with existing research findings from Kalisch et al. (2009) and Gagne and Toye (1994), stating that an active attempt to regulate one's bodily sensations distracts the mind from recurring thoughts and decreases the perceived anxiety. Even though the findings are significant, the field of sensation shifting by touch in relation to anxiety is still rather under-researched (Robinson et al., 2007). Furthermore, it is noticeable that the mean from sensation shift is much lower than the means from the other insignificant strategies. A possible explanation is that overall, the strategy is less often used because its effect is stronger in comparison to the other strategies and therefore does not have to be used as often as the others to make an impact.

The results did not confirm that walking around decreases students' level of presentation anxiety (H1). These unexpected findings might be due the sample size. A small sample size increases the difficulty of findings being statistically significant and the data is more subjective to change. Since H1 was almost accepted, it is possible that a larger sample would have led to a small adjustment of the p-value, stating that walking around does decrease students' level of presentation anxiety. In addition, the findings are not in line with the effect progressive muscle relaxation is indicated to have a tensed body as provided by Conrad and Roth (2007) and Jacobson (1938). They further state that the relaxation of muscles, resulting from walking, leads to a decrease of anxiety, contradicting the findings of this study even more. Hence, there are two possible factors explaining the lack of finding an effect. First, the setting of performing the exercise indoors possibly hindered an arising effect. Underlining this are findings from Song et al. (2018) indicating a decreasing effect of walking exercises performed outdoors on the participants level of anxiety. Second, the presence of an audience while presenting might be the reason for not finding an effect. Research conducted by Merom's et al. (2007), similarly performed the walking exercise indoors, however, was not watch by an audience and its findings showed a clear effect. Consequently, the setting of the presentation being inside as well as the students feeling observed due to the audience indicates a possible explanation why there was no effect of applying this strategy during a presentation. Walking might only lead to a decrease in presentation anxiety in the right setting but is not relevant for the state during a presentation.

The results showed that there was no significant effect of taking a break on decreasing the students' level of presentation anxiety (H2). The outcome is not in line with findings from

Epstein (1999) and Irving et al. (2009) who are both indicating that taking a break is a way of being mindful about the situation and one's own needs in it. Moreover, they support this behaviour is leading to a better acceptance of someone's mental processes and has a beneficial effect on anxiety. Reasons for the non-significant findings are unclear, but there might be a connection to articles from Bishop (2002) and Niazi and Niazi (2011) who both state that the field is under-researched. This possibly substantiates the ambiguous findings, as perhaps crucial information is missing about the way this strategy must be applied.

The findings did not confirm a decreasing effect the visualising strategy has on the level of presentation anxiety (H3) and is therefore not in line with the findings of Giacobbi et al. (2003) stating that visualising a certain outcome leads to improving one's own performance. This refutes Gammage's et al. (2000) findings, which further specify that goal-oriented visualisation releases stress and decreases the level of anxiety. Payne (2000, as cited in Huang, 2011) argues that for visualisation to be as successful as possible, it is advised to rehears it regularly before the event to make it easier for the individual performing it to get familiar with the mental image of the preferred outcome (goal). Therefore, those findings in relation with the findings of this study provide the possible explanation that visualisation needs to be practiced beforehand in order to be successful and might account for the findings.

The results of this study did not indicate a significant effect of smiling on decreasing anxiety (H4), leading to a rejection of the hypothesis. Furthermore, the findings are not in line with findings from Kleinke et al. (1998), addressing that a positive facial expression (smiling) leads to an increase of the individual's mood and in turn decreasing the experienced presentation anxiety. However, results from Noah et al. (2018) provide a different view on the topic, possibly justifying not finding an effect. They found out that the positive effect of facial feedback is diminished when the person who is engaging in it is aware of being monitored, especially when using a video camera. Furthermore, the same effect can be expected when standing in front of an audience, as the presenter is aware of being monitored by their audience. Hence, feeling monitored might have diminished the possibility of finding an effect.

The results from this study did not indicate a significant relation nor did self-talk decrease the presentation anxiety score (H5). Hence, the findings are contradicting research findings of Van Raalte et al. (1995), indicating that positive self-talk has an influence on a student's performance as it helps them decreases their level of anxiety. Notwithstanding, results from a study conducted by Dagrou et al. (1991), indicated that there is no difference in the effect self-talk in general has on the level of presentation anxiety, possibly reasoning that the

strategy of positive self-talk is not effective. The contradicting findings alongside findings from Gammage et al. (2001) indicate that the field of self-talk is under researched.

The exploratory research findings displays that there are multiple strategies to be applied before a presentation, and a few additional ones to focus on during a presentation. The findings of the exploratory research did not show a significant effect of applying additional strategies on lowering the level of presentation anxiety. This contradicts the findings of Kelly et al. (2008), stating that the more effort an individual places in handling their experienced anxiety, is lowering their level of anxiety. Nevertheless, findings from Solberg Nes and Segerstrom (2006) provide an alternative explanation of why there were no findings. They have a different division of attempts of coping with anxiety, namely the approach-avoidant classification. In the context of their research avoidance is used interchangeable with disengaging, which describes the way an individual is behaving when being confronted with anxious thought. Being avoidant of the challenging situation declines using strategies in order to reduce the perceived anxiety. Nevertheless, the exploratory part does add relevance since it provides examples of which strategies the students view as helpful and those can be in focus for future research.

The first limitation is the validity of the statements about applying strategies. The validity is not statistically confirmed because the items were individually developed based on literature. No pre-existing items were used because there was no suitable existing questionnaire that intended to measure what this study was supposed to measure. Thus, each construct was measured using a single item measurement, which is uncommon to use for this kind of research. In an attempt to support the under-researched field of internal (thought) processes (e.g., Carl et al., 2019; Emmelkamp et al., 2020; Wechsler et al., 2021), theories who had proven their general success in decreasing anxiety but were not yet tested in the context of presenting were retrieved from literature and used to formulate the strategies.

Another limitation concerns the open question. After looking at the data provided by the students, it became clear that the instructions introducing the text field were not clear enough. The question was intended to be an extension of the statements provided before and therefore the additional strategies asked to provide were supposed to be applied during presenting. Since this link was not clearly stated, many strategies were shared by the participants that cannot be utilized during a presentation but provide a starting point for future research. Moreover, the open question needs a more detailed introduction, stressing that the questionnaire is only interested in strategies that can be applied during a presentation. Furthermore, this is expected to solve the missing context difficulty about whether the strategy was applied during a

presentation, such as self-medication, which was not clearly indicated if done during or before a presentation.

Another explanation for the non-significance of the findings might be that reminding participants of past presentations encourages them to spend more time thinking about them leading to a priming effect (Bargh & Williams, 2006). Depending on the formulation of the prime, this can trigger either positive or negative memories of past performances leading to an increase or decrease of their anxious thoughts about those past performances (Lang & Lang, 2010). Furthermore, another influencing factor might be caused by a moderation effect, such as people who generally experience a lower level of presentation anxiety are less or not in need of applying strategies and therefore are not concerned about them.

Contrastingly, one clear strength of the study is that it shows that strategies can have a decreasing effect on the students' level of presentation anxiety while presenting. On top of that, this study was one of the first studies to look at the strategies of walking around, short break, positive visualisation, smiling, positive self-talk, and sensation shift in the context of a presentation. Oftentimes, a selection of those strategies was individually examined when presenting in front of an audience, but seldom all of them together. Moreover, this study explored additional strategies students have found helpful in the past, building a basis for future research.

After looking at the results, the following implication for future research can be made. Since five out of six strategies did not show an effect, it makes sense to narrow down the focus of the study to be solely about the sixth strategy, sensation shift. It would allow for an in-depth examination of what is a sensation shift for students and if there is a difference between shifting sensations consciously or subconsciously. Further, it can be explored which different sensation shifts are used by the new sample (e.g., pinching oneself) and if those do have a decreasing effect on presentation anxiety. This could be realised by conducting an experimentally based study, using a pre-post-design to measure effects on the level of presentation anxiety before and after presenting. When facing struggles in assembling a suitable sample audience, virtual reality can be of help in developing a diverse sample (Wechsler et al., 2021). Besides that, the physical arousal which often accompanies an anxiety response could be measured by using an electronic blood pressure cuff or other electronical devices to closely observe changes (Eysenck, 2007; Kajimoto et al., 2004).

Another way of continuing is by looking at the findings from the open question, which offers many different strategies to further examine. Most prominently was the need for students to have a familiar face or kind looking person in the audience in order to experience lower levels

of anxiety. Thus, the focus in future research can lie on closely looking at effects the audience has on presentation anxiety and what is needed to create a safe space. This can be further linked to the alternative explanations for the non-significant findings of H1 and H4, which describe that the presence of the audience might have inhibited the development of an effect (Merom et al., 2007; Noah et al., 2018). In addition, the impact external tools, such as flashcards, are having on presentation anxiety could be researched. Besides, it can be of interest to further research strategies with a low frequency, such as the extent to which student self-medicate in relation to presenting (Table 3).

Lastly, the anxiety to speak in front of an audience is deeply connected to people's overall level of anxiety and can significantly impact one's success in life (Sanders and Sander, 2007). Therefore, the findings of this research are playing a part in supporting students who are affected by increasing their self-confidence as well as by overwriting their negative past memories of presentations by new positive ones (Sanders and Sander, 2007; Wechsler et al., 2021). Moreover, the past success in performance is an indicator for future academic success, leading to an increase in life-satisfaction (Sanders and Sander, 2007).

References

American Psychiatric Association. (2013). *Diagnostic and statistical manual of mental disorders* (5th ed.). https://doi.org/10.1176/appi.books.9780890425596

Bargh, J. A., & Williams, E. L. (2006). The Automaticity of Social Life. *Current directions in psychological science, 15*(1), 1–4. https://doi.org/10.1111/j.0963-7214.2006.00395.x

Ben-Zur, H. (2009). Coping styles and affect. *International Journal of Stress Management, 16*(2), 87.

Bishop, S. (2002). What Do We Really Know About Mindfulness-Based Stress Reduction? *Psychosomatic Medicine, 64*(1), 71-83.

Carl, E., Stein, A.T., Levihn-Coon, A., Pogue, J.R., Rothbaum, B., Emmelkamp, P., et al. (2019). Virtual reality exposure therapy for anxiety and related disorders: A meta-analysis of randomized controlled trials. *Journal of Anxiety Disorders, 61*, 27-36. https://doi.org/10.1016/j.janxdis.2018.08.003

Carver, C. S., Scheier, M. F., & Weintraub, J. K. (1989). Assessing coping strategies: A theoretically based approach. *Journal of Personality and Social Psychology, 56*, 267–283.

Conrad, A., & Roth, W. T. (2007). Muscle relaxation therapy for anxiety disorders: It works but how? Jounral of Anxiety Disorder, 21(3), 243-264. https://doi.org/10.1016/j.janxdis.2006.08.001

Dagrou, E., Gauvin, L., & Halliwell, W. (1992). Effects of positive, negative, and neutral self-talk on motor performance. *Canadian Journal of Sport Sciences, 17*, 145–147.

Darwin, C. (1965). *The expression of the emotion in man and animals.* Chicago: University of Chicago Press. (Original work published 1872)

Emmelkamp, P. M. G., Meyerbröker, K., & Morina, N. (2020). Virtual reality therapy in social anxiety disorder. *Current Psychiatry Reports, 22*(7), 32. https://doi.org/10.1007/s11920-020-01156-1

Epstein, R. M. (1999). Mindful practice. *JAMA, 282*(9), 833-839. https://doi.org/10.1001/jama.282.9.833

Eysenck, M., Derakshan, N., Santos, R., & Calvo, M. (2007). Anxiety and cognitive performance: Attentional control theory. *Emotion, 7*(2), 336-353. https:doi.org/10.1037/1528- 3542.7.2.336

Gagne, D., & Toye, R. C. (1994). The effects of therapeutic touch and relaxation therapy in reducing anxiety. *Archives of Psychiatric Nursing, 8*(3), 184-189. https://doi.org/10.1016/0883-9417(94)90052-3

Gammage, K. L., Hardy, J., & Hall, C. R. (2001). A description of self-talk in exercise. *Psychology of Sport and Exercise, 2*, 233-247.

Giacobbi, P. R., Hausenblas, H. A., Fallon, E., & Hall, C. (2003). Even more about exercise imagery: A grounded theory of exercise imagery. *Journal of Applied Sport Psychology, 15*(2), 160-175. https://doi.org/10.1080/10413200305391

Hackfort, D., & Schwenkmezger, P. (1993). Anxiety. *Handbook of research on sport psychology*, 328–364.

Hausenblas, H. A., Hall, C. R., Rodgers, W., & Munroe, K. J. (1999). Exercise Imagery: Its Nature and Measurement. *Journal of Applied Sport Psychology, 11*(2), 171-180. https://doi.org/10.1080/10413209908404198

Highlen, P. S., & Bennett, B. B. (1983). Elite Divers and Wrestlers: A Comparison Between Open- and Closed-skill Athletes. *Journal of Sport Psychology, 5(4), 390-409. https://doi.org/10.1123/jsp.5.4.390*

Huang, M. S. (2011). Coping with performance anxiety: College piano students' perceptions of performance anxiety and potential effectiveness of deep breathing, deep muscle relaxation, and visualization.

Irving, J. A., Dobkin, P. L., & Park, J. (2009). Cultivating mindfulness in health care professionals: A review of empirical studies of mindfulness-based stress reduction (MBSR). *Complementary Therapies in Clinical Practice, 15*, 61-66. https://10.1016/j.ctcp.2009.01.002

Jacobson, E. (1938). Progressive relaxation (2nd ed.). Chicago: University of Chicago Press.

James, W. (1890). *The principles of psychology*, New York: Holt.

Kabat-Zinn, J. (2003). Mindfulness-based stress reduction (MBSR). *Constructivism in the Human Sciences, 8*(2), 73-107.

Kajimoto, H., Kawakami, N., Maeda, T., & Tachi, S. (2004). Electro-tactile display with tactile primary color approach. Graduate School of Information and Technology, The University of Tokyo.

Kelly, M. M., Tyrka, A. R., Price, L. H., & Carpenter, L. L. (2008). Sex differences in the use of coping strategies: predictors of anxiety and depressive symptoms. *Depression and anxiety, 25*(10), 839–846. https://doi.org/10.1002/da.20341

Kalisch, R., Wiech, K., Herrmann, K., & Dolan, R. J. (2006). Neural correlates of self-distraction from anxiety and a process model of cognitive emotion regulation. *Journal of cognitive neuroscience, 18*(8), 1266–1276. https://doi.org/10.1162/jocn.2006.18.8.1266

Kishida, K., Hida, N., & Ishikawa, S. (2022). Evaluating the effectiveness of a transdiagnostic universal prevention program for both internalizing and externalizing problems in children: two feasibility studies. *Child and Adolescent Psychiatry and Mental Health, 16*(9). https://doi-org.ezproxy2.utwente.nl/10.1186/s13034-022-00445-2

Kleinke, C. L., Peterson, T. R., & Rutledge, T. R. (1998). Effects of Self-Generated Facial Expressions on Mood. *Journal of Personality and Social Psychology, 74*(1), 272-279. https://doi.org/10.1037//0022-3514.74.1.272

Land, J. W. B., & Lang, J. (2010). Priming competence diminishes the link between cognitive test anxiety and test performance: Implications for the interpretation of test scores. *Psychological Science, 21*(6), 811-819.

McCroskey, J. C. (1970). Measures of communication-bound anxiety. Speech Monographs, 37, 269-277.

Merom, D., Rissel, C., Phongsavan, P., Smith, B. J., van Kemenade, C., Brown, W. J., & Bauman, A. E. (2007). Promoting walking with Pedometers in the community: The step-by-step trial. *American Journal of Preventive Medicine, 32*(4). https://doi:10.1016/j.amepre.2006.12.007

Mirdha, M., & Mishra, A. K. (2015). Effects of walking and relaxation exercises on controlling hypertension. *Journal of Current Research, 7*(8), 19595-19598

Mörtberg, E., Jansson-Fröjmark, M., Pettersson, A., & Hennlid-Oredsson, T. (2018). Psychometric properties of the personal report of public speaking anxiety (PRPSA) in a sample of university students in Sweden. *International Journal of Cognitive Therapy, 11*(4), 421-433. https:doi.org/10.1007/s41811-018-0022-0

Niazi, A. K., & Niazi, S. K. (2011). Mindfulness-based stress reduction: a non-pharmacological approach for chronic illnesses. *North American journal of medical sciences, 3*(1), 20–23. https://doi.org/10.4297/najms.2011.320

Noah, T., Schul, Y., & Mayo, R. (2018). When both the original study and its failed replication are correct: Feeling observed eliminates the facial-feedback effect. *Journal of Personality and Social Psychology, 114*(5), 657-664. https://doi.org/10.1037/pspa0000121

Robinson, J., Biley, F. C., & Dolk, H. (2007). Therapeutic touch for anxiety disorders. *The Cochrane database of systematic reviews, 2007*(3). https://doi.org/10.1002/14651858.CD006240.pub2

Sanders, L. D., & Sander, P. (2007). Academic Behavioural Confidence: A comparison of medical and psychology students. *Electronic Journal of Research in Educational Psychology, 13*(4), 633-649.

Solberg Nes, L., & Segerstrom, S. C. (2006). Dispositional optimism and coping: A metaanalytic review. *Personality and Social Psychology Review, 10*, 235–251.

Song, C., Ikei, H., Park, B. J., Lee, J., Kagawa, T., & Miyazaki, Y. (2018). Psychological Benefits of Walking through Forest Areas. *International Journal of Environment Research and Public Health, 15*. https://doi.org/10.3390/ijerph15122804

Steptoe, A., & Vögele, C. (1992). Individual differences in the perception of bodily sensations: The role of trait anxiety and coping style. *Behaviour Research and Therapy, 30*(6), 597-607. https://doi.org/10.1016/0005-7967(92)90005-2

Van Raalte, J. L., Brewer, B. & Lewis, B. (1995). Cork! The effects of positive and negative self-talk on dart throwing performance. *Journal of Sport Behavior, 18*, 50-57.

Voinea, A. (2007). Physical activity reduces anxiety. 230-234.

Wechsler, T. F., Pfaller, M., van Eickels, R. E., Schulz, L. H., & Mühlberger, A. (2021). Look at the Audience? A randomized controlled study of shifting attention from self-focus to nonsocial vs. social external stimuli during virtual reality exposure to public speaking in social anxiety. *Front Psychiatry, 12*. https://doi.org/10.3389/fpsyt.2021.751272

Wegner, D.M. (1994). Ironic processes of mental control. *Psychological Review, 101*, 34–52.

Westenberg, P. M., Bokhorst, C. L., Miers, A. C., Sumter, S.R., Kallen, V. L., van Pelt, J. et al. (2009). A prepared speech in front of a pre-recorded audience: Subjective, physiological, and neuroendocrine responses to the leiden public speaking task. *Biological Psychology, 82*(2), pp. 116-124. https://doi.org/10.1016/j.biopsycho.2009.06.005

Wong, Q. J. J., & Rapee, R. M. (2016). The aetiology and maintenance of social anxiety disorder: A synthesis of complimentary theoretical models and formulation of a new integrated model. *Journal of affect disorders, 203*, 84–100. https:doi.org/10.1016/j.jad.2016.05.069

Appendices

Appendix A – Introduction (Questionnaire)

Thank you for taking the time to complete this questionnaire!

The aim of this study is to compare the impact applying strategies has on the level of presentation anxiety in students. For that, the extent to which strategies are applied during presenting are further examined, followed by determining students' level of anxiety regarding presenting in front of an audience.

The completion of the questionnaire will take approximately 15-20 minutes.
Your participation in this study is voluntarily and withdrawing from it is possible at any time without needing to give an explanation. Concerning your privacy, since your responses are completely anonymous, no data, such as names, is being collected that can be traced back to you. Your response is only used for scientific research and will be deleted afterwards.

In case of any further questions and/or comments about the study, please contact the researcher via e-mail (s.frerichs@student.utwente.nl).
For questions regarding ethical concerns or your rights as a participant, please contact the Ethics Committee of the University of Twente (ethicscommittee-bms@utwente.nl).

→

Appendix B – Demographics (Questionnaire)

What is your gender?

○ Male
○ Female
○ Non-binary / third gender
○ Prefer not to say

What is your age?

What is your nationality?

○ Dutch

○ German

○ Other. Please specify:

[   ]

In which year of your studies are you currently?

○ 1st year Bachelor

○ 2nd year Bachelor

○ 3rd year Bachelor

○ 4th year Bachelor or higher

○ 1st year Master

○ 2nd year Master

○ 3rd year Master or higher

○ Other. Please specify:

[   ]

In which country are you currently studying?

○ The Netherlands

○ Germany

○ Other. Please specify:

[   ]

Do you study in your native language?

○ Yes

○ No

Do you present in your native language?

○ Yes

○ No

→

Appendix C – Cluster of applied strategies (Questionnaire)

Presenting in front of an audience can lead to an increase of the level of anxiety in the presenter.

Please read the following statements and indicate to what extent they were successfully applied in order to decrease your anxiety level <u>during</u> past presentations.

	Never	Rarely	Sometimes	Often	Always
I have walked around during presenting.	○	○	○	○	○
I have done a (short) breathing exercise to centre myself.	○	○	○	○	○
I have positively visualised the continuation of the presentation.	○	○	○	○	○
I have started smiling during the presentation.	○	○	○	○	○
I have used positive self-talk.	○	○	○	○	○
I have bit my tongue/cheek to shift from rotating thoughts to a different sensation.	○	○	○	○	○

→

Appendix D – Additional remarks (Questionnaire)

If there are any other strategies you are using, please share them below:

→

Appendix E – Presentation anxiety measurement (Questionnaire)

Please read the following statements and indicate whether you agree or disagree with them.

	Strongly disagree	Disagree	Neutral	Agree	Strongly agree
1. While preparing for giving a presentation, I feel tense and nervous.	○	○	○	○	○
2. I feel tense when I see the words "presentation" and "public speech" on a course outline when studying.	○	○	○	○	○
3. My thoughts become confused and jumbled when I am giving a presentation.	○	○	○	○	○

4. Right after giving a presention I feel that I have had a pleasant experience.

○   ○   ○   ○   ○

5. I get anxious when I think about a presentation coming up.

○   ○   ○   ○   ○

6. I have no fear of presenting.

○   ○   ○   ○   ○

7. Although I am nervous just before starting a presentation, I soon settle down after starting and feel calm and comfortable.

○   ○   ○   ○   ○

	Strongly disagree	Disagree	Neutral	Agree	Strongly agree
8. I look forward to giving a presentation.	○	○	○	○	○
9. When the instructor announces a speaking assignment in class, I can feel myself getting tense.	○	○	○	○	○
10. My hands tremble when I am giving a presentation.	○	○	○	○	○
11. I feel relaxed while giving a presentation.	○	○	○	○	○
12. I enjoy preparing for a presentation.	○	○	○	○	○
13. I am in constant fear of forgetting what I prepared to say.	○	○	○	○	○
14. I get anxious if someone asks me something about my topic that I don't know.	○	○	○	○	○

	Strongly disagree	Disagree	Neutral	Agree	Strongly agree
15. I face the prospect of giving a presentation with confidence.	○	○	○	○	○
16. I feel that I am in complete possession of myself while giving a presentation.	○	○	○	○	○
17. My mind is clear when giving a presentation.	○	○	○	◉	○
18. I do not dread giving a presentation.	○	○	○	○	○
19. I perspire just before starting a presentation.	○	○	○	○	○
20. My heart beats very fast just as I start a presentation.	○	○	○	○	○
21. I experience considerable anxiety while sitting in the room just before my presentation starts.	○	○	○	◉	○

	Strongly disagree	Disagree	Neutral	Agree	Strongly agree
22. Certain parts of my body feel very tense and rigid while giving a presentation.	○	○	○	○	○
23. Realizing that only a little time remains in a presentation makes me very tense and anxious.	○	○	○	○	○
24. While giving a presentation, I know I can control my feelings of tension and stress.	○	○	○	○	○

	Strongly disagree	Disagree	Neutral	Agree	Strongly agree
25. I breathe faster just before starting a presentation.	○	○	○	○	○
26. I feel comfortable and relaxed in the hour or so just before giving a presentation.	○	○	○	○	○
27. I do poorer on presentations because I am anxious.	○	○	○	○	○
28. I feel anxious when the teacher announces the date of a speaking assignment.	○	○	○	○	○

	Strongly disagree	Disagree	Neutral	Agree	Strongly agree
29. When I make a mistake while giving a presentation, I find it hard to concentrate on the parts that follow.	○	○	○	○	○
30. During an important presentation I experience a feeling of helplessness building up inside me.	○	○	○	○	○
31. I have trouble falling asleep the night before a presentation.	○	○	○	○	○
32. My heart beats very fast while I present.	○	○	○	○	○
33. I feel anxious while waiting to give my presentation.	○	○	○	○	○
34. While giving a presentation, I get so nervous I forget facts I really know.	○	○	○	○	○

→

Appendix F – Debriefing form (Questionnaire)

Thank you for your participation in this study.

Your response has been recorded.

In case of any further questions and/or comments about the study, please contact the researcher via e-mail (s.frerichs@student.utwente.nl).
For questions regarding ethical concerns or your rights as a participant, please contact the Ethics Committee of the University of Twente (ethicscommittee-bms@utwente.nl).