Digital and In-Person Interpersonal Emotion Regulation: The Role of Anxiety, Depression, and Stress

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Abstract

Interpersonal emotion regulation (IER) is the process by which individuals change their emotional experiences by socially interacting with others. While the literature on IER for in-person settings is growing, there is a dearth of research exploring IER in digital social interactions (i.e., via technology) – especially when considering the presence of psychopathology. The aim of this study was to compare perceived IER efficacy and use in digital versus in-person contexts and explore the impact that anxiety, depression, and stress have on IER. A sample of 93 university undergraduate students showed that participants perceived in-person IER as more efficacious than digital IER, and participants high in anxiety, depression, and stress tended to use both modalities of IER more than those low anxiety, depression, and stress. This study addresses a critical gap in our understanding of emotion regulation in digital environments and sheds light on how this is related to psychopathology and the psychotherapy experience.

Keywords Interpersonal emotion regulation · Anxiety · Depression · Stress · Teletherapy

Emotions serve a myriad of important functions; however, how well we manage them ultimately determines their helpfulness. Emotion regulation is a response to emotional stimuli with the goal of either upregulation or downregulation depending on valence and arousal and one's regulatory goals. Interpersonal emotion regulation (IER) is the act of communicating with another person to change either one's own or another person's emotional experience. IER has become a popular subject of recent research in the field of emotion (e.g., Gross 2015; Zaki & Williams, 2013). However, this area of research remains in its infancy, making it crucial to better understand how, by using each other as resources, we can best manage emotional experiences.

Thus far, interpersonal emotion regulation strategies have been studied through face-to-face interactions (e.g., Marroquin 2011). However, utilizing technology for communication (e.g., via phone, computer, internet application, etc.) is becoming a popular substitute for these face-to-face interactions. It is also of particular importance to study IER in individuals with psychological disorders categorized by symptoms of emotional dysregulation, such as anxiety and depression (e.g., Hofmann et al., 2012). One resource growing in popularity over time is digital psychological therapy, otherwise known as teletherapy. Teletherapy is available as video or phone calls with a therapist, texting, digital worksheets, and mobile interactive care applications. Despite a desire for teletherapy to succeed in providing high quality treatment, there remain some questions regarding this burgeoning practice.

Interpersonal Emotion Regulation

Interpersonal emotion regulation (IER) may occur intrinsically (receiving regulation from another person) or extrinsically (regulating another's emotions), and its success is either response-dependent (dependent on the strategy employed) or response-independent (regulation occurs from being with another regardless of strategy) (Zaki & Williams, 2013). Individuals seeking regulation have varying goals, which can be sorted within a taxonomy of motives (Tamir, 2016). Although seemingly categorical, Zaki and Williams'

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model of IER leaves room for overlap among different mechanisms, as it is rare that any interpersonal interaction has a single regulatory purpose (Gross, 2015). For IER to be successful, it must be utilized flexibly to meet the demands of varying situations, including digital settings (e.g., Aldao et al., 2015).

Even virtually, we can pursue regulatory goals with the help of others thanks to technological communication. Wadley and colleagues explored digital emotion regulation in discussing how people utilize technology to regulate their emotions (2020). The authors discuss digital emotion regulation as an intrapersonal mechanism, as well as the use of technology as a general interpersonal tool. An example of this intrapersonal mechanism (regulating oneself) would be distraction by browsing the internet, and an example of technology as an interpersonal tool would be giving a child a phone to play with. While these mechanisms are important, it is imperative to also examine the interpersonal implications of technological communication. One study by Colasante and colleagues (2020) found digital support (emotional support through digital means) to be as efficacious as in-person support, but only in the downregulation of negative emotions.

Emotion Regulation in Individuals with Mood and Anxiety Disorders

Individuals experiencing anxiety and depression are particularly affected by emotion dysregulation. Social support has been shown to be efficacious in regulating negative emotions in these individuals (e.g., Hofmann et al., 2012; Marroquin, 2011; Marroquin & Nolen-Hoeksema, 2015; Subrahmanyam et al., 2020). It seems likely that individuals turn to digital emotion regulation during times of social constraints (such as those presented by the COVID-19 pandemic). What is in question is whether digital IER (dIER) is as effective, especially considering individuals at risk for emotion dysregulation, as in-person IER (ipIER). A shift towards primarily digital emotion regulation could leave some individuals with psychopathology struggling to find the regulatory benefits that they may have experienced in in-person settings.

In-Person Therapy and Teletherapy

Teletherapy has been on the rise in recent years and has gained importance with social restrictions in place due to COVID-19 (e.g., Torous, J., & Wykes, T., 2020). The literature regarding the efficacy of teletherapy services compared to its traditional counterpart supports that both achieve similar levels of clinical treatment response among a variety of psychological disorders (e.g., Andersson & Cuijpers, 2009). Effectively measuring the efficacy of IER strategies among individuals with psychopathology is an important step in ensuring these individuals are meeting their regulatory needs. While measures of IER have been established and utilized (e.g., Hofmann et al., 2016; Williams et al., 2018), none of the existing measures were created with dIER as their target.

Present Objectives

Primarily, this study investigates whether individuals report different levels efficacy of and tendency for IER in digital interactions compared to in-person interactions. Also of interest is whether higher levels of anxiety, depression, or stress changes this relationship. The third goal of this study is to compare satisfaction with in-person therapy and teletherapy and explore connections to findings from the first two aims. The final purpose of this study is the initial exploration of an independent measure of dIER through modifying an existing IER measure (Williams et al., 2018) to assess the digital regulation modality.

We predict that individuals will report different levels of tendency of use and efficacy of IER in digital and in-person settings, and that individuals with high levels of anxiety, depression, or stress will report different levels of tendency of use and efficacy than individuals with low levels, reflecting their heightened regulatory needs. We also predict that individuals who have experience with both modalities of therapy will report lower levels of satisfaction with teletherapy than with in-person therapy due to burnout related to the reliance on technology.

Methods

Participants

Data were collected from 95 Moravian University undergraduate students and were analyzed from 93 (2 were dropped for failing attention check questions). Data collection took place from November, 2020 through January, 2021. Participants were recruited via on-campus announcements and were offered course credit or a raffle entry to win a gift card for their participation. Informed Consent was obtained from all participants to move forward with their participation. Demographic information was consistent with the small, private university, with 71% of participants identifying as female, 80.6% of participants identifying as White, 12.9% as African American or Black, 8.6% as

Hispanic/Latino, 6.5% as Asian, 4.3% as Native American, and 2.2% as other. 30.1% of participants reported experience with both teletherapy and in-person therapy.

Materials and Measures

Questionnaires administered include the Depression, Anxiety, and Stress Scales-21 (DASS-21; Lovibond & Lovibond, 1995), two adapted versions of the existing Interpersonal Regulation Questionnaire (IRQ; Williams et al., 2018), a satisfaction questionnaire on participants' therapy experiences, and a demographics questionnaire. All measures were self-report.

DASS-21

The DASS-21 was used to assess individuals' levels of anxiety, depression, and stress within the previous week (Lovibond & Lovibond, 1995). Participants were instructed to rate 21 items on a Likert scale from 0 (did not apply to me at all) to 3 (applied to me very much, or most of the time). Items formed three subscales: anxiety, depression, and stress subscales. Using quantitative guidelines set by Lovibond & Lovibond (1995), these subscale scores are associated with qualitative groups of normal, mild, moderate, severe, and extremely severe.

Digital IRQ and In-Person IRQ

The digital IRQ (dIRQ) questionnaire is a version of Williams and colleagues' scale (IRQ; 2018). Participants were prompted to respond to items regarding technological communication/interaction, which was defined as: "any method by which you would communicate with a single individual through the use of technology, the internet, or any other digital platform. This includes, but is not limited to: video calls (e.g., Zoom, FaceTime, Skype), text messaging (including WhatsApp, GroupMe, etc.), telephone or cell phone calls, email, direct messages through social media (e.g., Facebook Messenger, Instagram, Snapchat), etc." The 16 items in the IRQ were modified to reflect a digital environment. For example, an item on the IRQ reads, "Being with other people tends to put a smile on my face." On the dIRQ, the corresponding item reads, "Being digitally connected with other people tends to put a smile on my face." These changes were consistent throughout the 16 items to maintain the integrity of the IRQ while effectively measuring dIER.

Another version of the IRQ (Williams et al., 2018) was created to be compared to the dIRQ. This version, called the in-person IRQ (ipIRQ), featured changes similar to the dIRQ, however these changes placed an emphasis on ipIER. Participants were prompted to respond regarding in-person communication/interaction, which was defined as: "any method of communication or interaction that may take place while you are with another individual in-person." This allowed us to compare responses on the dIRQ when calculating the efficacy and tendency subscales. Full versions of the digital and in-person IRQs can be found in the Appendix.

Teletherapy and In-Person Therapy Questionnaire

Two questionnaires were created to collect information on participants' experience and satisfaction with teletherapy and in-person therapy. These questionnaires were identical except for interchangeably using the terms digital (online or with technology) and face-to-face (in-person) depending on which version of the questionnaire was presented. Satisfaction was measured using three different metrics: how much the experience helped, how enjoyable the experience was, and the quality of participants' relationships with their therapists. For example, participants were asked to select a number from 1 to 5 (1 being the lowest satisfaction and 5 being the highest satisfaction) to describe their overall experience with therapy (either digital or in-person, depending on the questionnaire) in terms of how much they believed it helped them.

Demographics Questionnaire

A standard demographics questionnaire was employed to collect information on participants' gender identification, highest completed level of education, race and ethnicity, employment status, relationship status, and age.

Procedure

This study was within groups and cross-sectional in design, and participants completed each part of the study independently on Qualtrics. All participants gave informed consent to participate in the study.

Participants first completed the DASS-21. Participants then completed the dIRQ and ipIRQ, the order of which was counterbalanced. Next, they completed the teletherapy and in-person versions of the therapy questionnaire, which were counterbalanced. Participants completed the demographics questionnaire last. Three attention check questions were employed (one in each of the DASS-21, dIRQ, and ipIRQ) to ensure that participants remained attentive.
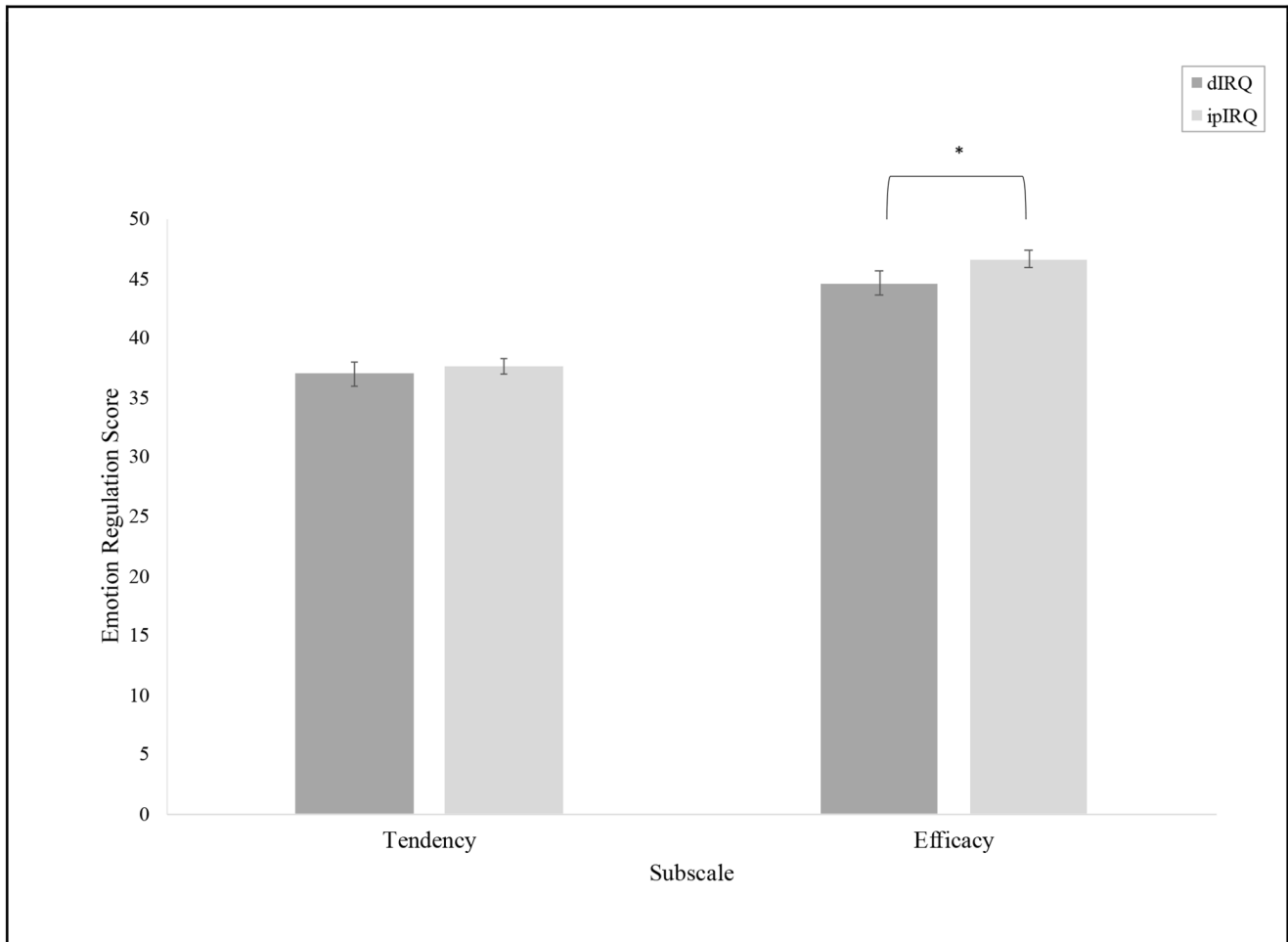
Fig. 1 *Comparing Efficacy and Tendency in the dIRQ and ipIRQ* (*Note.* This figure shows the comparison between participants' scores of total tendency and efficacy of interpersonal emotion regulation on the dIRQ and ipIRQ. Error bars reflect standard deviation. *$p < .05$)

Results

Data Analyses

For all analyses, reported p values are two-tailed, and significant effect sizes are presented as partial eta squared (η_p^2) for all ANOVAs and Cohen's d for t-tests. For the ANOVAs, the assumption of homogeneity of variance was met for each analysis (according to Levene's tests) except for digital efficacy in high depression versus low depression groups, and digital tendency in high stress versus low stress groups. To address the heterogeneity of variance found for these two analyses, a Welch ANOVA was completed for each.

Tendency and Efficacy in Digital IER and In-Person IER

Paired-samples *t*-tests were conducted to compare digital IER (dIRQ) and in-person IER (ipIRQ) for strategy

tendency and efficacy. There was not a significant difference in the tendency scores for dIER ($M = 36.96$, $SD = 10.37$) and ipIER ($M = 37.60$, $SD = 9.59$), $t(92) = 0.77$, $p = .44$; $d = 0.06$. When comparing efficacy, ipIER ($M = 46.63$, $SD = 6.45$) was perceived as significantly more efficacious compared to dIER ($M = 44.61$, $SD = 6.82$), $t(92) = 2.78$, $p = .01$; $d = 0.30$. See Fig. 1 for a graphical representation of these data on tendency and efficacy.

IER Tendency and Efficacy in Anxiety, Depression, and Stress

Participants were separated into two groups, those in the high anxiety (n = 32), depression (n = 16), or stress (n = 23) group reported severe or very severe symptoms, based on pre-established classification of the DASS-21 subscale, and those with no to moderate symptoms were placed in the low anxiety (n = 61), depression (n = 77), or stress (n = 70) group (Lovibond & Lovibond, 1995).

Anxiety

Results revealed that high anxiety participants ($M = 41.94$, $SD = 9.96$, 95% CI [38.35, 45.53]) reported a significantly higher tendency to use dIER than low anxiety participants ($M = 34.34$, $SD = 9.66$, 95% CI [31.87, 36.82]), $F(1, 91) = 12.69$, $p = .001$, $\eta_p^2 = 0.12$, and that high anxiety participants ($M = 47.16$, $SD = 6.56$, 95% CI [44.79, 49.52]) reported significantly higher efficacy of dIER than low anxiety participants ($M = 43.28$, $SD = 6.62$, 95% CI [41.58, 44.98]), $F(1, 91) = 7.24$, $p = .01$, $\eta_p^2 = 0.07$. Results also showed that high anxiety participants ($M = 41.00$, $SD = 10.19$, 95% CI [37.32, 44.68]) reported a significantly higher tendency to use ipIER than low anxiety participants ($M = 35.82$, $SD = 8.82$, 95% CI [33.56, 38.08]), $F(1, 91) = 6.50$, $p = .01$, $\eta_p^2 = 0.07$, but there was no significant difference for efficacy of ipIER between high anxiety participants ($M = 47.44$, $SD = 6.68$, 95% CI [45.03, 49.84]) and low anxiety participants ($M = 46.21$, $SD = 6.34$, 95% CI [44.59, 47.84]), $F(1, 91) = 0.76$, $p = .39$, $\eta_p^2 = 0.01$. See Fig. 2 for a graphical representation of these data.

Depression

Results showed that high depression participants ($M = 43.63$, $SD = 8.92$, 95% CI [38.87, 48.38]) reported a significantly higher tendency to use dIER than low depression participants ($M = 35.57$, $SD = 10.15$, 95% CI [33.27, 37.88]), $F(1, 91) = 8.66$, $p = .01$, $\eta_p^2 = 0.09$. Similarly, high depression participants ($M = 48.00$, $SD = 7.39$, 95% CI [44.06, 51.94]) reported a significantly higher efficacy of dIER than low depression participants ($M = 43.91$, $SD = 6.53$, 95% CI [42.43, 45.39]), $F(1, 91) = 4.97$, $p = .03$, $\eta_p^2 = 0.05$. Results also revealed that high depression participants ($M = 42.06$, $SD = 9.49$, 95% CI [37.01, 47.12]) reported a significantly higher tendency to use ipIER than low depression participants ($M = 36.68$, $SD = 9.40$, 95% CI [34.54, 38.81]), $F(1, 91) = 4.34$, $p = .04$, $\eta_p^2 = 0.05$, but no significant difference in IER efficacy between the high depression group ($M = 48.25$, $SD = 7.65$, 95% CI [44.18, 52.32]) and the low depression group ($M = 46.30$, $SD = 6.18$, 95% CI [44.90, 47.70]), $F(1, 91) = 1.22$, $p = .27$, $\eta_p^2 = 0.01$. See Fig. 2 for a graphical representation of these data.

Stress

High stress participants ($M = 41.52$, $SD = 10.83$, 95% CI [36.84, 46.20]) reported a higher tendency to use dIER than low stress participants ($M = 35.46$, $SD = 9.83$, 95% CI [33.11, 37.80]), $F(1, 91) = 6.27$, $p = .01$, $\eta_p^2 = 0.06$, and high stress participants ($M = 48.30$, $SD = 6.26$, 95% CI [45.60, 51.01]) reported higher efficacy of dIER than low stress

participants ($M = 43.40$, $SD = 6.60$, 95% CI [41.83, 44.97]), $F(1, 91) = 9.80$, $p = .01$, $\eta_p^2 = 0.10$. High stress participants ($M = 41.13$, $SD = 9.69$, 95% CI [36.94, 45.32]) also reported a significantly higher tendency to use ipIER than low stress participants ($M = 36.44$, $SD = 9.33$, 95% CI [34.22, 38.67]), $F(1, 91) = 4.29$, $p = .04$, $\eta_p^2 = 0.05$, but no significant difference in IER efficacy was found between the high stress group ($M = 47.52$, $SD = 6.97$, 95% CI [44.51, 50.54]) and the low stress group ($M = 46.34$, $SD = 6.29$, 95% CI [44.84, 47.84]), $F(1, 91) = 0.58$, $p = .45$, $\eta_p^2 = 0.01$. See Fig. 2 for a graphical representation of these data.

Therapy Satisfaction

We analyzed data from a subset of participants (n = 28) who reported having experience with both in-person therapy and teletherapy. Paired-samples t-tests were conducted, and no significant differences were found for satisfaction between in-person therapy ($M = 4.14$, $SD = 0.93$) and teletherapy ($M = 3.82$, $SD = 0.86$), $t(27) = 1.51$, $p = .14$; $d = 0.36$, positive experience between in-person therapy ($M = 4.14$, $SD = 0.97$) and teletherapy ($M = 3.93$, $SD = 1.02$), $t(27) = 0.95$, $p = .35$; $d = 0.21$, nor therapist-client relationship between in-person therapy ($M = 4.29$, $SD = 0.94$) and teletherapy ($M = 4.11$, $SD = 1.03$), $t(27) = 0.87$, $p = .39$; $d = 0.18$.

Discussion

Our results suggest that ipIER is perceived to be more efficacious in regulating an individual's emotion than dIER. This supports that individuals perceive interacting with others in-person as having more psychological benefits than digital interaction (Subrahmanyam et al., 2020). In-person IER having higher efficacy than dIER indicates this perception that our interactions with others are more impactful when in-person as opposed to digitally when experiencing emotional arousal. This may also suggest that, given society's reliance on technology for communication, we may be missing out on potential benefits received from interpersonal regulatory strategies, which could impact our emotional well-being. The full implications of this finding are not yet known; however, it is crucial to consider them moving forward.

We found no difference in the tendency to use one modality over the other, which was not in line with our hypotheses. This suggests individuals are flexible in their regulatory environments, dependent upon availability of social resources to interpersonally connect with (Aldao et al., 2015). If someone feels an emotion they want to regulate, dIER makes receiving interpersonal regulatory benefits more accessible to them. Wadley and colleagues (2020)
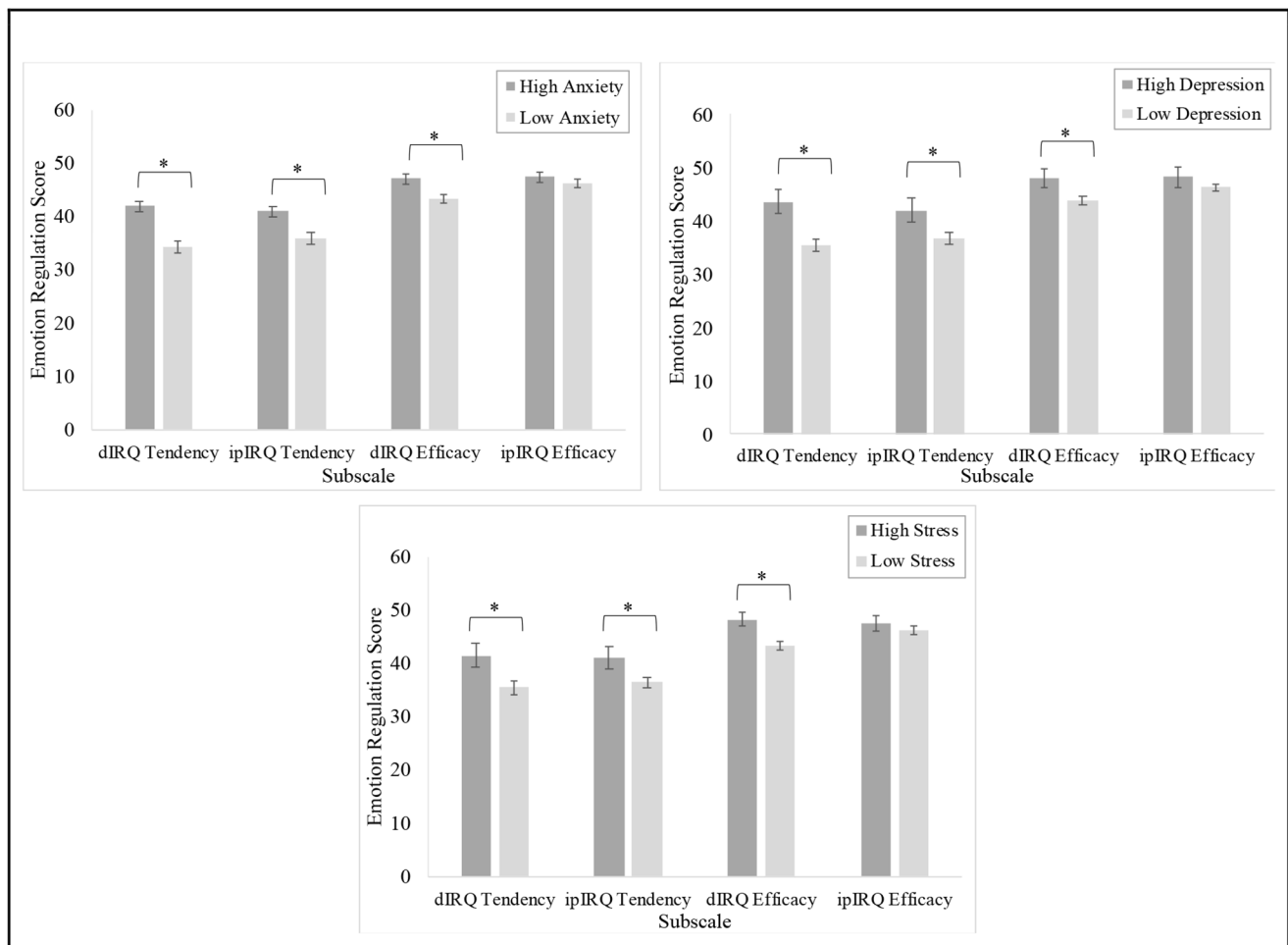
Fig. 2 Comparing IER in the Context of Anxiety, Depression, and Stress (*Note.* This figure shows the comparison of individuals reporting high anxiety, depression, or stress with individuals reporting low anxiety, depression, or stress on the various dIRQ and ipIRQ subscales. Error bars reflect standard deviation. *$p < .05$)

detail the benefits of technology to intrapersonally regulate (non-social), and our own findings seem to suggest some benefits for interpersonal regulation (social) in a digital context.

An interesting pattern appeared such that highly anxious, depressed, and stressed participants reported a higher tendency to use both dIER and ipIER than groups with lower levels of anxiety, depression, and stress. High-level participants reported significantly greater perceived efficacy when using dIER than low-level groups, but no differences in efficacy emerged for ipIER. These findings suggest that individuals experiencing high anxiety, depression, and stress have unique regulatory experiences and needs. Increased tendency to use dIER and ipIER in high-level groups supports that these groups may have higher regulatory needs which they address across modalities, turning to different modalities more often than low-level groups. This supports previous findings about the greater emotional dysregulation that individuals experiencing high levels of anxiety,

depression, and stress face when compared to individuals with low levels of anxiety, depression, and stress (Hofmann et al., 2012). The general finding discussed previously that ipIER is more perceived as more efficacious than dIER remains, however, the finding that high anxiety, depression, and stress individuals use dIER and ipIER more than individuals with low levels suggests the accessibility of regulatory strategies matters greatly, as opposed to only quality.

When comparing satisfaction metrics in participants that had experience with both in-person and teletherapy, there was no significant difference found across metrics. This supports current literature, which suggests that teletherapy is just as efficacious, and satisfying, when compared to in-person therapy (e.g., Andersson & Cuijpers, 2009).

In addition to the above findings, the dIRQ is the first brief, self-report measure of dIER. Serving as a comparison to the ipIRQ could prove beneficial in future studies. The dIRQ may be helpful if extended to serve as a supplement in experimental designs when determining potential

IER deficiencies in digital settings. Future studies should explore the psychometric properties of these modified versions of the IRQ (Williams et al., 2018) and combine its use in an experimental design.

While the current findings are novel and have implications for our understanding of IER, it is important to consider the following limitations. This study occurred during the COVID-19 pandemic. It may be that, because of a shift to a digital world during this time, participants were exhausted with technology and that this impacted the findings. We argue that this may have been the ideal time due to participants being more accustomed to the digital world. Potential limitations include that all measures were self-report, and participants were recruited from the same university and their results may not be generalizable to the larger population. The sample in this study was also relatively small, and the samples of participants with high anxiety, depression, and stress were even smaller. It may be difficult to ascertain the true impact of this study on these populations with a small sample, and replication of this study would benefit from a larger sample of highly anxious, depressed, and stressed participants. Further research could investigate how individuals with psychological comorbidities would respond to these measures, and how involving a larger, more diverse population may be more generalizable to validate results.

These findings further our understanding of how IER occurs in different modalities, and how the presence of anxiety, depression, and stress may impact IER. Digital IER, while perhaps not as efficacious as ipIER, is a more accessible way for individuals to fulfill their emotion regulatory needs. Our findings are novel and will become increasingly relevant as society becomes more reliant on technology for communication.

Appendix

Digital IRQ (dIRQ).

Instructions: Please indicate your level of agreement to the following statements. ***Assume that all of these statements involve technological communication/interaction in some capacity.*** When rating these statements, only rate them for technological communication/interactions.

Technological Communication/Interaction- Any method by which you would communicate with a single individual through the use of technology, the internet, or any other digital platform. This includes, but is not limited to: video calls (e.g., Zoom, FaceTime, Skype), text messaging (including WhatsApp, GroupMe, etc.), telephone or cell phone calls, email, direct messages through social media (e.g., Facebook Messenger, Instagram, Snapchat), etc.

(1) strongly disagree (2) disagree (3) somewhat disagree (4) neither agree nor disagree.

(5) somewhat agree (6) agree (7) strongly agree.

1. When something bad happens, my first impulse is to seek out the company of others through technology.
2. When I'm having trouble, I contact someone because I cannot wait to tell them about it.
3. I just have to reach out and get help from someone when things are going wrong.
4. I manage my emotions by expressing them to others via phone/text/computer-based mediums.
5. I appreciate having others' support from afar through difficult times.
6. Sometimes I just need someone to understand where I'm coming from even if they are not physically with me.
7. It really helps me feel better during stressful situations when someone knows and cares about what I'm going through regardless of if they are physically with me.
8. I really appreciate having other people to help me figure out my problems from afar.
9. When things are going well, I just have to contact other people about it.
10. When something good happens, my first impulse is to call or reach out and tell someone about it.
11. When things are going well, I feel compelled to seek out other people by calling or messaging them.
12. When I want to celebrate something good, I call/text/ message certain people to tell them about it.
13. I'm happier when I'm connected with my friends than when I'm not.
14. Being digitally connected with other people tends to put a smile on my face.
15. I find that even just digitally connecting with other people can help me to feel better.
16. I really enjoy calling/messaging the people I know.

In-person IRQ (ipIRQ).

Instructions: Please indicate your level of agreement to the following statements. ***Assume that all of these statements involve in-person communication/interaction.*** When rating these statements, only rate them for in-person communication/interactions.

In-person Communication/Interaction- Any method of communication or interaction that may take place while you are with another individual in-person.

(1) strongly disagree (2) disagree (3) somewhat disagree (4) neither agree nor disagree.

(5) somewhat agree (6) agree (7) strongly agree.

1. When something bad happens, my first impulse is to seek out the company of others.

2. When I'm having trouble, I cannot wait to meet up with and tell someone about it.
3. I just have to meet up with and get help from someone when things are going wrong.
4. I manage my emotions by expressing them in-person to others.
5. I appreciate having others' support in-person through difficult times.
6. Sometimes I just need to be with someone and have them understand where I'm coming from.
7. It really helps me feel better during stressful situations when someone I am around knows and cares about what I'm going through.
8. I really appreciate having other people with me to help me figure out my problems.
9. When things are going well, I just have to tell other people about it in-person.
10. When something good happens, my first impulse is to tell someone about it in-person.
11. When things are going well, I feel compelled to seek out and spend time with other people.
12. When I want to celebrate something good, I seek out certain people to tell them about it in- person.
13. I'm happier when I'm with my friends than when I'm by myself.
14. Being with other people tends to put a smile on my face.
15. I find that even just being around other people can help me to feel better.
16. I really enjoy being around the people I know.

Declarations

On behalf of all authors, the corresponding author states that there is no conflict of interest. This study received ethics approval from the Moravian University Institutional Review Board and Informed Consent was obtained from all participants.

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