From Conflict to Control: Coping with Wearable Ambivalence

An online experiment investigating the effect of ambivalence on confrontative coping and the moderating role of locus of control

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Abstract

Purpose – Research suggested that ambivalence could lead to more use of confrontative coping. This study aimed to test whether users of wearables exposed to experience ambivalence would use more confrontative coping strategies compared to users who experienced negative or neutral feelings. This study examined whether internal locus of control positively moderates this relationship.

Methodology – One hundred and fifty-seven participants were randomly assigned to one of three experimental conditions, designed to elicit different (ambivalent, negative or neutral) experiences. Scales measuring coping, locus of control and ambivalence were adapted from research. The proposed model was tested using multiple regression analyses.

Findings – The manipulation did not lead to significant differences in ambivalent feelings between the conditions. Ambivalence did not lead to significantly more or less use of confrontative or avoidance coping, compared to negative or neutral feelings. Internal locus of control did not moderate this relationship, but did significantly predict coping. Individuals with higher internal locus of control used more confrontative coping, while they used less avoidance coping. Females seemed to use more confrontative coping strategies.

Contributions – This study supports the view that internal locus of control is associated with confrontative coping strategies. Future studies could investigate how to effectively manipulate ambivalence.

Acknowledgements

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1. Introduction

Wearables can have both positive and negative outcomes. On the one hand, wearables can have beneficial health outcomes, by improving health management through tracking lifestyle behaviour (Wortley et al., 2017). Furthermore, Kazanskiy et al. (2024) show that wearables can reduce the burden on healthcare through remote healthcare delivery and monitoring. However, other studies also mention a "dark side" of using this technology. Examples include concerns about health and privacy (Marakhimov & Joo, 2017). Wearable use can also lead to guilt and worry when users fail to meet their goals (Leese et al., 2021). Some users also express ethical concerns (Wortley et al., 2017). Lastly, users of persuasive technology have also reported to experience technostress (stress arising from technology) (Rieder et al., 2020). Persuasive technologies are information systems that are created to alter a user's attitudes (Fogg, 2003). Sjöklint et al. (2015) and Rieder et al. (2020) mention negative feedback from wearables lead to dysfunctional responses. Schroeder et al. (2021) mention that both positive and negative feedback from wearables induce stress.

Wearables can lead to contradictory feelings (Fiegert & Brunzell, 2015). Wearable technology has the dual nature of extending human capabilities, but also inducing feelings of loss of autonomy (Duus et al., 2018). This function leads to a state of ambivalence, which are both the valence of positive and negative feelings towards a person, situation, task, idea or object, in this case wearable technology (Qahri-Saremi & Turel, 2020). Research has shown that the use of technology can result in ambivalence (Davis, 2012; Mick & Fournier, 1998; Wilson-Nash & Tinson, 2022).

Van Harreveld et al. (2009) find that the tension arising from ambivalence can lead to the use of different coping strategies. Coping entails how people deal with stress (Folkman & Lazarus, 1980). Ambivalence arising from technology is a form of technostress. According to Rieder et al. (2020), this technostress leads to different coping strategies in order to mitigate this technostress. They also mention that mostly the negative side has been studied for information systems. Tension arising from ambivalence from information systems specifically can lead to different coping responses (Perakslis,

2020; Qahri-Saremi & Turel, 2020). Rothman et al. (2017) states that psychologists mostly assume that ambivalent attitudes lead to dysfunctional attitudes. As has been shown in prior research, ambivalence is mostly seen as something negative. Therefore, it is beneficial to investigate whether ambivalence can also have positive outcomes. It is important to focus how people can positively deal with or cope with stress arising from ambivalence.

For technology specifically, there are mainly two different coping types: confrontative coping and avoidance coping (Mick & Fournier, 1998). Confrontative coping alters of actively manages or solves the stress (Mick & Fournier, 1998). Avoidance coping tries to mitigate the stress by reducing (physical or mental) exposure to the source of the stress (Mick & Fournier, 1998).

Present research does not have an answer on how mHealth users respond to ambivalence. This is beneficial to understand as coping influences adoption and engagement (Cui et al., 2009). Contrary to popular belief, Miron-Spektor et al. (2011) show that feelings of ambivalence might actually lead to increased creativity. This is needed for a more confrontative coping strategy (Falat, 2000; Pratitis, 2013). This is due to the paradoxical nature of ambivalence, and its characteristics that can lead to cognitive adaptability and flexibility (Cavazza & Butera, 2008; Pillaud et al., 2018; Rothman et al., 2017). Therefore, ambivalence rising from wearable technology could also lead to confrontative coping strategies. Contrary to psychologists' belief that ambivalence is dysfunctional (Rothman et al., 2017), this suggests that ambivalence (arising from wearables) could lead to (functional) confrontative coping. The aim of this study is to examine the impact of ambivalent versus non-ambivalent experiences on individuals' coping responses.

Given the unique profile of each individual, it will be essential to enrich literature on ambivalence and coping across different conditions. Romero Carrasco et al. (2009) wondered whether locus of control would impact the use of confrontative coping, as the related concept of feelings of autonomy does. Locus of control is an individual's perception of control over the future (McCormack & Cotter, 2013). People with internal locus of control belief they control their own

future, while individuals with external locus of control belief their fate is determined by outside forces (McCormack & Cotter, 2013). It is important to consider locus of control when studying the relationship between ambivalence and coping, as Dijkstra et al. (2011) mention internal locus of control to be an important mechanism when studying conflict. Earlier studies mention that individuals with higher levels of internal locus of control experience less stress due to more use of confrontative coping in the college and healthcare context respectively (Parkes, 1984; Tanck & Robbins, 1979). Lastly, a recent study suggested future research to focus on whether locus of control would influence paradoxical coping mechanisms in information systems (Whelan et al., 2025). Therefore, to enrich the first research objective, a second objective will be added: to examine the moderating role of internal locus of control in the relationship between ambivalent versus non-ambivalent experiences on coping responses.

This study will contribute to the academic literature of ambivalence, coping, locus of control and wearable technology. To date, there has not been a single study that studies these relationships in this context, to the author's knowledge. Prior research found that ambivalence leads to both coping strategies (Qahri-Saremi & Turel, 2020; van Harreveld et al., 2009), this study will advance on this topic by examining whether confrontative coping is more likely to occur when ambivalence arises from wearable use. Miron-Spektor et al. (2011) suggested that paradoxical feelings (ambivalence) can lead to adaptive outcomes, such as new insights. This study explores whether similar effects occur in the context of mHealth, specifically whether ambivalent experiences lead to greater use of (adaptive) confrontative coping strategies. In doing so, it answers the call for future research of Rothman et al. (2017) and Rieder et al. (2020) in considering ambivalence from different disciplines (e.g. marketing) and across different contexts (e.g. wearable technology). Furthermore, by introducing internal locus of control as a moderating variable, this study responds to the call for future research of Whelan et al. (2025) in proving whether internal locus of control is associated with coping with paradoxes. Although it has been shown that people with higher internal locus of control use more confrontative

coping (Dijkstra et al., 2011; Parkes, 1984; Tanck & Robbins, 1979), it's effect in the context of ambivalence arising from wearables remains unexplored.

This research will contribute to society as well. Understanding how users cope with wearable feedback is crucial for wearable producers in order to facilitate the retained usage of the wearables. Producers of information systems (thus also wearables) often consider paradoxical attitudes to be a problem (Qahri-Saremi & Turel, 2020), but this study could prove that paradoxical attitudes can also be beneficial for continued use. Producers of wearables may take an individuals' locus of control into account in order to personalize the wearable's characteristics. This information will also be beneficial for healthcare. Continued use of wearables reduces burden on healthcare through remote monitoring and healthcare delivery (Kazanskiy et al., 2024; Marakhimov & Joo, 2017).

The following chapter presents relevant theory surrounding the concepts of wearables, coping, ambivalence and locus of control respectively. That chapter ends with a conceptual framework. The consequent chapter goes into the methodology, after which the results are presented, which are discussed at the end.

2. Theoretical Background

2.1. Wearable Technology

There has been a rapid growth in interest regarding wearables (Adapa et al., 2018). Wearable devices are smart gadgets that are worn near one's body. Their main purpose is to track biometrics information to support one's wellbeing (Chopra & Singhal, 2021). Wearable technology can lead to beneficial health outcomes, through tracking of steps and heart rate for example which improves physical activity and health (Jakicic et al., 2016; Sjöklint et al., 2015; Wortley et al., 2017). These improvements are done through the tracking and goal-setting features of the technology which can encourage users to exercise (Leese et al., 2021). Healthcare also benefits from wearable technology, because it can monitor certain health metrics remotely, thus reducing the burden on healthcare (Marakhimov & Joo, 2017; Kazanskiy et al., 2024). Wearables can also act as an extension of human cognitive abilities, by sending reminders or tracking progress, which can feel empowering (Duus et al., 2018). Participants in a study from Sjöklint et al. (2015) perceived wearable self-tracking devices as a way to see into you own life, which could increase self-awareness and motivate behavioural change.

However, this is not always the case. Two systematic reviews found that mHealth use does not consistently result in beneficial health outcomes (Böhm et al., 2019; Jo et al., 2019), which is also supported by Sjöklint et al. (2015). More worryingly, wearable use can also have negative outcomes. The sense of accomplishment when reaching a specific goal was mentioned to have a smaller impact compared to the sensation when not having reached the goal. Additionally, Rieder et al. (2020) showed that the use of persuasive technologies (like wearables) can lead to technostress. Technostress is the stress that can arise from the use of technology (Ayyagari et al., 2011). Examples of causes of technostress are social comparison, not reaching of goals, complexity, having to adhere to the device's requests and over-dependence on the data (Rieder et al., 2020). Marakhimov & Joo (2017) also find some of these health concerns, but they also discuss privacy concerns regarding

wearables, such as lack of data use, sharing among third parties and the safety of this data. Furthermore, wearables can make mistakes in data collection which can lead to maladaptive health behaviour, such as undereating or overworking (Kaplan et al., 2023). Lastly, a study in a hospital found several other downsides to wearables, such as information overload and worry over own vital signs (Weenk et al., 2020). It is important to note that Weenk et al. (2020) also found positive outcomes of wearables. This proves that wearables can have conflicting outcomes, and that wearables can lead to stress.

2.2. Coping with Technology

Coping has an important role in responding to situations that cause psychological tension (Folkman & Moskowitz, 2004), such as ambivalence, which can be caused by the use of technology. Coping can maintain, manage or reduce this form of stress. Cui et al. (2009) has shown that coping with technology impacts intention to adopt the technology. Mick & Fournier (1998) divided all the coping strategies for the technological context into two main strategies: avoidance coping and confrontative coping. Avoidance coping is similar to emotion-focused coping. This is aimed at regulating the emotions that arise from stress (Folkman & Lazarus, 1980). This negatively impacts intention to adopt (Cui et al., 2009). Confrontative coping is similar to problem-focused coping. This aims to actively alter or manage the source of the stress (Folkman & Lazarus, 1980). This positively impacts intention to adopt (Cui et al., 2009). Folkman & Lazarus (1980) found that in most cases, individuals use a mix of both coping types, mostly dependent on the situation.

Confrontative coping involves actively addressing and engaging with the issues of technology, such as pretesting (trying out before purchase), buying heuristics (decision-making shortcuts), mastering (learning and dominating technology), partnering (developing bond with technology) and accommodation (adjust behaviour to fit limits of technology) (Mick & Fournier, 1998). These strategies can reduce (techno)stress, improve adaptation and enhance productivity. Suppose an individual has finished a run and his/her wearable has not registered it. A possible confrontative

coping strategy could be mastering. This means that an individual takes the time to understand and learns about the functionalities of the wearable device. This can be done through searching for information and trial-and-error for example (Mick & Fournier, 1998).

Avoidance coping involves minimizing the interactions with technology in order to minimize exposure to the stressor (Mick & Fournier, 1998). Examples of avoidance strategies are ignoring (not paying attention), refusing (decline adoption), delaying (postponing adoption), neglecting (rarely use), abandonment (stopping use) and distancing (creating mental or physical barriers to limit interaction). Avoidance coping minimizes negative effects of technostress without the need for problem-solving. Suppose that an individual is in the same scenario as in the previous example. Another coping strategy which could be used is neglect. In this case, an individual temporarily avoids using the wearable the next time he/she goes for a run. This individual avoids the stress and resulting emotions, rather than addressing it (Mick & Fournier, 1998).

It is uncertain whether stress arising from the paradox of wearables leads to use of particular coping strategies. Technostress has been shown to lead to avoidance coping (Rieder et al., 2020). But other research has shown that technostress also leads to use of both coping strategies (Pirkkalainen et al., 2019; Rohwer et al., 2022). These dual feelings in general have been shown to lead to use of both coping strategies (Qahri-Saremi & Turel, 2020; van Harreveld et al., 2009). However, not much is known about how users cope with the technostress from dual feelings in the context of mHealth and in the field of marketing. It remains unclear whether this duality can also lead to more use of confrontative coping strategies.

2.3. Responses to Ambivalence

In order to answer the knowledge gap of the preceding sub-section, it will be critical to turn to evidence of the positive outcomes of ambivalence.

Ambivalence is defined as “the simultaneous experience of positive and negative emotional or cognitive orientations towards a person, situation, object, task, goal, or idea, and the feelings of tension and conflict that result” (Rothman et al., 2017, p. 33). Besides broad orientations, Rothman et al. (2017) also show that ambivalence could be about tendencies, attitudes, emotions, affect, relations, and expressions.

Ambivalence is different from indifference, in that ambivalence entails involvement/conflict of positives and negatives, while indifference does not (Baek, 2010). Ambivalence is also different from uncertainty and ambiguity, because uncertainty is due to a lack of knowledge, while ambivalence is not (Baek, 2010). Inconsistency and ambivalence are different in terms of awareness (Baek, 2010). Inconsistency indicates ambivalence only when the respective person is aware of the inconsistency. Lastly, cognitive dissonance might be similar to ambivalence, but they too are not the same. Cognitive dissonance arises from inconsistency in one’s thoughts and it is exclusively cognitive, while these are not the case for ambivalence (Rothman et al., 2017).

Traditionally, ambivalence has been seen as something to avoid. However, Rothman et al. (2017) mention that this doesn’t have to be the case. Similarly, Rieder et al. (2020) mention that technostress arising from ambivalence can lead to both negative and positive outcomes. This claim is also supported in a similar study by Rohwer et al. (2022).

Ambivalence has several positive outcomes, which have been shown to lead to confrontative coping. Research has shown that ambivalence can nudge individuals to think more adaptively. (Cavazza & Butera, 2008; Pillaud et al., 2018; Rothman et al., 2017). Ambivalence can lead individuals to find patterns that would otherwise be unnoticed (Fong, 2006), which leads to better problem-solving (Fong, 2006; Schneider et al., 2021) and decision-making (Rees et al., 2013). Conflicting cognitions can increase motivation to act and work towards a certain goal (Harmon-Jones et al., 2015), which have been shown to lead to more use of confrontative coping (van Harreveld et al., 2009). Rothman et al. (2017) also argue that ambivalence can have certain benefits such as trust,

adaptation and creativity. Situations are perceived as being changeable. This has been shown to lead to more confrontative coping (Vitaliano et al., 1990). That ambivalence can lead to higher creativity has also been concluded in a study by Miron-Spektor et al. (2011). They argued that the paradoxical nature of ambivalence (both love and hate) can shift people to think complementary instead of competitive. Higher creativity can result in more confrontative coping too (Falat, 2000). This cognitive flexibility through complementary thinking has also been shown to lead to more confrontative coping (Cheng & Cheung, 2005; Johnson, 2016). Hence, ambivalence can have positive outcomes which can lead to confrontative coping. This leads to the following hypothesis:

H1a: Ambivalent experiences arising from wearable technology lead to greater use of confrontative coping strategies compared to non-ambivalent (negative and neutral) experiences.

The goal of this study is to try and prove that confrontative coping is more used in a situation with ambivalent experiences compared to one with negative experiences. Ambivalence is perceived as stressful or discomforting (van Harreveld et al., 2009). Naturally, negative experiences are perceived as stressful too. But it is the nature of ambivalence (and its characteristics to increase adaptability and flexibility) that are hypothesized to lead to more use of only confrontative coping strategies (which require this adaptability and flexibility) and not avoidance coping strategies (because these do not require this adaptability). Hence, the effect of ambivalence will be investigated on both types of coping. This leads to the following addition to the first hypothesis:

H1b: Ambivalent experiences arising from wearable technology do not lead to greater use of avoidance coping strategies compared to non-ambivalent (negative and neutral) experiences.

2.4. The Moderating Role of Locus of Control

It is important to explore under which conditions ambivalence could lead to more confrontative coping. Carver et al. (1989) have emphasized to consider individual differences when studying determinants of coping. One such possible difference could be locus of control.

Locus of control has to do with an individual's perception of power and control over the future (McCormack & Cotter, 2013). There is a distinction in people that have internal-or external locus of control as a personality trait. People with internal locus of control (internals) believe they can control what happens to them and that the power of change lies within them (McCormack & Cotter, 2013; Rotter, 1966). They believe that they can control their own actions. On the other hand, people with external locus of control (externals) perceive outside forces to control their destiny. This individual trait is not a "one or the other" but is more on an internal – external continuum (Parkes, 1984).

Locus of control has been mentioned by Tanck & Robbins (1979) to influence how people cope with stress. An even earlier study concluded that internals experience lower levels of stress and better performance due to the use of particular confrontative coping strategies (Anderson, 1977). This is supported by earlier studies which mention that individuals with higher levels of internal locus of control experience less stress due to more use of confrontative coping in the college and healthcare context respectively (Parkes, 1984; Tanck & Robbins, 1979). This is also confirmed by a study that mention locus of control is important when managing conflict (Dijkstra et al., 2011). Furthermore, experience of control has been shown to positively influence confrontative coping (Aspinwall & Taylor, 1992). Research of Whelan et al. (2025) suggests that people with higher internal locus of control have a tendency for proactive behaviour (or confrontative coping) when dealing with technology paradoxes. They investigated the privacy paradox (sharing personal data despite concerns) and concluded that externals share irrationally more data, despite their concerns. Lastly, an earlier study implied that externals engage in more avoidance coping, while internals engage in more confrontative coping (Keenan & McBain, 1979). These findings lead to the proposition of the following hypothesis:

H2: The effect of ambivalent experiences on the use of confrontative coping strategies is stronger for individuals with higher internal locus of control.

The resulting two hypothesis, led to the development of the following conceptual framework, which can be seen in Figure 1 below.

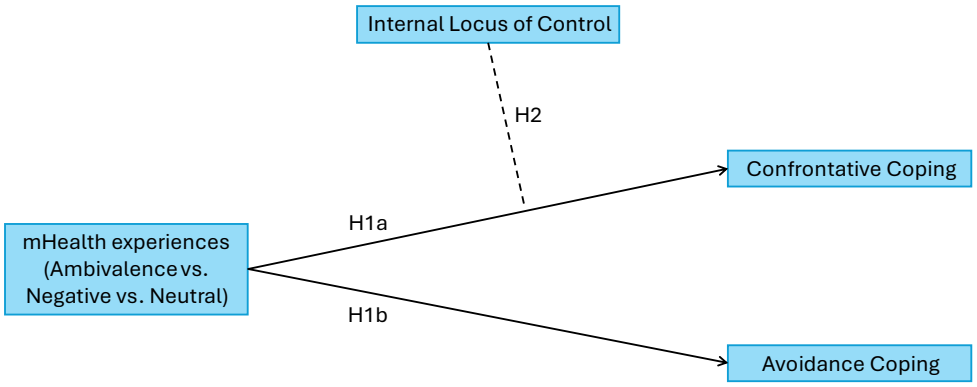

Figure 1. Conceptual Framework

3. Methodology

3.1. Participants & Design

To test the hypothesis that ambivalent experiences arising from wearable technology will increase use of confrontative coping strategies, and that this effect will be stronger among individuals with higher internal locus of control, a quantitative, (online) experimental approach was used. This was appropriate as it allows for systematic measurement of the constructs and their relationships that is generalizable (Hair et al., 2019).

Participants were recruited from the research team's personal network. To be included, participants had to have (had) experience with wearables, give consent and be 18+ years of age. Furthermore, the attention check had to be answered correctly in order for the answers of that participants to be included in the analyses.

This study employed a between-subjects design. Participants were randomly assigned to one of three conditions, an ambivalent, a negative or a neutral experience condition. The conditions got the same scenario, but differed in the experiences to be imagined by the participant. The full conditions can be seen in Appendix A and B for the English and Dutch respectively. The data was collected between 08-05-2025 and 20-05-2025.

Multiple regression analyses were used for confrontative coping and for avoidance coping. The minimal sample size was 150 participants. This was the preferred minimum sample size, as the participant per variable ratio is 50:1 for this type of statistical analysis (Hair et al., 2019). There are three independent variables in each regression. Ambivalence (dummy coded), negative experiences (dummy coded), neutral experiences (dummy coded) and locus of control. Ambivalence was used as a reference category. Thus, this was not entered in the regression.

The full study included questions about moderators from the whole research team. These other moderators will not be elaborated upon in this study.

3.2. Measurement

This study included seven concepts: wearable experience, confrontative coping, avoidance coping, ambivalence, internal locus of control. These were all measured on a 7-point Likert scale ranging from “strongly disagree” (1) to “strongly agree” (7). This was preferred over a 5-point Likert scale, because it allows for precise measurement of small differences, and measurement reliability and variability would be increased (Preston & Colman, 2000). Gender, age, duration of experience and wearable type were control variables.

The first variable is wearable experience, which was used to filter out participants who did not have experience with wearables. Participants were asked whether they have (had) experience with wearables.

Ambivalent feelings were measured as a manipulation check through a question containing to which degree they had conflicting feelings/thoughts. These items were adapted from Qahri-Saremi & Turel (2020).

Ambivalence was manipulated through different conditions with scenarios. The full scenarios can be seen in Appendix A and B and will be elaborated upon in the following sub-chapter.

Coping was measured as the dependent variable. For coping, an adaptation of validated scales was used (Carver, 1997; Duhachek, 2005). Lastly, some items were included that were inspired by unpublished qualitative research and adapted to this context.

Locus of control was an independent variable measured using the Spheres of Control scale (Paulhus, 1983), which includes three dimensions. Personal Efficacy refers to non-social contexts involving personal achievement (Parsons & Betz, 2001); Interpersonal Control concerns social or group settings; and Sociopolitical Control involves conflicts between personal beliefs and the political

environment. Each scale includes 10 items, half of which are reverse-coded (Lefcourt, 1991). Only the Personal Efficacy dimension was used, as wearables relate to personal control and achievement (Sjöklint et al., 2015; Wortley et al., 2017). Given the definition of internal locus of control (belief in personal control over the future) and its relevance to wearables, this dimension was most appropriate. The scale also suits this sports/activity study's context, as noted by Lefcourt (1991) and Parsons & Betz (2001), and is a well-suited refinement of Rotter's original scale (1966) (Lefcourt, 1991).

Lastly, the survey included questions about gender, age, the participants duration of wearable experience and the type of wearable that the participants has (had) experience with.

The author recognizes that these questions might be somewhat short for measuring such complex constructs. However, these scales are validated, and research has shown that questionnaire length reduces response rate and completion (Galesic & Bosnjak, 2009). Therefore, choosing a shorter scale was beneficial.

The survey was developed in English in Qualtrics. The survey was translated into Dutch for distribution and use. The research team checked the translation. The final questionnaire in English can be seen in Appendix A. The used Dutch translation can be seen in Appendix B.

3.3. Procedure

When participants decided to click on the link to participate in the study, they were first asked a screening question, which asked about whether participants have (had) experience with wearables technology. If participants did not, they would be redirected to the end of the questionnaire without any further information or questions.

If participants did have experience, they were provided with a general overview of the experiment with a question about informed consent. The full informed consent can also be seen in Appendix A and B, for the English and Dutch versions respectively. If participants provided consent,

they would be randomly assigned to one of three conditions, an ambivalent condition, a purely negative condition and a neutral condition. The ambivalent and negative condition were added, because these are about the main hypothesis about whether ambivalence leads to more confrontative coping. Coping is done in response to stress, which are induced by both ambivalent and negative experiences. The neutral condition was added as a control measure.

The experiment manipulated experiences in response to wearable feedback through differing conditions. Each of the three conditions used the same scenario. Coping is mainly situation dependent (Folkman & Lazarus, 1980). Therefore, it was of importance to keep the situations constant in order to investigate the effect of solely ambivalence on coping. The difference between these three conditions was what the participants would have to imagine experiencing in such a situation. The ambivalent condition induced paradoxical (both positive and negative) feelings. Participants in the purely negative condition only had to imagine the negative feelings, using the same wording as the ambivalence condition, resulting from the same scenario. The control condition experienced the same scenario, but they did not have to imagine experiencing anything specific. They were only shown descriptions of the wearable. The scenarios were validated through a pilot study before distribution of the actual survey. The pilot study and its Dutch translation can be seen in Appendix C and D respectively. The full scenario descriptions can be seen in Appendix A and B, for the English and Dutch versions respectively.

After the manipulation, the participants received questions about coping, after which questions about the moderators followed. The questions within and among the moderator(s) were asked in a random order. This was followed with a manipulation check for, in which ambivalent and negative feelings were measured. The purpose was to check whether the ambivalent or negative condition actually increased felt ambivalence or negative feelings versus the other conditions respectively. This was followed by a realism check, as participants were asked to put themselves in a scenario. Therefore, it was important to check whether this scenario was realistic, supporting

ecological validity. After this came an attention check, to check whether participants provided enough attention for reliable answers. If this question was not answered correctly, it was assumed that the participant did not answer the questions seriously and his/her answers were excluded. The following questions were demographic questions about demographics (age, gender, wearable use duration and which wearable they used).

The survey ended with a thank you, contact information of the research team and debrief about the manipulation.

3.4. Research Ethics

The experiment was conducted with transparency. Before providing informed consent, participants were introduced to the study's goal, though the manipulation was not disclosed to avoid biasing the results. The research team's contact details were shared for any comments or complaints.

The informed consent included several key points. Participants were told their responses would remain anonymous, with IP tracking disabled in Qualtrics. Participation was voluntary and involved no risk or harm. They could withdraw at any time without consequences. It was also stated that all data would be handled confidentially and stored on Radboud University's secure servers (RIS) in line with GDPR and university protocols. The data may be used and stored for a minimum of 10 years to ensure scientific integrity, and is findable, accessible, interoperable, and reusable (FAIR).

After the final question, participants were again shown the research team's contact information. They were debriefed on the study's full purpose and the manipulation. If they had concerns, they were informed they could request data removal by emailing the research team.

3.5. Pilot Study

To evaluate the effectiveness of the manipulation, a pilot study was conducted. The general procedure and scenarios mirrored the main study, excluding the coping and moderator items. Only the screening question, informed consent, randomized scenario, manipulation check, realism check, attention check, and demographics were included. The manipulation check initially had nine items; four were removed for the final version. One item was deleted due to poor conceptual fit with internal conflict and to substantially increase reliability. Three others were excluded due to unclear focus on control, support, or ambivalence.

Mean composite scores were calculated for the ambivalent and negative manipulation check items respectively, in order to compare between conditions. The pilot yielded 34 complete responses, which was insufficient. Still, a one-way ANOVA found no significant differences in ambivalence ($F(2, 34) = 0.012$, $p > 0.05$) or negative feelings ($F(2, 34) = 1.844$, $p > 0.05$) across conditions. Descriptive statistics showed similar ambivalence scores across all conditions (Ambivalence: $M = 4.333$; Negative: $M = 4.436$; Neutral: $M = 4.233$), suggesting the ambivalent condition did not elicit stronger ambivalent feelings. The same applied to negative feelings (Ambivalence: $M = 2.970$; Negative: $M = 3.871$; Neutral: $M = 3.067$). These results were not suitable for statistical inference.

After the survey, some participants informally reported that they interpreted the manipulation and attention check items without referencing the scenario, suggesting a lack of clarity or ambiguity in the scenarios. The research team revised the questionnaire accordingly, clarifying context, reducing steps to heighten realism, and rephrasing scenario language. Four manipulation check items were removed for clarity, and the attention check was changed from a scenario-action question to a question about the day the scenario occurred. These revisions were made through multiple iterations with the research team.

4. Results

4.1. Descriptives

The data analysis was done in IBM SPSS Statistics 29.0. To statistically test H1 and H2, multiple regression analyses were used. This is because H1 tests for the direct relationship between ambivalence and coping and H2 adds internal locus of control as a continuous moderator. This would also allow the testing of an interaction effect between ambivalence and internal locus of control. Data analysis was done using a 0.05 significance level.

To provide an overview of the dataset, descriptive statistics were computed. The descriptives can be seen in Table 1 below.

The study recruited 369 participants from the author's and colleagues' personal network. After deleting incomplete responses, respondents who did not have experience with wearables, respondents who did not give consent, participants who were younger than 18 years old and participants who did not successfully answer the attention check[1], 157 respondents were eligible for analysis. Table 1 illustrates that the ambivalence condition consisted of 44 participants, the negative condition of 61 and the neutral condition of 52 participants. Thus, the groups sizes were considered equal. Most people had more than 5 years of experience (30.6%). The sample consisted of 73 male participants, while 84 were female. Most participants were aged between 24 and 29 (38.9%).

The mean confrontative score was 3.979 (SD = 1.274), while avoidance coping had a mean of 2.951 (SD = 1.441) as can be seen in Table 1. The mean (internal) locus of control was 5.176 (SD =

[1] Two datasets were made. The reported one included people who definitely answered the attention check correctly (e.g. "Monday (evening)") and people who arguably answered the attention check correctly (e.g. "an evening on a working day" or a correct repetition of the scenario). The other dataset consisted of only people who definitely answered the attention check correctly. The choice was made for the larger dataset, due to increased sample size and power. Additional multiple regressions were run with a changed locus of control scale and with negative and neutral experience each as the reference category. Generally, the results did not differ between the analyses. If the results did differ, this would be elaborated upon in a footnote.

0.932). The mean for ambivalent feelings was 3.52 (SD = 1.55) and the mean negative feelings was 3.38 (SD = 1.75). Furthermore, Table 1 shows that the realism check had a mean of 5.47 (SD = 1.238).

Table 1.
Descriptives

Logistic parameter	*N (%)*	*M*	*SD*	*Minimum*	*Maximum*	*Skewness*	*Kurtosis*
Confrontative Coping	157	3.98	1.27	1.00	7.00	.01	-.32
Avoidance Coping	157	2.95	1.44	1.00	7.00	1.12	.74
Locus of Control	157	5.18	.93	2.60	6.50	-1.17	.70
Ambivalence Manipulation Check	157	3.52	1.55	1.00	7.00	.36	-.57
Negative Manipulation Check	157	3.38	1.75	1.00	7.00	.61	-.62
Realism Check	157	5.47	1.24	2.00	7.00	-1.15	.93
Condition							
Neutral	52 (33.1%)						
Negative	61 (38.9%)						
Ambivalence	44 (28.0%)						
Experience							
0-1 year	10 (6.4%)						
1-2 years	22 (14.0%)						
2-3 years	30 (19.1%)						
3-4 years	29 (18.5%)						
4-5 years	18 (11.5%)						
5+ years	48 (30.6%)						
Gender							
Male	73 (46.5%)						
Female	84 (53.5%)						
Age							
18-23	41 (26.1%)						
24-29	61 (38.9%)						
30-35	12 (7.6%)						
36-41	11 (7.0%)						
42-47	4 (2.5%)						
48-53	9 (5.7%)						
54-59	15 (9.6%)						
60-65	2 (1.3%)						
66-71	2 (1.3%)						

4.2. Factor Analysis

An exploratory factor analysis was done, as there was no existing questionnaire for this context and in Dutch. The questionnaire items were adapted from existing research. A VARIMAX rotation was used as part of the analysis. Factors were retained based on eigenvalues significantly greater than one. This was done on fourteen items on 157 responses. After the factor analysis, coping items 2 and 9 were iteratively removed. Coping item 2 ("I *would try to relativize the message, to make it seem more positive*") was removed first, because it had the lowest communality (0.313) and because it was a significant cross-loader. Subsequently coping item 9 ("*I would try to keep my feelings from controlling what I do at that moment*") was removed, because of a low communality (0.282) and because it only loaded negatively on the wrong factor. After the third iteration, the factor analysis resulted in three factors. The third factor only explained 8.698% more variance and had an eigenvalue of 1.044, it was determined that only two factors would be retained, especially because the third factor would not be theoretically relevant for this research.[2]

These two factors together explained 59.117% of the total variance in coping. The final coping item list resulted in a suitable dataset as the Kaiser-Meyer-Olkin measure of sampling adequacy (KMO) was 0.824. Bartlett's test of sphericity was significant ($\chi^2(66) = 951.293$, $p < 0.001$). Items 1, 3, 4, 5, 6 and 7 were deemed to be avoidance coping items. Together these items had a good internal consistency, with Cronbach's alpha = 0.880. Items 8, 10, 11, 12, 13 and 14 were deemed to be confrontative coping items. Together these items also had a good internal consistency, with Cronbach's alpha = 0.788. The final factor loadings can be seen in Table 2 below.

[2] The factor analysis on coping was also done on the smaller dataset with the participant who definitely answered the attention check correctly. Removing the same items in the same order resulted in only two factors. Therefore, the choice for including two factors in the analysis was warranted.

Table 2.
Factor Loadings for Two Factor Solution for Coping

Item	Factor 1 (Avoidance Coping)	Factor 2 (Confrontative Coping)
I would get upset and let my emotions out	.82	
I would completely ignore my app at that time	.63	
I would distract myself with something else to stop thinking about the message from my app	.82	
I would try to find an excuse for why I have not yet reached my step goal	.72	
I would think that it would be better to stop using the app for some time	.86	
I would think that it would be better to abandon the use of this app completely	.85	
I would concentrate my efforts on doing something about the situation	-.50	.60
I would try to come up with a strategy about what to do	-.32	.72
I would adjust the step goal to make it more realistic for my daily routine		.65
I would adjust the settings of the notification messages so that I receive them at times that fit my routine better		.69
I would check the data to find out what other times I could take extra steps	-.22	.72
I would make a plan to compensate for these extra steps in the following day		.69

Note. Loadings less than 0.20 are not shown. Extraction method: Principal Component Analysis. Rotation method: VARIMAX.

A factor analysis was also conducted for locus of control, as this scale had not yet been validated in this context or in Dutch. The initial reliability was good (Cronbach's $\alpha = 0.857$), with a KMO of 0.872 and a significant Bartlett's test ($\chi^2(45) = 765.997$, $p < 0.001$). Interestingly, two factors emerged after the first iteration. However, all items had sufficient communalities (generally > 0.50), and no significant cross-loaders were found (loading ratio > 1.50), based on Hair et al. (2019). Therefore, no items were removed. The scale has been validated in English (Parsons & Betz, 2001), and since modifying it was not central to this research, all items were retained. Even after deleting items 3 and 8 (lowest communality and closest cross-loaders), two factors remained. Items 7 ("*Competition discourages excellence*") and 9 ("*On any sort of exam or competition, I like to know how*

well I do relative to everyone else") appear to reflect competition or social comparison, but still align with the construct of locus of control as defined here, focusing on personal achievement. Locus of control involves both individual beliefs about control in general and within competitive settings. These items express control beliefs in achievement contexts, which are personal despite their social framing. Excluding them could overly narrow the definition of internal locus of control and reduce content validity. The final item list was not altered for locus of control and can be seen in Appendix E (chapter 8.5.4.).[3]

4.3. Manipulation Check

To verify the effectiveness of the manipulation, a one-way ANOVA was conducted. The assumptions of continuous variables, normality, independent observations and equal variances (Emerson, 2022) were tested, met with or dealt with accordingly. These will be elaborated upon below.

The manipulation check items were measured on a 7-point Likert scale. The three ambivalence manipulation check items were averaged, like the two items for the negative manipulation check. As the Likert scores are averaged, the resulting two values can be considered continuous and normally distributed (Norman, 2010). Furthermore, Norman (2010) mention than statistical analysis using Likert scales can be robust even when normality is violated. The Kolmogorov-Smirnov test show that the manipulation check items were non-normally distributed (see Appendix E). The group sizes were considered equal. The observations were made independent of each other, as the survey was distributed online. Levene's test showed equal variances for the ambivalence manipulation check ($F(2, 154) = 2.030$, $p = 0.135$), so a standard ANOVA with Tukey's HSD was used. For the negative manipulation check, variances differed significantly ($F(2, 154) = 19.765$, $p < 0.001$), so a Welch test with Games-Howell post hoc was applied.

[3] The results from the multiple regression analysis on coping did not change, regardless of whether a changed locus of control scale (according to a factor analysis) was used.

Table 3 shows that the ANOVA for ambivalence revealed no significant differences in conflicting feelings between conditions, F(2, 154) = 1.676, p = 0.191. Tukey's HSD post hoc test also found no differences (all p > 0.20). This suggests the ambivalent condition did not evoke stronger conflicting feelings compared to the two non-ambivalent conditions, indicating the manipulation may not have fully succeeded. Results should therefore be interpreted with caution.

Table 3.
One-way ANOVA for Ambivalence & Welch's ANOVA for Negative Feelings

Measure	Ambivalence		Negative		Neutral		*F-statistic*	η^2
	M	*SD*	*M*	*SD*	*M*	*SD*		
Ambivalence Manipulation Check	3.72	1.86	3.64	1.39	3.20	1.43	$1.68^{n.s.}$	.02
Negative Manipulation Check	3.00	1.38	4.22	2.06	2.72	1.15	1.89**	.15

Note. n.s. not significant, ** $p < 0.001$. F(2,156) for the one-way ANOVA, and F(2, 98.59) for the Welch's ANOVA

A Welch's ANOVA for the negative manipulation check showed a significant difference in negative feelings between conditions, Welch's F(2, 98.59) = 11.89, p < .001. A Games-Howell post hoc test revealed significant differences between all conditions. The negative condition scored significantly higher on negative experiences than both the ambivalent condition (mean difference = 1.221, p = 0.001, 95% CI [0.423, 2.020]) and the neutral condition (mean difference = 1.500, p < 0.001, 95% CI [0.767, 2.234]). No significant difference was found in negative feelings between the ambivalent and neutral conditions (p = 0.538). This indicates that the negative scenario manipulation was successful.

4.4. Multiple Regression Analysis

In order to test H1 and H2 multiple regression analyses (MRA's) were conducted. Ambivalence was manipulated through three conditions. Each condition was dummy coded for the analysis. Mean composite scores for confrontative coping, avoidance coping, internal locus of control and the manipulation check items were created. Additionally, locus of control was standardised, as this would be beneficial for studying interaction effects between a continuous and categorical

variable (Aiken & West, 1991). The mean scores were created through exploratory factor analyses, because the questionnaire included a combination of several scales that were not used in the mHealth context and in Dutch before.

4.4.1 Assumptions of MRA

There were no influential outliers, as the dataset contained no Cook's distance values above 0.50.

Linearity and independence of the error terms were acceptable for avoidance coping as no linear or clear pattern could be seen in the scatterplot of the standardized residuals in Appendix E (chapter 8.5.6.). For confrontative coping, no linear pattern can be seen in the scatterplot. But it could be argued that there is a pattern in the scatterplot for confrontative coping. This was not deemed to be a problem, as it is not a clear pattern, and it was of no problem for avoidance coping. Furthermore, the Durbin-Watson was always between 1.5 and 2.5 for both confrontative and avoidance coping as can be seen in the Model Summary in chapter 8.5.6. Therefore, no autocorrelation was present (Field, 2009).

The errors were normally distributed for avoidance coping as the residuals closely followed the line in the P-P Plot and Kolmogorov-Smirnov test was non-significant, $F(157) = 0.070$, $p = 0.061$ (see chapter 8.5.6.). However, the Shapiro-Wilk test was slightly significant, $F(157) = 0.983$, $p = 0.045$.[4] Normality was not deemed a problem, as these tests for confrontative coping were acceptable. The normality test for confrontative coping were fully successful, as the standardized residuals closely followed the line in the P-P Plot and both the Kolmogorov-Smirnov test ($F(157) = 0.051$, $p = 0.200$) and the Shapiro-Wilk test ($F(157) = 0.991$, $p = 0.376$) were non-significant.

To assess the assumption of multicollinearity, the Variance Inflation Factor (VIF) and tolerance values were examined for the main predictors and interaction terms. In the final model for

[4] The Shapiro-Wilk test was not significant for avoidance coping in the smaller dataset. Therefore, the assumption of normality was met.

both confrontative- and avoidance coping, all VIF values were below 5 and the tolerance values were always above 0.2 (Hair et al., 2019). Except for the standardized score for locus of control. The VIF of locus of control was 5.449 in the MRA for both types of coping and the tolerance was 0.184 for locus of control in the MRA for both types of coping. As these are only slightly outside the cut-off values, the rest of the VIF and tolerance values are acceptable and the moderator is central to this research, multiple regression was still deemed appropriate with locus of control as a moderator.

Thus, the assumptions were met, and regressions could be conducted.

4.4.2. Hypothesis Testing

Multiple regression analyses (MRA) were conducted as can be seen in the tables below. It should be noted that all results regarding confrontative coping should be interpreted with caution as the manipulation of ambivalence was not successful. The reference group was ambivalence.[5] The MRA was done for confrontative and avoidance coping each. This was done in order to test the effect of ambivalence on (1) confrontative coping and (2) avoidance coping and whether they are moderated by locus of control. The output of all MRA's can be seen in Appendix E (chapter 8.5.7.).

The model summary and ANOVA for confrontative coping can be seen in Table 4 below. Model 1 only included the control variables of age, gender and wearable experience ($F(3, 153) = 4.338$, $p = 0.006$, adjusted $R^2 = 0.060$, $p = 0.006$). The adjusted R^2 is preferred as this adjusts for the sample size and number of predictors (Hair et al., 2019). Model 2 added the main effects of ambivalence and locus of control ($F(6, 150) = 5.395$, $p < 0.001$, adjusted $R^2 = 0.145$, $p < 0.001$). Model 3 added the interaction terms of ambivalence and locus of control ($F(8, 148) = 4.787$, $p < 0.001$, adjusted $R^2 = 0.163$, $p = 0.076$). However, this change in adjusted R^2 was non-significant. Thus, the interaction terms did not add significant value to explaining the variance in confrontative coping and

[5] Both the negative and neutral experiences were used as the reference category in different MRA's. However, the results did not differ compared to ambivalence as the reference category.

Model 2 was inspected. The regression on Model 2 of confrontative coping can be seen in Table 5 below.

Table 4.
Model Summary and ANOVA for Confrontative Coping

Model	*R*	R^2	*Adjusted* R^2	ΔR^2	ΔF	*df1*	*df2*	Δp	*Model F*	*df*	*p*
1	.28[a]	.08	.06	.08	4.34	3	153	.006*	4.34	3, 153	.006*
2	.42[b]	.18	.15	.10	6.02	3	150	<.001**	5.40	6, 150	<.001**
3	.45[c]	.21	.16	.03	2.62	2	148	.076	4.79	8, 148	<.001**

a. Predictors: (Constant), wearable experience, gender, age
b. Predictors: (Constant), wearable experience, gender, age, negative feelings, neutral feelings, locus of control
c. Predictors: (Constant), wearable experience, gender, age, negative feelings, neutral feelings, locus of control, interaction negative, interaction neutral

Note. Dependent variable: Confrontative Coping. ΔR^2 and ΔF refer to the change from the previous step; Model F refers to the full model at each step. * $p < 0.05$ ** $p < 0.001$.

Table 5 for confrontative coping shows that for Model 2, only gender ($\beta = 0.424$, $p = 0.030$) and locus of control ($\beta = 0.385$, $p < 0.001$) significantly explained the variance in confrontative coping. Females reported more use of confrontative coping strategies.[6] Locus of control was a significant predictor ($\beta = 0.432$, $p < 0.001$). Participants with higher internal locus of control reported more use of confrontative coping strategies ($B = 0.385$, $SE = 0.105$, $\beta = .302$, $t(148) = 3.648$, $p = < 0.001$). Age, experience with mHealth, ambivalence and the interaction with locus of control did not lead to more or less use of confrontative coping compared to ambivalent experiences (all $p > 0.05$).

[6] Gender was no longer a significant predictor in the smaller dataset (and neither in the smaller dataset with a changed locus of control scale).

Table 5.
Results of Multiple Regression Analysis for Confrontative Coping with Simultaneous Entry

				95% CI			
Variable	*B*	*t*	*SE*	*LL*	*UL*	β	*P*
Constant	4.33	12.30	.35	3.63	5.02	-	< .001**
Gender	.42	2.20	.19	.04	.81	.17	.03
Age	-.05	-1.01	.05	-.15	.05	-.08	.32
Wearable Experience	-.05	-.79	.06	-.16	.07	-.06	.43
Locus of Control	.39	3.65	.11	.18	.59	.30	< .001**
Negative feelings	-.32	-1.34	.24	-.80	.15	-.12	.18
Neutral feelings	-.36	-1.46	.24	-.84	.13	-.13	.15

Note. Model 2 without the interaction effects. Reference category: ambivalent feelings. ** $p < .001$. $R^2 = .15$. $F(6, 156) = 5.40$, $p < .001$

The model to test H1b: to test the effect of ambivalent experiences on avoidance coping, moderated by internal locus of control, followed a similar process. The Model Summary and ANOVA table in Table 6 show that Model 1 consisted of only the control variables of age, gender, and wearable experience ($F(3, 153) = 5.163$, $p = 0.002$, adjusted $R^2 = 0.074$, $p = 0.002$). Model 2 consisted of the control variables and the main effects of ambivalence and locus of control ($F(6, 150) = 27.422$, $p < 0.001$, adjusted $R^2 = 0.504$, $p < 0.001$). Model 3 added the interaction terms and had the best significant model fit ($F(8, 148) = 22.827$, $p < 0.001$, adjusted $R^2 = 0.528$, $p = 0.009$).[7]

[7] In the smaller dataset and with the changed locus of control scale, model 3 did not significantly increase R^2. Therefore, there model 2 was analysed.

Table 6.
Model Summary and ANOVA for Avoidance Coping

Model	*R*	R^2	*Adjusted* R^2	ΔR^2	ΔF	*df1*	*df2*	Δp	*Model F*	*df*	*p*
1	.30[a]	.09	.07	.09	5.16	3	153	.002*	5.16	3, 153	.002*
2	.72[b]	.52	.50	.43	45.21	3	150	<.001**	27.42	6, 150	<.001**
3	.74[c]	.55	.53	.03	4.84	2	148	.009*	22.83	8, 148	<.001**

a. Predictors: (Constant), wearable experience, gender, age
b. Predictors: (Constant), wearable experience, gender, age, negative feelings, neutral feelings, locus of control
c. Predictors: (Constant), wearable experience, gender, age, negative feelings, neutral feelings, locus of control, interaction negative, interaction neutral

Note. Dependent variable: Avoidance Coping. ΔR^2 and ΔF refer to the change from the previous step; Model F refers to the full model at each step. * $p < 0.05$ ** $p < 0.001$.

Table 7 shows that for Model 3 only locus of control ($\beta = -0.816$, $p < 0.001$) and negative feelings ($\beta = 0.657$, $p = 0.002$) are significant predictors of avoidance coping compared to ambivalence.[8] Participants who were exposed to a negative experience condition reported more use of avoidance coping strategies compared to the participants who were exposed to experiencing ambivalence (B = 0.657, SE = 0.204, $\beta = .223$, $t(148) = 3.223$, $p = .002$) or neutral feelings (B = 0.602, SE = 0.196, $\beta = .204$, $t(148) = 3.078$, $p = .002$). Furthermore, participants with higher internal locus of control reported less use of avoidance coping strategies (B = –0.816, SE = 0.185, $\beta = –.566$, $t(148) = –4.41$, $p < .001$). Age, gender, experience with mHealth, neutral experiences, and the interaction terms did not lead to more or less use of avoidance coping strategies compared to ambivalent experiences (all $p > 0.05$).

[8] When using the adjusted scale for locus of control and in the smaller dataset, gender was also a significant predictor of avoidance coping (B = 0.348, SE = 0.175, $\beta = 0.116$, $p = 0.049$). Females reported to use more avoidance coping.

Table 7.

Results of Multiple Regression Analysis for Avoidance Coping with Simultaneous Entry

				95% CI			
Variable	*B*	*t*	*SE*	*LL*	*UL*	β	*P*
Constant	2.41	8.15	.30	1.83	3.00	-	< .001**
Gender	.23	1.39	.16	-.10	.55	.08	.17
Age	.03	.67	.04	-.06	.11	.04	.51
Wearable Experience	-.00	-.01	.05	-.10	.10	-.001	.99
Locus of Control	-.82	-4.41	.19	-1.18	-.45	-.57	< .001**
Negative feelings	.66	3.23	.20	.26	1.06	.22	.002*
Neutral feelings	.06	.26	.21	-.36	.47	.02	.80
Interaction Negative	-.27	-1.23	.22	-.69	.16	-.14	.22
Interaction Neutral	.42	1.57	.27	-.11	.96	.12	.12

Note. Model 3 with the interaction effects. Reference category: ambivalent feelings. * $p < .05$ ** $p < .001$. $R^2 = .53$. $F(8, 156) = 22.83$, $p < .001$

5. Discussion

5.1. Main Findings & Interpretation

At the start of this study, it was unclear if and how ambivalence arising from wearables could result to more use of a particular coping strategy. It was expected that ambivalent experiences would lead to more use of confrontative coping strategies due to its characteristics for cognitive adaptability and flexibility. Internal locus of control has been hypothesized to positively moderate this relationship. Internals have been shown to use more confrontative coping strategies. To study this, multiple MRA's were conducted, the results of which will be elaborated upon below.

Regarding H1a. Ambivalent experiences arising from wearable technology leads to greater use of confrontative coping strategies compared to non-ambivalent (negative and neutral) experiences. This is not supported, as multiple MRA's showed no statistically significant differences in the use of confrontative coping strategies between participants who experienced ambivalence, negativity, and neutral feelings. Non-ambivalent experiences (both negative and neutral) did not significantly explain the variance in confrontative coping compared to ambivalent experiences. Additionally, participants who experienced ambivalence and neutral feelings did not report significantly more or less use of confrontative coping strategies compared to those with a negative experience.[9] The results suggest that those who experience ambivalence with regards to wearables do not use more (or less) confrontative coping strategies compared to individuals who experience negative or neutral feelings. Gender seemed to have a significant effect on confrontative coping. The regression on confrontative coping suggested that females tend to use more confrontative coping strategies compared to males. These results should be interpreted with caution as the manipulation did not succeed in eliciting more ambivalent feelings in the ambivalent condition.

[9] This is the result of running the multiple regression again, but with negative feelings as the reference category instead of ambivalence.

Regarding H1b. Ambivalent experiences arising from wearable technology do not lead to greater use of avoidance coping strategies compared to non-ambivalent (negative and neutral) experiences. This is supported. The multiple regression on avoidance coping shows that those who experience negative feelings report more use of avoidance coping strategies compared to those who experience ambivalence (and neutral feelings[10]). Contrary to the regression on confrontative coping, gender did not seem to have a significant effect on avoidance coping. These findings are more reliable compared to the findings from H1a, as the manipulation did succeed in eliciting significantly more negative feelings for the negative experience condition, compared to the other two conditions.

Regarding H2. The effect of ambivalent experiences on the use of confrontative coping strategies is higher for individuals with higher internal locus of control. This is not supported as adding the interaction terms did not lead to a significant increase in explained variance in confrontative coping. Furthermore, for avoidance coping the interaction terms were non-significant. Thus, internal locus of control does not moderate the relation between ambivalence and coping. However, internal locus of did seem to have a robust main effect on the use of both coping strategies. Individuals with higher internal locus of control reported to use more confrontative coping strategies. Furthermore, internals reported even less use of avoidance coping strategies.

5.2. Implications

5.2.1. Theoretical Implications

The present study cannot provide the evidence to support the suggestion that the characteristics of ambivalence (cognitive adaptability and flexibility) lead to more use of confrontative coping strategies. The present study does quantitatively support the qualitative findings from Rieder et al. (2020) and Sjöklint et al. (2015). They argue that persuasive technologies and self-trackers respectively can have adverse consequences due to the way that individuals cope with them. This is

[10] These are the result of doing the multiple regression again, but with each condition as the reference category

supported by the findings from this study, as the results prove that avoidance coping strategies are used in response to feedback from wearables. However, it has also been proven that the use of wearables lead to confrontative coping strategies. This suggests that both coping strategies are used in response to feedback from wearables. This supports Folkman & Lazarus (1980) who state that individuals use both coping types depending on the situation. In this case, the situation refers to feedback from wearables. Additionally, and more specifically, this research supports the findings from Qahri-Saremi & Turel (2020) that found that ambivalence arising from information systems use, result in use of different coping tactics. Use of wearables (as an information system) has also been proven to lead to multiple coping strategies through feedback mechanisms that elicit specific feelings.

As opposed to research from Felsten (1988), Matud (2004) and Ptacek et al. (1992), females tended to use more confrontative coping strategies compared to men, instead of the other way around. The reason for this difference in results could be due to the increased impact of women's locus of control compared to men's. Tanck & Robbins (1977) suggested that the effect of locus of control on coping might be stronger for women. They suggested that internal women use more confrontative coping strategies compared to evenly external men. A one-sample t-test for locus of control showed that the respondents reported themselves to be more internal ($t(156) = 15.804$, $p < 0.001$) compared to the neutral option of 4. If the sample consisted of individuals who perceived themselves to be more internal, it could result in women using more confrontative coping strategies, because the effect of locus of control would be stronger for them.

Similar to Anderson (1977), this study found that internals reported greater use of confrontative coping strategies. In line with Aspinwall & Taylor (1992), internals also reported less use of avoidance strategies than those with lower internal locus of control. These findings support Parkes' (1984) suggestion that internals cope more adaptively with stress than externals. Tanck & Robbins (1977) suggested that internals actively control stress, while externals rely more on external sources to manage it, an implication confirmed by this study. Individuals with higher internal locus of control

were more likely to actively engage with wearable feedback through confrontative coping. Similarly, this study suggests that internals actively manage stress triggered by wearable notifications, much like how they protect their privacy when facing privacy-related stress, as shown in Whelan et al. (2025).

5.2.2. Practical Implications

The results from this study are beneficial for developers of wearables and healthcare providers. Retained use of a wearable has been shown to reduce the burden on healthcare (Kazanskiy et al., 2024; Marakhimov & Joo, 2017). Thus, adapting wearables based on these results, will increase continued use, which is beneficial for developers (to maximize sales) and for healthcare providers (to reduce their burden).

It is beneficial for the developer to ask the customer a few screening questions before use of the wearable, to decipher the user's locus of control. The developer could make sure that the notifications on the app would align with the user's locus of control. Externals could receive messages that nudge them towards more confrontative coping strategies (e.g., "Your watch didn't track sleep? Here's how to recalibrate"). This is because externals are not inclined to actively solve the source of the stress by themselves. Internals are inclined do to that and thus don't necessarily need these messages. Feedback for externals could be based on social influence and conformity for externals. These have been shown to influence externals in making decisions (Avtgis, 1998). Examples of feedback for these externals could focus on healthcare giver notifications (instead of the notifications from purely the wearable) and group challenges, as externals are less inclined to actively cope with personalized feedback from only the wearable.

Developers of wearables and healthcare providers could also benefit from these results in terms of adjusting the nature of the feedback from wearables. Negative experiences regarding the feedback from wearables have been shown to lead to more use of avoidance coping strategies. These strategies are detrimental to retained use. Therefore, it is of importance to positively frame the

feedback from wearables in order to minimize the possibility of negative experiences arising from this feedback.

Additionally, women have been shown to use more confrontative coping strategies with regards to feedback from wearables. Therefore, it is of importance for developers of wearables to screen the user based on their gender. Male users would benefit more from nudges towards confrontative coping strategies.

5.3. Limitations and Future Research

Firstly, it is important to note that the manipulation of ambivalence was not successful. The group in the ambivalence condition did not experience more conflicting feelings compared to the non-ambivalence groups (negative and neutral experience). This is interesting, as the negative group did score significantly higher on experiencing negative feelings compared to the ambivalence (and control) group, even though the same words were used in the experience section of the manipulation. This suggests that the scenarios were not ineffective in eliciting the intended feelings necessarily. Furthermore, the scenarios were confirmed to be realistic as can be seen in a one-tailed one sample t-test. This showed that the participants perceived the scenario to be statistically more realistic compared to the neutral option of 4 ($t(156) = 14.891$, $p < 0.001$). Future studies could develop ways to effectively manipulate ambivalence or similar concepts. Like Qahri-Saremi & Turel (2020), this study calls to investigate the sources and triggers of ambivalence. This would have helped in effectively manipulating ambivalence in this study. To the author's knowledge, there is not a validated way to manipulate ambivalence in this context yet.

There are three possibilities why the manipulation could have failed. One possibility is that the ambivalent scenario remained ineffective in eliciting ambivalent feelings, despite prior validation in a pilot study and iterative refinement by the research team. In hindsight, the scenarios could have benefitted from a larger emphasis on conflicting feelings. Future research into this subject could include wearable users in the making of the scenarios, in order to increase the degree of imagination

into the scenario. A second explanation is that ambivalent and negative experiences may have induced similar levels of stress, as both involve conflicting or unpleasant feelings respectively in response to the same wearable message. This aligns with Schroeder et al. (2021), who found that all types of feedback from wearables can elicit stress, and with Ayyagiri et al. (2011), who note that intrusive message (like push notifications) are particularly stress-inducing. Since the manipulation used such a message, it may have triggered stress regardless of the intended emotional valence, potentially undermining the manipulation. However, this remains speculation, as stress was not directly measured in this study. Future research could delve further into the subject of whether stress resulting from ambivalence is equal to stress resulting from negative experiences. The third explanation is that the manipulation check items were not appropriate and that the participants did not understand the manipulation check items. This would also be interesting, as the questions were adapted from Qahri-Saremi & Turel (2020) and were also improved by the research team.

Furthermore, the experiment was based on an online hypothetical scenario, instead of a real-life observation and manipulation. These can lead to recall bias, hypothetical bias and social desirability bias. Social desirability bias is also indicated by a paired samples t-test. This showed that the mean for confrontative coping was significantly higher than the mean for avoidance coping ($t(156) = 5.76$, $p < .001$, one-tailed, Cohen's $d = 0.46$, see Appendix E, chapter 8.5.10.). This suggest that the sample reported more use of confrontative coping strategies. This could indicate social desirability bias, as confrontative coping strategies may be seen as more socially desirable. These biases can also result from the self-reports used as measures of the variables in this study.

Another limitation concerns the sample, which was drawn from the research team's personal network—limiting generalizability. Attitudes toward wearables vary across cultures (Koo, 2017; Yang Meier et al., 2020), and a Dutch-only sample may not reflect global responses, particularly since the Dutch tend to be more individualistic. Reported use of confrontative coping was significantly higher than avoidance coping ($t(156) = 5.76$, $p < .001$, one-tailed), which may differ in more

collectivist cultures. Individuals in collectivist societies tend to use more avoidance coping (Oláh, 1995), while those in individualistic cultures rely more on confrontative strategies (Hirano & Ishii, 2024). This study partly confirms that, as these Dutch participants reported significantly more confrontative coping. Therefore, the findings may not extend to collectivist cultures. Future research could explore whether similar results are found in those collectivist cultures.

Furthermore, only one moderating factor, locus of control, was taken into account. But reality is subject to many more moderating factors. It has been shown that multiple other factors influence coping, such as self-esteem (Servidio et al., 2018), self-efficacy and social support satisfaction (Trouillet et al., 2009). Self-esteem and self-efficacy have been shown to positively correlate with locus of control (Abdallah, 1989). Therefore, future research could investigate how different correlated individual personality traits affect coping with wearable feedback.

Lastly, it is uncertain if gender influenced an individual's tendency to use more confrontative coping. Females reported more use of confrontative coping strategies. However, research states that males tend to use more confrontative coping strategies (Felsten, 1998; Matud, 2004; Ptacek et al., 1992). Therefore, future research could investigate the effects of gender on coping with technology.

6. Conclusion

The present study examined how felt ambivalence in wearables influenced coping and whether locus of control moderates this relationship. The results show that it is unclear whether ambivalence from wearables can lead to more use of a confrontative coping strategy. This inconclusiveness is due to failure of the ambivalence manipulation check. This failed to elicit significant ambivalent feelings in participants. However, negative experiences with regards to wearable feedback have been proven to increase use of avoidance coping strategies. When studying coping, it is of importance to consider an individual's locus of control. Internals use more confrontative coping strategies and even less avoidance coping strategies. Developers and healthcare providers might benefit from this result, in order to change the feedback mechanisms of the wearable according to a user's locus of control. Future research should focus on how to effectively manipulate ambivalence. By revealing how locus of control interacts with coping, the next generation of wearables can be guided towards user-centric and thus sustainable engagement.

7. References

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8. Appendix

8.1. Appendix A English Survey

Welcome to our study!

Participating in this study requires that you have used in the recent past or you are currently using a mobile health app for tracking your physical activity (e.g., steps, running, etc.) Such an app can be a wristband/smartwatch designed for activity tracking (e.g., Fitbit or Apple Watch). It can also be an app on your smartphone (e.g. Samsung Health or Apple Health), which then tracks your activity.

By "using", we do not mean that you need to use the app daily or intensively. Even if you only check the app occasionally, for instance, to see how many steps you have taken, that also counts.

- Have you used in the recent part or are you currently using any type of the above mobile health apps for activity tracking?

Yes; No

Informed Consent

Before you decide whether you want to proceed with this study, please read the information below about what this study entails:

Aim: This study aims to explore how people experience feedback from their health apps.

Tasks: You will be asked to imagine that you receive feedback from your health app and to answer questions about the situation.

Voluntary participation: You can terminate your participation, at any point in time for any reason. If you have completed the study, you can request your data to be deleted by sending an email to olga.tsoumani@ru.nl

Risks/discomfort: No major risk or discomfort is associated with participating in this study.

Personal information: We ask for demographic information and your experience in health app use. However, we will not use this information (alone or in combination with other data) to identify individual participants. We do not collect any other information that could be privacy sensitive.

Data storage: We treat your data with confidentiality. They are stored on Radboud University's secure servers, according to the university's protocol, and in line with the General Data Protection Regulation (GDPR). They may be used for other studies and will be stored for a minimum of 10 years to ensure scientific integrity.

Questions/complaints: For questions about the study, please contact any member of our research team (see details below). You are also welcome to contact the supervisor if you prefer.

Our research team: Students in MSc program Marketing:

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- I have read the above and I agree to participate in the study as described above.

Yes; No

Scenario's

1. Ambivalence

Imagine the following scenario as vividly as possible:

You are trying to have a healthier lifestyle. In order to achieve this, you have started using an app that tracks your physical activity, such as your daily steps. With the help of this app, you have set a goal for yourself to walk 10.000 steps every day.

It's now Monday evening. You have just finished dinner and are heading for the sofa to relax when you hear your app buzzing. It has been tracking your movements all day and it now tells you that you still need another 1000 steps to reach your daily goal.

At a moment when you had almost forgotten about your daily step goal, this message comes both as an incentive and an order from the app to take those extra steps. Just when you were about to sit down and relax, this message encourages you to take those extra steps. It makes you think that it is up to you to change your behaviour. At the same time, though, it dictates you to take those additional steps. You can't help but think that you are being forced to act in a certain way. At this moment, you feel torn between taking control of your life with the help of the app and your life being controlled by the app instead.

2. Non-ambivalence (purely negative)

Imagine the following scenario as vividly as possible:

You are trying to have a healthier lifestyle. In order to achieve this, you have started using an app that tracks your physical activity, such as your daily steps. With the help of this app, you have set a goal for yourself to walk 10.000 steps every day.

It's now Monday evening. You have just finished dinner and are heading for the sofa to relax when you hear your app buzzing. It has been tracking your movements all day and it now tells you that you still need another 1000 steps to reach your daily goal.

At a moment when you had almost forgotten about your daily step goal, this message comes as an order from the app to take those extra steps. Just when you were about to sit down and relax, this message dictates you to take those additional steps. You can't help but think that you are being forced to act in a certain way. At this moment, you feel your life being controlled by the app.

3. Non-ambivalence (neutral)

Imagine the following scenario as vividly as possible:

You are trying to have a healthier lifestyle. In order to achieve this, you have started using an app that tracks your physical activity, such as your daily steps. With the help of this app, you have set a goal for yourself to walk 10.000 steps every day.

It's now Monday evening. You have just finished dinner and are heading for the sofa to relax when you hear your app buzzing.

You look at the notification from your app. It shows the number of steps you have taken on the same day and on previous days. It also shows you the number of calories you burned and the number of minutes you were engaged in vigorous activity, such as exercising.

Coping

Confrontative coping.

Keeping the scenario in mind that you just read, what would you do at the moment you received the notification? For each of the statements below, select a response ranging from 1 (totally disagree) to 7 (totally agree).

- I would concentrate my efforts on doing something about the situation (adopted from Duhachek 2005)
- I would try to keep my feelings from controlling what I do at that moment (adopted from Duhacheck 2005 and adjusted)
- I would try to come up with a strategy about what to do (adopted from Carver 1997)
- I would adjust the step goal to make it more realistic for my daily routine (developed for this research)
- I would adjust the settings of the notification messages so that I receive them at times that fit my daily routine better (developed for this research)
- I would check the data to find out at what other times I could take extra steps (developed for this research)
- I would make a plan to compensate for these extra steps in the following day (developed for this research)

Strongly disagree; Disagree; Somewhat disagree; Neither agree nor disagree; Somewhat agree; Agree; Strongly agree

<u>Avoidance coping</u>

- I would get upset and let my emotions out (adopted from Carver 1997)
- I would try to relativize the message, to make it seem more positive (adopted from Carver 1997 and adjusted)
- I would completely ignore my app at that time (developed for this research)
- I would distract myself with something else to stop thinking about the message from my app (developed for this research)
- I would try to find an excuse for why I have not yet reached my step goal (developed for this research)
- I would think that it would be better to stop using the app for some time.

- I would think that it would be better to abandon the use of this app completely.

Strongly disagree; Disagree; Somewhat disagree; Neither agree nor disagree; Somewhat agree; Agree; Strongly agree

Locus of Control

Paulhus, 1983: Personal Efficacy (dimension 1 from SOC scale):

- When I get what I want, it's usually because I worked hard for it
- When I make plans, I am almost certain to make them work
- I prefer games involving some luck over games requiring pure skill (-)
- I can learn almost anything if I set my mind to it
- My major accomplishments are entirely due to my hard work and ability
- I usually don't set goals, because I have a hard time following through on them (-)
- Competition discourages excellence (-)
- Often people get ahead just by being lucky (-)
- On any sort of exam or competition, I like to know how well I do relative to everyone else
- It's pointless to keep working on something that's too difficult for me (-)

Does not apply at all; Mostly does not apply; Slightly does not apply; Neutral; Slightly applies; Mostly applies; Fully applies

Manipulation check

To what extent do you agree or disagree with each of the following statements about the app?

- The app created a feeling of conflict in me.
- The app gave me mixed feelings.

- I felt that the app was offering me control over my life but also controlling me.
- I felt like the app was trying to control my life.
- I felt like the app was dictating me what to do.

Strongly disagree; Disagree; Somewhat disagree; Neither agree nor disagree; Somewhat agree; Agree; Strongly agree

Realism check

- How easy or difficult was it for you to imagine yourself in that situation?

Very difficult; Difficult; Somewhat difficult; Neither easy nor difficult; Somewhat easy; Easy; Very easy

Attention check

- In the scenario you read, on which day of the week did you receive the notification from your app?

Open-ended response

Demographics

- To which age group do you belong?

< 18 (exclusion); 18-23 for every 5 years a new choice, until 90 +

- What gender identity do you identify with most?

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

- How long have you used/been using activity trackers?

0-1; 1-2; 2-3; 3-4; 4-5; 5+ years

- Which of the following physical activity trackers have you used/are you using?

Fitbit; Apple Health app; Google Fit; Samsung Health; Strava; GarminConnect; MyFitnessPal; YAZIO; WeightWatchers; BetterMe; Lose It!; Peloton; Xiaomi; Other, please name it:

Debrief

Thank you for participating in this study!

This study focuses on how people respond to feedback from mobile health apps. More precisely, it examines how emotional reactions, particularly conflicting feelings, influence the way people deal with mental strain. The goal is to understand whether such feedback leads to active problem-solving or rather to avoidant behaviour. The study also investigates whether certain personality traits affect how someone responds to these kinds of situations.

You were randomly assigned to one of the following three scenarios:

- A scenario in which you experienced both motivation and reluctance, resulting in mixed feelings.
- A scenario in which you felt demotivated to take action.
- A scenario in which you received only factual information, without any emotional tone or motivational cues.

These scenarios were designed to simulate potential emotional experiences when using health apps. No deception involving false information was used, but the emotional tone of the scenarios was intentionally varied to explore different psychological responses.

If, after reading this explanation, you no longer wish for your data to be included in the analysis, you have the right to request its removal without providing any further explanation. To do so, please contact the research team using the information below. Your responses will otherwise remain anonymous and be handled confidentially.

For questions, comments, or requests to have your data removed, you can contact one of the members of the research team:

Ameryl Juliaans – ameryl.juliaans@ru.nl

Luuk Kessels – luuk.kessels@ru.nl

Simone Kroon – simone.kroon@ru.nl

Jasmijn van Kuijk – jasmijn.vankuijk@ru.nl

Joppe Wijnberger – joppe.wijnberger@ru.nl

Research project supervisor: Olga Tsoumani – olga.tsoumani@ru.nl

We appreciate your time and valuable contribution to this study. Your participation helps advance our research into digital health technologies and how people use them.

8.2. Appendix B Dutch Survey

Welkom bij ons onderzoek!

Om mee te doen aan dit onderzoek is het belangrijk dat je recent een mobiele gezondheidsapp hebt gebruikt of momenteel gebruikt om je lichamelijke activiteit bij te houden (bijvoorbeeld stappen, hardlopen, enz.). Zo'n app kan een polsbandje/smartwatch zijn dat speciaal is ontworpen voor de registratie van je activiteit (bijvoorbeeld Fitbit of Apple Watch). Het kan óók een app op je smartphone zijn (zoals Samsung Health of Apple Gezondheid), die dan je activiteit bijhoudt.

Met "gebruiken" bedoelen we niet dat je de app dagelijks of intensief moet gebruiken. Ook als je de app af en toe checkt, bijvoorbeeld om te zien hoeveel stappen je hebt gezet, telt dat mee.

- Heb je recentelijk een van bovenstaande mobiele gezondheidsapps gebruikt of gebruik je er momenteel een voor het bijhouden van je activiteit?

Ja; Nee

Geïnformeerde toestemming

Voordat je beslist of je wilt deelnemen aan dit onderzoek, lees alsjeblieft onderstaande informatie over wat het onderzoek inhoudt:

Doel:

Dit onderzoek heeft als doel om te onderzoeken hoe mensen feedback van hun gezondheidsapps ervaren.

Wat wordt er van je gevraagd?

Je wordt gevraagd om een scenario te lezen over een gezondheidsapp en vervolgens vragen te beantwoorden over dit scenario.

Vrijwillige deelname:

Je kunt op elk moment en om welke reden dan ook stoppen met deelname. Als je het onderzoek hebt voltooid, kun je verzoeken om je gegevens te laten verwijderen door een e-mail te sturen naar olga.tsoumani@ru.nl.

Risico's/ongemak:

Er zijn geen grote risico's of vormen van ongemak verbonden aan deelname aan dit onderzoek.

Persoonlijke informatie:

We vragen je om demografische gegevens en naar je ervaring met het gebruik van gezondheidsapps. Deze informatie wordt echter niet gebruikt om individuele deelnemers te identificeren, ook niet in combinatie met andere gegevens. We verzamelen verder geen privacygevoelige informatie.

Opslag van gegevens:

Je gegevens worden vertrouwelijk behandeld en opgeslagen op de beveiligde servers van de Radboud Universiteit, volgens het protocol van de universiteit en in overeenstemming met de Algemene Verordening Gegevensbescherming (AVG). De gegevens kunnen voor andere onderzoeken worden gebruikt en worden minimaal 10 jaar bewaard om de wetenschappelijke integriteit te waarborgen.

Vragen of klachten:

Voor vragen over het onderzoek kun je contact opnemen met een van de leden van ons onderzoeksteam (zie de contactgegevens hieronder). Je kunt ook contact opnemen met de begeleider als je dat liever hebt.

Ons onderzoeksteam: Studenten van de MSc opleiding Marketing:

- Ameryl Juliaans – ameryl.juliaans@ru.nl
- Luuk Kessels – luuk.kessels@ru.nl
- Simone Kroon – simone.kroon@ru.nl
- Jasmijn van Kuijk – jasmijn.vankuijk@ru.nl
- Joppe Wijnberger – joppe.wijnberger@ru.nl

Onderzoeksbegeleider:

Olga Tsoumani – olga.tsoumani@ru.nl

- Ik heb bovenstaande gelezen en ga akkoord met deelname aan het onderzoek zoals hierboven beschreven.

Ja; Nee

Scenario's

1. Ambivalence

Probeer je zo goed mogelijk in te leven in het volgende scenario:

Je probeert een gezondere levensstijl te hebben. Om dit te bereiken ben je begonnen met het gebruiken van een app die lichamelijke activiteit bijhoudt, zoals je dagelijkse stappen. Met behulp van deze app heb je jezelf het doel gesteld om elke dag 10.000 stappen te zetten.

Het is nu maandagavond. Je hebt net gegeten en bent onderweg naar de bank om te ontspannen wanneer je app begint te trillen. De app heeft je bewegingen de hele dag bijgehouden en geeft aan dat je nu nog 1000 stappen nodig hebt om je dagelijkse doel te bereiken.

Op een moment dat je je dagelijkse stappendoel bijna was vergeten, komt deze melding zowel als een stimulans als een bevel van de app om die extra stappen te zetten. Net op het moment dat je wilde gaan zitten en ontspannen, moedigt dit bericht je aan om die extra stappen te zetten. Dit bericht laat je nadenken om je gedrag te veranderen. Aan de andere kant, het moedigt je aan om de extra stappen te zetten maar je voelt je enigszins gedwongen om je op een bepaalde manier te gedragen. Op dit moment voel je aan de ene kant dat de app controle heeft over je leven maar je aan de andere kant ook probeert te motiveren.

2. Non-ambivalence (negatief)

Probeer je zo goed mogelijk in te leven in het volgende scenario:

Je probeert een gezondere levensstijl te hebben. Om dit te bereiken ben je begonnen met het gebruiken van een appt die lichamelijke activiteit bijhoudt, zoals je dagelijkse stappen. Met behulp van deze app heb je jezelf het doel gesteld om elke dag 10.000 stappen te zetten.

Het is nu maandagavond. Je hebt net gegeten en bent onderweg naar de bank om te ontspannen wanneer je app begint te trillen. De app heeft je bewegingen de hele dag bijgehouden en geeft aan dat je nu nog 1000 stappen nodig hebt om je dagelijkse doel te bereiken.

Op een moment dat je je dagelijkse stappendoel bijna was vergeten, komt dit bericht als een bevel van de app om die extra stappen te zetten. Net op het moment dat je wilde gaan zitten en ontspannen, vertelt dit bericht je om die extra stappen te zetten. Je kunt het niet helpen, maar je denkt dat je gedwongen wordt om op een bepaalde manier te handelen. Op dit moment heb je het gevoel dat je leven wordt beheerst door de app.

3. Non-ambivalence (neutraal)

Probeer je zo goed mogelijk in te leven in het volgende scenario:

Je probeert een gezondere levensstijl te hebben. Om dit te bereiken ben je begonnen met het gebruiken van een appt die lichamelijke activiteit bijhoudt, zoals je dagelijkse stappen. Met behulp van deze app heb je jezelf het doel gesteld om elke dag 10.000 stappen te zetten.

Het is nu maandagavond. Je hebt net gegeten en bent onderweg naar de bank om te ontspannen wanneer je app begint te trillen. De app heeft je bewegingen de hele dag bijgehouden en geeft aan dat je nu nog 1000 stappen nodig hebt om je dagelijkse doel te bereiken.

Je bekijkt de melding van je app. Het toont het aantal stappen dat je hebt gezet op dezelfde dag en op voorgaande dagen. Het toont je ook het aantal calorieën dat je hebt verbrand en het aantal minuten dat je bezig was met een intensieve activiteit, zoals sporten.

Coping

<u>Confrontative coping</u>

Houd het scenario dat je net gelezen hebt in gedachten. Wat zou je op dat moment doen wanneer je de melding ontvangt? Geef voor elk van de onderstaande uitspraken aan in hoeverre die op jou van toepassing is, op een schaal van 1 (helemaal oneens) tot 7 (helemaal eens).

- Ik zou mijn best doen om iets aan de situatie te doen.
- Ik zou proberen mijn gevoelens niet de controle te laten overnemen op dat moment.
- Ik zou proberen een strategie te bedenken over wat ik moet doen.
- Ik zou het stappendoel aanpassen zodat het beter past bij mijn dagelijkse routine.
- Ik zou de instellingen van de meldingen aanpassen zodat ik ze op geschiktere momenten ontvang.

- Ik zou de gegevens bekijken om te zien op welke andere momenten ik extra stappen zou kunnen zetten.
- Ik zou een plan maken om de extra stappen de volgende dag in te halen.

Helemaal oneens; Oneens; Enigszins oneens; Neutraal; Enigszins eens; Eens; Helemaal eens

Avoidance coping

- Ik zou boos of verdrietig worden en mijn emoties laten gaan.
- Ik zou proberen het bericht te relativeren, zodat het positiever overkomt.
- Ik zou mijn app op dat moment volledig negeren.
- Ik zou mezelf afleiden met iets anders zodat ik niet meer aan het bericht hoef te denken.
- Ik zou een excuus proberen te verzinnen waarom ik mijn stappendoel nog niet heb gehaald.
- Ik zou denken dat het beter is om de app een tijdje niet meer te gebruiken.
- Ik zou denken dat ik beter helemaal kan stoppen met het gebruiken van de app.

Helemaal oneens; Oneens; Enigszins oneens; Neutraal; Enigszins eens; Eens; Helemaal eens

Locus of Control

- Als ik iets bereik, komt dat meestal doordat ik er hard voor heb gewerkt.
- Als ik plannen maak, lukt het me meestal om die ook uit te voeren.
- Ik speel liever spelletjes waarbij geluk een rol speelt dan spelletjes die alleen om vaardigheid gaan.
- Ik kan bijna alles leren als ik er echt voor ga.
- Mijn belangrijkste prestaties komen door mijn eigen inzet en vaardigheden.
- Ik stel vaak geen doelen voor mezelf omdat ik ze toch lastig vind om vol te houden.

- Concurrentie belemmert excellentie.
- Mensen bereiken vaak iets gewoon doordat ze geluk hebben.
- Bij toetsen of wedstrijden wil ik graag weten hoe ik het doe vergeleken met anderen.
- Het heeft geen zin om verder te werken aan iets dat te moeilijk voor me is.

Helemaal niet van toepassing; Niet van toepassing; Enigszins niet van toepassing; Neutraal; Enigszins van toepassing; Van toepassing; Helemaal van toepassing

Manipulation check

In hoeverre ben je het eens of oneens met de volgende uitspraken over de notificatie?

- De notificatie gaf me een gevoel van innerlijk conflict.
- De notificatie gaf me gemengde gevoelens.
- Ik had het gevoel dat de notificatie mij enerzijds controle over mijn leven gaf, maar mij anderzijds ook controleerde.
- Ik had het gevoel dat de notificatie probeerde mijn leven te controleren.
- Ik had het gevoel dat de notificatie mij vertelde wat ik moest doen.

Helemaal oneens; Oneens; Enigszins oneens; Neutraal; Enigszins eens; Eens; Helemaal eens

Realism check

- Hoe makkelijk of moeilijk was het om jezelf in deze situatie in te leven?

Zeer moeilijk; Moeilijk; Enigszins moeilijk; Niet makkelijk of moeilijk; Enigszins makkelijk; Makkelijk; Zeer makkelijk

Attention check

- Dit is een vraag om te kijken of je het scenario goed hebt gelezen. Op welke dag speelde het scenario zich af?

Open antwoord

Demographics

- Tot welke leeftijdsgroep behoor je?

<18 (wordt uitgesloten); 18–23, 24–29; 30–35; (in stappen van 5 jaar); tot 90+

- Met welke genderidentiteit identificeer je je het meest?

Man; Vrouw; Non-binair/derde gender; Wil ik liever niet zeggen

- Hoelang gebruik je al mobiele gezondheidsapps?

0–1 jaar; 1–2 jaar; 2–3 jaar; 3–4 jaar; 4–5 jaar; 5+ jaar

- Welke van de volgende mobiele gezondheidsapps heb je gebruikt of gebruik je nog steeds?

Fitbit; Apple Gezondheid; Google Fit; Samsung Health; Strava; Garmin Connect; MyFitnessPal; YAZIO; WeightWatchers; BetterMe; Lose It!; Peloton; Xiaomi; Anders, namelijk:

Debriefing

Bedankt voor je deelname aan dit onderzoek!

Dit onderzoek richt zich op hoe mensen reageren op feedback van mobiele gezondheidsapps. Om precies te zijn onderzoekt de studie hoe emotionele reacties, vooral tegenstrijdige gevoelens, van invloed zijn op de manier waarop mensen omgaan met mentale spanning. Het doel is om te begrijpen hoe dit soort feedback leidt tot een actieve probleemaanpak, of juist tot ontwijkend gedrag. Daarnaast wordt onderzocht of bepaalde persoonlijkheidskenmerken invloed hebben op de manier waarop iemand reageert op dit soort situaties.

Je bent willekeurig toegewezen aan een van de volgende drie scenario's:

- Een scenario waarin je zowel motivatie als tegenzin voelde, dus gemengde gevoelens ervaarde.

- Een scenario waarin je geen motivatie had om actie te ondernemen.
- Een scenario waarin je alleen feitelijke informatie kreeg, zonder dat er gevoelens of motivatie in meespeelden.

Deze scenario's zijn ontworpen om mogelijke emotionele ervaringen bij het gebruik van gezondheidsapps na te bootsen. Er is geen sprake geweest van misleiding met valse informatie, maar de emotionele toon in de scenario's is bewust gevarieerd om verschillende psychologische reacties te onderzoeken.

Als je na het lezen van deze uitleg niet langer wilt dat jouw gegevens worden meegenomen in de analyse, heb je het recht om deze zonder verdere toelichting te laten verwijderen. Neem hiervoor contact op met het onderzoeksteam via de onderstaande gegevens. Jouw antwoorden blijven verder anoniem en worden vertrouwelijk behandeld.

Voor vragen, opmerkingen of verzoeken tot verwijdering van je gegevens kun je contact opnemen met een van de leden van het onderzoeksteam:

- Ameryl Juliaans – ameryl.juliaans@ru.nl
- Luuk Kessels – luuk.kessels@ru.nl
- Simone Kroon – simone.kroon@ru.nl
- Jasmijn van Kuijk – jasmijn.vankuijk@ru.nl
- Joppe Wijnberger – joppe.wijnberger@ru.nl

Onderzoeksbegeleider: Olga Tsoumani – olga.tsoumani@ru.nl

Wij waarderen je tijd en waardevolle bijdrage aan dit onderzoek. Jouw deelname helpt ons onderzoek naar digitale gezondheidsapps en het gebruik hiervan verder te ontwikkelen.

8.3. Appendix C English Pilot Study

Welcome to our study!

Participating in this study requires that you have used in the recent past or you are currently using a mobile health app for tracking your physical activity (e.g., steps, running, etc.) Such an app can be a wristband designed for activity tracking (e.g., Fitbit), a smartwatch that, amongst other things, also tracks your physical activity (e.g., an Apple smartwatch), or an app installed on your smartphone, connected or not to a wristband or smartwatch device (e.g., Runtastic).

Have you used in the recent part or are you currently using any type of the above mobile health apps for activity tracking?

Yes/No

Scenario's

1. ***Ambivalence***

Imagine the following scenario as vividly as possible:

You are trying to have a healthier lifestyle. In order to achieve this, you have started using an app that tracks your physical activity, such as your daily steps. With the help of this app, you have set a goal for yourself to walk 10.000 steps every day.

It's now Monday evening. You have just finished dinner and are heading for the sofa to relax when you hear your app buzzing. It has been tracking your movements all day and it now tells you that you still need another 2000 steps to reach your daily goal.

At a moment when you had almost forgotten about your daily goal, this message comes both as an incentive and an order to discipline yourself to take these additional steps. Just when you were about to sit down and relax, the message makes you think that it's up to you to change your plans for this

evening, but you also can't help but think that you are being forced to do it.

It feels like the app is giving you the power to control your life and health while, at the same time, it also controls your life. On the one hand, you are now in charge of the daily choices that affect your health, but on the other hand, though, the app is also in charge.

2. ***Non-ambivalence (purely negative)***

Imagine the following scenario as vividly as possible:

You are trying to have a healthier lifestyle. In order to achieve this, you have started using an app that tracks your physical activity, such as your daily steps. With the help of this app, you have set a goal for yourself to walk 10.000 steps every day.

It's now Monday evening. You have just finished dinner and are heading for the sofa to relax when you hear your app buzzing. It has been tracking your movements all day and it now tells you that you still need another 2000 steps to reach your daily goal.

At a moment when you had almost forgotten about your daily goal, this message comes as an order to discipline yourself to take these additional steps. Just when you are about to sit down and relax, the message forces you to change your plans for this evening. It feels like the app is taking control of your life. It is the app that is now in charge of the daily choices that affect your health.

3. ***Non-ambivalence (neutral)***

Imagine the following scenario as vividly as possible:

You are trying to have a healthier lifestyle. In order to achieve this, you have started using an app that tracks your physical activity, such as your daily steps. With the help of this app, you have set a goal for yourself to walk 10.000 steps every day.

It's now Monday evening. You have just finished dinner and are heading for the sofa to relax when you hear your app buzzing. It has been tracking your movements all day and it now tells you that you still need another 2000 steps to reach your daily goal.

You look at your app. It shows the number of steps you have taken in a circle that fills as you take more steps. It also shows you the number of calories burned, and the number of minutes you were engaged in vigorous activity, such as exercising.

Questions manipulation check

To what extent do you agree or disagree with each of the following statements about the app?

1. The app created a feeling of conflict in me.
2. The app gave me contradictory feelings.
3. The app gave me mixed feelings.
4. The app gave me both a positive and a negative feeling.
5. The app gave me a negative feeling.
6. I felt like the app was offering me control over my life.
7. I felt like the app was trying to control my life.
8. I felt like the app was helping me do things I might not otherwise do.
9. I felt like the app was forcing me to do things I did not want to do at that moment.

Strongly disagree; Disagree; Somewhat disagree; Neither agree nor disagree; Somewhat agree; Agree; Strongly agree

Realism check

1. **How easy or difficult was it for you to imagine yourself in that situation?**

Very difficult; Difficult; Somewhat difficult; Neither easy nor difficult; Somewhat easy; Easy; Very easy

2. **How common do you think are such kinds of situations between users and mHealth apps?**

Very uncommon; Uncommon; Somewhat uncommon; Neither common nor uncommon; Somewhat common; Common; Very common

Attention check

In the scenario you read, what were you about to do when you heard your app buzzing?

Open-ended response

Demographics

- To which age group do you belong?
  - < 18 (exclusion), 18-23 for every 5 years a new choice, until 90+
- What gender identity do you identify with most?
  - Male, Female, Non-binary/third gender, Prefer not to say
- How long have you used/been using activity trackers?

- 0-1, 1-2, 2-3, 3-4, 4-5, 5+ years

- Which of the following physical activity trackers have you used/are you using?

- Fitbit
- Apple Health app
- Google Fit
- Samsung Health
- Strava
- Garmin Connect
- MyFitnessPal
- YAZIO
- WeightWatchers
- BetterMe
- Lose It!
- Peloton
- Xiaomi
- Other, please name it: (14)

8.4. Appendix D Dutch Pilot Study

Welkom bij ons onderzoek!

Om mee te doen aan dit onderzoek is het belangrijk dat je recent een mobiele gezondheidsapp hebt gebruikt of momenteel gebruikt om je fysieke activiteit bij te houden (bijvoorbeeld stappen, hardlopen, enz.). Zo'n app kan een polsbandje zijn dat speciaal is ontworpen voor activiteitsregistratie (bijvoorbeeld Fitbit), een smartwatch die onder andere ook je fysieke activiteit bijhoudt (bijvoorbeeld een Apple Watch), of een app op je smartphone, al dan niet gekoppeld aan een polsbandje of smartwatch (zoals Runtastic).

Heb je recentelijk een van bovenstaande mobiele gezondheidsapps gebruikt of gebruik je er momenteel een voor het bijhouden van je activiteit?

- Ja/Nee

Scenario's

Ambivalence

Probeer je zo goed mogelijk in te leven in het volgende scenario:

Je probeert een gezondere levensstijl aan te nemen. Om je hierbij te helpen gebruik je een app die je fysieke activiteit bijhoudt, zoals je dagelijkse stappen. Met behulp van de app, heb je jezelf als doel gesteld om elke dag 10.000 stappen te zetten.

Het is nu maandagavond. Je hebt net avondeten gehad en bent op weg naar de bank om te ontspannen, wanneer je app begint te trillen. De app heeft je bewegingen de hele dag bijgehouden en geeft nu aan dat je nog 2.000 stappen nodig hebt om je dagelijkse doel te halen.

Op een moment waarbij je bijna je dagelijkse doel was vergeten, voelt dit bericht zowel als een aanmoediging als een bevel om jezelf te disciplineren om die extra stappen te zetten. Net wanneer je wilde gaan zitten en ontspannen, laat dit bericht je nadenken: jij kunt zelf bepalen of je je avondplannen gaat veranderen, maar tegelijk voelt het alsof je ertoe gedwongen wordt.

Het voelt alsof de app je de kracht geeft om je leven en gezondheid in eigen hand te nemen, maar tegelijkertijd ook controle over je leven uitoefent. Aan de ene kant maak jíj nu de keuzes die je gezondheid beïnvloeden, maar aan de andere kant lijkt de app ook de regie te hebben.

Non-ambivalence (negatief)

Probeer je zo goed mogelijk in te leven in het volgende scenario:

Je probeert een gezondere levensstijl aan te nemen. Om je hierbij te helpen gebruik je een app die je fysieke activiteit bijhoudt, zoals je dagelijkse stappen. Met behulp van de app, heb je jezelf als doel gesteld om elke dag 10.000 stappen te zetten.

Het is nu maandagavond. Je hebt net avondeten gehad en bent op weg naar de bank om te ontspannen, wanneer je app begint te trillen. De app heeft je bewegingen de hele dag bijgehouden en geeft nu aan dat je nog 2.000 stappen nodig hebt om je dagelijkse doel te halen.

Op een moment waarbij je bijna je dagelijkse doel was vergeten, voelt dit bericht als een bevel om jezelf te disciplineren om die extra stappen te zetten. Net wanneer je wilde gaan zitten en ontspannen, dwingt het bericht je om je avondplannen te wijzigen. Het voelt alsof de app de controle over je leven overneemt. De app bepaalt nu welke keuzes je maakt die je gezondheid beïnvloeden.

Non-ambivalence (neutraal)

Probeer je zo goed mogelijk in te leven in het volgende scenario:

Je probeert een gezondere levensstijl aan te nemen. Om je hierbij te helpen gebruik je een app die je fysieke activiteit bijhoudt, zoals je dagelijkse stappen. Met behulp van de app, heb je jezelf als doel gesteld om elke dag 10.000 stappen te zetten.

Het is nu maandagavond. Je hebt net avondeten gehad en bent op weg naar de bank om te ontspannen, wanneer je app begint te trillen. De app heeft je bewegingen de hele dag bijgehouden en geeft nu aan dat je nog 2.000 stappen nodig hebt om je dagelijkse doel te halen.

Je kijkt naar je app. Die toont het aantal stappen dat je hebt gezet in een cirkel die zich vult naarmate je meer loopt. Ook laat de app het aantal verbrande calorieën zien en het aantal minuten dat je intensief actief bent geweest, bijvoorbeeld door te sporten.

Vragen – Manipulatiecheck

In hoeverre ben je het eens of oneens met de volgende uitspraken over de app?

- De app zorgde voor een gevoel van innerlijk conflict.
- De app gaf mij tegenstrijdige gevoelens.
- De app gaf mij gemengde gevoelens.
- De app gaf mij zowel een positief als een negatief gevoel.
- De app gaf mij een negatief gevoel.
- Ik had het gevoel dat de app mij controle gaf over mijn leven.
- Ik had het gevoel dat de app mijn leven probeerde te controleren.
- Ik had het gevoel dat de app mij hielp dingen te doen die ik anders misschien niet zou doen.
- Ik had het gevoel dat de app mij dwong dingen te doen die ik op dat moment niet wilde doen.

Antwoordopties:

Helemaal oneens – Oneens – Enigszins oneens – Neutraal – Enigszins eens – Eens – Helemaal eens

Realiteitscheck

Hoe makkelijk of moeilijk was het om jezelf in deze situatie in te beelden?

Zeer moeilijk – Moeilijk – Enigszins moeilijk – Noch makkelijk noch moeilijk – Enigszins makkelijk – Makkelijk – Zeer makkelijk

Hoe vaak denk je dat dit soort situaties voorkomen bij gebruikers van mHealth-apps?

Zeer zeldzaam – Zeldzaam – Enigszins zeldzaam – Noch zeldzaam noch vaak – Enigszins vaak – Vaak – Zeer vaak

Aandachtscheck

Wat was je van plan te gaan doen toen je je app hoorde trillen in het scenario dat je hebt gelezen?

(*Open antwoord*)

Demografische gegevens

Tot welke leeftijdsgroep behoor je?

<18 (exclusie), *18–23, 24–29, 30–35 … (in stappen van 5 jaar tot 90+)*

Met welke genderidentiteit identificeer je je het meest?

Man, Vrouw, Non-binair/derde gender, Wil ik liever niet zeggen

Hoelang gebruik je al mobiele gezondheidsapps?

0–1 jaar, 1–2 jaar, 2–3 jaar, 3–4 jaar, 4–5 jaar, 5+ jaar

Welke van de volgende mobiele gezondheidsapps heb je gebruikt of gebruik je nog steeds?

- Fitbit
- Apple Gezondheid
- Google Fit

- Samsung Health
- Strava
- Garmin Connect
- MyFitnessPal
- YAZIO
- WeightWatchers
- BetterMe
- Lose It!
- Peloton
- Xiaomi
- Anders, namelijk: (open antwoord)

8.5. Appendix E SPSS Output

8.5.1. Descriptives

Condition_new

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Neutral	52	33.1	33.1	33.1
	Negative	61	38.9	38.9	72.0
	Ambivalence	44	28.0	28.0	100.0
	Total	157	100.0	100.0	

Met welke genderidentiteit identificeer je je het meest?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Man	73	46.5	46.5	46.5
	Vrouw	84	53.5	53.5	100.0
	Total	157	100.0	100.0	

Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation	Skewness		Kurtosis	
	Statistic	Statistic	Statistic	Statistic	Statistic	Statistic	Std. Error	Statistic	Std. Error
Hoe makkelijk of moeilijk was het om jezelf in deze situatie in te leven?	157	2	7	5.47	1.238	-1.145	.194	.929	.385
ConfrontScore	157	1.00	7.00	3.9788	1.27444	.010	.194	-.320	.385
AvoidScore	157	1.00	7.00	2.9512	1.44119	1.119	.194	.738	.385
Sum_LoC	157	2.60	6.50	5.1758	.93222	-1.165	.194	.695	.385
Tot welke leeftijdsgroep behoor je?	157	1	9	2.90	2.109	1.204	.194	.254	.385
Hoelang gebruik je al mobiele gezondheidsapps?	157	1	6	4.06	1.636	-.228	.194	-1.191	.385
AmbiMC	157	1.00	7.00	3.5159	1.55041	.363	.194	-.570	.385
NegMC	157	1.00	7.00	3.3822	1.74600	.612	.194	-.623	.385
Valid N (listwise)	157								

8.5.2. Pilot test

Report

Condition		Ambivalence_score	Negative_score
,00 Neutral	Mean	4.2333	3.0667
	N	10	10
	Std. Deviation	1.85958	1.24524
1,00 Negative	Mean	4.4359	3.8718
	N	13	13
	Std. Deviation	1.46176	1.46274
2,00 Ambivalence	Mean	4.3333	2.9697
	N	11	11
	Std. Deviation	1.63299	1.05887
Total	Mean	4.3431	3.3431
	N	34	34
	Std. Deviation	1.59225	1.31166

8.5.3. Factor Analysis Coping: Principal Component Analysis & VARIMAX Rotation

Avoidance coping reliability analysis:

Reliability Statistics

Cronbach's Alpha	N of Items
.862	7

Item-Total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
A_C_Co_1	19.89	64.102	.736	.829
A_C_Co_2	17.71	74.773	.330	.880
A_C_Co_3	18.42	66.117	.537	.857
A_C_Co_4	18.92	61.602	.721	.829
A_C_Co_5	18.41	63.411	.628	.844
A_C_Co_6	19.59	62.615	.747	.827
A_C_Co_7	19.79	63.962	.753	.827

Confrontative coping reliability analysis:

Reliability Statistics

Cronbach's Alpha	N of Items
.778	7

Item-Total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
A_C_Co_8	24.10	52.502	.566	.738
A_C_Co_9	23.87	58.471	.287	.788
A_C_Co_10	24.62	48.787	.644	.720
A_C_Co_11	25.05	53.408	.455	.759
A_C_Co_12	24.97	50.993	.494	.752
A_C_Co_13	24.68	50.067	.588	.732
A_C_Co_14	24.80	52.612	.483	.753

First iteration:

KMO and Bartlett's Test

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.825
Bartlett's Test of Sphericity	Approx. Chi-Square	1069.116
	df	91
	Sig.	<.001

Communalities

	Initial	Extraction
A_C_Co_1	1.000	.690
A_C_Co_2	1.000	.313
A_C_Co_3	1.000	.515
A_C_Co_4	1.000	.668
A_C_Co_5	1.000	.539
A_C_Co_6	1.000	.713
A_C_Co_7	1.000	.713
A_C_Co_8	1.000	.591
A_C_Co_9	1.000	.272
A_C_Co_10	1.000	.643
A_C_Co_11	1.000	.423
A_C_Co_12	1.000	.512
A_C_Co_13	1.000	.528
A_C_Co_14	1.000	.431

Extraction Method: Principal Component Analysis.

Total Variance Explained

	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings		
Component	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	5.111	36.508	36.508	5.111	36.508	36.508	4.454	31.813	31.813
2	2.438	17.415	53.923	2.438	17.415	53.923	3.095	22.110	53.923
3	1.261	9.007	62.930						
4	.945	6.747	69.677						
5	.792	5.654	75.331						
6	.634	4.525	79.857						
7	.570	4.068	83.925						
8	.513	3.665	87.590						
9	.479	3.424	91.014						
10	.366	2.613	93.627						
11	.310	2.216	95.843						
12	.240	1.718	97.561						
13	.187	1.337	98.898						
14	.154	1.102	100.000						

Extraction Method: Principal Component Analysis.

Rotated Component Matrix[a]

	Component	
	1	2
A_C_Co_1	.818	
A_C_Co_2	.470	.303
A_C_Co_3	.611	-.376
A_C_Co_4	.817	
A_C_Co_5	.733	
A_C_Co_6	.826	
A_C_Co_7	.827	
A_C_Co_8	-.494	.589
A_C_Co_9	-.464	.238
A_C_Co_10	-.297	.745
A_C_Co_11		.647
A_C_Co_12		.708
A_C_Co_13	-.226	.691
A_C_Co_14		.651

Extraction Method: Principal Component Analysis.
Rotation Method: Varimax with Kaiser Normalization.

a. Rotation converged in 3 iterations.

2nd iteration after deleting item 2, because of low communality and big cross-loader:

KMO and Bartlett's Test

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.824
Bartlett's Test of Sphericity	Approx. Chi-Square	1022.264
	df	78
	Sig.	<.001

Communalities

	Initial	Extraction
A_C_Co_1	1.000	.713
A_C_Co_3	1.000	.511
A_C_Co_4	1.000	.660
A_C_Co_5	1.000	.519
A_C_Co_6	1.000	.742
A_C_Co_7	1.000	.737
A_C_Co_8	1.000	.595
A_C_Co_9	1.000	.282
A_C_Co_10	1.000	.625
A_C_Co_11	1.000	.423
A_C_Co_12	1.000	.486
A_C_Co_13	1.000	.561
A_C_Co_14	1.000	.476

Extraction Method: Principal Component Analysis.

Total Variance Explained

	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings		
Component	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	5.058	38.911	38.911	5.058	38.911	38.911	4.352	33.476	33.476
2	2.273	17.481	56.392	2.273	17.481	56.392	2.979	22.915	56.392
3	1.203	9.256	65.648						
4	.827	6.360	72.008						
5	.676	5.199	77.207						
6	.629	4.840	82.048						
7	.555	4.270	86.317						
8	.507	3.897	90.214						
9	.370	2.843	93.058						
10	.313	2.407	95.465						
11	.244	1.878	97.343						
12	.191	1.470	98.813						
13	.154	1.187	100.000						

Extraction Method: Principal Component Analysis.

Rotated Component Matrix[a]

	Component	
	1	2
A_C_Co_1	.839	
A_C_Co_3	.604	-.382
A_C_Co_4	.811	
A_C_Co_5	.719	
A_C_Co_6	.852	
A_C_Co_7	.848	
A_C_Co_8	-.499	.588
A_C_Co_9	-.494	
A_C_Co_10	-.333	.717
A_C_Co_11		.649
A_C_Co_12		.694
A_C_Co_13	-.217	.717
A_C_Co_14		.687

Extraction Method: Principal Component Analysis.
Rotation Method: Varimax with Kaiser Normalization.

a. Rotation converged in 3 iterations.

3rd iteration after deleting item 9, because of low communality and loads only negatively on the wrong expected factor and not at all on the expected factor:

KMO and Bartlett's Test

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.824
Bartlett's Test of Sphericity	Approx. Chi-Square	951.293
	df	66
	Sig.	<.001

Communalities

	Initial	Extraction
A_C_Co_1	1.000	.679
A_C_Co_3	1.000	.545
A_C_Co_4	1.000	.674
A_C_Co_5	1.000	.513
A_C_Co_6	1.000	.754
A_C_Co_7	1.000	.746
A_C_Co_8	1.000	.600
A_C_Co_10	1.000	.625
A_C_Co_11	1.000	.424
A_C_Co_12	1.000	.488
A_C_Co_13	1.000	.565
A_C_Co_14	1.000	.482

Extraction Method: Principal Component Analysis.

Total Variance Explained

	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings		
Component	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	4.826	40.216	40.216	4.826	40.216	40.216	4.119	34.324	34.324
2	2.268	18.900	59.117	2.268	18.900	59.117	2.975	24.793	59.117
3	1.044	8.698	67.815						
4	.775	6.456	74.271						
5	.676	5.632	79.903						
6	.575	4.791	84.694						
7	.507	4.222	88.916						
8	.379	3.156	92.073						
9	.315	2.621	94.694						
10	.270	2.253	96.947						
11	.208	1.732	98.679						
12	.159	1.321	100.000						

Extraction Method: Principal Component Analysis.

Rotated Component Matrix[a]

	Component	
	1	2
A_C_Co_1	.817	
A_C_Co_3	.625	-.393
A_C_Co_4	.820	
A_C_Co_5	.715	
A_C_Co_6	.857	
A_C_Co_7	.852	
A_C_Co_8	-.496	.595
A_C_Co_10	-.323	.722
A_C_Co_11		.648
A_C_Co_12		.691
A_C_Co_13	-.215	.720
A_C_Co_14		.690

Extraction Method: Principal Component Analysis.
Rotation Method: Varimax with Kaiser Normalization.

a. Rotation converged in 3 iterations.

Last reliability analysis avoidance coping:

Reliability Statistics

Cronbach's Alpha	N of Items
.880	6

Item-Total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
A_C_Co_1	15.47	53.392	.754	.849
A_C_Co_3	14.01	55.455	.540	.884
A_C_Co_4	14.50	51.777	.707	.855
A_C_Co_5	14.00	53.718	.601	.874
A_C_Co_6	15.18	51.647	.781	.843
A_C_Co_7	15.38	53.069	.780	.845

Last reliability analysis confrontative coping:

Reliability Statistics

Cronbach's Alpha	N of Items
.788	6

Item-Total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
A_C_Co_8	19.29	43.952	.538	.757
A_C_Co_10	19.82	40.254	.633	.733
A_C_Co_11	20.24	44.210	.454	.776
A_C_Co_12	20.16	42.071	.489	.770
A_C_Co_13	19.87	40.924	.601	.741
A_C_Co_14	19.99	42.525	.528	.759

8.5.4. Factor Analysis Locus of Control: Principal Component Analysis & VARIMAX Rotation

This was done on the full group (attention check 1 and 2) only.

First and last reliability analysis:

Reliability Statistics

Cronbach's Alpha	N of Items
.857	10

Item-Total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
LOC_1	46.24	70.092	.730	.831
LOC_2	46.55	69.993	.699	.833
RevLOC_3	46.97	70.410	.570	.843
LOC_4	46.45	69.313	.709	.832
LOC_5	46.26	69.066	.731	.830
RevLOC_6	46.68	66.067	.711	.830
RevLOC_7	46.71	78.937	.245	.869
RevLOC_8	46.75	69.444	.634	.837
LOC_9	46.64	84.244	.031	.885
RevLOC_10	46.57	67.516	.663	.834

Principal components factor analysis with VARIMAX rotation:

First iteration:

KMO and Bartlett's Test

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.872
Bartlett's Test of Sphericity	Approx. Chi-Square	765.997
	df	45
	Sig.	<.001

Communalities

	Initial	Extraction
LOC_1	1.000	.712
LOC_2	1.000	.671
RevLOC_3	1.000	.473
LOC_4	1.000	.660
LOC_5	1.000	.728
RevLOC_6	1.000	.638
RevLOC_7	1.000	.659
RevLOC_8	1.000	.540
LOC_9	1.000	.520
RevLOC_10	1.000	.607

Extraction Method: Principal Component Analysis.

Total Variance Explained

	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings		
Component	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	4.943	49.430	49.430	4.943	49.430	49.430	4.888	48.880	48.880
2	1.266	12.663	62.092	1.266	12.663	62.092	1.321	13.212	62.092
3	.888	8.882	70.974						
4	.629	6.295	77.269						
5	.590	5.901	83.169						
6	.462	4.617	87.787						
7	.418	4.184	91.970						
8	.376	3.762	95.732						
9	.265	2.645	98.377						
10	.162	1.623	100.000						

Extraction Method: Principal Component Analysis.

Rotated Component Matrix[a]

	Component 1	Component 2
LOC_1	.844	
LOC_2	.819	
RevLOC_3	.608	.321
LOC_4	.812	
LOC_5	.852	
RevLOC_6	.793	
RevLOC_7		.798
RevLOC_8	.697	.234
LOC_9		.717
RevLOC_10	.779	

Extraction Method: Principal Component Analysis.
Rotation Method: Varimax with Kaiser Normalization.

a. Rotation converged in 3 iterations.

8.5.5. Manipulation check

Equal group sizes--> yes

Condition_new

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Neutral	52	33.1	33.1	33.1
	Negative	61	38.9	38.9	72.0
	Ambivalence	44	28.0	28.0	100.0
	Total	157	100.0	100.0	

Descriptives

		N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean Lower Bound	95% Confidence Interval for Mean Upper Bound	Minimum	Maximum
AmbiMC	Neutral	52	3.1987	1.42688	.19787	2.8015	3.5960	1.00	6.00
	Negative	61	3.6393	1.38550	.17740	3.2845	3.9942	1.00	6.00
	Ambivalence	44	3.7197	1.85515	.27967	3.1557	4.2837	1.00	7.00
	Total	157	3.5159	1.55041	.12374	3.2715	3.7603	1.00	7.00
NegMC	Neutral	52	2.7212	1.14795	.15919	2.4016	3.0407	1.00	6.00
	Negative	61	4.2213	2.06059	.26383	3.6936	4.7491	1.00	7.00
	Ambivalence	44	3.0000	1.37672	.20755	2.5814	3.4186	1.00	5.50
	Total	157	3.3822	1.74600	.13935	3.1069	3.6574	1.00	7.00

Tests of Normality

		Kolmogorov-Smirnov[a]			Shapiro-Wilk		
	Condition_new	Statistic	df	Sig.	Statistic	df	Sig.
AmbiMC	Neutral	.151	52	.005	.942	52	.014
	Negative	.153	61	.001	.958	61	.034
	Ambivalence	.121	44	.112	.921	44	.005
NegMC	Neutral	.216	52	<.001	.913	52	.001
	Negative	.167	61	<.001	.906	61	<.001
	Ambivalence	.175	44	.002	.922	44	.006

a. Lilliefors Significance Correction

Homogeneity of variance:

Tests of Homogeneity of Variances

		Levene Statistic	df1	df2	Sig.
AmbiMC	Based on Mean	2.030	2	154	.135
	Based on Median	1.925	2	154	.149
	Based on Median and with adjusted df	1.925	2	138.806	.150
	Based on trimmed mean	2.010	2	154	.138
NegMC	Based on Mean	19.765	2	154	<.001
	Based on Median	17.260	2	154	<.001
	Based on Median and with adjusted df	17.260	2	136.937	<.001
	Based on trimmed mean	20.076	2	154	<.001

One-way-ANOVA:

ANOVA

		Sum of Squares	df	Mean Square	F	Sig.
AmbiMC	Between Groups	7.988	2	3.994	1.676	.191
	Within Groups	367.000	154	2.383		
	Total	374.988	156			
NegMC	Between Groups	72.101	2	36.051	13.760	<.001
	Within Groups	403.469	154	2.620		
	Total	475.570	156			

ANOVA Effect Sizes[a,b]

			95% Confidence Interval	
		Point Estimate	Lower	Upper
AmbiMC	Eta-squared	.021	.000	.076
	Epsilon-squared	.009	-.013	.064
	Omega-squared Fixed-effect	.009	-.013	.064
	Omega-squared Random-effect	.004	-.006	.033
NegMC	Eta-squared	.152	.056	.248
	Epsilon-squared	.141	.044	.239
	Omega-squared Fixed-effect	.140	.044	.237
	Omega-squared Random-effect	.075	.022	.135

a. Eta-squared and Epsilon-squared are estimated based on the fixed-effect model.

b. Negative but less biased estimates are retained, not rounded to zero.

Post-hoc-tests:

AmbiMC --> Tukey HSD, because equal group sizes and non-significant Levene's test (thus equal/homogeneous variances)

Multiple Comparisons

Dependent Variable: AmbiMC

Tukey HSD

					95% Confidence Interval	
(I) Condition_new	(J) Condition_new	Mean Difference (I-J)	Std. Error	Sig.	Lower Bound	Upper Bound
Neutral	Negative	-.44063	.29137	.288	-1.1302	.2489
	Ambivalence	-.52098	.31621	.229	-1.2693	.2274
Negative	Neutral	.44063	.29137	.288	-.2489	1.1302
	Ambivalence	-.08035	.30533	.963	-.8030	.6422
Ambivalence	Neutral	.52098	.31621	.229	-.2274	1.2693
	Negative	.08035	.30533	.963	-.6422	.8030

NegMC --> Welch test & Games-Howell, because equal group sizes, but significant Levene's test (this not equal/heterogeneous variances)

Robust Tests of Equality of Means

NegMC

	Statistic[a]	df1	df2	Sig.
Welch	11.890	2	98.589	<.001

a. Asymptotically F distributed.

Multiple Comparisons

Dependent Variable: NegMC

Games-Howell

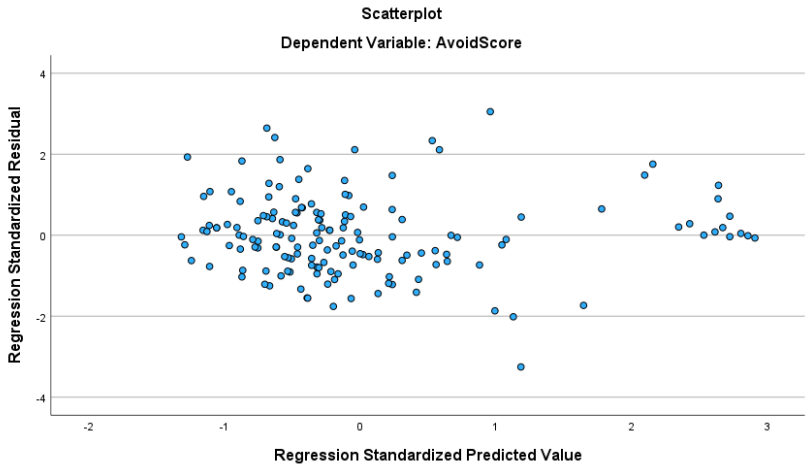
(I) Condition_new	(J) Condition_new	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval Lower Bound	95% Confidence Interval Upper Bound
Neutral	Negative	-1.50016*	.30814	<.001	-2.2336	-.7667
	Ambivalence	-.27885	.26157	.538	-.9029	.3452
Negative	Neutral	1.50016*	.30814	<.001	.7667	2.2336
	Ambivalence	1.22131*	.33568	.001	.4230	2.0196
Ambivalence	Neutral	.27885	.26157	.538	-.3452	.9029
	Negative	-1.22131*	.33568	.001	-2.0196	-.4230

*. The mean difference is significant at the 0.05 level.

8.5.6. Assumptions of MRA

8.5.6.1. Assumptions MRA Avoidance Coping

Linearity:



Independence of errors:

Model Summary[d]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics					Durbin-Watson
					R Square Change	F Change	df1	df2	Sig. F Change	
1	.303[a]	.092	.074	1.38674	.092	5.163	3	153	.002	
2	.723[b]	.523	.504	1.01496	.431	45.205	3	150	<.001	
3	.743[c]	.552	.528	.98996	.029	4.836	2	148	.009	2.264

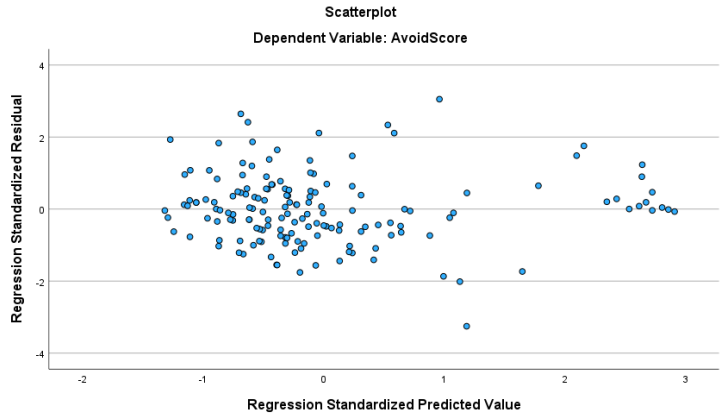
a. Predictors: (Constant), Hoelang gebruik je al mobiele gezondheidsapps?, Gender_Binary, Tot welke leeftijdsgroep behoor je?

b. Predictors: (Constant), Hoelang gebruik je al mobiele gezondheidsapps?, Gender_Binary, Tot welke leeftijdsgroep behoor je?, dummy_neutraal, Zscore(Sum_LoC), dummy_negatief

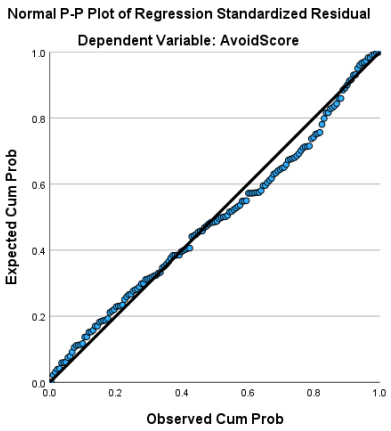
c. Predictors: (Constant), Hoelang gebruik je al mobiele gezondheidsapps?, Gender_Binary, Tot welke leeftijdsgroep behoor je?, dummy_neutraal, Zscore(Sum_LoC), dummy_negatief, Interaction_Neutr, Interaction_Neg

d. Dependent Variable: AvoidScore

Homoscedasticity:



Normality of errors:



Tests of Normality

	Kolmogorov-Smirnov[a]			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
Unstandardized Residual	.070	157	.061	.983	157	.045

a. Lilliefors Significance Correction

No multicollinearity:

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients			Collinearity Statistics	
		B	Std. Error	Beta	t	Sig.	Tolerance	VIF
1	(Constant)	2.565	.344		7.457	<.001		
	Gender_Binary	.121	.226	.042	.534	.594	.962	1.040
	Tot welke leeftijdsgroep behoor je?	.209	.054	.306	3.887	<.001	.961	1.041
	Hoelang gebruik je al mobiele gezondheidsapps?	-.070	.069	-.080	-1.022	.308	.979	1.022
2	(Constant)	2.462	.303		8.128	<.001		
	Gender_Binary	.173	.166	.060	1.043	.299	.956	1.046
	Tot welke leeftijdsgroep behoor je?	.040	.042	.059	.952	.342	.825	1.212
	Hoelang gebruik je al mobiele gezondheidsapps?	-.010	.051	-.011	-.198	.843	.958	1.043
	Zscore(Sum_LoC)	-.892	.091	-.619	-9.823	<.001	.801	1.249
	dummy_negatief	.693	.208	.235	3.341	.001	.641	1.559
	dummy_neutraal	.153	.209	.050	.731	.466	.675	1.481
3	(Constant)	2.412	.296		8.150	<.001		
	Gender_Binary	.226	.164	.079	1.385	.168	.938	1.066
	Tot welke leeftijdsgroep behoor je?	.028	.042	.041	.666	.507	.809	1.237
	Hoelang gebruik je al mobiele gezondheidsapps?	-.001	.050	-.001	-.011	.992	.947	1.056
	Zscore(Sum_LoC)	-.816	.185	-.566	-4.408	<.001	.184	5.449
	dummy_negatief	.657	.204	.223	3.228	.002	.634	1.577
	dummy_neutraal	.055	.211	.018	.261	.795	.631	1.585
	Interaction_Neg	-.264	.215	-.142	-1.227	.222	.225	4.443
	Interaction_Neutr	.423	.269	.123	1.569	.119	.489	2.044

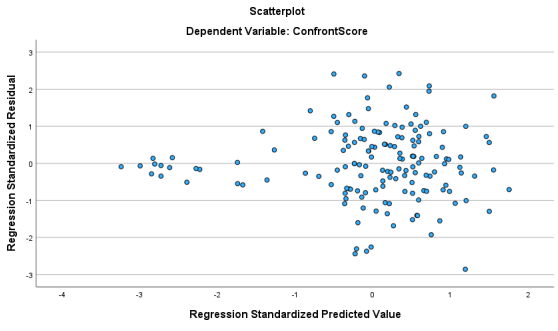
a. Dependent Variable: AvoidScore

No influential outliers:

No responses with Cook's distance above 0.50.

8.5.6.3. Assumptions MRA Confrontative Coping

Linearity:



Independence of errors:

Model Summary[d]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics					Durbin-Watson
					R Square Change	F Change	df1	df2	Sig. F Change	
1	.280[a]	.078	.060	1.23540	.078	4.338	3	153	.006	
2	.421[b]	.177	.145	1.17871	.099	6.024	3	150	<.001	
3	.453[c]	.206	.163	1.16621	.028	2.616	2	148	.076	1.812

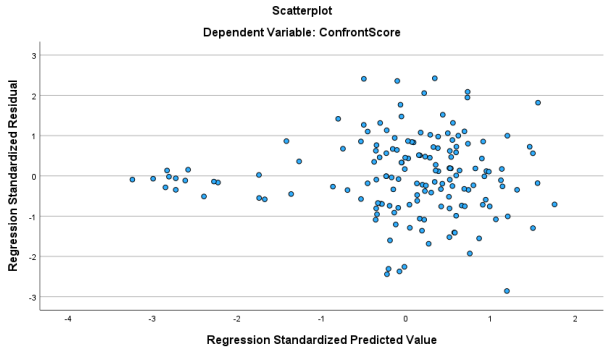
a. Predictors: (Constant), Hoelang gebruik je al mobiele gezondheidsapps?, Gender_Binary, Tot welke leeftijdsgroep behoor je?

b. Predictors: (Constant), Hoelang gebruik je al mobiele gezondheidsapps?, Gender_Binary, Tot welke leeftijdsgroep behoor je?, dummy_neutraal, Zscore(Sum_LoC), dummy_negatief

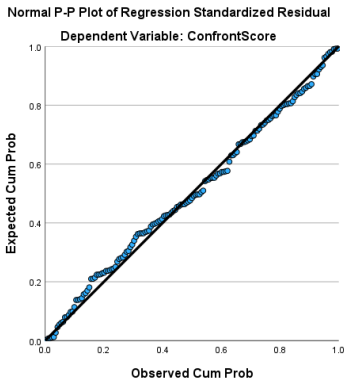
c. Predictors: (Constant), Hoelang gebruik je al mobiele gezondheidsapps?, Gender_Binary, Tot welke leeftijdsgroep behoor je?, dummy_neutraal, Zscore(Sum_LoC), dummy_negatief, Interaction_Neutr, Interaction_Neg

d. Dependent Variable: ConfrontScore

Homoscedasticity:



Normality of errors:



Tests of Normality

	Kolmogorov-Smirnov[a]			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
Unstandardized Residual	.051	157	.200*	.991	157	.376

*. This is a lower bound of the true significance.

a. Lilliefors Significance Correction

No multicollinearity:

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients			Collinearity Statistics	
		B	Std. Error	Beta	t	Sig.	Tolerance	VIF
1	(Constant)	4.152	.306		13.549	<.001		
	Gender_Binary	.434	.202	.170	2.154	.033	.962	1.040
	Tot welke leeftijdsgroep behoor je?	-.118	.048	-.195	-2.459	.015	.961	1.041
	Hoelang gebruik je al mobiele gezondheidsapps?	-.016	.061	-.020	-.257	.797	.979	1.022
2	(Constant)	4.327	.352		12.301	<.001		
	Gender_Binary	.424	.193	.166	2.196	.030	.956	1.046
	Tot welke leeftijdsgroep behoor je?	-.050	.049	-.082	-1.008	.315	.825	1.212
	Hoelang gebruik je al mobiele gezondheidsapps?	-.046	.059	-.059	-.785	.434	.958	1.043
	Zscore(Sum_LoC)	.385	.105	.302	3.648	<.001	.801	1.249
	dummy_negatief	-.322	.241	-.124	-1.336	.183	.641	1.559
	dummy_neutraal	-.355	.243	-.131	-1.458	.147	.675	1.481
3	(Constant)	4.364	.349		12.516	<.001		
	Gender_Binary	.389	.193	.153	2.020	.045	.938	1.066
	Tot welke leeftijdsgroep behoor je?	-.042	.049	-.070	-.857	.393	.809	1.237
	Hoelang gebruik je al mobiele gezondheidsapps?	-.057	.059	-.074	-.978	.329	.947	1.056
	Zscore(Sum_LoC)	.436	.218	.342	1.999	.047	.184	5.449
	dummy_negatief	-.279	.240	-.107	-1.162	.247	.634	1.577
	dummy_neutraal	-.241	.249	-.089	-.970	.334	.631	1.585
	Interaction_Neg	.079	.254	.048	.311	.756	.225	4.443
	Interaction_Neutr	-.519	.317	-.172	-1.637	.104	.489	2.044

a. Dependent Variable: ConfrontScore

No influential outliers:

No responses with Cook's distance above 0.50.

8.5.7. Multiple Regression Analysis

8.5.7.1. MRA Avoidance Coping

Model Summary[d]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics					Durbin-Watson
					R Square Change	F Change	df1	df2	Sig. F Change	
1	.303[a]	.092	.074	1.38674	.092	5.163	3	153	.002	
2	.723[b]	.523	.504	1.01496	.431	45.205	3	150	<.001	
3	.743[c]	.552	.528	.98996	.029	4.836	2	148	.009	2.264

a. Predictors: (Constant), Hoelang gebruik je al mobiele gezondheidsapps?, Gender_Binary, Tot welke leeftijdsgroep behoor je?

b. Predictors: (Constant), Hoelang gebruik je al mobiele gezondheidsapps?, Gender_Binary, Tot welke leeftijdsgroep behoor je?, dummy_neutraal, Zscore(Sum_LoC), dummy_negatief

c. Predictors: (Constant), Hoelang gebruik je al mobiele gezondheidsapps?, Gender_Binary, Tot welke leeftijdsgroep behoor je?, dummy_neutraal, Zscore(Sum_LoC), dummy_negatief, Interaction_Neutr, Interaction_Neg

d. Dependent Variable: AvoidScore

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	29.788	3	9.929	5.163	.002[b]
	Residual	294.226	153	1.923		
	Total	324.015	156			
2	Regression	169.492	6	28.249	27.422	<.001[c]
	Residual	154.522	150	1.030		
	Total	324.015	156			
3	Regression	178.971	8	22.371	22.827	<.001[d]
	Residual	145.043	148	.980		
	Total	324.015	156			

a. Dependent Variable: AvoidScore

b. Predictors: (Constant), Hoelang gebruik je al mobiele gezondheidsapps?, Gender_Binary, Tot welke leeftijdsgroep behoor je?

c. Predictors: (Constant), Hoelang gebruik je al mobiele gezondheidsapps?, Gender_Binary, Tot welke leeftijdsgroep behoor je?, dummy_neutraal, Zscore (Sum_LoC), dummy_negatief

d. Predictors: (Constant), Hoelang gebruik je al mobiele gezondheidsapps?, Gender_Binary, Tot welke leeftijdsgroep behoor je?, dummy_neutraal, Zscore (Sum_LoC), dummy_negatief, Interaction_Neutr, Interaction_Neg

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients			95,0% Confidence Interval for B		Correlations			Collinearity Statistics	
		B	Std. Error	Beta	t	Sig.	Lower Bound	Upper Bound	Zero-order	Partial	Part	Tolerance	VIF
1	(Constant)	2.565	.344		7.457	<.001	1.885	3.245					
	Gender_Binary	.121	.226	.042	.534	.594	-.326	.568	-.015	.043	.041	.962	1.040
	Tot welke leeftijdsgroep behoor je?	.209	.054	.306	3.887	<.001	.103	.315	.291	.300	.299	.961	1.041
	Hoelang gebruik je al mobiele gezondheidsapps?	-.070	.069	-.080	-1.022	.308	-.206	.065	-.046	-.082	-.079	.979	1.022
2	(Constant)	2.462	.303		8.128	<.001	1.863	3.060					
	Gender_Binary	.173	.166	.060	1.043	.299	-.155	.502	-.015	.085	.059	.956	1.046
	Tot welke leeftijdsgroep behoor je?	.040	.042	.059	.952	.342	-.043	.124	.291	.078	.054	.825	1.212
	Hoelang gebruik je al mobiele gezondheidsapps?	-.010	.051	-.011	-.198	.843	-.110	.090	-.046	-.016	-.011	.958	1.043
	Zscore(Sum_LoC)	-.892	.091	-.619	-9.823	<.001	-1.071	-.713	-.692	-.626	-.554	.801	1.249
	dummy_negatief	.693	.208	.235	3.341	.001	.283	1.103	.371	.263	.188	.641	1.559
	dummy_neutraal	.153	.209	.050	.731	.466	-.261	.567	-.182	.060	.041	.675	1.481
3	(Constant)	2.412	.296		8.150	<.001	1.827	2.997					
	Gender_Binary	.226	.164	.079	1.385	.168	-.097	.550	-.015	.113	.076	.938	1.066
	Tot welke leeftijdsgroep behoor je?	.028	.042	.041	.666	.507	-.055	.110	.291	.055	.037	.809	1.237
	Hoelang gebruik je al mobiele gezondheidsapps?	-.001	.050	-.001	-.011	.992	-.099	.098	-.046	-.001	-.001	.947	1.056
	Zscore(Sum_LoC)	-.816	.185	-.566	-4.408	<.001	-1.181	-.450	-.692	-.341	-.242	.184	5.449
	dummy_negatief	.657	.204	.223	3.228	.002	.255	1.060	.371	.256	.178	.634	1.577
	dummy_neutraal	.055	.211	.018	.261	.795	-.362	.473	-.182	.021	.014	.631	1.585
	Interaction_Neg	-.264	.215	-.142	-1.227	.222	-.689	.161	-.638	-.100	-.067	.225	4.443
	Interaction_Neutr	.423	.269	.123	1.569	.119	-.110	.955	-.162	.128	.086	.489	2.044

a. Dependent Variable: AvoidScore

8.5.7.3. MRA Confrontative Coping

Model Summary[d]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics					Durbin-Watson
					R Square Change	F Change	df1	df2	Sig. F Change	
1	.280[a]	.078	.060	1.23540	.078	4.338	3	153	.006	
2	.421[b]	.177	.145	1.17871	.099	6.024	3	150	<.001	
3	.453[c]	.206	.163	1.16621	.028	2.616	2	148	.076	1.812

a. Predictors: (Constant), Hoelang gebruik je al mobiele gezondheidsapps?, Gender_Binary, Tot welke leeftijdsgroep behoor je?

b. Predictors: (Constant), Hoelang gebruik je al mobiele gezondheidsapps?, Gender_Binary, Tot welke leeftijdsgroep behoor je?, dummy_neutraal, Zscore(Sum_LoC), dummy_negatief

c. Predictors: (Constant), Hoelang gebruik je al mobiele gezondheidsapps?, Gender_Binary, Tot welke leeftijdsgroep behoor je?, dummy_neutraal, Zscore(Sum_LoC), dummy_negatief, Interaction_Neutr, Interaction_Neg

d. Dependent Variable: ConfrontScore

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	19.863	3	6.621	4.338	.006[b]
	Residual	233.511	153	1.526		
	Total	253.374	156			
2	Regression	44.971	6	7.495	5.395	<.001[c]
	Residual	208.403	150	1.389		
	Total	253.374	156			
3	Regression	52.087	8	6.511	4.787	<.001[d]
	Residual	201.287	148	1.360		
	Total	253.374	156			

a. Dependent Variable: ConfrontScore

b. Predictors: (Constant), Hoelang gebruik je al mobiele gezondheidsapps?, Gender_Binary, Tot welke leeftijdsgroep behoor je?

c. Predictors: (Constant), Hoelang gebruik je al mobiele gezondheidsapps?, Gender_Binary, Tot welke leeftijdsgroep behoor je?, dummy_neutraal, Zscore (Sum_LoC), dummy_negatief

d. Predictors: (Constant), Hoelang gebruik je al mobiele gezondheidsapps?, Gender_Binary, Tot welke leeftijdsgroep behoor je?, dummy_neutraal, Zscore (Sum_LoC), dummy_negatief, Interaction_Neutr, Interaction_Neg

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients			95,0% Confidence Interval for B		Correlations			Collinearity Statistics	
		B	Std. Error	Beta	t	Sig.	Lower Bound	Upper Bound	Zero-order	Partial	Part	Tolerance	VIF
1	(Constant)	4.152	.306		13.549	<.001	3.547	4.758					
	Gender_Binary	.434	.202	.170	2.154	.033	.036	.832	.201	.172	.167	.962	1.040
	Tot welke leeftijdsgroep behoor je?	-.118	.048	-.195	-2.459	.015	-.212	-.023	-.225	-.195	-.191	.961	1.041
	Hoelang gebruik je al mobiele gezondheidsapps?	-.016	.061	-.020	-.257	.797	-.136	.105	-.023	-.021	-.020	.979	1.022
2	(Constant)	4.327	.352		12.301	<.001	3.632	5.022					
	Gender_Binary	.424	.193	.166	2.196	.030	.042	.805	.201	.177	.163	.956	1.046
	Tot welke leeftijdsgroep behoor je?	-.050	.049	-.082	-1.008	.315	-.147	.048	-.225	-.082	-.075	.825	1.212
	Hoelang gebruik je al mobiele gezondheidsapps?	-.046	.059	-.059	-.785	.434	-.163	.070	-.023	-.064	-.058	.958	1.043
	Zscore(Sum_LoC)	.385	.105	.302	3.648	<.001	.176	.593	.354	.285	.270	.801	1.249
	dummy_negatief	-.322	.241	-.124	-1.336	.183	-.798	.154	-.148	-.108	-.099	.641	1.559
	dummy_neutraal	-.355	.243	-.131	-1.458	.147	-.835	.126	.006	-.118	-.108	.675	1.481
3	(Constant)	4.364	.349		12.516	<.001	3.675	5.053					
	Gender_Binary	.389	.193	.153	2.020	.045	.008	.770	.201	.164	.148	.938	1.066
	Tot welke leeftijdsgroep behoor je?	-.042	.049	-.070	-.857	.393	-.139	.055	-.225	-.070	-.063	.809	1.237
	Hoelang gebruik je al mobiele gezondheidsapps?	-.057	.059	-.074	-.978	.329	-.173	.059	-.023	-.080	-.072	.947	1.056
	Zscore(Sum_LoC)	.436	.218	.342	1.999	.047	.005	.867	.354	.162	.146	.184	5.449
	dummy_negatief	-.279	.240	-.107	-1.162	.247	-.753	.195	-.148	-.095	-.085	.634	1.577
	dummy_neutraal	-.241	.249	-.089	-.970	.334	-.733	.251	.006	-.079	-.071	.631	1.585
	Interaction_Neg	.079	.254	.048	.311	.756	-.422	.580	.375	.026	.023	.225	4.443
	Interaction_Neutr	-.519	.317	-.172	-1.637	.104	-1.146	.107	-.019	-.133	-.120	.489	2.044

a. Dependent Variable: ConfrontScore

8.5.8. Pilot Study

Ambivalence manipulation check items:

Reliability Statistics

Cronbach's Alpha	N of Items
.872	4

Item-Total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
MC_9 In hoeverre ben je het eens of oneens met de volgende uitspraken over de app? - Ik had het gevoel dat de app mij dwong dingen te doen die ik op dat moment niet wilde doen	6.68	7.983	.593	.566
MC_7 In hoeverre ben je het eens of oneens met de volgende uitspraken over de app? - Ik had het gevoel dat de app mijn leven probeerde te controleren	7.12	7.319	.541	.626
MC_5 In hoeverre ben je het eens of oneens met de volgende uitspraken over de app? - De app gaf mij een negatief gevoel	6.26	8.261	.485	.690

Negative manipulation check items:

Reliability Statistics

Cronbach's Alpha	N of Items
.717	3

Item-Total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
MC_9 In hoeverre ben je het eens of oneens met de volgende uitspraken over de app? - Ik had het gevoel dat de app mij dwong dingen te doen die ik op dat moment niet wilde doen	6.68	7.983	.593	.566
MC_7 In hoeverre ben je het eens of oneens met de volgende uitspraken over de app? - Ik had het gevoel dat de app mijn leven probeerde te controleren	7.12	7.319	.541	.626
MC_5 In hoeverre ben je het eens of oneens met de volgende uitspraken over de app? - De app gaf mij een negatief gevoel	6.26	8.261	.485	.690

One-way ANOVA:

ANOVA

		Sum of Squares	df	Mean Square	F	Sig.
AmbiMC	Between Groups	.063	2	.031	.012	.988
	Within Groups	86.267	32	2.696		
	Total	86.330	34			
NegMC	Between Groups	5.867	2	2.934	1.844	.175
	Within Groups	50.908	32	1.591		
	Total	56.775	34			

8.5.9. One-sample t-test

One-sample t-test for Coping, Locus of Control and Realism Check:

One-Sample Test

	Test Value = 4						
	t	df	Significance One-Sided p	Significance Two-Sided p	Mean Difference	95% Confidence Interval of the Difference Lower	95% Confidence Interval of the Difference Upper
ConfrontScore	-.209	156	.417	.835	-.02123	-.2221	.1797
AvoidScore	-9.119	156	<.001	<.001	-1.04883	-1.2760	-.8216
Sum_LoC	15.804	156	<.001	<.001	1.17580	1.0288	1.3228
Hoe makkelijk of moeilijk was het om jezelf in deze situatie in te leven?	14.891	156	<.001	<.001	1.471	1.28	1.67

One-Sample Effect Sizes

		Standardizer[a]	Point Estimate	95% Confidence Interval Lower	Upper
ConfrontScore	Cohen's d	1.27444	-.017	-.173	.140
	Hedges' correction	1.28061	-.017	-.172	.139
AvoidScore	Cohen's d	1.44119	-.728	-.903	-.551
	Hedges' correction	1.44816	-.724	-.898	-.548
Sum_LoC	Cohen's d	.93222	1.261	1.050	1.470
	Hedges' correction	.93673	1.255	1.045	1.463
Hoe makkelijk of moeilijk was het om jezelf in deze situatie in te leven?	Cohen's d	1.238	1.188	.983	1.392
	Hedges' correction	1.244	1.183	.978	1.385

a. The denominator used in estimating the effect sizes.
Cohen's d uses the sample standard deviation.
Hedges' correction uses the sample standard deviation, plus a correction factor.

8.5.10 Paired-sample t-test

Paired Samples Test

		Paired Differences					t	df	Significance One-Sided p	Significance Two-Sided p
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference Lower	Upper				
Pair 1	ConfrontScore - AvoidScore	1.02760	2.23677	.17851	.67498	1.38022	5.756	156	<.001	<.001

Paired Samples Effect Sizes

			Standardizer[a]	Point Estimate	95% Confidence Interval Lower	Upper
Pair 1	ConfrontScore - AvoidScore	Cohen's d	2.23677	.459	.294	.623
		Hedges' correction	2.24760	.457	.293	.620

a. The denominator used in estimating the effect sizes.
Cohen's d uses the sample standard deviation of the mean difference.
Hedges' correction uses the sample standard deviation of the mean difference, plus a correction factor.