From couch to screen: A cross-sectional survey study into psychology students' openness to use technology in their future.

Emna Akremi (s2735571)

Faculty Behavioural, Management, & Social Sciences, University of Twente

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First Supervisor: Marlon Nieuwenhuis

Second Supervisor: Anneleen Klaassen

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Abstract

The integration of e-health has brought up alarm amongst psychologists, raising doubts about how this is going to affect the therapeutic relationship between psychologist and client. Moreover, psychology students are crucial stakeholders as they are the future psychologists who will deal with e-health in their workplace. Therefore, this study explores the relationship between technology openness and perceived threat to psychologist-client relationship among psychology students in the future career. Additionally, since literature brings forth evidence on self-efficacy being important towards technology openness, it is necessary to investigate it as a moderator variable.

A quantitative online study was performed with a total of 70 psychology students. They filled out three questionnaires, which measured their technology openness, perceived threat to psychologist-client relationship, and self-efficacy. The main analyses were multiple regression analysis and moderation analysis.

The analyses showed insignificant relationships between technology openness and perceived threat to psychologist-client relationship ($p = .29$) and self-efficacy on the aforementioned relationship ($p = .615$). However, a significant relationship existed between self-efficacy and technology openness ($p < .001$).

Previous research suggests that confounding variables such as technology proficiency could play a role here. It showed a few limitations such as a small sample size, which is why future research should focus on a bigger sample size as well as degrouping the different levels of self-efficacy to see for a potential effect on the relationship.

Keywords: E-health acceptance, technology acceptance, therapeutic relationship, self-efficacy, psychologists, psychology students

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Due to the increasing demand for interconnectivity and efficiency, the world's population has been going through a digital transformation for the past decades (Stoumpos et al., 2023). Digitalization is a global phenomenon that affects all areas of life and has particularly made its way to the healthcare sector, some examples are teletherapy, wearable mental health devices, and Virtual Reality therapy (VR) (Audrain-Pontevia et al., 2017). Especially, the introduction of online therapy sessions has brought us a revolutionary shift in how mental health services can be delivered as it poses as an effective alternative to in-person therapy sessions (Bee et al., 2008). Online therapy, which can also be recognized as teletherapy, online counselling, or just another form of e-health, was recorded to be used the most during the covid pandemic (Chunara et al., 2021). As physical distance was a necessity, it seemed as the only natural solution to interact with the client/psychologist. Furthermore, e-health, specifically online therapy, poses further advantages such as accessibility, time efficiency, and for some clients even the feeling of security due to the physical space that exists between the client and psychologist (Odugbose et al., 2024).

Nevertheless, studies have shown that obstacles for psychologists also exist. It has been reported that one of the most prominent concerns for psychologists as well as psychology students was that e-health would bring harm onto therapeutic relationships (Lin et al., 2021; Meier et al., 2023).

Technology and the therapeutic relationship

The therapeutic relationship between the psychologist and client can be considered as a partnership that is collaborative and supportive in its nature (Flückiger et al., 2018). It is built upon fundamental components such as trust, empathy, validation, and among other

things, mutual understanding (Hilty et al., 2013). Hartley et al. (2020) suggest that maintaining a high standard relationship could positively affect the outcome of the client.

However, with the new incorporation of e-health tools, it opens up additional nuances to the therapeutic relationship, such as making sure that the relationship stays the same for both offline and online settings (Aafjes-van Doorn, 2022). Many psychologists fear that they cannot uphold such a standard due to the lack of interaction that exists (Lin et al., 2021). The minimal contact enables for difficulty to cultivate trust and emotional connection between the two parties, which could deteriorate the relationship and therefore pose a threat not only to the outcome but also to the professional identity of psychologists (Roesler, 2017). The professional identity indicates how individuals perceive themselves in regards to their profession (Aafjes-van Doorn, 2022). In the case of psychologists, delivering great therapeutic services and particularly maintaining a strong relationship with their clients is part of their professional identity (Flückiger et al., 2018). Moreover, when psychologists want to have great relationships with clients, they have to understand them, which is, amongst other things, being done by interpreting and responding to their non-verbal behaviour (Schubert et al., 2023). Yet, Burgoyne and Cohn (2020) stated that e-health technologies would allow for negligence of non-verbal cues, which could lead to a lack of understanding and miscommunication, making a further negative impact on the quality of the relationship (Burgoyne & Cohn, 2020). This is further supported by research, which showed that psychologists find it difficult to properly analyse the body language of patients in online therapy, and therefore sometimes misassess the needs of clients (Geller, 2021). Moreover, about 79% of psychologists reported that technological difficulties, such as connectivity disruptions or poor audio quality, could lead to further misunderstanding and therefore disconnection between psychologist and client (Bekes et al., 2021). In Addition, there is a fear that e-health will jeopardise confidentiality because of all the risks of data breaches that

could happen, which would only weaken the clients' trust and ability to open up to the psychologist (Childress, 2000; Cavallo et l., 2023).

These findings suggest that when e-health is involved, a perceived threat to the therapeutic relationship between psychologist and client exists. There is an indication that people are not willing to use e-health if they feel that it will harm the therapeutic relationship. The willingness to use technology can also be referred to as technology openness, which describes the receptiveness towards e-health adoption (Alharbi & Drew, 2019). Accepting technological tools represents a certain level of self-assurance, commonly known as self-efficacy.

Technology self-efficacy

Self-efficacy is a core concept of the social cognitive theory, which was proposed by psychologist Bandura and can be defined as the perception of one's own competence in executing tasks to reach certain achievements (Waddington, 2023). Moreover, technology self-efficacy is a category within the framework of self-efficacy, which describes someone's self-confidence in their skills to implement technology accordingly (Alharbi & Drew, 2019).

Findings show that (technology) self-efficacy is related to technology openness, meaning that when psychologists are confident in their abilities to effectively use technology, namely have a high self-efficacy, they experience greater acceptance towards it (Manolika et al., 2022). Several factors exist as to why an individual would have higher levels of self-efficacy, however, one of the most prominent ones would be that they are more experienced with technological tools (Jaffe & Steele, 2024).

Especially the ones who have received education on the topic of e-health, particularly how to properly integrate e-health technologies in their future workplace, have more

experience and therefore higher (technology) self-efficacy levels (McCoy, 2010). Having such high levels is particularly important for today's day and age because the mental healthcare field makes use of e-health significantly (Jaffe & Steele, 2024).

On the other hand, psychologists who have lower (technology) self-efficacy levels are less likely to utilise it. To give an example, a survey with 106 clinicians revealed that when wanting to sustain a strong therapeutic relationship, they feel less confident in a remote setting than in an in-person one, making their preference towards conventional therapy clear (Sucala et al., 2013). Not only does this survey study demonstrate how self-efficacy is related to the openness to use e-health but it also suggests how it can have an effect on the relationship between technology openness and perceived threat to psychologist-client relationship.

Exploring the relationship between perceived threat to psychologist-client relationship and technology openness, as well as looking at self-efficacy as a moderator to this relationship is of great importance, particularly when it comes to psychology students. This is mainly because psychology students are the next generation of mental health professionals who will guide the path of e-health adoption in their future workplaces. Their current attitudes towards e-health is therefore crucial as it is showing us what will await in the future of the mentalhealth sector. Furthermore, there is limited research in regards to psychology students and their perceptions of e-health. Most research deals with skill development of mental health professionals where the focus is on digital literacy as well as helping them integrate technology into their work. By investigating psychology students, the research gap will therefore be filled. Hence why this study will focus on psychology students and their technology openness pertaining to their perceived threat to psychologist-client relationship in the context of their future career.

Additionally, since studies also indicated that self-efficacy has an impact on technology openness, it can serve as a valuable moderator variable between the aforementioned relationship, especially since self-efficacy is an important concept that can be applied to numerous of fields such as e-health. It was shown that psychology students with higher levels of self-efficacy have a positive self-image whereas those with lower levels of self-efficacy have a negative one where they fear failure and are therefore hesitant to make decisions on certain tasks such as the use of e-health (McCoy, 2010).

The current Study

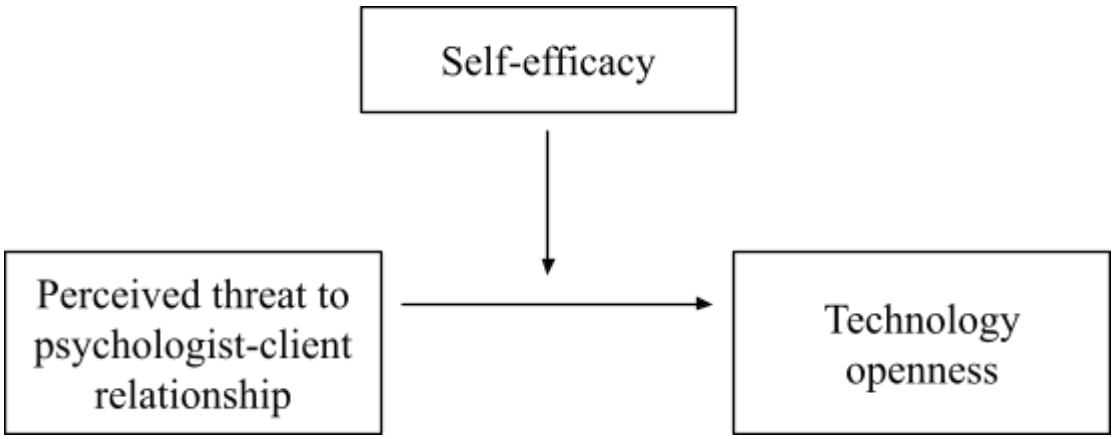
The body of research in regards to psychology students on their technology openness and perceived threat to psychologist-client relationship is scarce. Thus, this study aims to get to know the attitudes of the students by investigating the relationship between "Technology openness", which is the dependent variable, and "Perceived threat to psychologist-client relationship, which is the independent variable, through a cross-sectional survey study. In addition, the moderator variable "Self-efficacy" will also be examined. The following research question can be constructed "How does openness to use technology in the future job among psychology students relate to their perceived threat to the psychologist-client relationship and how is this moderated by self-efficacy?". Given this, the two following hypotheses will be assessed:

- Hypothesis 1: A significant negative relationship between perceived threat to psychologist-client relationship and technology openness in the future job among psychology students exists.
- Hypothesis 2: Self-efficacy positively moderates the relationship between perceived threat to psychologist-client relationship and technology openness in the future job

among psychology students, namely we expect that the relationship will be more strongly negative for those with lower self-efficacy.

Figure 1

The conceptual model of the relationship between perceived threat to psychologist-client relationship (IV) and Technology openness (DV), with self-efficacy being a moderator variable



Methods

Procedure

Psychology students, from the University of Twente, were invited to participate in the study via the test subject pool and received study credits for their participation. In addition, psychology students beyond the University of Twente were targeted via Social media, namely through WhatsApp and Facebook Group Chats. It was also shared on the survey website Pollpool. Students were informed about the study's purpose, along with the requirements to participate, that is being over 18 and studying psychology.

Once the student clicked on the study's link, they were presented with the informed consent. The informed consent provided information on the survey's purpose, objective, procedure, confidentiality, and voluntary participation. The survey was available in the English, Dutch, and German languages. After agreeing on their participation, they were asked demographic questions which included gender, age, nationality, educational level, field of study, and career aspiration.

Then, they answered questions related to their overall e-health engagement, regarding how much e-health experience they have had, whether or not they received training/education in e-health during their psychology studies, which e-health technologies they have had experience with, and to what extent they would like to involve e-health into their future career.

Next, they were asked to answer three questionnaires about technology openness, perceived threat to psychologist-client relationship, and (technology) self-efficacy. In the last section, they had the opportunity to express any comments as well as provide their email addresses if they wanted a summary of the study's results. The survey took the participants 5-10 minutes to complete.

Participants

The study's population of interest was psychology students, primarily because they are the future professionals to deliver e-health. They were recruited through convenience sampling in order to gather responses efficiently. Furthermore, purposive sampling was also utilised to ensure that participants were in fact of the necessary target group.

In total, 88 students started the questionnaire. Of those, 18 respondents were removed because they either did not complete the entire questionnaire or they did not meet the

inclusion criteria, namely being a psychology student. Consequently, this led to the final number of 70 participants.

Among them, 80% (n = 56) were female, 15.71% (n = 11) were male, and 4.29% (n = 3) were non-binary/third gender. A total of 20 different nationalities participated, of which, 38.57% (n = 27) were German, 24.29% (n = 17) were Dutch, and the rest of 37.14% (n = 26) consisted of other nations such as Britain, Greece, and Malaysia. Age ranged from 18 to 48 (M = 23.3 (SD = 4.9). Further, 57.71% (n = 53) were undergraduate students, 17.14% (n = 12) were graduate students, and 7.14% (n = 5) were postgraduate students. With roughly 52.86% (n = 37), it showed that most people aspired to be clinical psychologists whereas the rest of 47.14% (n = 33) aspired other psychology related careers such as neuropsychology, health psychology and school psychology.

Materials

All items were measured on a 7-point likert scale, from 1 '*Strongly Disagree*' to 7 '*Strongly Agree'*, unless stated otherwise.

Technology openness

The Unified Theory of Acceptance and Use of Technology questionnaire (UTAUT) was used to measure technology openness (Spil & Schuring, 2006). The model uses 4 subscales, however, the only important ones for this variable are 2, namely performance expectancy and effort expectancy. In total, 6 items were established, of those 3 items belonged to the subscale of performance expectancy, whereas the other 3 items to the subscale of effort expectancy. The original items are identical to the ones that were used in this study, however, one modification was made about item '*If I use the system, I will*

increase my chances of getting a raise', which was replaced with '*Integrating e-health technology in my future career will allow for a good client outcome'* (see Appendix A).

Both items concentrate on profiting off of technology, however, the original one rather focuses on personal economic gains, whereas the adopted one deals with positive therapeutic outcomes, which seems more suitable to the research question. The items also showed a strong level of interrelatedness (α = .84).

Perceived threat to psychologist-client relationship

A combination of jussupow's group directed threats (GDT) and self-developed items were used to measure the perceived threat to the psychologist-client relationship (Jussupow et al., 2018). In total, 7 items were implemented for this construct, of which 4 items consisted of the GDT and the other 3 items were self-constructed ones. The self-constructed items were created based on the aforementioned definition by Hilty et al. (2013) in regards to what a therapeutic relationship is about. They were self-composed, as the rest of the GDT items do not fully capture the essence of the perceived threat to psychologist-client relationship, as they are more focused on having control over the patient rather than concentrating on the therapeutic relationship. One of the self-developed ones was '*I fear that when using e-health technology in my future career, there will not only be a physical distance but also an emotional one between my client and me.'* (see Appendix B). On the other hand, one of the GDT items that were used stated *'I fear that when using e-health technology in my future career, the therapeutic relationship between my client and me will deteriorate.'* (see Appendix B). Overall, the items showed great internal consistency (α = .91).

Self-efficacy

The Therapist self-efficacy scale (T-SES) but also self-developed items were used to measure self-efficacy (Gori et al., 2022). Altogether, 8 items were utilised, of which 5 items belonged to the T-SES scale and the other 3 were self-composed. Items were self-composed here because the T-SES scale only gave attention to the relational competence of an individual as well as their communication skills. The scale disregarded the individuals' technical competence, which would be about their technology proficiency. One of the technical competence items included *'When using e-health technology in my future career, I would feel confident in knowing where to securely store sensitive client information obtained through e-health.'*, whereas one of the T-SES items were *'When using e-health technology in my future career, I would feel confident in effectively communicating to clients the information obtained through e-health.'* (see Appendix C). Furthermore, the items showed high internal consistency ($\alpha = .92$).

Data Analysis

The software programme Rstudio was used to perform statistical analyses. Moreover, the following R packages were crucial for data processing: "psych", "dplyr", and "readr". The data underwent a cleaning process where the dataset was transformed into a numeric format (so that analyses can take place) and the missing values were removed. Additionally, the values that seemed irrelevant to the study, namely the values from non-psychology students, were excluded as well. After cleaning the data, only 70 respondents remained.

Furthermore, a statistical power analysis was used in order to indicate the necessary sample size for this study, which resulted in at least 77 participants. The determination of the sample size was assessed with a significance level of .05 and a power of .8. After that, the four assumptions were thoroughly examined and displayed no violations. To give an

example, the Shapiro-Wilk normality test was utilised where it showed a test statistic of .977, which concludes that the data is normally distributed.

Once the dataset was prepared, it was ready to be used for the following analyses: multiple regression analysis, moderation analysis, correlation analysis, and reliability analysis (cronbach's alpha). A multiple regression analysis was conducted for the purpose of exploring the relationship between “Technology openness” and “Perceived threat to psychologist-client relationship”. The moderator variable “Self-efficacy” was added as well. For the analysis, the items of each variable were simply summed together to create a single score.

Furthermore, in order to examine the influence of the “Self-efficacy” on the aforementioned relationship, a moderator analysis was performed. Following this, a Pearson correlation analysis (correlation matrix) was carried out to comprehend the interrelations among the different variables. Finally, the reliability analysis (Cronbach's alpha) served to measure the internal consistency of the scales that were used. The level of significance was set at $p < 0.05$.

Results

Descriptives

For each of the key variables, the mean scores and standard deviation values were computed using a descriptive analysis. The mean of “Technology openness” is 4.85 (*SD* = 1.02), and for “Self-efficacy” is 4.74 (*SD* = 1.06), which reflects that the average response to these variables seemed to lean more towards the category of *‘Somewhat Agree‘* of the 7 point

likert scale. Moreover, the mean for “Perceived threat to psychologist-client relationship” is 4.35 (*SD* = 1.16), which signals that the respondents took more of a neutral position here by choosing '*Neither agree nor Disagree*'.

Table 1 shows the correlations of the 3 aforementioned key variables. Its findings indicate that the perceived threat to the psychologist-client relationship is moderately negatively correlated with both the technology openness and self-efficacy. This implies that the correlations indicate that whenever someone perceives high levels of threat towards the therapeutic relationship, it is associated with lower levels of technology openness. The same goes for self-efficacy, whenever the perceived threat is higher, the self-efficacy lowers. There is, however, a strong positive correlation between “Technology openness” and “Self-efficacy”, which suggests that those who feel high levels of self-efficacy tend to be more receptive to technology. The correlation between perceived threat to the psychologist-client relationship and technology openness is significant ((*p* = .003) as well as the correlation between perceived threat to the psychologist-client relationship and self-efficacy (*p* = .00). The correlation between self-efficacy and technology openness is highly significant ((*p* < 0.00000001).

Table 1

Pearson's Correlation of Technology openness, Perceived threat to psychologist-client relationship and Self-efficacy

Variable	1	2	3
1. Technology openness	.	-0.36	0.63
2. Perceived threat to psychologist-client relationship	-0.36	.	-0.42
3. Self-efficacy	0.63	-0.42	.

Inferential statistics

A multiple regression analysis was performed, which included the variables "Technology openness", "Perceived threat to psychologist-client relationship", and "Self-efficacy" (see Model 1 and Figure 1).

The results show that "Perceived threat to psychologist-client relationship" does not significantly relate to "Technology openness". In contrast, "Self-efficacy" relates significantly and positively to "Technology openness".

Furthermore, in the same table (Table 2), a moderation analysis was conducted by adding the interaction term between "Perceived threat to psychologist-client relationship" and "Self-efficacy" to model 1 (see Model 2). The analysis showed that the interaction effect was not significant.

Table 2

Regression Analysis with Technology openness as the dependent variable

Coefficients	*b*	*SE*	*t*	*p*		
Model 1 (Multiple Regression Analysis)						
Intercept	2.49	.73	3.42	.00		
Perceived threat to client-psychologist relationship	-.10	.09	-1.06	.29		
Self-efficacy	.57	.10	5.64	3.86e-07***		
Model 2 (Moderation Analysis)					**95% Confidence Interval**	
					Lower bound	Upper bound
Perceived threat to client-psychologist relationship * Self-efficacy	.04	.08	.50	.615	-.120	.200

Note. Dependent variable: Technology openness. *** $p < .001$

Discussion

The purpose of this study was to examine the relationship between technology openness and perceived threat to the psychologist-client relationship, as well as how self-efficacy acts as a moderator variable. This research was driven by the notable research

gap in regards to psychology students, but also by the motivation to gain insight into their attitudes as they are the next generation of mental health professionals. This paper is relevant as it contributes to greater understanding of the topic. Therefore, a quantitative online study with 70 psychology students was conducted where the results showed that when e-health is involved, the openness to use technology does not relate to the perceived threat to the psychologist-client relationship. Moreover, it was revealed that, although these results showed that self-efficacy impacts technology openness, it does not influence the strength of the direction between technology openness and perceived threat to psychologist-client relationship.

Considering the first hypothesis, it was indicated that perceived threat to the psychologist-client relationship would negatively impact technology openness. This hypothesis showed insignificant results, meaning that psychology students who have had higher levels of perceived threat towards the psychologist-client relationship did not experience less openness towards technology. One study that confirms this insignificant relationship, is the study of Sucala et al. (2013). There it was disclosed that although 88% out of 106 clinicians stated that they feared for the quality of therapeutic relationship as well as for the non-observable behaviour, 66,9% still wanted to engage with e-therapy in the future (Sucala et al., 2013). This suggests that the openness to use technology is simply dependent on other factors. Moreover, further literature has shown that students already have high levels of technology openness, which is due to the fact that technology integration into daily life, and especially within the field of psychology, has been normalised to the point it has become a standard practice (Cresswell & Sheikh, 2013). This has diminished their perceived threat towards technological tools, which means that despite their worries regarding the therapeutic relationship, their technology openness will still act independently (Sheperis & Smith, 2021). This is particularly the case for the students during covid-19, who have been exposed to more

online therapy and had to adapt to the utilisation of e-health in general (Smith et al., 2022). Moreover, research also highlights the fact that students are receiving education and training on digital interventions, which fosters their technology understanding and openness (Earle & Freddolino, 2022). Therefore, it is likely that the psychology students in our sample already possess high levels of technology openness, unrelated to how they are feeling towards the therapeutic relationship.

Furthermore, it has been reported that there is no significant difference between offline and online therapy. This is because psychologists report similarities of therapeutic relationship quality in both therapy types, which in turn implies that despite the differences in technology openness, e-health is still used (Doorn et al., 2021).

Next, the second hypothesis was tested, which stated that lower self-efficacy levels positively moderate the negative relationship between perceived threat to psychologist-client relationship and technology openness. Findings of this study showed that there was no significant support, meaning that students' lower self-efficacy does not strengthen the relationship between having higher levels of perceived threat to the psychologist-client relationship and therefore lower technology openness. Research to test this hypothesis does not exist, however, one study describes that students who are in the midst of finding and shaping their professional roles and identities are more affected by external factors such as their education as well as institutional structures that surround them rather than their own internal factors, namely their self-efficacy levels (Lent et al., 2000). This suggests that psychology students' educational environment, namely the field of psychology, might be the influence on their perceptions towards the relationship between perceived threat of psychologist-client relationship and technology openness. Moreover, other underlying confounding factors could play a role here, such as the technology proficiency of an individual, as there are respondents who might have different experiences and knowledge

about technology (McCoy, 2010). For instance, individuals with increased technology proficiency could have higher levels of self-efficacy which could eventually impact the relationship between perceived threat to psychologist-client relationship and technology openness. This is because there is a difference between being technologically proficient and having self-efficacy, meaning that those who have a clearer understanding and needed skills for technology, could potentially influence their self-efficacy, which in turn could moderate the relationship between perceived threat to psychologist-client relationship and technology openness.

The findings about self-efficacy being a predictor of technology openness seem consistent with current literature, as Holden and Rada (2011) have shown that technology self-efficacy is directly related to technology acceptance. Moreover, the descriptive statistics showed that the participants seemed to respond positively to questions regarding self-efficacy and technology openness, implying that they feel self-assured in being able to use e-health and are pretty receptive to it. This can further be explained by the aforementioned social cognitive theory indicating that higher educational programs, such as psychology, enhance self-efficacy through motivation and learning (Van Dinther et al., 2011). Moreover, a study showed that technology openness among psychology students showed considerably high means, stating that they are more likely to use social networks (Cano et al., 2024). These high levels align with Bandura's theory as it suggests that respondents with high self-efficacy are prone towards accepting technology and making use of it as they increased their self-efficacy through e-health related skills and experience (Muran et al., 2018), which gives evidence to the significant relationship between self-efficacy and technology openness. Furthermore, as for the questionnaire regarding the perceived threat to the psychologist-client relationship, the participants appeared to be more neutral. Considering their responses to technology openness, self-efficacy, and perceived threat, it indicates that they appreciate e-health while still

acknowledging the potential threats it can have. Their even-handed viewpoint hints to a future of where e-health will be embraced but with caution.

Strengths and limitations

This study showcases a few strengths. To start off with the participants themselves, they were quite diverse as individuals from 20 different nations responded, making this study multinational, and therefore applicable to various cultural backgrounds. This heterogeneous sample is therefore less prone to bias.

Moreover, the chosen target group, which consists of psychology students, has not been extensively studied. There is only minimal research dedicated towards psychology students' technology openness, and nothing about their perception of threat towards the therapeutic relationship between psychologist and client. Thus, this study provides important insights into the field while also filling in the existing large research gap. Therefore, this paper shows valuable data, which could help out future studies as it establishes a foundation to the topic at hand.

A further strength is that the scales of "Perceived threat to psychologist-client relationship" and "Self-efficacy" were heavily modified and some items self-developed, which alphas' showed high internal consistencies, and could therefore be used again in future research as this suggests their high reliability.

Nevertheless, there are a few limitations that need to be taken into account for this study. First, the sample size indicated a challenge, as a total of 70 psychology students participated in this study. This in relation with the computed power analysis with a minimum of 77 participants shows that the collected sample size signifies insufficiency. Therefore, a small sample size could lead to higher variability and, thus, hindering the detection of true relationships between the variables.

Another limitation that exists about this study deals with response bias. Meaning, that since this study uses self-reported questionnaires, participants may have provided answers that do not reflect their own truth. Moreover, since this study was put onto the survey site called pollpools, to generate more participants, it could have been that some of them did not provide honest answers as there were incentives at stake, namely getting points for their participation.

Lastly, the third existing limitation is that in the second hypothesis, the moderator self-efficacy did not provide insights into the lower and higher levels of self-efficacy among respondents. Thus, it was challenging to see whether participants displayed differences in their outcome when for instance their self-efficacy is low.

Implications for future research

In regard to the aforementioned limitations, it is important to take some implications for future research into account. First, the low sample size of this study displayed an obstacle as it could potentially lead to bias of results (Maas & Hox, 2005). Therefore, it would be crucial to collect a bigger sample size in order to aim for more accurate responses in order to draw conclusions. This could be done by extending the time for sample collection as well as the distribution on further online platforms in order to increase the number of participants (Anderson et al., 2017).

Second, due to the fact that there were insignificant effects for both hypotheses, one can consider other potential factors that might impact technology openness. Investigating further variables such as technology experience, educational level, or career aspirations would be interesting to incorporate as a moderator in the association between perceived threat to psychologist-client relationship and technology openness. This can be further supported by Hennemann et al. (2017), which revealed that the technology openness rate for clinicians varied significantly from 29% to 50%, meaning that other variables could be involved here.

Another recommendation for future research would be the distinction between two different groups of the moderator self-efficacy among respondents. Since there was no significant effect of the moderator, considering an experimental study between low self-efficacy and high self-efficacy could aid in finding a potential significant effect on the relationship. This is because different levels, when not put into one category, could potentially reveal an impact on the relationship between technology openness and perceived threat to psychologist-client relationship. Additionally, since only half of the total participants saw themselves as future clinical psychologists, which is the type of psychologist that would make use of e-health the most, it would be interesting to analyze differences between all fields of psychology, such as school psychology, neuropsychology, and researcher.

Moreover, using a qualitative research helps respondents to express their opinions further and are able to add more information that could be useful in understanding the target group better. For instance, it would be helpful to know, from their perspectives, what exact factors would impact the relationship between technology openness and perceived threat to psychologist-client relationship. Furthermore, with an online survey, there is always a possibility that participants would just answer the questionnaires without careful consideration, as they would just want to quickly get their rewards, namely (sona) points. By utilizing a qualitative research such as interviews, the individuals could therefore be more truthful and also elaborative in their answers. Moreover, for this reason, a mixed methods approach could also be made use of in the future.

Conclusion

This research aimed to explore the attitudes of the next generation of psychologists, namely psychology students. It investigated the relationship between technology openness and perceived threat to psychologist-client relationship, where it showed that both hypotheses can be rejected, suggesting that no relationship exists between the two as well as no

moderation of self-efficacy on them either. There was, however, a relationship between self-efficacy and technology openness, which only contributes to the already existing literature. This study is relevant and valuable as it adds to a foundation, which is quite non-existent. Not only does it fill in the research gap but also gets to see into the perspectives of individuals that will lead the future of psychology, particularly will decide whether or not to continue implementing e-health or completely remove it from therapeutic practices.

References

Aafjes-van Doorn, K. (2022). The complexity of teletherapy: Not better or worse, but different. https://doi.org/10.1037/cps0000073

Alharbi, S., & Drew, S. (2019). The role of self-efficacy in technology acceptance. In *Proceedings of the Future Technologies Conference (FTC) 2018: Volume 1* (pp. 1142-1150). Springer International Publishing. https://doi.org/10.1007/978-3-030-02686-8_85

Anderson, S. F., Kelley, K., & Maxwell, S. E. (2017). Sample-size planning for more accurate statistical power: A method adjusting sample effect sizes for publication bias and uncertainty. *Psychological science*, *28*(11), 1547-1562. https://doi.org/10.1177/0956797617723724

Audrain-Pontevia, A. F., Menvielle, W., & Menvielle, L. (2017). Patient Communities: A New Paradigm for Medicine. *The Digitization of Healthcare: New Challenges and Opportunities*, 225-237. https://doi.org/10.1057/978-1-349-95173-4_13

Bee, P. E., Bower, P., Lovell, K., Gilbody, S., Richards, D., Gask, L., & Roach, P. (2008). Psychotherapy mediated by remote communication technologies: a meta-analytic review. BMC psychiatry, 8, 1-13. https://doi.org/10.1186/1471-244X-8-60

Békés, V., Aafjes-van Doorn, K., Luo, X., Prout, T. A., & Hoffman, L. (2021). Psychotherapists' challenges with online therapy during COVID-19: Concerns about

connectedness predict therapists' negative view of online therapy and its perceived efficacy over time. Frontiers in Psychology, 12, Article 705699. https://doi.org/10.3389/fpsyg.2021.705699

Burgoyne, N., & Cohn, A. S. (2020). Lessons from the transition to relational teletherapy during COVID‐19. *Family process*, *59*(3), 974-988. https://doi.org/10.1111/famp.12589

Cano, J. M. M., Santiago, E. G., & Ruiz, M. E. M. (2024). Technology Acceptance Model (TAM) applied to a Disciplinary Social Network for online psychology students. *Research, Society and Development*, *13*(1), e7013144782-e7013144782. https://doi.org/10.33448/rsd-v13i1.44782

Cavallo, M., Pedroli, E., Cantoia, M., McGrath, B., & Cecchetti, S. (2023). Attitudes of Mental Health Professionals towards Telepsychology during the Pandemic: A Pilot Study. *Healthcare (Basel), 11*(11), 1542. https://doi.org/10.3390/healthcare11111542

Childress, C. (2000). Ethical issues in providing online psychotherapeutic interventions. *Journal of Medical Internet Research, 2*(1), e5. doi: 10.2196/jmir.2.1.e5

Chunara, R., Zhao, Y., Chen, J., Lawrence, K., Testa, P. A., Nov, O., & Mann, D. M. (2021). Telemedicine and healthcare disparities: a cohort study in a large healthcare system in New York City during COVID-19. *Journal of the American Medical Informatics Association*, *28*(1), 33-41. https://doi.org/10.1093/jamia/ocaa217

Cresswell, K., & Sheikh, A. (2013). Organizational issues in the implementation and adoption of health information technology innovations: an interpretative review. *International journal of medical informatics*, *82*(5), e73-e86. https://doi.org/10.1016/j.ijmedinf.2012.10.007

Doorn, A. V., Békés, V., & Luo, X. (2021). Related traumatic distress in psychotherapy patients during the pandemic: The role of attachment, working alliance, and therapeutic agency. https://doi.org/10.3390/brainsci11101288

Earle, M. J., & Freddolino, P. P. (2022). Meeting the practice challenges of COVID-19: MSW students' perceptions of e-therapy and the therapeutic alliance. *Clinical Social Work Journal*, *50*(1), 76-85. https://doi.org/10.1007/s10615-021-00801-3

Flückiger, C., Del Re, A. C., Wampold, B. E., & Horvath, A. O. (2018). The alliance in adult psychotherapy: A meta-analytic synthesis. *Psychotherapy*, *55*(4), 316. https://doi.org/10.1037/pst0000172

Geller, S. (2021). Cultivating online therapeutic presence: Strengthening therapeutic relationships in teletherapy sessions. *Counselling Psychology Quarterly*, *34*(3-4), 687-703. https://doi.org/10.1080/09515070.2020.1787348

Gori, A., Topino, E., Brugnera, A., & Compare, A. (2022). Assessment of professional self‐efficacy in psychological interventions and psychotherapy sessions: Development of the Therapist Self‐Efficacy Scale (T‐SES) and its application for eTherapy. Journal of Clinical Psychology, 78(11), 2122-2144. DOI: 10.1002/jclp.23391

Hennemann, S., Beutel, M. E., & Zwerenz, R. (2017). Ready for eHealth? Health professionals' acceptance and adoption of eHealth interventions in inpatient routine care. *Journal of health communication*, *22*(3), 274-284. https://doi.org/10.1080/10810730.2017.1284286

Hilty, D. M., Ferrer, D. C., Parish, M. B., Johnston, B., Callahan, E. J., & Yellowlees, P. M. (2013). The effectiveness of telemental health: a 2013 review. *Telemedicine and e-Health*, *19*(6), 444-454. https://doi.org/10.1089/tmj.2013.0075

Holden, H., & Rada, R. (2011). Understanding the influence of perceived usability and technology self-efficacy on teachers' technology acceptance. *Journal of research on technology in education*, *43*(4), 343-367. https://doi.org/10.1080/15391523.2011.10782576

Jaffe, N., & Steele, S. J. (2024). Therapists' self-efficacy and experiences managing clinical risk in teletherapy: a mixed methods exploration. *British Journal of Guidance & Counselling*, 1-15. https://doi.org/10.1080/03069885.2024.2311209

Jussupow, E., Spohrer, K., Heinzl, A., & Link, C. (2018). I am; We are-conceptualizing professional identity threats from information technology. Retrieved from: https://www.researchgate.net/profile/Ekaterina-Jussupow/publication/331716077_I_am_We_are_-_Conceptualizing_Professional_Identity_Threats_from_Information_Technology/links/5db6bef1a6fdccc99da90b5f/I-am-We-are-Conceptualizing-Professional-Identity-Threats-from-Information-Technology.pdf

Lent, R. W., Brown, S. D., & Hackett, G. (2000). Contextual supports and barriers to career choice: A social cognitive analysis. *Journal of Counseling Psychology, 47*(1), 36–49. https://doi.org/10.1037/0022-0167.47.1.36

Lin, T., Stone, S. J., Heckman, T. G., & Anderson, T. (2021). Zoom-in to zone-out: Therapists report less therapeutic skill in telepsychology versus face-to-face therapy during the COVID-19 pandemic. *Psychotherapy*, *58*(4), 449. https://doi.org/10.1037/pst0000398

Manolika, M., Kotsakis, R., Matsiola, M., & Kalliris, G. (2022). Direct and indirect associations of personality with audiovisual technology acceptance through general self-efficacy. *Psychological Reports*, *125*(2), 1165-1185. https://doi.org/10.1177/0033294121997784

Maas, C. J., & Hox, J. J. (2005). Sufficient sample sizes for multilevel modeling. *Methodology*, *1*(3), 86-92. https://doi.org/10.1027/1614-2241.1.3.86

Mcclelland, L., Faulkner, K., Gale, J., & Johnstone, K. (2003). A partnership model for the delivery of health education to rural and remote communities using multipoint videoconferencing. *Journal of telemedicine and telecare*, *9*(2_suppl), 30-32. https://doi.org/10.1258/135763303322596192

McCoy, C. (2010). Perceived self-efficacy and technology proficiency in undergraduate college students. *Computers & Education*, *55*(4), 1614-1617. https://doi.org/10.1016/j.compedu.2010.07.003

Meier, J. V., Noel, J. A., & Kaspar, K. (2023). Understanding psychology students' perspective on video psychotherapy and their intention to offer it after graduation: a mixed-methods study. *Frontiers in Psychology*, *14*, 1234167. https://doi.org/10.3389/fpsyg.2023.1234167

Muran, J. C., Safran, J. D., Eubanks, C. F., & Gorman, B. S. (2018). The effect of alliance-focused training on a cognitive-behavioral therapy for personality disorders. Journal of Consulting and Clinical Psychology, 86(4), 384–397. https://doi.org/10.1037/ccp0000284

Odugbose, T., Adegoke, B. O., & Adeyemi, C. (2024). REVIEW OF INNOVATIVE APPROACHES TO MENTAL HEALTH TELETHERAPY: ACCESS AND EFFECTIVENESS. *International Medical Science Research Journal*, *4*(4), 458-469. https://doi.org/10.51594/imsrj.v4i4.1022

Roesler, C. (2017). Tele‐analysis: The use of media technology in psychotherapy and its impact on the therapeutic relationship. *Journal of Analytical Psychology*, *62*(3), 372-394. https://doi.org/10.1111/1468-5922.12317

Scott, S., Knott, V., Finlay-Jones, A. L., & Mancini, V. O. (2023). Australian psychologists experiences with digital mental health: a qualitative investigation. *Journal of Technology in Behavioral Science*, *8*(4), 341-351. https://doi.org/10.1007/s41347-022-00271-5

Schubert, S., Buus, N., Monrouxe, L. V., & Hunt, C. (2023). The development of professional identity in clinical psychologists: a scoping review. *Medical Education*, *57*(7), 612-626. https://doi.org/10.1111/medu.15082

Sheperis, D. S., & Smith, A. (2021). Telehealth best practice: A call for standards of care. *Journal of Technology in Counselor Education and Supervision*, *1*(1), 4. https://doi.org/10.22371/tces/0004

Shklarski, L., Abrams, A., & Bakst, E. (2021). Will we ever again conduct in-person psychotherapy sessions? Factors associated with the decision to provide in-person therapy in the age of COVID-19. *Journal of Contemporary Psychotherapy*, *51*, 265-272. https://doi.org/10.1007/s10879-021-09492-w

Smith, K., Moller, N., Cooper, M., Gabriel, L., Roddy, J., & Sheehy, R. (2022). Video counselling and psychotherapy: A critical commentary on the evidence base. *Counselling and Psychotherapy Research*, *22*(1), 92-97. https://doi.org/10.1002/capr.12436

Sora, B., Nieto, R., Del Campo, A. M., & Armayones, M. (2021). Acceptance and use of telepsychology from the clients' perspective: Questionnaire study to document perceived advantages and barriers. *JMIR Mental Health*, *8*(10), e22199. doi:10.2196/22199

Spil, T. A., & Schuring, R. W. (2006). The UTAUT questionnaire items. In *E-Health Systems Diffusion and Use: The Innovation, the User and the Use IT Model* (pp. 93-98). IGI Global. Retrieved from:

https://www.igi-global.com/viewtitlesample.aspx?id=9038&ptid=310&t=The%20UTAUT%20Questionnaire%20Items&isxn=9781591404231

Stoumpos, A. I., Kitsios, F., & Talias, M. A. (2023). Digital transformation in healthcare: technology acceptance and its applications. *International journal of environmental research and public health*, *20*(4), 3407. https://doi.org/10.3390/ijerph20043407

Sucala, M., Schnur, J. B., Brackman, E. H., Constantino, M. J., & Montgomery, G. H. (2013). Clinicians' attitudes toward therapeutic alliance in E-therapy. *The Journal of general psychology*, *140*(4), 282-293. https://doi.org/10.1080/00221309.2013.830590

Van Dinther, M., Dochy, F., & Segers, M. (2011). Factors affecting students' self-efficacy in higher education. *Educational research review*, *6*(2), 95-108. https://doi.org/10.1016/j.edurev.2010.10.003

Waddington, J. (2023). Self-efficacy. *ELT Journal*, *77*(2), 237-240. https://doi.org/10.1093/elt/ccac046

Appendices

Appendix A

Items of Technology openness

Performance expectancy:

1. Integrating e-health technology in my future career will allow me to complete my tasks faster
2. Integrating e-health technology in my future career will allow me to be more productive
3. Integrating e-health technology in my future career will allow for a good client outcome

Effort expectancy:

4. Integrating e-health technology in my future career will be easy for me
5. Integrating e-health technology in my future career will be clear and understandable
6. Integrating e-health technology in my future career will be effortless for me

Appendix B

Items of perceived threat to psychologist-client relationship

1. I fear that when using e-health technology in my future career, the therapeutic relationship between my client and me will deteriorate
2. I fear that when using e-health technology in my future career, I will be less able to treat my clients well

3. I fear that when using e-health technology in my future career, there will be a lack of understanding between my client and me
4. I fear that when using e-health technology in my future career, there will be miscommunication between my client and me
5. I fear that when using e-health technology in my future career, I will not be able to provide my client with enough emotional support
6. I fear that when using e-health technology in my future career, there will be a negative impact on the emotional bond between my client and me
7. I fear that when using e-health technology in my future career, there will be not only be a physical distance but also an emotional one between my client and me

Appendix C

Items of Self-efficacy

Technical competence

1. When using e-health technology in my future career, I would feel confident in interpreting client information obtained through e-health.
2. When using e-health technology in my future career, I would feel confident in knowing where to securely store sensitive client information obtained through e-health.
3. When using e-health technology in my future career, I would feel confident in being able to use the software/programmes to access patient information.

Communicative competence

4. When using e-health technology in my future career, I would feel confident in having the skills to communicate via e-health with the client.
5. When using e-health technology in my future career, I would feel confident in effectively communicating to clients the information obtained through e-health.
6. When using e-health technology in my future career, I would feel confident in making healthcare related decisions

Relational competence

7. When using e-health technology in my future career, I would feel confident in building and maintaining a trusting therapeutic relationship with clients.
8. When using e-health technology in my future career, I would feel confident in adapting e-health to the needs of the clients.