BACHELOR THESIS

„If it is bad for me, why does it feel so good?“ – a quantitative study on how Instagram use can influence young adults‘ mental health

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Abstract

Background: Social media use has been steadily rising for decades now, reaching billions of people worldwide. Instagram, one of the most popular social media sites, now reaches a billion people online. The frequency and duration of Instagram use has also been rising exponentially. Most of Instagram's users are between the ages of 18 to 34, so a big part of users is still in their mental developmental phase, and susceptible to social influences. Social media sites like Instagram facilitate social comparisons (SCF) by default. These can have negative effects on people's mental health. Instagram also offers to fulfil some of the users' social needs and offer certain gratifications (U&G framework). Little is known about how the positive impacts and gratifications of social media use can be maximized, while minimizing its pitfalls concerning the mental well-being of the users. **Objective:** Therefore, this study is focused on the effect of young adults' Instagram use duration and frequency on their mental well-being with moderations such as the fulfilment of the needs for self-expression and social connectedness. **Method:** This study was done by using an online questionnaire being answered by 144 young adults between the ages of 18 and 34 (M_{age} = 24.7; 73.7% female). The participants were asked questions about their Instagram use duration and frequency, their mental well-being, their social need fulfilment concerning the needs for self-expression and for social connectedness, as well as their tendency to engage in social comparisons while using Instagram. For the statistical analysis, the statistical analysis program SPSS was used. **Results:** The results of the study at hand show non-significant effects for the main effect of Instagram use duration and frequency on mental well-being, as well as for the moderation effects of the fulfilment of social needs and the tendency to engage in upward social comparison. **Conclusion:** These findings conclude that participants were using Instagram daily and the fulfilment of the social need for self-expression and for social connectedness, as well as the tendency to engage in upward social

comparison are present within the participants experience while using Instagram. However, these results are unable to confirm the proposed hypotheses. **Recommendations:** The insights could be used to facilitate further research and social media campaigns aimed at enhancing users' experience on the platform as much as possible, while effectively mitigating the possible negative effects.

Keywords: Instagram use, mental well-being, social comparison, social needs, social gratifications, social media, Instagram

1. Introduction

Humanities indulgence in social media has been growing exponentially during the past decade. According to information derived from the *Social Media Fact Sheet* (2023), over 70% of American adults are active users on one or more social media platforms. This indicates a steep rise from the formerly recorded 5% of American adults using social media actively in 2005. This increase in people's social media use is even more apparent among individuals of the younger generations: a whopping 90% of young adults between the ages of 18 to 29 are actively using social media nowadays (Social Media Fact Sheet, 2023). Because of this rapid growth of interest in the topic of social media use, many social media sites, Instagram especially, have seen a major increase in their popularity as a platform, company, and brand. As of now, Instagram has been able to reach over 1 billion active users per month, making it one of the largest, and most influential social media sites ever, globally (Insider Intelligence, 2022). Unsurprisingly, in connection to the recent increase in public interest in social media use, most active Instagram users still are young adults between the ages of 18 and 34 years (We Are Social, DataReportal & Meltwater, 2023). This period in life, especially the years between the age of 18 and 25, is crucial for the development of self-concept, as well as for shaping one's personal identity (Fullwood et al., 2016). Given the substantial role that social media platforms play in the daily lives of young adults nowadays, there is an understandable and well-motivated, ever-growing interest in gaining answers to the question of how social media use can affect users' psychological well-being negatively and/or positively (Lin et al., 2016). Furthermore, any insights into this question have the potential greatly influence the way we understand the short-term and long-term effects of prolonged Instagram use. Consequently, this additional knowledge will also impact and shape the way social media platforms will be designed, used, and legally limited for future generations of influencers and the influenced alike.

Even though social media platforms, such as Instagram, offer users a platform aimed at connecting and sharing information with other users, research has shown that excessive use of social media has the potential to lead to negative consequences for users' mental health. These consequences can include symptoms of increased anxiety, depression, and damaging social comparison (Fardouly et al., 2018; Kircaburun et al., 2019; Woods & Scott, 2016). In contrast, in certain contexts, social media

use can also have a positive effect on users' mental well-being, such as providing social support and positive feedback to the user (Liu et al., 2018; Wang et al., 2019). To gain a more thorough understanding of young adults' use of Instagram, researchers have employed the Uses and Gratification (U&G) framework numerous times. This specific approach posits that users are actively seeking out certain media to satisfy some of their specific (social) needs, such as *social connection* or *self-expression* (Katz, Blumler, & Gurevitch, 1973). Furthermore, the U&G framework has been used to explain how young adults use Instagram to *enhance their social capital* and *personal identity* (Zhao, Grasmuck, & Martin, 2008). For instance, Instagram users are usually posting photos and videos that align with their desired self-image, and they actively follow and interact with others and consume their content to build social connections and garner feedback (Dhir, Pallesen, Torsheim, & Andreassen, 2017).

Additionally, another framework that has been used to explain young adults' social media use is the Social Comparison Theory (SCT). This theory postulates that individuals evaluate their own abilities, opinions, and social standing by comparing themselves to others (Festinger, 1954). Young adults oftentimes use Instagram to engage in social comparison by following and comparing themselves with other users' profiles and their posted content (Chua & Chang, 2016). On one hand, this comparison may be *upward*, where users compare themselves to those who they perceive as *better off*. On the other hand, the comparison may be *downward*, meaning the users compare themselves to those who they perceive as *worse off*. Both forms of comparison can impact users' self-esteem, with especially the *upward* comparison oftentimes leading to negative emotions (Vogel, Rose, Okdie, Eckles, & Franz, 2015). The Social Comparison theory entails that people have an innate drive to evaluate their abilities, opinions, and social status by comparing themselves to others in their desired or actual social circles. *Upward social comparison* describes the process of comparing oneself to others who are perceived to be better off. On the other hand, *downward social comparison* involves comparing oneself to those who are perceived to be worse off. Social media, particularly Instagram, provides a platform with highly visual media for users to engage in both types of social comparison, upward and downward. In consequence, this can have both positive and negative effects on the users' mental well-being. As described in research done by Vogel et al. (2015), *upward social comparison* can invoke feelings of

envy, low self-esteem, and depression, in some people. While *downward social comparison* can provide a sense of social support and even improve one's self-esteem. (Vogel et al., 2015; Nesi & Prinstein, 2015). Hence, understanding the social factors that influence the effects that social comparison can have on an individual's mental well-being is necessary for improving the mental well-being of young adults who use social media, like Instagram, actively over an extended period.

Contrastingly, the Uses and Gratification (UG) framework explains that individuals actively choose to make use of certain media to fulfill their specific needs and desires, such as the formerly mentioned social needs of *self-expression* and *social connection* (Katz, Blumler, & Gurevitch, 1973) as well as the need to *enhance* their *social capital* and *personal identity* (Zhao, Grasmuck, & Martin, 2008) as well as simple *entertainment*. Similarly, like described in the SCT, the satisfaction of these social needs derived from the U&G framework can potentially affect people's mental well-being positively by, for example providing a sense of belonging and connectedness. Nevertheless, excessive social media use motivated by the aim to fulfill these needs, and especially failing to fulfill them at all, can evoke negative outcomes, such as engagement in downward social comparison, addiction, as well as a decrease in individual's life satisfaction (Song, LaRose, Eastin, & Lin, 2004).

The concept of psychological well-being (PWB) in people can be defined as a multidimensional concept, including both positive and negative aspects of an individual's mental well-being and their psyche (Ryff, 1989). The increasing number of research publications of the past decade connected to the topic have shown the growing interest in figuring out the relationship between the psychological well-being of young adults and their time spent on social media. On one hand, most studies have, unsurprisingly, concluded that social media use is associated with negative symptoms of mental well-being, such as feelings of depression and anxiety (Lin et al., 2016). On the other hand, there is also a good number of studies that have found that social media use can indeed have a positive impact on mental well-being (Faelens et al., 2022). According to research done by Faelens et al. (2022), spending time on social media can have a positive impact on a user's mental well-being by facilitating emotions of social support, connectedness, and self-expression. Nevertheless, the prevalent and negative effects seem to be enough cause for great concern, however, it must be mentioned that overall research findings are mixed for due reason, even though the general societal consensus suggests otherwise. Surprisingly,

some studies have even found little to no association between time spent on social media and mental health outcomes. For example, a large-scale study done by Twenge & Campbell (2018) only found a small but significant negative association between screen time and mental well-being scores. However, this association was only found to be true for individuals who spent more than 2 hours per day on social media (Twenge & Campbell, 2018), which is much more time spent in one sitting than the average user reaches on social media sites like Instagram.

In order to further explore the relationship between time spent on social media and mental well-being, the needs and gratifications derived from the UG framework, such as social interaction, entertainment, and information seeking, can be used to predict the positive effects of social media use on mental well-being. However, excessive social media use to fulfill these needs can lead to negative effects on mental well-being, such as increased feelings of loneliness and depression. Similarly, upward and downward social comparison on Instagram can have both positive and negative effects on mental well-being, as it can lead to either inspiration and motivation or feelings of inadequacy and low self-esteem. (Chou & Edge, 2012; Kim & Lee, 2011; Vogel et al., 2015; Wang et al., 2019).

Combining the Uses and Gratification (UG) framework and Social Comparison (SC) theory can address the research gap in the field of communication. This research gap encompasses the understanding of to what extent Instagram use affects mental health, and how these effects are moderated by the satisfaction of needs that drive social media use in the first place (in this case: Instagram) and the direction and frequency of the experienced social comparison. Previous studies have either used the UG or SC framework separately, failing to provide a comprehensive understanding of how these factors interact. By combining both frameworks, this research aims to answer the following questions:

(1) "How does the time spent on Instagram affect young adults' psychological well-being?"

(2) "How does the fulfillment of the needs for *self-expression* and for *social connectedness* moderate the effect of time spent on Instagram on young adults' psychological well-being?"

(3) "To what extent is a tendency towards downward social comparison moderating the effect of the relationship between time spent on Instagram and young adults' mental health?"

2. Theoretical Framework

For this current research, the main concepts of psychological well-being, the amount of Instagram use, upward and downward social comparison, and the need for self-expression and social connectedness that drives social media use will be explained. Moreover, the proposed hypotheses for the current research will be introduced.

2.1 Mental well-being

The concept of mental well-being is, and has always been, an essential part of gaining an understanding individuals' overall psychological health and resulting quality of life. Over time, researchers have worked on expanding and nuancing their perception of mental well-being, recognizing its multidimensional nature beyond the absence of mental illness. With this change in approaching the concept of mental well-being it is evident that the professional understanding and the scientific definition of mental well-being has changed greatly until today. Initially, mental well-being was primarily associated with and explained by the mere absence of mental health problems and mental disorders. However, research in the social sciences has broadened this perspective, acknowledging that mental well-being encompasses positive psychological functioning and overall life satisfaction as well. The earlier studies researching individuals' mental well-being examined the relationship with subjective well-being and self-acceptance (Ryff & Keyes, 1995; Diener, 1984). Studies like these laid the foundation for a more comprehensive and inclusive understanding of mental well-being.

In modern times, mental well-being is generally defined as a state of positive mental health, encompassing emotional, psychological, and social well-being. Behavior-wise, it involves the ability to cope with stress, maintain satisfying relationships, the experience of positive emotions, and achievement of personal fulfillment (World Health Organization, 2022). For instance, Diener and Ryan (2009) finally highlighted the importance of subjective well-being and psychological well-being, emphasizing individual happiness and psychological growth during the beginning of the new

millennium. These reforms in defining mental well-being taking so long can be explained to a large part since measuring mental well-being is challenging because of the concept being highly subjective in nature. However, over time, various assessment tools have been developed to capture its multidimensional aspects. One widely used and validated scale is the Warwick-Edinburgh Mental Well-being Scale (WEMWBS), which is a self-report questionnaire designed to assess mental well-being across several domains (Tennant et al., 2007). The WEMWBS incorporates concepts such as positive affect, satisfying relationships, and personal accomplishment in order to make an objective assessment of an individual's mental well-being across multiple domains. It assesses several key concepts that contribute to an individual's overall well-being. The WEMWBS has been widely used in past research due to its strong psychometric properties and its ability to capture multiple dimensions of mental well-being. Its validity has been demonstrated through various studies that have shown positive correlations with measures of psychological well-being, life satisfaction, and happiness (Tennant et al., 2007; Stewart-Brown et al., 2009). The scale's internal consistency and test-retest reliability further support its validity and usefulness in measuring mental well-being over time (Tennant et al., 2007).

Consequently, the multidimensional nature of the WEMWBS allows researchers to obtain a comprehensive assessment of mental well-being, considering emotional, social, and personal aspects. By capturing these dimensions, the scale provides a more nuanced understanding of an individual's overall well-being. The WEMWBS has been employed in various research contexts, including population surveys, clinical studies, and intervention evaluations, enabling researchers to explore the impact of different factors and interventions on mental well-being (Tennant et al., 2007; Stewart-Brown et al., 2009). Its wide usage and proven psychometric properties further underline its validity and usefulness in past research. Overall, the Warwick-Edinburgh Mental Well-being Scale (WEMWBS) has demonstrated its validity and usefulness in measuring mental well-being through its inclusion of concepts such as positive affect, satisfying relationships, and personal accomplishment. Its strong psychometric properties and multidimensional nature have made it a valuable tool for researchers investigating mental well-being in various populations and contexts.

Concluding it can be said that mental well-being is a complex and multidimensional concept that has evolved in its understanding within the field of social sciences. Researchers have expanded

their perception, recognizing the significance of positive psychological functioning and overall life satisfaction. The measurement of mental well-being, exemplified by the WEMWBS, allows researchers to assess its various dimensions. However, due to its subjective and broad nature, mental well-being remains challenging to define and measure comprehensively.

2.2 Social Media use

Numerous studies have investigated the association between social media use and mental health outcomes among young adults. For instance, Hunt et al. (2018) found a positive relationship between excessive social media use and symptoms of depression and anxiety. Similarly, Uram and Skalski (2020) reported a significant link between time spent on social media platforms and increased feelings of loneliness and decreased self-esteem. These findings are consistent with the broader body of research, revealing common trends of negative psychological consequences associated with high social media use.

However, over time research showed, just like the findings of Przybylski and Weinstein (2017), that the relationships between digital screen-time and mental well-being is non-linear and that a moderate amount of screen-time is not harmful to one's mental well-being. Furthermore, it is feasible that digital media, used in moderate amounts, could present measurable benefits to adolescents. The benefits described could include outlets for creativity, development, and communication (Granic, Lobel, & Engels, 2014). For example, popular games like Minecraft provide a context for socializing and creativity (Nguyen, 2016).

Prolonged or excessive social media use has been linked to decreased mental well-being among young adults. One explanation is the social comparison theory (Festinger, 1954), which suggests that individuals engage in upward social comparisons when exposed to idealized representations on social media. This can lead to negative self-perception and lower self-esteem (Vogel et al., 2015). Moreover, the Fear of Missing Out (FOMO) phenomenon has been identified as a consequence of excessive social media use, contributing to increased anxiety and decreased life satisfaction (Dempsey et al., 2019).

These explanations are supported by empirical evidence, emphasizing the detrimental impact of excessive social media use on mental well-being.

Overall, understanding the relationship between social media use and mental well-being is an important area of research, given the widespread use of social media among young adults and the potential impact it can have on their mental health. Numerous studies in the past have investigated the association between social media use and mental health outcomes among young adults. Some research suggests that excessive social media use is associated with negative mental health outcomes, including increased levels of depression, anxiety, and loneliness (Lin et al., 2016; Primack et al., 2017). However, it is crucial to consider the specific social media platforms used, as they differ in their content and functionality, and their subsequent effect on mental health.

Instagram, the world's most popular image-sharing platform, is particularly relevant for studying the relationship between social media use and mental well-being among young adults. Instagram's emphasis on visual content and self-presentation allows for unique comparisons and influences self-perception (Perloff, 2014). As previously mentioned, research by Hunt et al. (2018) demonstrated that Instagram use was associated with higher levels of depressive symptoms and body dissatisfaction. Moreover, Fardouly et al. (2018) found that exposure to idealized body images on Instagram led to increased negative affect and appearance dissatisfaction. These findings highlight the relevance and suitability of Instagram as a platform for investigating the impact of social media use on mental well-being.

Based on past research, it is expected that the relationship between time spent on Instagram and mental well-being is negative. The constant exposure to carefully curated and idealized content can foster negative self-comparisons, leading to decreased self-esteem and psychological well-being (Krasnova et al., 2013). However, it is essential to acknowledge that social moderating factors, such as social support and meaningful interactions, can mitigate the negative effects of Instagram use on mental well-being (Chou & Edge, 2012).

In conclusion, the relationship between social media use, specifically excessive use, and mental well-being among young adults is a complex and multifaceted phenomenon. Research consistently demonstrates a negative correlation between excessive social media use and mental well-being

outcomes, including depression, anxiety, loneliness, and decreased self-esteem. Instagram, with its visual focus and impact on self-perception, provides an appropriate context for investigating this relationship. Therefore, the following is proposed as a first hypothesis:

H1: The amount of time spent on Instagram negatively affects young adults' mental well-being.

Further research is necessary to fully understand the mechanisms underlying the relationship between social media use and mental well-being, as well as the role of social moderating factors. Understanding these dynamics can inform interventions and strategies to promote healthy social media use.

It is important to understand which social mediators affect the relationship between social media use and mental well-being among young adults who are digital natives. The complex nature of social media use and its impact on mental health necessitates a nuanced understanding of the factors that mediate the relationship between the two. For instance, research has shown that frequent and continuous upward social comparison on social media can lead to decreased self-esteem and increased anxiety, while downward social comparison can lead to improved mood and self-esteem (Vogel et al., 2015). Additionally, the Uses and Gratifications framework highlights the importance of social needs and gratifications in shaping social media use, suggesting that factors such as social interaction and self-expression can have significant effects on mental well-being (Sheldon, Abad, & Hinsch, 2011). Understanding these mediating social factors can help inform interventions and policies aimed at promoting positive mental health outcomes among young adults who use social media.

The Uses and Gratification (U&G) framework and the Social Comparison framework (SCF) are two well-established theoretical perspectives that have been used to explain the relationship between social media use and mental well-being. While the U&G framework focuses on the reasons why individuals use social media and the gratifications they derive from it, the SCF focuses on the role of social comparison in shaping individuals' psychological outcomes. Combining these two frameworks may offer a more comprehensive understanding of the moderating social factors influencing the relationship between social media use and mental well-being.

According to the U&G framework, social needs and gratifications drive individuals to use social media. These social needs include social interaction, self-expression, entertainment, and education. Social media use can satisfy these needs and provide individuals with a sense of social connectedness and support. However, the SCF suggests that social comparison may influence individuals' psychological outcomes. Social comparison can be upward, where individuals compare themselves to those they perceive as better off, or downward, where individuals compare themselves to those they perceive as worse off. Upward social comparison can lead to negative outcomes such as envy, jealousy, and low self-esteem, while downward social comparison can lead to positive outcomes such as gratitude and increased self-esteem.

2.3 The moderating role of Social Comparison (SCF)

The complex nature of social media use and its impact on mental health necessitates a nuanced understanding of the factors that mediate the relationship between the two. The Social Comparison framework (SCF) is a theoretical perspective that suggests that individuals engage in social comparison processes to evaluate their own abilities and attributes by comparing themselves to others (Festinger, 1954). One framework, aiming to explain and conceptualize these processes of social comparison and their effects is the Social Comparison framework. It has been known for a long time, that social media use has been associated with increased social comparison processes, which may ultimately have negative effects on individuals' mental well-being (Vogel et al., 2015). According to the SCF, social comparison can happen as upward or downward comparisons, which can result in positive or negative affective responses, respectively (Wood, 1989).

2.3.1 Upward Social Comparison

Past research has shown that social media use is associated with increased upward social comparisons and can consequently have negative effects on individuals' mental well-being (Vogel et al., 2015). *Upward social comparisons*, are social comparisons in which individuals compare themselves to others who are perceived as *better off*. This can lead to negative affective responses, such

as feelings of envy, jealousy, and low self-esteem (Festinger, 1954). According to Festinger's (1954) social comparison theory, individuals compare themselves with others to evaluate their own abilities and opinions. However, this is hardly achievable in the context of social media. This is because social media platforms, and especially Instagram, almost always present an idealized version of individuals' lives, which often leads to inaccurate and skewed social comparison processes that ultimately result in negative affective responses (Haferkamp & Kramer, 2011). Furthermore, it was shown in previous research that individuals who engage in more frequent social media use have been more vulnerable to the resulting negative effects of social comparison processes (Vogel et al., 2015).

Upward social comparison, specifically in the context of Instagram use, has been found to have negative implications for young adults' mental health. Firstly, research by Perloff (2014) revealed that exposure to idealized images on Instagram led to increased body dissatisfaction and lowered self-esteem among young adults, as they compare their own appearance to the carefully curated and filtered images of others. Secondly, Krasnova et al. (2013) found that upward social comparison on social media platforms, such as Instagram, can lead to feelings of envy and depression as individuals perceive their own lives as less successful or fulfilling compared to their peers. Lastly, the study by Vogel et al. (2015) indicated that frequent engagement in upward social comparison on Instagram was associated with higher levels of anxiety and decreased life satisfaction among young adults.

These findings collectively highlight the detrimental impact of upward social comparison on young adults' mental well-being when using Instagram as a platform for comparison and allow us to formulate the following hypothesis for the current study:

H2: The tendency of engaging in upward social comparison moderates the effect between Instagram use and mental well-being.

2.3.2. Downward Social Comparison

Downward social comparisons, in which individuals compare themselves to others who are perceived as *worse off*. This can lead to positive affective responses, such as gratitude and self-enhancement (Wood, 1989). Engaging in downward social comparison is the tendency of individuals

to compare themselves to others whom they perceive as less fortunate or less successful. In the context of Instagram use, downward social comparison occurs when users compare themselves to others who appear to be less attractive, less accomplished, or facing more difficulties in life. Research in the past has shown several consequences of frequent downward social comparison on Instagram, particularly for young adults. Most of the results were rather positive effects, compared to the previously explained prevalent effects of upward social comparison.

A study by and Wang et al. (2019) found that engaging in downward social comparison on social media platforms can boost self-esteem and enhance positive affect, as individuals perceive themselves as better off than others. Even if their self-esteem is usually quite low. This positive effect can contribute to improved mental well-being. Furthermore, Tandoc et al. (2015) and Vogel et al. (2015) discovered that engaging in downward social comparison on Instagram can decrease feelings of envy and depression, as individuals compare themselves to less successful peers. This can alleviate social comparison-induced stress and improve overall psychological health.

Another study by Appel et al. (2016) demonstrated that downward social comparison can lead to increased feelings of gratitude and empathy, fostering a positive and supportive online community. This positive effect on mental struggles is especially relevant for young adults on Instagram, as they often experience pressures related to body image, success, and social acceptance. Engaging in downward social comparison can provide a counterbalance to upward comparisons for these young adults, offering inspiration, gratitude, and a healthier perspective on one's own life. Concluding, it is important to note that while downward social comparison can have positive effects, it is crucial for individuals to maintain a balanced perspective and avoid excessive comparison in either direction, *downward* or *upward.*

2.4. Uses and Gratifications framework (U&G)

The Uses and Gratifications (U&G) framework is another theoretical perspective that seeks to explain why individuals use media, such as social media, and what gratifications they derive from it (Ruggiero, 2000). The Uses and Gratifications (U&G) framework was introduced by social scientists Elihu Katz, Jay Blumler, and Michael Gurevitch in the late 1970s. The framework originated as a

response to the limitations of traditional media effects research, which focused primarily on the effects of media on audiences without considering the active role of individuals in media consumption. The U&G framework shifted the focus to understanding why and how individuals use media, emphasizing the gratifications or psychological needs that media fulfill for users. According to Katz, Blumler, and Gurevitch (1974), the framework aimed to examine the active and goal-directed nature of media consumption, highlighting the importance of audience agency and their choices in seeking specific gratifications through media use. By studying the motivations behind media consumption, the U&G framework finally provided a more comprehensive understanding of how individuals engage with media and how media fulfill their social, psychological, and entertainment needs. Social media platforms provide a range of functions and opportunities for individuals to fulfill various social needs and gratifications.

2.4.1. The need for and the gratifications of self-expression and social connectedness on Instagram

The Uses and Gratifications (U&G) framework encompasses both *self-expression* and *social connectedness* as key components. These two needs were picked specifically because they are integral parts of young adults' user experience in the context of the digital landscape within the social media platform Instagram. The concept *Self-expression* aligns with the gratification-seeking aspect of the U&G framework, where individuals actively choose and utilize media to fulfill their needs for self-presentation and identity expression. This is supported by research conducted by Wang et al. (2019) and Tiggemann and Slater (2014), which highlight how Instagram serves as a platform for users to curate their profiles, visually communicate their unique identities, and engage in self-presentation strategies. On the other hand, the concept of *social connectedness* corresponds to the social interaction aspect of the U&G framework. Instagram allows users to connect with others, engage in communication, and experience a sense of belonging. Studies by Dhir et al. (2017) and Krasnova et al. (2015) demonstrate how Instagram fulfills users' need for social connectedness by fostering engagement, building social capital, and enhancing a sense of belonging. Overall, the U&G framework

recognizes the role of *self-expression* and *social connectedness* as important motivations that are driving individuals' media use in the first place, as supported by empirical evidence.

The fulfillment of a young adult's need for *self-expression* can play a moderating role in the effect that Instagram use ultimately has on their mental well-being. Instagram provides an excellent platform for self-expression, allowing users to showcase their creativity, interests, and personal experiences. A study by Boyd (2014) noted that social media can provide an opportunity for young adults to explore and experiment with *various* identities, allowing them to gradually construct their sense of self over time. Social media can also be used as a platform for personal branding, where individuals can construct and communicate their personal identities (Marwick, 2013). This has increased in relevance since Instagram has long been proven to also be a lucrative hobby or even a full-blown job opportunity for so-called *influencers*. Additionally, social media like Instagram provides an outlet for private, personal self-expression, enabling young adults to share their thoughts, opinions, and creativity with others (Boyd, 2014). Furthermore, research by Wang et al. (2019) highlights that self-expression on Instagram can positively impact self-esteem. When young adults engage in authentic self-expression through creative content and meaningful interactions, they are more likely to experience positive emotional outcomes and higher levels of life satisfaction. Consequently, keeping this in mind, the following hypothesis can be proposed for the research at hand:

H3: The fulfillment of the need for self-expression moderates the effect that Instagram use has on young adults' mental well-being.

Moreover, *social connectedness* plays a vital role in the well-being of young adults on Instagram. Studies by Dhir et al. (2017) and Krasnova et al. (2015) have shown that social connectedness on Instagram can lead to increased feelings of belonging, social support, and overall psychological well-being. In line with its' namesake, social media provides a platform for users to connect with others, exchange information, and engage in social interactions (Dhir, Chen & Nieminen, 2015). Past research has also shown that social media use is associated with higher levels of social support, increased social connectedness, and decreased loneliness (Nabi, Prestin, & So, 2013). All in

all, it can be said that social media provides an opportunity for individuals to overcome social isolation and to establish and maintain social relationships.

When young adults are able to form meaningful connections, engage in positive social interactions, and experience a sense of community on Instagram, it fulfills their need for *social connectedness* and can buffer against negative mental health outcomes. Similarly, built upon these previous findings the following hypothesis can be proposed as well:

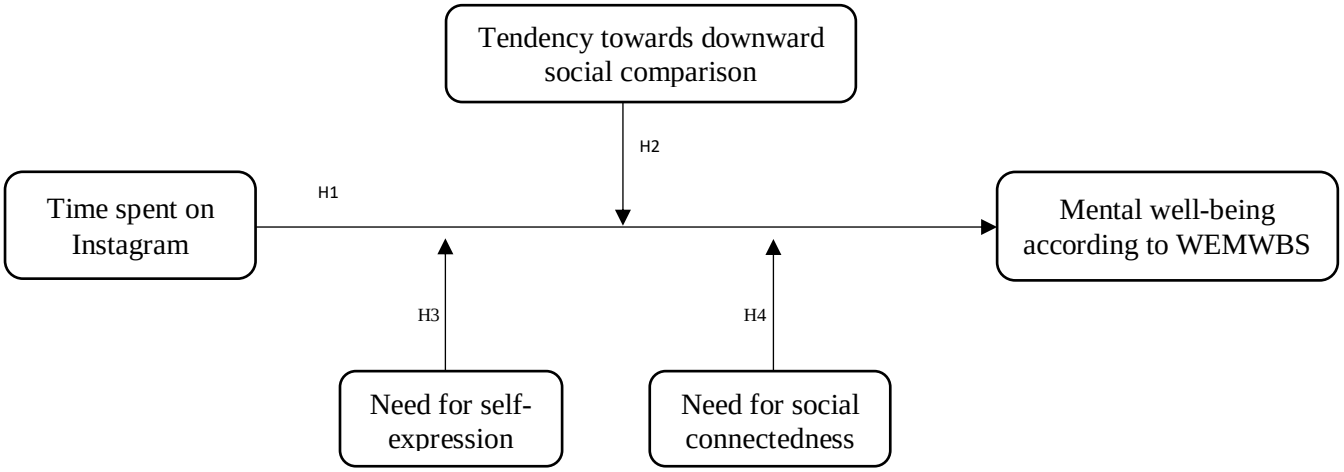
H4: The fulfillment of the need for social connectedness moderates the effect that Instagram use has on young adults' mental well-being.

The combined or solitary fulfillment of *self-expression* and/or *social connectedness* needs can act as protection in the face of potential negative effects of excessive, prolonged Instagram use. Engaging in self-expression and connecting with others who share similar interests and experiences has shown to create a positive and supportive online environment for everybody involved. This is especially relevant for young adults who may face societal pressures, such as body image concerns or social comparison. By utilizing Instagram as a tool for self-expression and connecting with like-minded individuals, young adults could potentially enhance their mental well-being and mitigate potential negative effects.

In summary, the fulfillment of self-expression and social connectedness needs during Instagram use can moderate the resulting impact on young adults' mental well-being. These mentioned factors contribute to positive emotional outcomes, higher levels of life satisfaction, and a sense of belonging. All this ultimately shows how important it is to foster healthy engagement on Instagram. This entails consciously emphasizing and fostering the authentic self-expression and meaningful social interactions, that can promote positive mental well-being among young individuals who spend their time on social media sites like Instagram.

Figure 1

A Hypothesized Model of the Relationship Between Time Spent on Instagram and Mental Well-being



3 Method

3.1. Design

This study was a quantitative online survey-based research design. This choice was made with the aim of the research study in mind, as it allowed for examining effects and as well as possible moderation effects. To gather data the most easy and quick way possible, in addition to reaching the widest pool of young adults as quickly as possible were the main drivers behind the decision to design the study this way. Doing the data collection this way it was the most likely outcome that the data would come out to be representative for the whole population of the study. The participants' time spent on Instagram acted as the independent variable of the survey, while the young adults' mental well-being according to the WEMWBS scale was the dependent variable. The expected moderating variables between them were the fulfilment or frustration of the social needs for self-expression and for social connectedness, as well as the tendency towards either upward or social comparison while using Instagram.

3.2. Participants and recruitment

This research's participants who were recruited had to fulfil three criteria in line with the research aims and scope of the study. The first criterion was that they had to be able to read and understand text in the

English language, to understand the surveys' description/introduction, and questions sufficiently. Second, they had to be somewhat active users of the social media site Instagram, meaning they are using Instagram at least "rarely". The third and last criterion for participation in this study was that participants had to be between the ages of 18 and 34. Moreover, it must be said that both males, females, as well as non-binary people were decided to be part of the study, as to make a brief comparison between the gender groups. This research was not focused on differences between gender groups; however, it is an interesting insight to have on top of the already pinpointed aims of this study. Overall, the participants were recruited through convenience sampling for the most part, meaning that the anonymous hyper link was posted and shared via social media like Instagram, Reddit, Twitter, and Facebook, as well as on messaging applications like WhatsApp to reach already known people who fit into the population of this study. In addition to this it can be said that the snowball method was also used, since participants were also asked to share the hyperlink to the study with other possible participants who fit the study's target group.

All in all, the final sample of the online survey included 144 participants since 26 of the recorded answers had to be deleted due to incomplete data. Participants ages ranged from 18 to 34, just as intended, with an average of 24.7 years old (SD = 4.838). The participants' ages were distributed in a way that shows that most answers came from people between the ages of 19 and 24 years old (51% of sample). Therefore, it can be concluded that the sample is not ideally representative for the whole of the intended population. All demographics of the survey sample can be found in Table 1. With 73.7% of the participants being female it is evident the bigger part of participants were women, while 22.9% of participants were male. Consequently, only two participants, meaning 1.7% of participants, prescribed to a third gender or a non-binary identification of gender. Similarly, two people indicated they did not wish to disclose information concerning their gender. Since this study was not limited to gender, due to the fact that it was not designed to detect differences between them in the first place, all participants were considered to be part of the research population of young adults using Instagram somewhat actively. Moreover, regarding the frequency of Instagram use, most participants indicated they are using Instagram daily (79.7%). Similarly, the most common answer concerning the estimated duration of Instagram-use on an average day was 30-60 minutes per day (39%). The two items

concerning the variable of Instagram Use were combined later in the analysis, two proceed with a combined variable indicating only one value for Instagram use by generating the mean score between the original two items' responses.

Table 1

Participants Demographics

Characteristic	N	%
Age		
18-24 (GenZ)	72	60.8%
25-34 (Millenials)	46	40.2%
Gender		
Male	27	22.9%
Female	87	73.7%
Non-binary / Third gender	2	1.7%
Prefer not to say	2	1.7%

3.3. Procedure

The data collection of the online survey took place from the 6th of June until the 24th of June of the year 2023. This study's participants had the possibility to take part in and fill out the online survey from any device, be it mobile (like mobile phone, and laptops) or stationary devices live PCs. Once the survey was published, it was possible for interested participants to fill out the survey during any time of the day, or night respectively.

The survey started with a brief description, which could be seen as a general introduction which consisted of information about the study and its research aims in general, with the goal in mind to not bias the incoming answers made by participants in any way. There was no option for choosing the

language of the questionnaire, as the default and only option was to read, understand, and answer the questions in English. Furthermore, the participants of this study were then informed about their right to withdraw from the study at any given point in time, and that it was a completely voluntary and anonymous choice to participate in the study in the first place. Moreover, the participants received a short briefing concerning the handling of their data. They were informed about the confidentiality of the data collection, and that the data would only be used for the sole purpose of this study and would not be used and/or published in any other way. Once the participants agreed to the previously mentioned terms and were willing to consent to the participation, they were asked to indicate whether they fulfil the criterion of active Instagram use, as well as the criterion of being between the ages of 18 and 34 years old. If the participants' answer was 'no' to any of those two questions, or they did not answer 'yes' for the informed consent, the participants were not able to continue filling out the survey any further. After fulfilling all the necessary criteria and answering 'yes' to the first three questions, the participants were finally able to move on to the next page of the survey, starting the demographic part of questions which also included questions concerning the study's independent variable, namely Instagram-use. The demographic questions started with the participants age, their gender, then their frequency of Instagram-use, and lastly their estimated time spent on Instagram on an average day. The survey followed up with blocks of questions concerning the participant's mental well-being according to the WEMWBS, their social need satisfaction or frustration in connection to their need for social connection and self-expression, and lastly their tendency to make either upward or downward social comparison during Instagram-use. Participation in this study took an average of 5 to approximately 11 minutes and the study was approved by the ethics committee of the University of Twente prior to the start of the data collection.

3.4. Instruments

Every question of the online survey, except for the demographic questions, the questions concerning the participants' Instagram-use, and the last block of questions, contained a form of a 5-point Likert Scale of frequency. The 5 points of choice started with 'None of the time' to 'All of the time'. This kind of scale was chosen in order to make the process of answering the questions as fast, accessible, and easy

for all kinds of participants. Contrastingly, in the last block of questions concerning the participants' tendency to engage in upward or downward social comparison, a simple 10-point scale, with two contrasting attributes associated with each end of the scale, was chosen. This was done because it is the most easy and quick way to establish an understanding for a tendency towards engaging in social comparison with other users and their content while using Instagram. This allowed for a quicker way of answering a relatively extensive set of attribute-questions, after an initial explanation and example. The example question was included in order to eliminate any chance for confusion on part of the participants, and consequently to ensure that the collected data is valuable and actually representative for the study's population. The following part will explain each set of items included in the questionnaire, as well as (if applicable) their origin. The scales on which the items of the survey are based on can be found in Appendix B.

3.4.1. Frequency and duration of Instagram Use

The participants' frequency and duration of Instagram Use was measured by two simple questions. Both questions were part of the 'Demographics' block of the questionnaire. The first question was "Please give an estimation: How often do you use Instagram?". The 5-point Likert Scale consisted of answers ranging from 'Every Day', to 'Several Times a Week', 'Once a Week', 'Several Times a Month', to 'Rarely'. The higher the score on the Likert Scale, the smaller the average estimated number of Instagram uses per month.

3.4.2. Mental Well-Being

The construct "Mental Well-being" was measured by 7 items in total, from which all of them were adopted from the shortened version of the Warwick-Edinburgh Mental Well-being Scale (WEMWBS) (Tennant et al., 2007). The official overview of the seven items, which was received with the official approval to use the scale for this research, can be found in Appendix B. The questionnaire's participants were asked to assess each statement on a 5-point Likert Scale which ranged from 'None of the Time' to 'All of the Time'.

3.4.3. Need for Social Connectedness and Need for Self-expression

The items in the questionnaire meant for measuring the fulfilment of the social need for connectedness and the need for self-expression were taken from the Basic Psychological Need Satisfaction and Frustration measurement scale (Deci & Ryan, 2000). The scale was originally developed, like the name suggests, in order to measure the fulfilment or frustration for basic psychological (social) needs**.** The items were achieved by adapting the most suitable scoring information from the existing original questions in the scale. For measuring "Need for Social Connectedness" were attained by making deliberate changes to the original questions aimed at measuring "Relatedness". In order to measure the fulfilment of the participants' "Need for Self-expression" were loosely adapted from the original scale's questions aimed at measuring "Autonomy". The original list of questions by Deci and Ryan (2000) can be found in Appendix B. Four items each were designed to measure the two social needs' respective frustration and fulfillment. Higher scores meant depending on the question either a higher frustration or higher satisfaction concerning the social need in question: the need for social connectedness, and the need for self-expression.

3.4.4. Upward and Downward Social Comparison

Regarding the measurement of the second to-be-expected moderating variable "Upward and Downward Social Comparison", the items were based on the "Social Comparison Scale" (Allan & Gilbert, 1995). This scale uses a semantic differential methodology and consists of 11 bipolar constructs. The questionnaire's participants are required to make an overall comparison of themselves in relation to other Instagram users' profiles and content, and to rate themselves along a ten-point scale. The original validated scale was a good fit for the research objectives of this study and was therefore adopted in its original form. An overview of the original Social Comparison Scale (Allan & Gilbert, 1995) can be found in Appendix B. The closer the participants rated themselves towards one of the bipolar attributes, indicated for each item whether they expressed a tendency to engage in either downward or upward comparison by rating themselves compared to other Instagram users' profile and content. In the case of this study, higher indications on the 10-point scale indicated a tendency towards engaging in downward social comparisons.

3.5. Pre-testing

Before the final data collection, a pre-test was conducted for gaining an evaluation of whether the items formulated were as understandable as possible, and to get an indication on how long it would take for people to participate in the study by filling out the online survey in question. For the pre-test, just like for the real data collection, the participants were chosen from the research population (between the ages of 18 and 34 years old, an active user of Instagram, able to speak and understand the English language). According to the objective of the pre-testing they were asked to think aloud while filling out the survey, so the researcher would be able to somewhat understand their line of thinking and ease of understanding while answering each set of items. Afterwards the pre-test participants were asked to evaluate their experience and give feedback on the questions presented in the first version of the survey. Five participants filled out the first version of the questionnaire during pre-testing. This led to gaining helpful information on what needed to be changed within the questionnaire to make it as easy and quick to fill out as possible, before beginning the real data collection. Overall, the suggested changes included basic wording changes within single items, but also bigger changes like including an easy-to-understand example question in the last block of questions, for example. The suggestion to use easy to understand English words was also adopted and small changes were made to some of the items. For gaining an understanding of how long the participation in the study would take, pre-test participants were timed while they filled out the online survey, so an overall estimate could be calculated. Consequently, the pre-test showed that the estimated time needed for filling out the survey was around 8 minutes, with 11 minutes at most. This was concluded to be an adequate amount of time needed to be invested while participating in the study. The published, improved version of the questionnaire can be found in Appendix A.

3.6. Data preparation and Analysis

The statistical software SPSS was used with a default level of significance of .05 alpha (Maier & Lakens, 2022) in order to be able to analyze the collected data from the online questionnaire. Those participants who ended up not completing the entire survey, were deleted from the data set. As a result,

as mentioned before, a total of 26 responses were deleted to clean the data set appropriately. Therefore, only 118 responses, out of the total number of 144 responses were useful for the conduction of the data analysis. Additionally, the items measuring dissatisfaction of both social needs were reverse recoded, so they would also measure the degree of overall social need satisfaction, just like the other items of the construct. As a very first step for the analysis process of this dataset, descriptive statistics were calculated. A summarized overview of these descriptive statistics can be found in section XX called "Participants and recruitment". On one hand, for the numerous variables (e.g., age) that can be found in this data set, the mean, standard deviation, as well as the minimum and maximum were calculated. On the other hand, for the categorical variables (e.g., gender, time spent on Instagram, and frequency of Instagram use) the minimum and maximum, as well as the frequency percentages were calculated.

3.6.1. Factor Analysis

As a first step, all 37 questions related to the formerly proposed hypotheses underwent factor analysis, which gave the possibility to measure internal dimensionality, structure, and construct validity using principal components analysis with a Varimax rotation. The Kaiser-Meyer-Olkin (KMO) measure of sampling adequacy amounted to .698, which is above the most commonly recommended value of .5. Additionally, the Barlett's test of sphericity was $p < .001$, which is considered to be significant because the p-value should always be under .05 (Williams et al., 2010). These values together give the insight, that enough data was collected in order to perform the factor analysis. However, the analysis showed 11 factors with an eigenvalue above 1, which is too many constructs as to interpret this outcome in line with the theoretical variables created for measuring the desired effects. For this reason, the amount of factors to be extracted was fixed to 5 prior to running the factor analysis again. This was also further motivated by the fact that only validated scales were adopted in their original form for this research, except for the scale used to measure the satisfaction / dissatisfaction of the two social needs. Especially for this construct some of the items showed low communalities of < .4 and were therefore deleted before running the factor analysis again. A list of the deleted items can be found in Appendix C. After running the factor analysis with a fixed number of 5 factors to be extracted, the KMO measure of sampling adequacy increased to .724 and the Barlett's test of sphericity was with $p < .001$ still significant.

Furthermore, all items except for two were loading in the expected constructs. The two subsequently deleted items are number 7 of the shortened WEMWBS and "I feel like individuals I interact with on Instagram are distant to me". These two questions were excluded, and another factor analysis was run, again with the number of factors to be extracted set to 5. Ultimately it can be said, that as expected there are 5 constructs which can be found in the data. These can be named as the following: (1) Instagram Use; (2) Social Needs Dissatisfaction; (3) Social Needs Satisfaction; (4) Social Comparison; and (5) Mental Well-being. The factor loadings ranged from .449 and .863. Therefore, it can be concluded that all the factor loadings meet the criterion of being above .4 (Williams et al., 2010). The factor loadings in question and the related Cronbach's alphas can be found below in Table 2. Moreover, it can be said that even though some of the factor loadings were quite low compared to others, they never got under the critical value of .4 and they also loaded to only one factor clearly. These were the reasons to include them in further analysis anyway. The constructs in the factor analysis are not the same as the ones used for the analyses. This is due to the fact that satisfactory factor loadings were only achieved when looking at the constructs the items originally measured, before being reverse coded for the further analysis of the data. Otherwise, too many items would have to have been deleted.

3.6.2. Reliability analysis

Next, in order to test the reliability of the constructs, a reliability analysis is done by calculating Cronbach's alpha for each of the 5 dimensions. The common statistical suggestion is to achieve an alpha of >.6 in order to reach sufficient, high reliability. In the case of this study all constructs reached this desired Cronbach's alpha of at least .6, except for one construct: Instagram use. This is highly likely due to the low number of items (2) and is with an alpha of 0.58 in a satisfactory range to the originally desired alpha of 0.6.

Table 2

Cronbach's Alpha and Factor Loadings for all Constructs

Construct	Cronbach's Alpha	Item	Factor loading
Instagram Use	.580	Please give an estimation: How often do you use Instagram?	.676
		Please give an estimation: On average, how long are you using Instagram on a normal day?	.743
Mental Well-being	.769	I have been feeling optimistic about the future.	.677
		I have been feeling useful.	.739
		I have been feeling relaxed.	.553
		I have been dealing with problems well.	.665
		I have been thinking clearly.	.542
		I have been feeling close to other people.	.587
Social Needs Dissatisfaction	.783	I feel excluded from groups of popular people on IG.	.449
		I feel pressured to interact with IG users too much.	.768
		Most of my IG posts & interactions feel like I "have to" make them.	.845
		Answering messages and liking posts on IG feels like an obligation.	.732
		I feel pressured to post on IG.	.863
Social Needs Satisfaction	.790	I feel like the people I interact with on IG care about me.	.768
		I feel close to my own followers and the people I follow.	.751
		I feel a connection to the people I interact with on IG.	.829
		I feel good after using IG to interact with other people.	.682
Social Comparison	.878	Inferior (1) – Superior (10)	.771
		Incompetent (1) – More competent (10)	.763
		Unlikeable (1) – More likeable (10)	.733
		Left out (1) – Accepted (10)	.546
		Untalented (1) – More talented (10)	.748
		Weaker (1) – Stronger (10)	.650
		Insecure (1) – Confident (10)	.576
		Unattractive (1) – More attractive (10)	.607

4. Results

The proposed hypotheses of this study have been tested by performing a linear regression analysis, and two moderation analyses. The results of these mentioned analyses are discussed in the following parts.

4.1. Linear Regression Analysis

Before performing the linear regression analysis, the assumptions of linear regression had to be checked for our model (see Appendix D). The histogram which was used to check for normality of the dependent variable, indeed suggested normality. Furthermore, the Q-Q and P-P plots are close to their comparison lines which indicates that the assumption of normality was met. When looking at the scatterplot of residuals against the observation order, no systematic relationship between the two can be spotted. Consequently, it can be said that also the assumptions of linearity and homoscedasticity were met as well. As a last step, the Durbin-Watson test was used in order to check for the assumption of independence. The calculated Durbin-Watson value was 1.917, indicating that the assumption of independence was met as well.

A Univariate Analysis of Variance (ANOVA) was done, with Mental Health being the dependent variable and Instagram Use being the independent variable. This univariate analysis was done with the aim to test hypothesis H1 ("*The amount of time spent on Instagram negatively affects young adults' mental well-being*."), checking whether Instagram Use explained variance within Mental Health. The model showed non-significant results, with $F(6,109)=1.022$, and $p=.424$. As a conclusion it can be said that there is no significant main effect. Consequently, we have to reject H1 while failing to reject the null hypothesis (*0H1: The time spent on Instagram does not negatively affect young adults' mental well-being)* since there was no significant effect found.

4.2. Moderator analysis

Moderator analyses were conducted to test the proposed hypotheses H2, H3, and H4.

4.2.1. Social Comparison

To check whether hypothesis H2 ("The tendency of engaging in upward social comparison moderates the effect between Instagram use and mental well-being") can be validated or not, a moderator analysis was done. This moderator analysis revealed that there is non-significant (2,115)=.462, p=.750 moderation effect of Social Comparison on the effect between the independent variable *Instagram-use* and the dependent variable *Mental health*. The variable explained only .8% of variation in the dependent variable. Ultimately, this means that the null hypothesis belonging to H2 cannot be rejected and H2 can therefore not be confirmed.

4.2.2. Social Need Fulfilment

In order to test the third hypothesis H3 ("*The fulfillment of the need for self-expression moderates the effect that Instagram use has on young adults' mental well-being.")* and the fourth hypothesis H4 ("*The fulfillment of the need for social connectedness moderates the effect that Instagram use has on young adults' mental well-being.")* of this research two more moderation analyses were conducted.

Both analyses only showed non-significant moderation effects. For the moderating effect of the fulfilment of the need for *self-expression* the values of F(2,115)=.879 and p=.339 indicate a non-significant relationship, resulting in the disability to reject the null-hypothesis of H3. Similarly, for the moderating effect of the fulfilment of the need for *social connectedness* the results F(2,115)=.516 and p=.655 indicated that the null-hypothesis for H4 cannot be rejected.

4.3. Summary of the findings

To summarize the findings of this study, it is clear that the amount and frequency of young adults' Instagram-use is not a significant factor for predicting their mental health. Furthermore, the conducted moderation analyses' results were also inconclusive. This leads to the insight that neither the tendency to make upward social comparisons, nor the fulfilment of the social needs for connectedness and for self-expression affect the relationship between the Instagram-use of young adults and their mental health. All four null hypotheses were failed to be rejected.

5. Discussion

With the following part, the findings of this research's analysis will be discussed with the aim of putting them in the theoretical context of past literature which motivated this study originally. The findings of this study originally aimed to answer the following three research questions:

(1) "How does the time spent on Instagram affect young adults' psychological well-being?"

(2) "How does the fulfillment of the needs for *self-expression* and for *social connectedness* moderate the effect of time spent on Instagram on young adults' psychological well-being?"

(3) "To what extent is a tendency towards downward social comparison moderating the effect of the relationship between time spent on Instagram and young adults' mental health?"

5.1. Theoretical Implications

With the aim of gaining answers to these three questions, a quantitative online survey was performed. This research on one hand had the goal to gather more insights into the relationship between young adults' Instagram use and their mental health. This was motivated by former research which has shown time and time again, that the social mechanisms like social comparison as well as the social needs which drive social media use in the first place can have detrimental effects on social media users mental states. On the other hand, this study also aimed to find out what moderating role the fulfilment of the social need for connectedness and the need for self-expression has on the expected relationship of Instagram use on young adults' mental health. Additionally, the effect of the tendency to engage in upward social comparison on this main relationship between Instagram use and mental health was aimed to be explored.

While the negative effects of social media use have been researched, highlighted and consecutively also communicated much more openly during the last decade of research (see e.g., Lin et al., 2016; Primack et al., 2017), it is also clear that the full scope of social media use's effects on peoples' mental states cannot be sufficiently understood until also the positive effects that social media might have on our brains has been researched as seriously as their negative counter parts. In addition to this, it was derived from past research that the design of a theoretical model encompassing social mechanism

within Instagram use that have negative *and* positive effects on users' mental health would be an insightful addition into the existing field of research on the topic of the effect of the use of social media sites.

The results of this research's analysis have not been able to confirm the hypothesized expectation that the duration and frequency of Instagram use has a direct negative effect on the participant's mental health. This is not in line with formerly explored research like the one by Hunt et al. (2018). These researchers found a positive relationship between excessive social media use and symptoms of depression and anxiety. These negative mental symptoms were also part of this research's mental health component measured by the WEMWBS. Similarly, as formerly mentioned, Uram and Skalski (2020) have previously measured a significant link between time spent on social media platforms and increased feelings of loneliness and decreased self-esteem, which are also associated with bad mental health outcomes. These findings are consistent with the broader body of research, revealing common trends of negative psychological consequences associated with high social media use, to which our study could not contribute additional confirmatory results.

In addition to this, this research was also unable to confirm the hypothesis that the tendency to engage in upward social comparison has a moderating negative effect on the hypothesized main effect of Instagram use on mental health. This assumption was originally based on the Social Comparison Framework (SCF) by Festinger (1954), which suggests that people involve themselves in social comparisons in order to evaluate their own social standing and abilities. As reported by Vogel et al. (2015) social comparison which is induced by prolonged social media use can have a profound negative effect of people's mental state. Since the majority of content on Instagram presents the user with idealized images, past research has found interesting results suggesting that spending prolonged amounts of time on social networks like Instagram can lead to body dissatisfaction, lowered self-esteem, higher levels of anxiety, and decreased life satisfaction which are all big parts of mental well-being (Perloff, 2014; Vogel et al., 2015). The most likely reason for the fact that this study's analyses' results could not contribute to the already validated assumption, that engaging in upward social comparisons has a negative effect on the relationship between Instagram use and users' mental health, can most likely

be found within the limitations of the current study, which will be explained and discussed further in part 5.3. of this paper.

Furthermore, this study's results of the data analysis also were unable to confirm the hypothesized assumption that the fulfilment of the social needs (self-expression & social connectedness) which motivate and drive social media use in the first place has a moderating positive effect on the relationship Instagram use has on users' mental well-being. This hypothesis was originally founded on research by Elihu Katz, Jay Blumler, and Michael Gurevitch in the late 1970s. Their Uses and Gratifications (U&G) framework seeks to explain why users engage in media, such as social media, in the first place (Ruggerio, 2000). Additionally, it aims at explaining what gratifications are derived from this use of media (Ruggerio, 2000). This U&G framework shifted the focus to understanding why and how individuals use media, emphasizing the gratifications or psychological needs that media fulfill for users, opening up space in the field of research to assume that social media use can in fact have a positive effect on users. As previously mentioned, social media platforms encompass a wide range of functions and opportunities for individuals to fulfill various social needs like the ones chosen to be investigated within this research: the need for self-expression and for social connectedness. Similarly, to the other parts of this research's analyses, the results concerning the hypothesized moderating positive effect of the fulfilment of both social needs on the main effect, cannot be reported to be in line with the previously mentioned ground of formerly published and highly validated research. Part 5.3. of this paper aims at investigating the question of why all of this study's null-hypotheses were failed to be rejected and why none of the analysis' results are in line with the research the hypotheses were originally grounded on.

5.2. Practical Implications

Even though the results of this study were not in line with the proposed hypotheses, looking at the answers given by the participants of this research, some practical implications can be derived as well as suggestions for improvements of Instagram as a social networking site. Since, according to the participants' responses, the mean value for the tendency to engage in upward social comparison is above 6 out of a possible score of 10, we can say that most Instagram users that were interviewed for this study

are comparing themselves to idealized perfect images on Instagram, risking negative effects to their mental state by using the social media site. One reason for the prevalence and influence of these idealized images is the fact that, by default, Instagram puts filters that alter one's appearance drastically towards the perceived 'ideal' on all images and videos captured through the apps' camera feature. This is especially harmful, considering that Instagram's' own camera lens is usually used to capture moments for Instagram stories, which as a concept are supposed to be candid and spontaneous snapshots or videos, meant to function as authentic insights into people's daily lives, thoughts, and interests. In order to mitigate this prevalence of artificially idealized images and videos under the pretence of authenticity it would probably a huge call to suggest the complete abolition of the aforementioned Instagram camera filters. However, it would probably worth mentioning that the fact that these filters are applied by default is much more harmful than their existence itself. Therefore, the first practical implication which can be derived from this study for Instagram as a platform is the abolition of the application of image and video altering filters by default in their camera application, as it has proven negative effects on peoples' body image and self-esteem and makes users engage in mentally harmful upward social comparisons more frequently than necessary.

Secondly, it could be proposed that since Instagram as a social networking site has high stake in people's mental well-being in order to keep them coming back to Instagram, a planned campaign of collaborations with the aim of highlighting the importance of mindful social media use and engagement could be proposed. These collaborations could be designed in a way that employs the help of highly followed and influential users or so-called "influencers". A common way for users to expose inauthenticity and unrealistically set beauty and life-style standards is to show side-by-side comparisons of unedited and edited content. This has a disillusioning effect on users because they get to look at normally edited posts without the pre-set filters and alterations that come with them. This in combination with authentic interviews based around honesty and the influencer's own struggle with unrealistic comparisons on social media could be a way to make Instagram users adapt slowly but surely and to get them to accept more authentic, less-perfect content as likeable and worthwhile when scrolling through their Instagram feed in the future. For the sake of users' own mental health this could ultimately lead to a less toxic, and more accepting digital social environment for everyone. This proposed kind of

campaign could also be done in the form of live workshops at schools and universities, helping young people actually learn how to interpret, and engage with content on Instagram and how to find their own space in the digital landscape of highly visual social media.

5.3. Limitations and future research directions

Although this study was based on several existing theories, literature and research, and the measurement scales used for this study were almost entirely based on past research's already validated scales, which is a sign of high validity, there are a few limitations that should be addressed concerning this study and its analyses' results. First, most participants who answered this study's survey were between the ages of 19 and 24 (51%), which means that the participants who were of the older age spectrum of the population (age 25 to 34) were not equally represented in this study's results. This means in consequence, that the presented results of the analysis are more accurate for the younger participants, and not for the older ones.

Second, it has to be mentioned, that the only other criterion (except for age, and active Instagram use) for participation in this study was that participants had to be able to understand the English language. This means that the Instagram users who took part in this research's survey could have been from all over the world. Perhaps the results would be more conclusive if the nationality had been specified further before conducting the research. An increase in the survey's sample size could also have a tremendous positive effect on the analyses since this study accumulated only 144 respondents, of which 26 responses had to be deleted due to incomplete answers.

Moreover, it has to be mentioned that the employed sampling methods to find participants for the survey were convenience and snowball sampling. There are several limitations that can be put in connection to these sampling methods. For one, the researchers are relying on their own social circle/network, so the method of sampling in fact cannot be seen as a randomized sampling method. Consequently, this leads to the results of the research to be less applicable to the whole population of the research and could in turn also mean that a correct replication of the study becomes almost impossible. Finally, it can be said that the fact that responses were self-reported by the participants during the filling out of the online survey makes it hard to deny the invalidity of portions of the data. This is due to what is known as

response bias, which refers to systematic errors when participants answer survey questions. This can come up due to factors like social desirability or cultural norms, which can compromise the validity of research findings (Tourangeau et al., 2000).

In connection to the results and insights of this study and also the previously mentioned limitations that went hand-in-hand with it, some recommendations and ideas for future research will be shared in order to inspire and improve future research looking into the same or similar topics. Firstly, it should be considered to expand the period of time during which data is collected. Since the aim is to measure the experience of Instagram use and its' effects on mental well-being more frequent data collection over a longer period of time might wield more interesting results. Additionally, the amount of social needs to be tested for fulfilment, because different social needs can have effects with different intensities depending on their fulfilment. This would give more insight into which social drivers of social media use can actually affect Instagram users' mental health. Additionally, it would also improve the studies' results if not only the tendency for engaging in upward social comparison would be tested and analyzed but also the tendency to engage in downward social comparisons could be included to gain more insight into the effect of the *spectrum* of social comparison. Lastly, future research in this field should try to maximize and improve the sample of the study by size, as well as by demographic changes (e.g., another age group or specific nationalities). This would lead to the achievement of clear results which could be used to make more specific assumptions about the effects that possible changes and campaigns that might be employed by social media sites like Instagram will have on users in the future.

6. Conclusion

This research could not produce results in line with the hypothesized negative effect of Instagram use on young adults' mental well-being. This could be due to the limitations that stand in connection to the study at hand, or due to the reason that more aspects than just the frequency and duration of use of Instagram make up the actual component of Instagram use in a model like this. Furthermore, the research found that neither the moderating effect of the fulfilment of social needs, nor the tendency to

engage in upward social comparison could be proven to have a significant effect on the relationship Instagram use has on young Instagram users' mental health.

As a result of this research, it is suggested to contribute to similar studies in this field by including more social needs that drive social media use in the first place according to the U&G framework, and to maximize, as well as specify the sample size and demographics in a way that enables researchers to gain more targeted insights. In addition to this, other theoretical and practical implications are given. The implications focus on Instagram's ability to improve users' experiences and the effect their use has on their mental states. This would be done by employing campaigns and collaborations with influencers aimed at disillusion users' perception of content on Instagram to fake or artificially enhanced content. The users could be influenced by these campaigns in a way that decreases the number of social comparisons with seemingly superior individuals on Instagram in an effort to minimize the negative effects of Instagram use while also trying to maximize the positive effects which might also be in connection to the social needs Instagram can fulfil as a social media site.

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Appendix A – The complete survey

Self-expression, Connection & Comparisons: Instagram's Effect on Young Adults' Mental Health FINAL

Start of Block: Introduction and Informed Consent

Introduction Thank you for your participation in this survey!

Your involvement in this research project is greatly appreciated and will contribute to my bachelor thesis in Communication Science at the University of Twente. The aim of this study is to evaluate the effect Instagram use has on young adults' mental well-being. Social needs like self-expression and connectedness, as well as social comparisons during Instagram use will be taken into account.

Therefore the participation in this survey has two requirements:

Instagram Use Do you use Instagram actively to some extent? Please refrain from continuing this survey if the answer to this question is 'No'.

○ Yes (1)

Age Are you between 18 and 34 years old? Please refrain from continuing this survey if the answer to this question is 'No'.

○ Yes (1)

Instructions This survey will consist of 4 parts.
1. You will be presented with demographic questions.
2. You will be asked questions to indicate how you have been feeling recently.
3. You will be presented with statements concerning your social connections on Instagram.
4. You will give indications about the way you compare yourself to other users on

Instagram.

For this survey it does not matter whether you are using a desktop / laptop or your mobile device.

Please, take your time and read all the instructions and questions carefully. The entire survey should take approximately 5-10 minutes of your time.

Be assured that all the information you provide will be treated as strictly confidential and anonymous.

Informed Consent By participating in this study you confirm that you have been sufficiently informed about the nature and methodology of this research. Your participation is entirely voluntary, and you have the right to withdraw your consent and stop your participation at any given time without giving a reason.

- ○ I agree to participate. (1)

End of Block: Introduction and Informed Consent

Start of Block: Demographic Questions & Instagram Use

Age How old are you? (In years)

_____

Gender How do you identify your gender?

- ○ Male (1)
- ○ Female (2)
- ○ Non-binary / third gender (3)
- ○ Prefer not to say (4)

Instagram Use Please give an estimation: How often do you use Instagram?

- ○ Every day (1)
- ○ Several times a week (2)
- ○ Once a week (3)
- ○ Several times a month (4)
- ○ Rarely (5)

Instagram Use Please give an estimation: On average, how long are you using Instagram on a normal day?

- ○ Less than 15 minutes (1)
- ○ 15-30 minutes (2)
- ○ 30-60 minutes (3)
- ○ 60-90 minutes (4)
- ○ More than 90 minutes (5)

End of Block: Demographic Questions & Instagram Use

Start of Block: Mental Well-being

Below are some statements about feelings and thoughts you might have in your daily life. Please select the answer that best describes your experience of each over the last 2 weeks.

	None of the Time (1)	Rarely (2)	Some of the Time (3)	Often (4)	All of the time (5)
1. I have been feeling optimistic about the future. (1)	○	○	○	○	○
2. I have been feeling useful. (2)	○	○	○	○	○
3. I have been feeling relaxed. (3)	○	○	○	○	○
4. I have been dealing with problems well. (4)	○	○	○	○	○
5. I have been thinking clearly. (5)	○	○	○	○	○
6. I have been feeling close to other people. (6)	○	○	○	○	○
7. I have been able to make up my own mind about things. (7)	○	○	○	○	○

End of Block: Mental Well-being

Start of Block: Psychological Social Need Satisfaction & Frustration

Connectedness Below are some statements about the kind of experiences you might have while using Instagram (IG). Please read each of the following statements carefully. You can indicate below the degree to which the statement is true for you at this point in your life.

	None of the Time (1)	Rarely (2)	Some of the Time (3)	Often (4)	All of the Time (5)
1. I feel like the people I interact with on IG care about me. (1)	○	○	○	○	○
2. I feel excluded from the groups of popular people on IG. (2)	○	○	○	○	○
3. I feel like individuals on IG that I interact with are distant to me. (3)	○	○	○	○	○
4. I feel close to my own followers and the people I follow. (4)	○	○	○	○	○
5. I have the impression that the people I interact with on IG dislike me. (5)	○	○	○	○	○
6. I feel a connection to the people I interact with on IG. (6)	○	○	○	○	○
7. I feel good after using IG to interact with other people. (7)	○	○	○	○	○
8. I feel like the relationships I have on IG are superficial. (8)	○	○	○	○	○

Page Break

Self-expression Below are some statements about the kind of experiences you might have while using Instagram (IG). Please read each of the following statements carefully. You can indicate below the degree to which the statement is true for you at this point in your life.

	None of the Time (1)	Rarely (2)	Some of the Time (3)	Often (4)	All of the Time (5)
1. I feel a sense of choice or freedom when expressing myself through my posts on IG. (1)	○	○	○	○	○
2. I feel like the accounts I follow express my interests and desires. (2)	○	○	○	○	○
3. I feel pressured to interact with IG users too much. (3)	○	○	○	○	○
4. Most of my IG posts & interactions feel like I “have to” make them. (4)	○	○	○	○	○
5. I feel like my posts on IG express who I really am. (5)	○	○	○	○	○
6. Answering messages and liking posts on IG feels like an obligation. (6)	○	○	○	○	○
7. I feel like I have been consuming & creating content on IG that is interesting to me. (7)	○	○	○	○	○

8. I feel pressured to post on IG. (8)	○	○	○	○	○

End of Block: Psychological Social Need Satisfaction & Frustration

Start of Block: Social Comparisons

Q14 Please read the spectrum given in each row carefully. Afterwards indicate a number from 1-10 that best describes the way in which you see yourself in comparison to other users on Instagram.

Example Question:
Please rate yourself along a 10-point scale.
Short (1) - Tall (10) 1 2 3 4 5 6 7 8 9 10

If you choose (for example):
Choosing 3 means you see yourself as shorter than others.
5 (middle) means about average height.
7 means somewhat taller.
If you understand the above instructions, please proceed.

	Please rate yourself along a 10-point scale:

	1 (1)	2 (2)	3 (3)	4 (4)	5 (5)	6 (6)	7 (7)	8 (8)	9 (9)	10 (10)
Inferior (1) - Superior (10) (1)	○	○	○	○	○	○	○	○	○	○
Incompetent (1) - More Competent (10) (2)	○	○	○	○	○	○	○	○	○	○
Unlikeable (1) - More likeable (10) (3)	○	○	○	○	○	○	○	○	○	○
Left out (1) - Accepted (10) (4)	○	○	○	○	○	○	○	○	○	○
Different (1) - Same (10) (5)	○	○	○	○	○	○	○	○	○	○
Untalented (1) - More talented (10) (6)	○	○	○	○	○	○	○	○	○	○
Weaker (1) - Stronger (10) (7)	○	○	○	○	○	○	○	○	○	○
Insecure (1) - Confident (10) (8)	○	○	○	○	○	○	○	○	○	○
Undesirable (1) - More desirable (10) (9)	○	○	○	○	○	○	○	○	○	○
Unattractive (1) - More attractive (10) (10)	○	○	○	○	○	○	○	○	○	○

End of Block: Social Comparisons

Appendix B – Scales on which the final items are based on

Mental Well-being → WEMWBS (Short version: 7 items)

1. I have been feeling optimistic about the future.
2. I have been feeling useful.
3. I have been feeling relaxed.
4. I have been dealing with problems well.
5. I have been thinking clearly.
6. I have been feeling close to other people.
7. I have been able to make up my own mind about things.

Social Need Fulfilment → Basic Social Need Satisfaction and Frustration Scale

F1 Autonomy satisfaction
1. I feel a sense of choice and freedom in the things I undertake
7. I feel that my decisions reflect what I really want
13. I feel my choices express who I really am
19. I feel I have been doing what really interests me

F2 Autonomy frustration
2. Most of the things I do feel like "I have to"
8. I feel forced to do many things I wouldn't choose to do
14. I feel pressured to do too many things
20. My daily activities feel like a chain of obligations

F3 Relatedness satisfaction
3. I feel that the people I care about also care about me
9. I feel connected with people who care for me, and for whom I care
15. I feel close and connected with other people who are important to me
21. I experience a warm feeling with the people I spend time with

F4 Relatedness frustration
4. I feel excluded from the group I want to belong to
10. I feel that people who are important to me are cold and distant towards me
16. I have the impression that people I spend time with dislike me
22. I feel the relationships I have are just superficial

F5 Competence satisfaction
5. I feel confident that I can do things well
11. I feel capable at what I do
17. I feel competent to achieve my goals
23. I feel I can successfully complete difficult tasks

F6 Competence frustration
5. I have serious doubts about whether I can do things well
12. I feel disappointed with many of my performances
18. I feel insecure about my abilities
24. I feel like a failure because of the mistakes I make

Social Comparison → Social Comparison Measurement Scale

Inferior (1) – Superior (10)

Incompetent (1) – More Competent (10)

Unlikeable (1) – More Likeable (10)

Left Out (1) – Accepted (10)

Different (1) – Same (10)

Untalented (1) – More Talented (10)

Weaker (1) – Stronger (10)

Insecure (1) – Confident (10)

Undesirable (1) – More Desirable (10)

Unattractive (1) – More Attractive (10)

Appendix C – List of deleted items

Mental Well-being

I feel like I have been able to make up my own mind about things.

Social Needs

1. I feel a sense of choice or freedom when expressing myself through my posts on IG.

2. I feel like the accounts I follow express my interests and desires.

3. I feel like my posts on IG express who I really am.

4. I feel like I have been consuming & creating content on IG that is interesting to me.

5. I feel like individuals on IG that I interact with are distant to me.

6. I have the impression that the people I interact with on IG dislike me.

7. I feel like the relationships I have on IG are superficial.

Social comparison part

Different (1) - Same (10)

Appendix D – Checking Assumptions of Multivariate Linear Regression

Assumption of Normality

The assumption of Normality was tested for the dependent variable by creating and interpreting a histogram, a P-P plot, and a Q-Q plot (See figure 1,2, and 3). For the dependent variable Mental Health, the histogram indicated a shape which corresponds with normality. In addition to this, the data in the P-P plot and the Q-Q plot is close to the comparison lines. As a consequence it can be concluded, that the assumption of normality is met for the dependent variable Mental Health.

Figure 1

Histogram of Mental Health

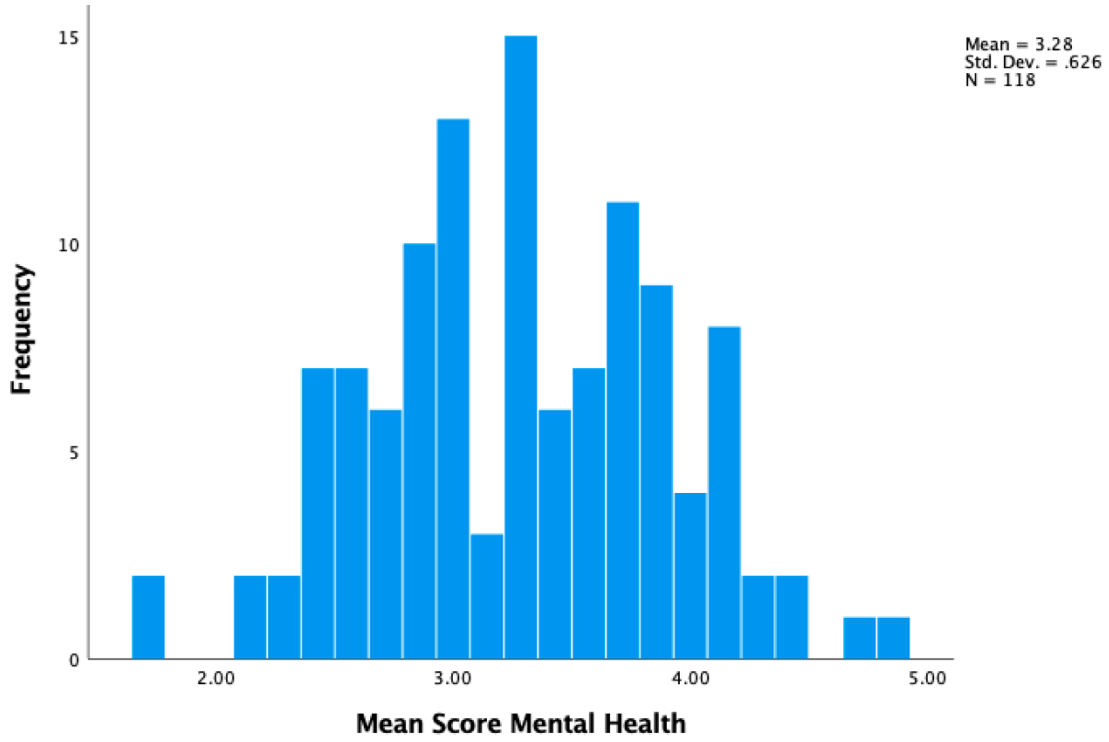


Figure 2

P-P plot of Mental health

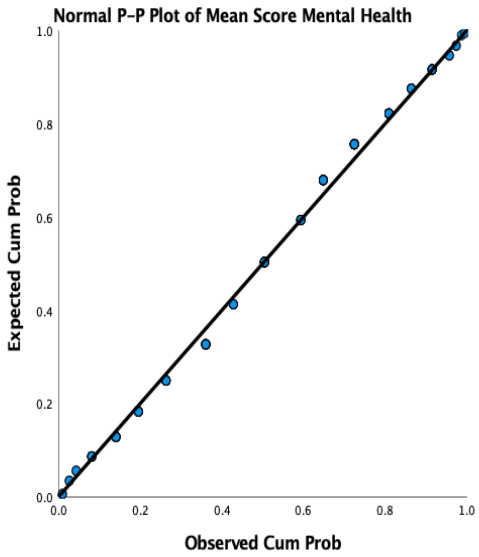
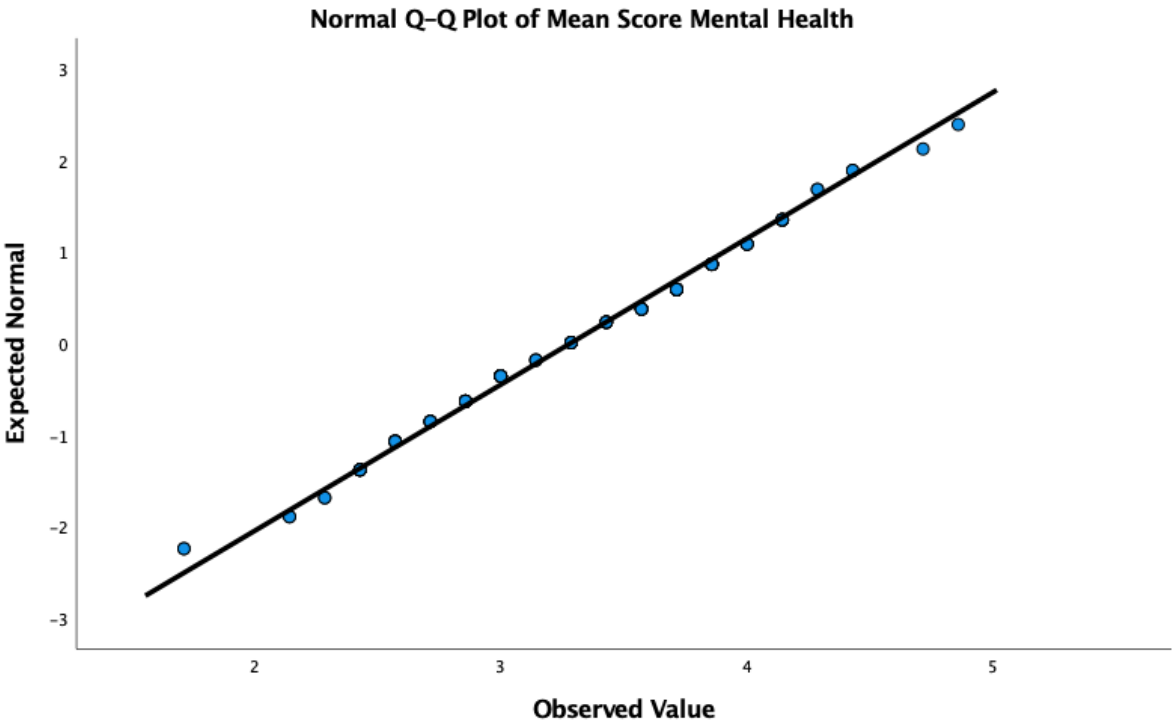


Figure 3

Q-Q plot of Mental Health

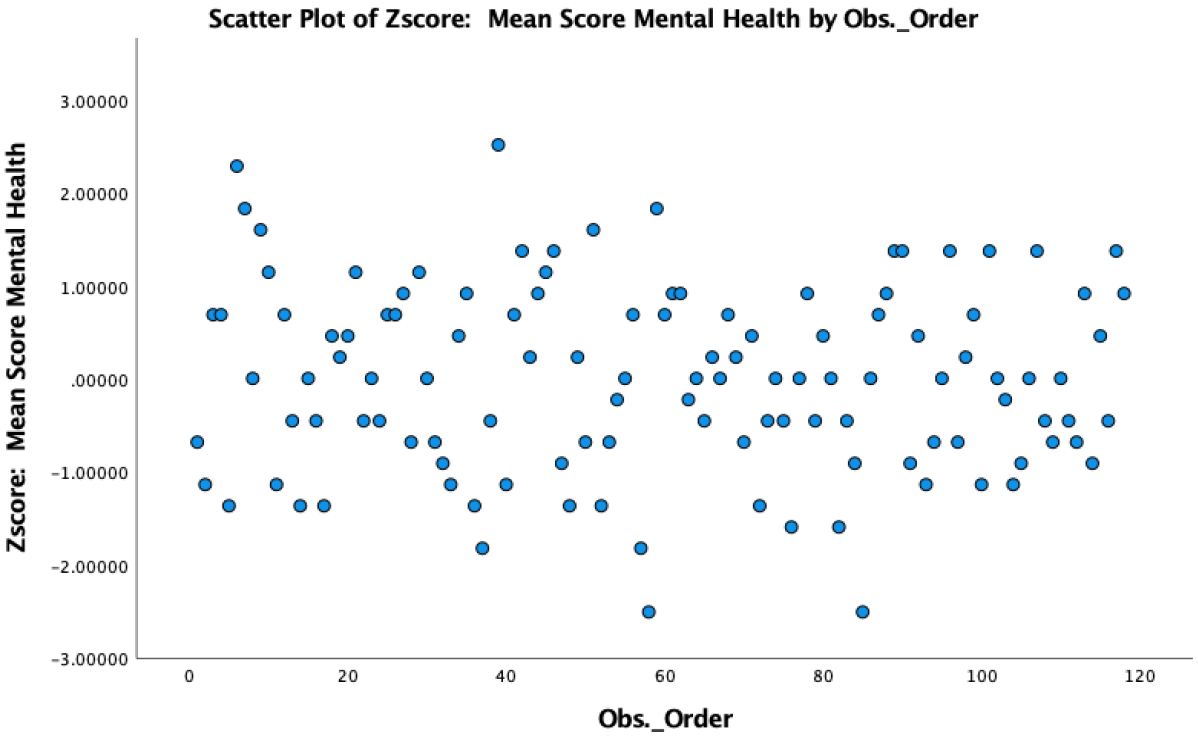


Assumptions of Linearity and Homoscedasticity

The assumptions of linearity and homoscedasticity have both been checked for by making use of a scatterplot of the residuals against the observation order. There was no systematic relationship between the residuals and the observation order visible in the scatterplot (see Figure 4). Consequently, it can be concluded, that the assumptions of linearity and homoscedasticity are met.

Figure 4

Scatterplot to check Linearity and Homoscedasticity for Mental Health



Assumption of Independence

For checking the assumption of independence, the test which was performed is the Durbin-Watson test. The Durbin-Watson value was 1.917. This is between 1 and 3, meaning that the assumption of independence is met.