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Online Relationship Social Comparisons, Singlehood, and Well-being

by

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Committee Approval

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Sincerely,

Ralph Baergen, PhD, MPH, CIP

Human Subjects Chair

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Abstract

Individuals can make social comparisons easily, quickly, and frequently on commonly used social networking sites such as Facebook. Prior research has shown that upward and downward social comparisons to romantic relationships on social media can affect relationship satisfaction and well-being of individuals in romantic relationships. The present study extended past research by examining the effects of romantic relationship social comparisons on single individuals. 177 participants were randomized into either an upward or downward social comparison group, then completed social comparison, well-being, social media use, and satisfaction with relationship status measures. Those in the downward condition exhibited significantly higher social comparison scores than those in the upward condition, however, no other significant differences emerged between groups. Our results indicate that while singles' social comparison can be manipulated effectively, they may be too different from those in relationships to replicate effects on well-being and satisfaction with relationship status.

Keywords: online social comparisons, romantic relationships, singles

Introduction

Social networks are impactful. They can influence personal growth (Toyama et al., 2020) and protect from the effects of stress on health (Gurung et al., 2001). When we interact with others, there is always a chance of social comparison. Social comparisons have implications for various aspects of life including relationships (Broemer & Diehl, 2003) and well-being (Li, 2019; Van de Ven, 2017). We are able to make upward and downward social comparison to others. Social comparisons have the power to influence us in negative and positive ways. By being aware of these effects, we can potentially enhance our relationships and well-being.

Social Comparison

Festinger (1954) described social comparisons as the experience of evaluating one's opinions and abilities against another's. Social comparisons impact individuals in a variety of situations such as academics (Lockwood et al., 2004), work settings (Brown et al., 2007), wealth and lifestyle (Schor, 1999), appearance (Shahyad et al., 2015), and relationships (Broemer & Diehl, 2003; Morry et al., 2018). Social comparisons, especially within American culture, can be viewed as the "need to keep up" (Schor, 1999). Individuals can compare themselves with others by either making an upward comparison or a downward comparison. An upward comparison results when the individual making the comparison evaluates themselves compared to an individual who is perceived to be better off than them. For example, if an individual is using a social networking site (SNS) and they view a picture of an individual that they perceive to be more attractive than they are, then they may make an upward social comparison to that target. This individual may feel envious towards that target or potentially inspired by them because they are comparing themselves "upward" to someone they believe is better off than they are in some capacity (e.g., attractiveness). A downward comparison results when the individual making the

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comparison evaluates themselves compared to an individual who is perceived to be doing worse off than them. Using the previous example, if an individual encounters a photo of someone on a SNS that they perceive as being less attractive than they are, then they may make a downward social comparison to that target and feel superior to the target.

While the direction of a social comparison is the focus of the present study, it is also important to note that both upward and downward social comparisons can be viewed as having negative and positive interpretations. However, in general, upward social comparisons are associated with more detrimental outcomes such as reduction in subjective well-being and depressive symptoms, and downward social comparisons are associated with more beneficial outcomes such as higher self-esteem and increased well-being (Li, 2019; Lim & Yang, 2019; Lockwood, 2002; Van de Ven, 2017; Wheeler & Miyake, 1992). These effects were also found in Morry et al. (2018), the study the current research has replicated and extended. In Morry et al. (2018), individuals who were in romantic relationships were introduced to a couple on Facebook that evoked either an upward or downward social comparison. In addition to manipulating the direction of social comparison, Morry et al. (2018) also measured the interpretation of social comparisons (negative vs. positive), however the present study focused on social comparison direction and did not examine interpretations due to the different population (see Measures section and discussion of the Relationship Social Comparison Interpretation Scale).

Relationship Social Comparison

Individuals can also make social comparisons in terms of their romantic relationships. This can be in the form of comparisons between romantic partners, which would involve making a social comparison within the partnership. These social comparisons are easy to make since romantic partners typically interact daily and have knowledge of one another's successes and

failures. An example of social comparisons between romantic partners would be a comparison of academic achievement between partners (Lockwood et al., 2004). Another form of social comparison concerning romantic relationships is comparisons to others' romantic relationships (Buunk, 2006; Broemer & Diehl, 2003). An example of this would be thinking of a happy couple that is perceived to be satisfied in their relationship and have minimal disagreements. In this situation, individuals may experience an upward comparison to the couple they are envisioning (Broemer & Diehl, 2003).

The perceived superiority of one's relationship is associated with some benefits. Individuals who believe that their relationship is better than others typically experience higher levels of relationship satisfaction and believe that others were also in good relationships. This perception may be because perceiving that others had bad relationships could pose a threat to their own relationship by influencing them to question if the same negative consequences could happen to their relationship (Broemer & Diehl, 2003).

Relationship social comparisons have been associated with detrimental effects on relationship satisfaction and well-being, especially when one's current relationship is not ideal. Men, in particular, show a link between satisfaction within their relationship and perceived superiority of their relationship. When men experienced low relationship satisfaction, they often attributed others as being unhappy in their relationships more than men who experienced high relationship satisfaction. This downward comparison strategy may be an attempt to rationalize their relationship problems (Buunk, 2001). When individuals perceive their relationship to be similar to that of an unhappy couple's relationship, relationship satisfaction can decrease. When alternative relationships that are perceived as better, these alternative relationships become attractive, and a decrease in relationship satisfaction can occur (Broemer & Diehl, 2003).

Well-being

Well-being is a multifaceted concept. Broadly, it can include various components such as mental, physical, psychological, emotional, spiritual, and social well-being. Well-being can be assessed by using self-report measures such as the Satisfaction With Life Scale, State Self-Esteem Scale, or Subjective Happiness Scale. These three measures are commonly used to assess subjective well-being and were used in Morry et al. (2018) as their primary measures of well-being, and thus were chosen for the present study as part of the replication.

The Satisfaction With Life Scale (SWLS) focuses on evaluating an individual's life as a whole (Pavot & Diener, 1993). The SWLS assesses the positive side of a person's experiences and is partially independent from measures of specific positive affect. This scale also has moderate convergence between self-reported life satisfaction and when others are asked to judge someone's life satisfaction (Pavot & Diener, 1993).

Self-esteem is an individual's perception of their worth as a person (Orth & Robins, 2014). The State Self-Esteem Scale assesses temporary changes to self-esteem. While self-esteem is a relatively stable disposition, it can be manipulated through various situations. State self-esteem is also distinctive from mood. Mood is something that can be altered independently of self-esteem, therefore having different measures for these concepts is helpful when looking at subjective well-being (Heatherton & Polivy, 1991).

Happiness is the presence of positive or pleasant emotions and can be assessed using the Subjective Happiness Scale. This scale includes items that measure happiness based on absolute ratings and ratings participants believe they would receive from peers. There are also items that ask individuals to rate how they identify with statements about happy and unhappy people. This measure of happiness assesses happiness from the individual's own perspective (Lyubomirsky &

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Lepper, 1999). Happiness is associated with mental health outcomes and has an influence on an individual's quality of life and well-being, particularly when an individual rates happiness as being important to them (Burns & Crisp, 2022).

Positive and negative affect can also be indicators of well-being. Positive affect refers to feelings of enthusiasm, high energy, and pleasurable engagement. Negative affect refers to feelings of distress, and negative moods such as anger, disgust, and nervousness (Watson et al. 1988). Both positive and negative affect are associated with satisfaction with life (Extremera & Rey, 2016). Therefore, positive and negative affect can have a role in well-being.

Well-being can also include components of our health that allow us to thrive. Flourishing is viewed as the experience that your life is going well and is viewed as the opposite of living with mental illness (Huppert & So, 2013). Flourishing and life satisfaction are overlapping concepts, however they each deserve their own recognition as distinct concepts. Huppert & So (2013) found only a modest overlap between life satisfaction and flourishing. In their sample, a third of those with high life satisfaction were flourishing and half of those who were flourishing had high life satisfaction. It may be that life satisfaction is better suited for measuring hedonic well-being (i.e experiences of pleasure and enjoyment) while flourishing has the ability to also measure eudemonic well-being (i.e experiences of meaning and purpose.)

Single Individuals

In 2016, 44.9% (or 110.5 million) individuals age 18 and older were unmarried in the U.S. 53.2% of those individuals were women and 46.8% were men (United State Census Bureau, 2017). Just 26% of Millennials are married by age 32, which is a decrease from previous generations (Pew Research Center, 2014). Among those that are married, the average age of first marriage is 29.8 for men and 28 for women (United States Census Bureau, 2018). Compared to

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those in a relationship, single individuals are often viewed in a negative light. For instance, undergraduates characterized single individuals as insecure, unhappy, lonely, and immature (DePaulo & Morris, 2006). Slonim et al. (2015) found that singles who chose to remain single were viewed as lonelier, miserable, and less warm and sociable compared to those who did not want to be single. Although there are some negative perceptions of single individuals, fewer than 20% of individuals in the US believe that being married is essential for an individual to live a fulfilling life (Pew Research Center, 2019). While being in a relationship is something that is valued, one study found that educated women saw the benefits of being single such as developing financial stability, building their careers, accruing assets, and delaying marriage until they found a partner who was equally as educated as they were and shared similar values (Maharaj & Shangase, 2020). Adamczyk (2017) found that there was no differences in mental illness between those who are voluntarily single and those who are single but wish to be in a relationship. Being single has been associated with greater social involvement compared to those that are married. Single individuals are more likely to give help, get help, and socialize with friends, and also more likely to contact their parents or siblings more frequently than those who are married (Sarkisian & Gerstel, 2016). These positive, long-lasting, and significant relationships are what DePaulo and Morris (2006) claim to be a large aspect of why single people do not differ much from married people in terms of well-being.

DePaulo & Morris (2006) discuss singlism, which is the negative stereotype and discrimination of single individuals in our culture and academic research. From a cultural stance, singles, especially those over the age of 40, are viewed as immature, less well adjusted, more self-centered, and more envious than those who are in a relationship. DePaulo and Morris describe how some laws and policies discriminate against singles such as the inability to

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subsidize health benefits to a different family member (i.e., parent) instead of a spouse. In academic research, DePaulo and Morris give examples of how singles are typically a narrow focus of research. One example was how marital status has been well researched as a predictor of well-being. They claim that this may be a poor proxy for more important predictors such as longevity, well-being, and happiness. DePaulo and Morris argue that the relationships research literature (including on marital status) reflects singlism as the assumption that all single individuals are worse off and would benefit from being in a romantic relationship. They also point out that there is very little research on single individuals that does not utilize this biased assumption or framework. They call for research addressing fundamental questions about singles and singlism, saying that these research questions could have important implications for both public policy and everyday life.

Facebook

One of the most widely used social networking sites is Facebook. According to Pew Research Center (2019), 69% of adults in the United States use Facebook. Further, 74% of those users access Facebook daily. Gray (2018) found that some of the main motivations for using social networking sites are to stay in touch with friends, make plans, get to know others, and present themselves. Facebook usage can be categorized into two patterns: active or passive (Tosun & Kasdarma, 2019). Active Facebook usage involves posting, sharing, and communicating online and is typically associated with positive outcomes such as receiving social support (Silva et al., 2018; Gilmore et al., 2019). By actively posting on Facebook, individuals may receive feedback from friends that help them feel supported and included. Passive Facebook usage involves viewing photos and statuses posted by others (without active engagement by commenting, liking, posting, etc.) and is typically associated with negative outcomes such as

depression (Tosun & Kasdarma, 2019) and reduced self-esteem (Wang et al., 2017). This may be because individuals on Facebook portray themselves in favorable ways (Tworney & O’Rielly, 2017) and share positive life events more frequently than negative ones (Kross et al., 2013). This could elicit envy which can then influence negative outcomes such as depression (Li, 2019).

Facebook usage has the potential to provide individuals with social and emotional support from others, reduced feelings of isolation, and increases in well-being (Frost et al., 2017). Those who engaged in authentic or positive self-presentation on Facebook were associated with higher self-esteem, greater social support (Tworney & O’Reilly, 2017), lower stress, and increased psychological well-being (Grieve & Watkinson, 2016). Social networking sites may also provide educational benefits such as perspective-taking and critical thinking (Tynes, 2007). The number of friends that an individual has on Facebook can also have some benefits. Nabi et al. (2013) found that outside of mental health benefits such as reduced stress and greater well-being, those with a higher amount of Facebook friends were also less likely to experience physical illness.

Concerns over the addictive properties of social media and their effects on individuals have become a recent topic of investigation. Lian et al. (2018) found that social media addiction¹ was associated with procrastination, especially in those who exhibited low effortful control. Individuals who experience social media addiction can experience communication overload, difficulties concentrating and completing tasks, and devote more time and cognitive resources to social media sites.

¹ Lian et al. (2018) defined social networking addiction as “a specific form of internet addiction applicable to individuals who are excessively involved in SNS activities, and thus experiencing detrimental effects on their lives” (p. 2). Further, social networking addiction is characterized by salience, withdrawal symptoms, relapse, mood modification, tolerance, and conflict. It is important to note that while Lian et al. (2018) use the term “social networking addiction”, this is not a clinical diagnosis and the term does not appear in the Diagnostic and Statistical Manual (DSM) – 5.

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Facebook has been linked to detrimental mental health outcomes such as anxiety, depression, negative body image, and alcohol use (Frost et al., 2017). These outcomes were more commonly experienced in those who passively use Facebook. Brooding, rumination, social comparison, and appearance comparison have been cited as potential mediators of these mental health outcomes. These moderators fall under the umbrella of negative self-evaluations, which are linked to passive Facebook use (Frost et al., 2017).

How one presents themselves on Facebook also has implications for mental health. Those who presented themselves in an inauthentic manner were consistently associated with low self-esteem and higher levels of social anxiety. Inauthentic self-presentation on Facebook was more likely to occur among those who were high in neuroticism and narcissism (Tworney & O'Reilly, 2017).

Online Social Comparison

With 72% of adults in the United States having at least one social media profile (Pew Research Center, 2019), it is important to understand the implications that these sites have on an individual's well-being. Social networking users can experience both active and passive usage. Passive usage has been associated with social comparisons, depression (Tosun & Kasdarma, 2019), reduced self-esteem, and decreases in subjective well-being (Wang et al., 2017). However, it has also been found that social comparisons made on Facebook to close friends can have a positive effect. These positive experiences can include admiration, optimism, and inspiration. Further, these comparisons were related to lower depression as opposed to those who experienced contrasting comparisons that were related to higher depression (Tosun & Kasdarma, 2019).

Individuals comparing themselves to a target online may have biased interpretations of that target. Those with social media profiles often participate in selective self-presentation and present themselves in a positive manner (Kim & Lee, 2011). This may promote users to develop a heuristic that gives users the impression that others are satisfied with their lives and are doing well. When individuals then contrast this with their own life, which may include challenges and negative events, they may perceive that life is unfair. This effect was stronger when individuals had more friends on Facebook that they did not know in real life. This may be because they do not experience in-person social interactions that allow the individual to gain access to both positive and negative interactions in that individual's life. This effect was also more robust the longer individuals had been using Facebook (Chou & Edge, 2012).

The Current Study

Social media has become an integral aspect of most individual's life, and consequently people frequently make social comparisons to the online social portrayals they see. The existing literature indicates that these social comparisons can have significant impacts on an individual's relationships, well-being, and other aspects of mental health. For example, Morry et al. (2018) demonstrated that both upward and downward social comparisons to couples' profiles on Facebook have significant impacts on the relationship quality and personal well-being of individuals in relationships. In the Morry et al. study, participants were from a Canadian university who were in a heterosexual relationship. Participants were given access to one of two sets of fake Facebook profiles depicting a heterosexual couple. One set was intended to elicit an upward social comparison while the other was intended to elicit a downward social comparison. For the upward social comparison profile, the couple was depicted as being kind and supportive of one another. The posts on these profiles showed that the couple was looking forward to an

upcoming family dinner, that they had a positive interaction over a photo that the female had posted, and that they had plans for their anniversary. These individuals had also uploaded photos featuring them as a couple. In contrast, the set of profiles that were used to elicit a downward social comparison depicted the couple as emotionally distant from one another. The posts on these profiles showed that one member of the couple had canceled plans to attend a family dinner, they had a negative interaction over a photo that the female had posted, and that one of the members of the couple forgot their anniversary. These individuals had photos of themselves with potential alternative partners. Each set included access to the male's profile and the female's profile, with the ability to click on links within the profile (i.e. Photos, About) and to go between the two profiles by clicking on the other person's profile next to the "In a relationship with" feature. Participants were instructed to navigate through the profiles and take note of the different events that occur in the individual's everyday lives. After participants viewed these profiles, they were then asked to participate in a series of questionnaires that examined the effects that these social comparisons had on the participant's relationship satisfaction and well-being. This study found that for well-being measures, there was a main effect for manipulated comparison direction. Specifically, participants experienced higher levels of happiness after a downward comparison compared to an upward comparison.

The purpose of the current study was to replicate Morry et al. (2018) and extend the research to include an investigation of how single individuals may be influenced by romantic relationship social comparison and how this comparison may influence well-being. To date, there have been no studies that have examined the effects that social comparisons to couples have on individuals who identify as single. By identifying how these types of social comparisons affect single individuals, the field can gain further knowledge regarding social comparison theory

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concerning these individuals and the role that the perception of others' romantic relationships has on the well-being of these individuals.

This study aimed to explore well-being and social comparisons made using the popular social networking platform, Facebook, and how single individuals are influenced by these social comparisons. With 90% of individuals aged 18-29 using at least one social media site (Pew Research, 2019), and usage increasing yearly, the understanding of the impact of social media is a necessary endeavor. Exploring the extent to which relationship social comparisons made using Facebook influences well-being has important implications since social media is an integral aspect of most individuals' lives.

Research Questions

- 1) What effect on well-being does social comparison to a romantic relationship have on an individual who identifies as single?
- 2) Are the results of Morry et al. (2018) replicable with a fully-online protocol among single individuals?

Hypotheses

- 1) Participants randomized to the downward social comparison group will report greater happiness compared to participants randomized to the upward social comparison group.
- 2) Participants randomized to the downward social comparison will report greater state self-esteem compared to participants randomized to the upward social comparison group.
- 3) Participants randomized to the downward social comparison will report greater satisfaction with life compared to participants randomized to the upward social comparison group.

Exploratory Question

- 1) Is satisfaction with relationship status a significant moderator for the effect of social comparison on well-being?

Method

The present study is a replication and extension of Morry et al. (2018). After contacting the researchers that worked on this study, they recommended some minor adjustments to the methodology of the study (S. Petty, personal communication, October 10, 2019). These included having lab members look at the profiles and verify that they seemed authentic, as a handful of participants questioned the authenticity of the profiles in Morry et al. (2018) and had to be excluded from the dataset. Following this, the researchers advised incorporating any suggestions that would help the profiles achieve a more realistic presentation. As the original study looked at how social comparison of romantic relationships affected the well-being of those who were currently in a relationship, the present study attempted to extend our knowledge of how relationship social comparison affects the well-being of individuals who identify as single. DePaulo & Morris (2006) discuss how there is little research on single individuals compared to those who are in a relationship. By focusing on singles, we not only extended Morry et al. (2018) but also aid in the call for more research focusing on these individuals.

Rationale and Approach

The present study sought to determine if online social comparisons to a romantic relationship affects the well-being of individuals who are single and to determine if the results of Morry et al. (2018) were replicable. To establish how social comparisons on Facebook influence well-being, the present study used the same experimental design as Morry et al. (2018). Fake but convincing Facebook profiles were designed to elicit either an upward or a downward social

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comparison and served as the independent variable. Participants were asked to view these profiles and then given a series of questionnaires to assess social comparison and aspects of well-being such as self-esteem, happiness, and satisfaction with life. These surveys allowed for the collection of quantitative data and served as the dependent variables of the study. The design of this study was a suitable approach to answering the research question because viewing Facebook is an activity that nearly 3/4th of those with an account experience daily (Pew Research Center, 2019). While participants interacted with the profiles slightly differently than they would in real life, overall, the interaction was similar to what a participant would experience in their personal life.

Participants and Power Analysis

Participants were undergraduate students enrolled at Idaho State University (ISU) who accessed the study through ISU's SONA system. Participants were over the age of 18, had a Facebook account, and self-identified as single and heterosexual. Participants had to identify as heterosexual because the profiles they will be looking at will feature a heterosexual couple. If non-heterosexual individuals attempted to participate in the study, they would be denied eligibility and be unable to participate in the study. Social comparisons are more effective the more similar an individual is to the target of comparison (Festinger, 1954). To help reduce the likelihood of individuals being unable to compare to the couples featured in this study, it is essential that the participants also identified as heterosexual. G*Power MANOVA: Global effects analysis was conducted to determine how many participants would be needed to achieve power = .80 with a p value = .05 and an effect size of .07. This effect size was determined based on the study that we replicated (Morry et al., 2018). The analysis concluded that the sample size would need to consist of 150 participants. An additional 15% of the recommended sample were

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recruited to account for any data that needed to be excluded, including participants who did not pass attention checks or if they skipped looking at one or more of the profiles. This resulted in the recruitment of 260 eligible participants. After verifying that these participants passed attention checks, our final sample consisted of 177 participants (see results for more details). Participants consisted of 144 females (males = 33) with an average age of 21.9. 125 identified as Christian (not religious = 47, other = 1) , and 133 identified as White (Hispanics = 22, Asian = 4, African American = 2, and other = 11) . Participants were recruited through SONA and announcements posted in the researcher's online psychology courses.

Facebook Profiles

To look at how social comparisons affect the well-being of single individuals, two sets of Facebook profiles were created to elicit either an upward or downward social comparison. Similar to Morry et al. (2018), both sets featured a female named Hannah Stevens and a male named Ryan Cameron. The photos that were used in the original study were also used in this one. While the original profiles and our profiles differ in terms of the wording of the posts featured on the timelines, many themes overlap (e.g., making plans with one another, posting about an anniversary.) The couple in the original study were Canadian students. Our couple was updated to Idaho State University students so they would be seen as peers by participants. In the about section of the profile, it said that both individuals attend Idaho State University and live in Pocatello, Idaho. Clickable links included the individual's timeline, about, photos, and the profile of the other partner listed in the "in a relationship" portion of the about section. The timeline included posts such as memes, status updates, posts from the partner's on one another's timeline, posts from friends, articles, Facebook event posts, and photos. Most of the posts on the profiles were the same between profile sets, except for posts that show interactions between the couple or

that feature information about the couple. Following the creation of these profiles, undergraduates at another university were asked to view the profiles and assess them for believability. Feedback from the researcher's lab were then incorporated to help improve the authenticity of the profiles.

For the upward social comparison profiles, the couple was featured having positive interactions with one another such as Hannah posting that she appreciates Ryan cat sitting for her while she is out of town and him responding "For you, anything!" The couple was also featured making plans. For example, Hannah creates a "Happy anniversary" post. When her friend asks her what they did to celebrate, Hannah responds "Ryan took me out for dinner and dessert! We had a great time!" In the photos section of the profile, participants were able to view photos of the couple together. For example, there is a photo of them sitting side by side smiling at the camera.

For the downward social comparison profiles, the couple was featured having negative interactions with one another such as Hannah posting a silly photo of herself and Ryan commenting "You look ridiculous. Definitely not your best picture, why would you even post this?" The couple also has posts that indicate that neither of them viewed their plans together as a priority. For example, Ryan forgets to schedule off their anniversary, so they must celebrate on a different day. In the photos section of the profile, participants were able to view photos of the couple with alternative partners. Photos of the couple were not present.

Measures

In Morry et al. (2018), three well-being measures were used in data analysis. These consisted of the Satisfaction With Life Scale (SWLS), Subjective Happiness Scale, and State Self-Esteem Scale. These measures were also used in the present study. In addition to these

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measures, we also included the Flourishing Scale and the Positive and Negative Affect Scheduler (PANAS) as measures of well-being.

The SWLS (Diener et al., 1985) is a five-item scale with a 7-point Likert scale with responses ranging from “Strongly Disagree” to “Strongly Agree.” Items on the scale include statements such as “In most ways my life is close to my ideal” and “If I could live my life over, I would change almost nothing”. See Appendix A for the full scale. The coefficient alpha for the SWLS ranged from .79 to .89 in six studies, which indicates that the scale has high internal validity. Test-retest reliability has also been found across a variety of different samples from .80 to .84 (Pavot & Diener 2008). The Cronbach’s alpha for our data was .86.

The Subjective Happiness Scale (Lyubomirsky & Lepper, 1999) consists of four items with a 7-point Likert scale with responses varying per item. Examples of the statements and responses include “In general, I consider myself” with responses ranging from “not a very happy person” to “a very happy person,” and “Some people are generally very happy. They enjoy life regardless of what is going on, getting the most out of everything. To what extent does this characterization describe you?” with responses ranging from “not at all” to “a great deal”. See Appendix B for the full scale. Internal consistency for this scale was measured using Cronbach’s alpha reliability. The alphas ranged from .79 to .94 (Lyubomirsky & Lepper, 1999). The Cronbach’s alpha for our data was .80.

The State Self-Esteem Scale (Heatherton & Polivy, 1991) consists of seven items with a 5-point Likert scale with responses ranging from “not at all” to “extremely”. Items on the scale include statements such as “I am worried about whether I am regarded as a success or failure” and “I feel inferior to others at this moment”. See Appendix C for the full scale. Internal

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consistency for this scale was found to have a coefficient alpha of .92 (Heatherton & Polivy, 1991). The Cronbach's alpha for our data was .91.

The Positive and Negative Affect Schedule (PANAS) (Watson, et al. 1988) consists of 20 items with a 5-point Likert scale with responses ranging from “very slightly or not at all” to “extremely”. Items on the scale include statements such as “Indicate to what extent you feel this way right now, that is, at the present: strong”. See Appendix D for the full scale. The alphas ranged from .89 to .95 (Watson et al. 1988). The Cronbach's alpha for the negative affect portion of the scale within our data was .86. The Cronbach's alpha for the positive affect portion of the scale within our data was .92.

The Flourishing Scale (Diener, et al. 2009) consists of eight items with a 7-point Likert scale with responses ranging from “strongly disagree” to “strongly agree”. Items on the scale include statements such as “I am a good person and live a good life”. See Appendix E for the full scale. Internal consistency for this scale was measured using Cronbach's alpha reliability. The alphas ranged from .7 to point .88 (Diener, et al. 2009). The Cronbach's alpha for our data was .75.

A measurement of social comparison was also given to assess to what extent individuals compare themselves to others, as this influences the extent that well-being could be affected by online social comparisons. Morry et al. (2018) used the Relationship Social Comparison Interpretation Scale (RSCI) developed by Morry and Sucharyna (2016). The scale consists of 45 items with a 7-point Likert scale, ranging from “I am not thinking about it at all” to “thinking about it a lot”. Items included statements such as “If they can survive their fights, we can get through ours as well” and “We're doing better than them”. These items reflect the underlying motives for social comparison and are designed to measure three types of social comparison

interpretations. These interpretations include positive upward (positive expectations and working to make things better), positive downward (own relationship doing better than others), and negative (negative thoughts about their relationship). However, the RSCI is intended to be used for those who are currently in a relationship, not those that identify as single. As a result, the Social Comparison Scale (Gilbert & Allen, 1995) was used as an alternative measure to identify social comparison. This social comparison measure has been tested for reliability and has been found to have Cronbach alphas of .91 and .90 with student populations. This scale contains 11 items all beginning with “In relationship to others I feel:”, with a scale allowing individuals to rate themselves on a scale of 1 to 10, with different adjectives on each end of the scale. For example, 1=inferior, 10=superior, 1=undesirable, 10=more desirable. Low scores indicate that individuals feel inferior and have low perceptions of themselves when making a social comparison, which is consistent with what we expect to see when someone makes an upward social comparison. High scores indicate that an individual feels superior and has high perceptions of themselves when making a social comparison, which is consistent with what we expect to see when someone makes a downward social comparison. In addition to using this scale as a measure of social comparison and to verify if our manipulation worked, we also intended to use it as an attention check. If participants did not have social comparison scores that aligned with the direction of the social comparison that they were randomly assigned to, then their data would not be included in analysis. The Cronbach’s alpha for our data was .89. See Appendix F for the full scale.

A measure of social media use was also included in the study. The Social Media Use and Integration Scale (SMUIS) (Jenkins-Guarnieri et al. 2013) consists of 10 items with a 6-point Likert scale with responses ranging from “strongly disagree” to “strongly agree”. Items on the

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scale include statements such as “I get upset when I can’t log on to Facebook”. See Appendix G for the full scale. Internal consistency was measured using Cronbach’s alpha reliability with an alpha of .91 (Jenkins-Guarnieri et al. 2013). Additional questions pertaining to Facebook and social media usage including frequency were also asked in this section. The Cronbach’s alpha for our data was .88.

The present study also extended the work of Morry et al. (2018) by including an additional measure of satisfaction with relationship status. The Satisfaction with Relationship Scale (ReSta) (Lehmann et al., 2014) contains five items on a 4-point Likert scale with responses ranging from “Not at all” to “To a great extent”. Items include statements such as “In general, how satisfied are you with your current status?” and “To what extent does your current status meet your expectations?” See Appendix H for the full scale. This scale can be used with individuals of all relationship statuses. However, many participants in our first wave of data collection skipped this measure. This was likely due to them believing that it did not apply to them because they were single. Therefore, on our second wave of data collection, we updated this measure to say “Please note: Regardless of your relationship status (even if you are single), please fill out the following questionnaire.” This measure was incorporated into this study because DePaulo and Morris (2006) discuss how well-being may be related to an individual’s satisfaction with their relationship status, not the relationship status itself. The Cronbach’s alpha for our data was .89.

Additionally, the study used the same profile verification questions that Morry et al. (2018) used. The purpose of this measure is to ensure that the profiles elicited the comparison that they were intended to elicit (upward vs. downward) and to verify that participants paid attention to the profiles. The profile verification consisted of 10 questions, 5 of which acted as an

attention check, while the other 5 questions were about the quality and perception of the relationship. The attention check included questions such as “The task you have just completed required you to view the profile page of a female and a male. Please choose the name of the female Facebook user using the options below”. The questions about the quality and perception of the relationship included items such as “Based on their Facebook profiles, how satisfied do you think Ryan is in his relationship with Hannah?”. Each question was presented on a separate page. See Appendix I for the full scale.

A one item measure was added to the survey that asked the question “How similar are you to the partner in the Facebook profiles that best matches your gender?” with responses ranging from “very similar” to “not similar”. This item was included since social comparisons are more likely to be made to others who are perceived as similar (Festinger, 1954).

Lastly, demographics were collected. Demographic information included age, gender, racial and ethnic background, religion, and relationship status. See Appendix J for the full scale.

Tools and Technology

To create the mock Facebook profiles, multiple tools were used including Facebook, Photoshop, and Wix. Facebook was used to create the profiles. These profiles included exchanges of interactions, friends, and posts such as memes, articles, photo uploads, and status updates. The original photos that were used in Morry et al. (2018) were used for these profiles, along with some of the posts and interactions from the original study. However, following the advice of the Morry et al. (2018) researchers (S. Petty, personal communication, October 10, 2019), the profiles were updated to appear more authentic. This included having posts timestamped in 2020, more natural interactions, and having lab members check that the profiles

appeared authentic. Once the profiles were deemed to be authentic by lab members, screenshots of the profiles were taken.

Photoshop was used to enhance the authenticity of the profiles by manipulating the number of likes on posts, increasing the number of friends, and changing the timestamps to be as close to the beginning of the study as possible, reflecting that posts were from December 2019 to February 2020. It was deemed that this time period may be the most suitable for this study so that participants do not find the lack of COVID-19 posts suspicious.

Wix was used to set up the mock Facebook profiles so that participants had restrictions on the amount of content that they were able to interact with on the profiles. To increase the authenticity of these profiles, participants were told that the profiles are of a couple that attends Idaho State University and that they allowed the research team to have access to part of their profiles to help with conducting this study. To protect the privacy of the couple's friends, participants were told that they were only allowed to have access to the couple's timeline, about, relationship status, and photos. Participants had the ability to go between the profiles by clicking on the "In a relationship with" link.

The materials for this study were presented to the participants using Qualtrics and the study itself was administered through Idaho State University's SONA system.

Procedure

After ISU Human Subjects Committee approval, the study was posted on Idaho State University Psychology Department's SONA system for participants to sign up through and was titled "Facebook, Personal Relationships, and The Self." The study was fully online.

At the beginning of the study, participants were provided with an informed consent document and were made aware that they can leave the study at any time without penalty. In

order to continue onto the study, participants had to provide informed consent, and verify that they meet the inclusion criteria through a set of screening questions. These screening questions included demographic information (e.g., age, relationship status) as well as questions that screened for eligibility. Through these questions, participants would disclose whether they identified as single, heterosexual, were at least 18 years of age, and whether they had a personal Facebook profile. Participants were made aware that there was a time limit at the beginning of the study and were informed that they needed to complete the study in one sitting. Participants were asked to verify that they were in a quiet place without distractions and informed that the study should take them approximately 30 minutes to complete. Individuals were randomly assigned to one of two profiles of a couple and were also randomly assigned to either begin with the male's profile or the female's profile. These profiles were of the same couple, however, the profiles were manipulated to elicit an upward or downward social comparison. Participants were told to take a few minutes to study the profiles. We explained to them that they were able to freely explore the profiles, including the about section, photos, and posts and photos that are on the profile's timeline. Participants could navigate between the couple's profiles through the "in a relationship with" link. The participants were told to pay attention to the different events that occurred in the couple's life. There was no minimum time that must be spent on the profiles. This was because the website that hosts the profiles required participants to temporarily leave Qualtrics and thus the amount of time spent viewing the profiles could not be tracked. However, participants had to access both profiles and be able to pass the attention check for their data to be included in analysis. Participants were notified that the maximum time that they were able to browse the profiles was 10 minutes, which is the same length of time that Morry et al. (2018) allotted their participants. Once this time was up, the survey automatically moved forward to the

next task. Participants then received a questionnaire containing profile verification questions such as “The task you have just completed required you to view the profile page of a female and a male. What is the name of the female Facebook user?” Following this, participants received measures assessing well-being and social comparison in randomized order. Participants concluded the study by answering demographic questions. Participants were awarded course credit for their participation in the form of 1 SONA research credit.

The study by Morry et al. (2018) was conducted in person, and this was so that a lab member could ensure that participants exited the mocked-up Facebook profiles before proceeding to the profile verification questions. This study was completed fully online using Qualtrics, and was set up so that participants were unable to proceed to the profile verification without moving past the profiles. The transition to fully-online for data collection was in part due to concerns related to conducting in person studies as a result of COVID-19, but also because aside from being able to verify in person that the participants had exited out of the profiles, there are no other reasons why data needed to be collected in person and the rest of the methodology was the same as that of Morry et al. (2018). This shift in methodology could also potentially extend generalizability of results as fully online studies allow for greater accessibility and inclusion of participants. Additionally, this fully online methodology may result in data that are more naturalistic since a researcher did not monitor the participant as they browsed the profiles. Participants were able to view these profiles in private which is how we would expect them to use social media in their daily life.

Results

Data preparation

Before statistical analysis was conducted, the data were prepared for analysis. This involved exporting the data from Qualtrics and removing anyone who did not pass the eligibility requirements. Participants had to be between the ages of 18-89, have a Facebook account, identify as single, and identify as heterosexual. Qualtrics captured 999 responses. Of those responses, five individuals said that they were not between the ages of 18-89, 178 did not identify as heterosexual, 71 did not have a Facebook account, and 407 identified as not being single. This resulted in 338 individuals who met the eligibility criteria for the study. However, another 78 participants were lost due to attrition as they did not complete the measures, for a total of 260 participants.

The next phase involved verifying that participants passed the attention check and the profile verification questions. Sixty-seven participants (eight in the upward comparison condition and 59 in the downward comparison condition) incorrectly answered two or more attention check and/or profile verification questions. An additional attention check question was embedded within one of the questionnaires to verify that participants were not clicking through responses without reading them carefully. Sixteen participants (five in the upward comparison condition and 11 in the downward comparison condition) incorrectly answered this question. Therefore, 83 participants who qualified for the study had their data excluded from analysis.

The next phase involved excluding participants' individual survey responses from analysis if they did not participate in that survey or scored less than the lowest possible response on a questionnaire due to incomplete survey responses. SPSS was used to automatically exclude those who did not participate in a survey by using pairwise deletion. However, 14 participants'

responses had to be manually excluded from the analysis for the Flourishing scale because they did not meet the lowest score possible for that scale.

The total number of participants who met all the qualifications of the study was 177 (93 in the upward comparison group and 84 for the downward comparison group; see Figure 1). Due to some participants' data being excluded from certain analyses (e.g., participants did not complete all measures), the *n* value for each analysis ranged from 150 – 163.

Analysis

Before conducting analysis, descriptive statistics were conducted. Within this dataset, the negative subset of the PANAS scale had the highest skewness at 1.23 and the highest kurtosis at 1.37. According to George and Mallery (2010), the skewness and kurtosis of this data set was within an acceptable range, which is between -2 and 2. Therefore, no data transformations were conducted.

An independent samples *t*-test was conducted to determine if there was a statistical difference between the self-esteem of the upward social comparison condition and the downward social comparison condition prior to the introduction of the manipulation. There was not a significant difference in the scores for the upward social comparison condition ($M = 36.45$, $SD = 7.02$) and the downward social comparison condition ($M = 36.41$, $SD = 7.92$); $t(176) = -.036$, $p = .972$. The magnitude of the differences in the means (mean difference = $-.04$, 95% CI $[-2.25, 2.17]$) was small (Cohen's $d = -.005$).

Next, the data was assessed to determine if covariates were present. A Chi Squared test was used to analyze gender. It was found that the groups did not significantly differ by gender $X^2(1, N = 177) = .065$, $p = .798$. Additionally, Gender was not significantly correlated with any of the dependent variables. The Pearson's r ranged from $-.09$ to $.04$ and all of the p values were

greater than .23. Therefore, it was determined that gender did not need to be a covariate in subsequent analyses. An independent samples *t*-test was conducted to compare age in the upward social comparison condition and the downward social comparison condition. There was not a significant difference in the scores for the upward social comparison condition ($M = 21.78$, $SD = 6.44$) and the downward social comparison condition ($M = 22.04$, $SD = 7.13$); $t(172) = .247$, $p = .81$. The magnitude of the differences in the means (mean difference = .25, 95% CI [-1.78, 2.28]) was small (Cohen's $d = -.04$). Additionally, age was not significantly correlated with any of the dependent variables. Pearsons's r ranged from $-.04$ to $.08$. The p values were greater than .31. Therefore, it was determined that age did not need to be a covariate in subsequent analyses. Since there were no covariates to account for, an ANOVA was used for further analysis.

Originally, these data were going to be analyzed using a MANOVA or a MANCOVA, depending on whether significant covariates were present. However, due to an error during Qualtrics programming, the setting to require that participants complete each item was not activated and a MANOVA was not able to be performed due to missing data. Multiple imputation was conducted to resolve the missing data issue. However, SPSS cannot conduct a MANOVA using data that has been filled through multiple imputation. This is because a MANOVA conducted through SPSS will not use the pooled data compiled through multiple imputation. MANOVAs also use listwise deletion meaning that any case with a missing value was dropped from analysis, therefore reducing the total number of participants eligible for analysis. After consulting with the thesis committee, it was determined that conducting multiple ANOVAs and correcting for multiple testing would be a suitable compromise for this dilemma. Since there were only two groups being used in analysis (upward social comparison condition

and downward social comparison condition), independent samples *t*-tests were used in place of ANOVAs. We used independent samples *t*-tests to analyze our DVs and used Holm-Bonferroni to adjust for multiple testing. As a result, 9 measures received new adjusted *p*-values. To do this, we ranked the original *p*-values from smallest to largest. We then divided .05 by the number of tests-their rank +1 to get the new *p*-value. If the newly generated *p*-value was greater than the original *p*-value, then we rejected the null. We used Holm-Bonferroni correction in place of Bonferroni correction since Bonferroni can be too conservative. These new *p*-values are: 0.05, 0.025, 0.1667, 0.0125, 0.01, 0.0083, 0.0071, 0.0063, 0.0056.

An independent samples *t*-test was conducted to compare social comparison in the upward social comparison condition and the downward social comparison condition. There was a significant difference in the scores for the upward social comparison condition ($M = 58.33$, $SD = 15.92$) and the downward social comparison condition ($M = 73.34$, $SD = 14.45$); $t(156) = 6.18$, $p < .001$. This meant that those randomly assigned to the upward social comparison group were more likely to have made an upward social comparison than those in the downward social comparison group. The magnitude of the differences in the means (mean difference = 15.01, 95% CI [10.21, 19.80]) was large (Cohen's $d = .99$). Following Holm-Bonferroni correction, this result remained statistically significant.

An independent samples *t*-test was conducted to compare negative affect in the upward social comparison condition and the downward social comparison condition. There was not a significant difference in the scores for the upward social comparison condition ($M = 16.96$, $SD = 6.16$) and the downward social comparison condition ($M = 17.77$, $SD = 7.74$); $t(161) = -.74$, $p = .46$. The magnitude of the differences in the means (mean difference = .80, 95% CI [-1.35, 2.96]) was small (Cohen's $d = .12$).

An independent samples *t*-test was conducted to compare positive affect in the upward social comparison condition and the downward social comparison condition. There was a significant difference in the scores for the upward social comparison condition ($M = 27.93$, $SD = .9.30$) and the downward social comparison condition ($M = 30.88$, $SD = 9.85$); $t(161) = 1.97$, $p = .05$. The magnitude of the differences in the means (mean difference = 2.96, 95% CI [-0.01, 5.92]) was small (Cohen's $d = .31$). However, following Holm-Bonferroni correction, positive affect was no longer statistically significant.

An independent samples *t*-test was conducted to compare subjective happiness in the upward social comparison condition and the downward social comparison condition. There was not a significant difference in the scores for the upward social comparison condition ($M = 4.89$, $SD = 1.09$) and the downward social comparison condition ($M = 4.94$, $SD = 1.13$); $t(151) = .30$, $p = .76$. The magnitude of the differences in the means (mean difference = .05, 95% CI [-0.30, .41]) was small (Cohen's $d = -.04$).

An independent samples *t*-test was conducted to compare satisfaction with life in the upward social comparison condition and the downward social comparison condition. There was not a significant difference in the scores for the upward social comparison condition ($M = 22.50$, $SD = 6.28$) and the downward social comparison condition ($M = 21.68$, $SD = .87$); $t(156) = -.75$, $p = .45$. The magnitude of the differences in the means (mean difference = -.82, 95% CI [-2.99, 1.34]) was small (Cohen's $d = -.12$).

An independent samples *t*-test was conducted to compare satisfaction with relationship status in the upward social comparison condition and the downward social comparison condition. There was not a significant difference in the scores for the upward social comparison condition ($M = 7.84$, $SD = 3.63$) and the downward social comparison condition ($M = 8.70$, $SD = 4.05$);

$t(148) = 1.37, p = .17$. The magnitude of the differences in the means (mean difference = .86, 95% CI [-.38, 2.10]) was small (Cohen's $d = .22$).

An independent samples t -test was conducted to compare flourishing in the upward social comparison condition and the downward social comparison condition. There was a significant difference in the scores for the upward social comparison condition ($M = 41.23, SD = 6.18$) and the downward social comparison condition ($M = 43.81, SD = 6.62$); $t(157) = 2.53, p = .01$. The magnitude of the differences in the means (mean difference = 2.58, 95% CI [.57, 4.58]) was small (Cohen's $d = .4$). Following Holm-Bonferroni correction, this result was no longer statistically significant.

An independent samples t -test was conducted to compare social media use and integration in the upward social comparison condition and the downward social comparison condition. There was not a significant difference in the scores for the upward social comparison condition ($M = 26.62, SD = 8.92$) and the downward social comparison condition ($M = 27.58, SD = 9.57$); $t(160) = .66, p = .51$. The magnitude of the differences in the means (mean difference = .96, 95% CI [-1.91, 3.83]) was small (Cohen's $d = .10$).

An independent samples t -test was conducted to compare state self-esteem in the upward social comparison condition and the downward social comparison condition. There was not a significant difference in the scores for the upward social comparison condition ($M = 22.94, SD = 7.43$) and the downward social comparison condition ($M = 21.85, SD = 6.77$); $t(163) = -.99, p = .33$. The magnitude of the differences in the means (mean difference = -1.09, 95% CI [-3.28, 1.10]) was small (Cohen's $d = -.15$). The Cronbach's alpha for our data was .91.

For this study, we wanted to explore if satisfaction with relationship status is a significant moderator for the effect of the social comparison on well-being. There were two significant well-being measures: positive affect and flourishing. Before this analysis began, I standardized relationship satisfaction. This was standardized due to concerns over multicollinearity. The independent variable is not continuous and was coded using 0 and 1 so it was not standardized. I then created the interaction terms.

To test the hypothesis that satisfaction with relationship status moderates the relationship between the comparison direction and positive affect, linear regression moderation analysis was conducted. The moderation was not significant, $B = -1.682$, $SE = 1.564$, $t(131) = -1.076$, $p = .284$. Therefore, it was determined that satisfaction with relationship status does not moderate the relationship between the comparison direction and positive affect.

To test the hypothesis that satisfaction with relationship status moderates the relationship between the comparison direction and flourishing, linear regression moderation analysis was conducted. The moderation was not significant, $B = -.360$, $SE = 1.077$, $t(127) = -.334$, $p = .739$. Therefore, it was determined that satisfaction with relationship status does not moderate the relationship between the comparison direction and flourishing.

Discussion

General Discussion

While romantic relationship social comparison effects among those in relationships have been established, there has been no prior study to investigate this among individuals who identify as single. Thus, the purpose of the present study was to explore the effect of romantic relationship social comparisons that singles make on Facebook and how these comparisons affect

their well-being. In addition to being the first study to investigate this effect among individuals who identify as single, we also wanted to see if the results of Morry et al. (2018) were replicable with a fully-online protocol.

It was hypothesized that similar to previous research with those in romantic relationships, single participants who were randomized to the downward social comparison group would report greater well-being compared to participants who were randomized to the upward social comparison group. Initially, this hypothesis was correct for positive affect and flourishing. However, after multiple testing correction, these results were no longer statistically significant. While the well-being measures were no longer significant, social comparison was still significant, indicating that our manipulation did work. Those in the upward social comparison condition had lower social comparison scores compared to those in the downward social comparison condition. This indicated that those who were in the upward social comparison condition viewed themselves less positively than those in the downward social comparison group. These supports the validity of the manipulation since upward social comparisons are associated with negative outcomes such as low self-esteem. These results first confirm that the experimental protocol designed by Morry et al. (2018) can be successfully utilized fully online.

While our study did not show that this type of social comparison had an effect on well-being, this is not surprising. Morry et al. (2018) only evaluated three measures of well-being and found small effects. That study also did not use multiple test correction since they were able to use a MANOVA. The present study evaluated nine measures of well-being and used multiple test correction since we were unable to use a MANOVA. Since we were looking for small effect sizes while changing the target population and study modality from Morry et al. (2018), the null results were perhaps not surprising. It may be that the social comparison that we used did not

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affect well-being in our sample as the comparison target may have been too different from our participants. For instance, it may have been difficult for our participants to relate to someone who is in a relationship. However, it may be possible that there is an effect, but our sample size was too small to detect it following multiple test correction. Future researchers should aim for larger samples and/or strategies to mitigate missing data (e.g., requiring participants complete every item in each measure).

This study also had an exploratory question that asked whether satisfaction with relationship status is a significant moderator for the effect of social comparison on well-being. While our well-being measures were not statistically significant following Holm-Bonferroni correction, we decided to perform this moderation analysis since it was included in our preregistration with Open Science Framework. The results of this exploratory analysis found that relationship satisfaction was not a moderator for positive affect and flourishing. However, once interaction terms were created for this analysis, the sample sizes were reduced due to exclusion of cases with missing data and the differences between groups were no longer significant. These analyses were under powered due to incomplete data, but because this was an exploratory question and not a research question, we continued the analysis. Therefore, these results should be interpreted with caution since a larger sample size may have produced different results.

Limitations and Future Directions

There are some limitations to the present study. One limitation is that although we connected with the researchers who conducted Morry et al. (2018) for recommended updates for the study and had undergraduates at another university look at the Facebook profiles, these profiles may have been perceived as unrealistic by our participants. In an attempt to keep the profiles true to the original study while updating them to help them seem more authentic, the

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profiles still had interactions on them that may seem atypical. For example, for the downward social comparison profile, Hannah posts a status saying “Ugh, one insane work week down, another to go” to which Ryan responds “I’ve barely seen you. I wish you would make some time for us.” Participants may have been skeptical that a conversation of this nature would take place over Facebook.

Participants were asked how similar they thought they were to the couple. When asked this question, 32% of participants said that they were not similar, while only 22% said that they were somewhat similar. Based on social comparison theory, we know that we are less likely to be able to make social comparisons to individuals who are different from us (Festinger, 1954). Therefore, many of our participants may not have been able to relate to the couple and thus would be less likely to make a social comparison to them. This may be one reason that we did not see significant results in some of the well-being measures. Since it was difficult for some of our participants to see themselves as similar to the couple used in the manipulation, it is not surprising that we did not find the effect that we were looking for (especially as we were aiming to replicate what previously has been a small effect size). Participants being unable to find themselves similar to the couple in the manipulation is a potential limitation of the study. However, this also may be an important finding. It may be possible that social comparisons cannot be made between singles and those in a romantic relationship. If future researchers wish to future explore this relationship, they should consider strengthening the possibility of an effect by increasing perceived similarity of participants to the couple in the manipulation (e.g., by emphasizing similar characteristics such as being students at the same institution).

Using Facebook was a prerequisite for participation in this study. Therefore, 100% of participants were Facebook users. However, when thinking to generalize to the United States

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population, future studies should consider looking at romantic relationship social comparisons on other social media sites such as Instagram or Snapchat. According to Pew Research Center (2021), of adults between the ages of 18-29 in the United States, 65% have used Snapchat, 71% have used Instagram, and 70% have used Facebook. Those who are on the younger side of that range (18-24) are even more likely to use Instagram (76%) and Snapchat (75%). Due to the popularity of these sites among traditional college aged individuals, the effects of online romantic relationship social comparisons may be greater on these sites than those that were found in the present study. This may be because these individuals are more familiar with the sites and are using them more frequently. Therefore, they may be more used to these platforms and can navigate them more effectively.

Additionally, since our sample largely identified as white (74%), the results cannot be generalized to those of the global majority. Researchers should consider recruiting more diverse samples in future studies. Individuals from different backgrounds and cultures may use these social media sites differently and may have different experiences when exposed to the social comparison stimuli. Since our population was also exclusively heterosexual, the findings of this study cannot be generalized to individuals within the 2SLGBTQIA+ community and future research could examine the effect in these populations.

There were 83 participants who qualified for our study that had their data excluded from analysis due to attention check failures. The majority of these attention check failures occurred in the downward social comparison group. There are a few reasons this may have occurred. Participants in our sample were on average about 21 years old. They may not have enough experience with relationships at this point to be able to tell that a relationship is not healthy or that the couple appeared unsatisfied within their relationship. With more experience and

education regarding healthy relationships, these individuals may be able to better identify a bad romantic relationship. It may be that participants in the downward social comparison group paid less attention to the profiles because they were negative. Prior research has shown that we pay more attention to positive targets and that we judge them more accurately than negative ones (Human, et al. 2012), therefore our participants may not have been able to accurately judge the couple in the downward social comparison profiles due to their more negative presentation.

Another limitation of our study is that the manipulation was indirect. While we did directly manipulate the Facebook profiles in a way that was meant to illicit an upward or a downward social comparison, this manipulation did not guarantee that participants made an upward or a downward social comparison. It is possible that participants in the downward social comparison condition still felt that the couple was doing better than them and vice versa for the upward social comparison group. Future researchers should consider ways that they can accomplish this type of research using a direct manipulation. This may include asking participants to make online social comparisons to a couple that they know whom they feel would be a good target for an upward or downward social comparison, based on the group they are randomized to.

Morry et al. (2018) used the relationship social comparison interpretation (RSCI) scale in their study. However, when preparing this replication, we decided that the RSCI could not be modified to work effectively in our study. This scale consists of 45 items focused on relationship social comparison. Many of the questions could not be adjusted for singles without jeopardizing the validity and reliability of the scale. For example, items include “If we work hard enough, we can make it work” and “I can see us doing as badly as them”. As a substitute, we decided to use the Social Comparison Scale to assess social comparison among our participants. Initially, we

intended to use this scale as both a measure of social comparison and a way of removing participants data if their social comparisons were inconsistent with the type of social comparison that we intended for them to make. However, this scale was unable to be used in such a way with our sample. Morry et al. (2018) not only assessed the direction of the social comparison, but they recognized that upward and downward social comparisons can have varying interpretations. Within their study, they identified that those who make upward social comparisons can experience both positive and negative interpretations. This means that participants in this condition could feel either motivated to improve their relationships or that their relationship is not as good as they believed it to be prior to the manipulation. When their participants made downward social comparisons, they experienced more positive interpretations such as believing that they will be able to prevent their relationship from becoming as bad as the couple in the Facebook profiles. In our study, participants in the downward social comparison group had significantly higher social comparison scores than the upward social comparison group. This indicated that the downward social comparison group had more positive perceptions of themselves. The upward social comparison group had lower scores, indicating that their perceptions of themselves were lower than the downward social comparison group. This is what we would typically expect to see with downward and upward social comparisons since downward social comparisons are associated with positive outcomes and upward social comparisons are associated with negative outcomes. These results were expected and suggest that the manipulation and randomization was effective at creating differences in social comparison at the group level. However, when we examine the individual scores of participants in the upward social comparison group, some individuals actually had higher social comparison scores. It appears that the participants in this condition may have had both positive and negative

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interpretations of the social comparison they made which would be consistent with the results of Morry et al. (2018). While we initially intended to exclude participants who had inconsistent interpretations, we recognize that social comparisons are more complex. We thus used the Social Comparison Scale consistent with how Morry et al. (2018) used the RSCI – to describe and verify overall group differences between conditions, but not as an individual score used for exclusion. Since this scale is something that we added to our study and we were attempting to use this scale in a way that may not have been consistent with its intended use, this is another limitation of our study. Future researchers should consider how the interpretation of social comparisons may affect their study and attempt to find a measure that accurately assesses this.

If future researchers decide to use this same methodology, they should also consider trying to increase the authenticity of the interactions on the Facebook profiles to enhance the effect of the manipulation. For the upward social comparison profiles, this may mean doing things like creating realistic positive posts (e.g., One partner praising another for reaching a milestone such as graduation). Some of the positive posts on the profiles may have seemed artificial and exaggerated in comparison to what you would normally see on a Facebook profile. For the downward social comparison profiles, this may mean changing the interactions from overtly negative to more passive aggressive. However, creating an authentic downward social comparison profile can be difficult since some individuals prefer to keep their conflicts private and not post them on social media.

Future researchers should consider the difference between social comparison among close others compared to strangers. Social comparisons may be less effective when made to strangers instead of close others. When an individual makes an upward social comparison to someone who they have a close relationship with, then that social comparison is more distressing

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in comparison to a social comparison made against a stranger (Tesser, 1988). The participants of this study were strangers to the couple in the Facebook profiles. Participants do not know the intricacies of this couple's relationship outside Facebook. For example, they do not know if the positive and happy posts that they were presented with in the upward social comparison group are a genuine and true reflection of the couple or if these posts are a bad representation of what the couple's relationship is like in real life. Therefore, future researchers may find larger effects if they have individuals compare to close others.

The present study did not include a lateral or neutral social comparison condition. Due to this, we were unable to determine how much of a change the downward and upward social comparison groups experienced in comparison to a control condition. Future researchers may consider creating a condition in which participants view the profile of another single before completing the well-being measures or having a group bypass any manipulation and instead only fill out the well-being measures. Future researchers may also consider attempting a longitudinal study. Researchers can have participants answer the well-being measures, then coming back for a follow up session where they view the profiles and then answer the well-being measures from the first session. This would allow researchers to see how each participant increases or decreases in well-being after being exposed to the manipulation.

Researchers can also explore whether certain social media platforms have users that are more prone to social comparisons than others. Platforms such as Instagram that focus on sharing photos may provide more information to users which can make it easier to make social comparisons. When singles compare themselves to those in romantic relationships, downward social comparisons may result in greater well-being as compared to upward social comparisons.

While this study did not replicate previous effects of social comparisons (Li, 2019; Lim & Yang, 2019; Lockwood, 2002; Van de Ven, 2017; Wheeler & Miyake, 1992), future studies with larger samples and/or stronger manipulations may. If future researchers find that singles are affected by social comparisons made to those in romantic relationships, then they should also look into identifying ways that individuals can mitigate the effects of online social comparisons. While social comparisons can be effective in the short-term, there may be more effective long-term strategies for well-being management that do not require comparing oneself to others such as engaging in activities that allow for creativity (Acar et al., 2020), creating meaning in life and our daily activities (Hooker et al., 2020), becoming more optimistic (Mens et al., 2021), or developing a growth mindset (Lam and Zhou, 2020). Therefore, it may be important for people who use social comparisons as a strategy for managing well-being to consider exploring alternative strategies for improving well-being.

Conclusion

The present study found that when singles socially compare themselves to those that are in a romantic relationship, their well-being is not affected. However, two of our well-being measures were statistically significant before we used Holm-Bonferroni correction. While our social comparison manipulation worked, it did not affect well-being. The present study was also a replication of Morry et al. (2018) using an online protocol. We learned that the method used in the original study can be effectively used fully online. Due to this ability, this type of research allows for more accessibility. Whether the issue is geographical distance, safety precautions in the face of a pandemic, or ease of access, this method allows more individuals the ability to participate in this type of study.

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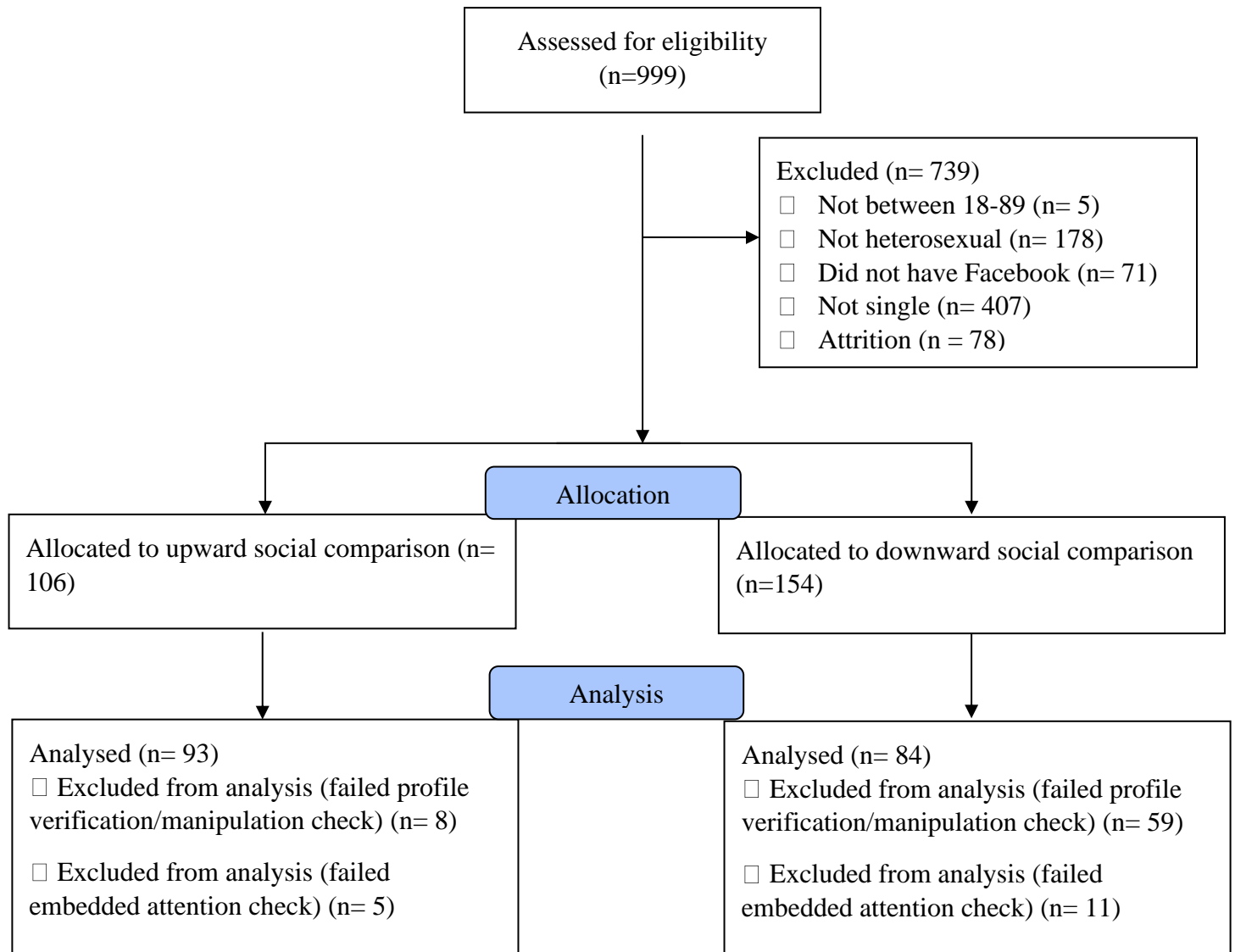
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Figure 1

Participants excluded from data analysis



Appendix A

Satisfaction With Life Scale

Instructions: Below are five statements that you may agree or disagree with. Using the 1 - 7 scale below, indicate your agreement with each item by placing the appropriate number on the line preceding that item. Please be open and honest in your responding.

- 7 - Strongly agree
- 6 - Agree
- 5 - Slightly agree
- 4 - Neither agree nor disagree
- 3 - Slightly disagree
- 2 - Disagree
- 1 - Strongly disagree

_____ In most ways my life is close to my ideal.

_____ The conditions of my life are excellent.

_____ I am satisfied with my life.

_____ So far I have gotten the important things I want in life.

_____ If I could live my life over, I would change almost nothing.

Appendix B

Subjective Happiness Scale

For each of the following statements and/or questions, please select the point on the scale that you feel is most appropriate in describing you.

1. In general, I consider myself:

1	2	3	4	5	6	7
not a very						a very
happy						happy
person						person

2. Compared with most of my peers, I consider myself:

1	2	3	4	5	6	7
less						more
happy						happy

3. Some people are generally very happy. They enjoy life regardless of what is going on, getting the most out of everything. To what extent does this characterization describe you?

1	2	3	4	5	6	7
not at						a great
all						deal

4. Some people are generally not very happy. Although they are not depressed, they never seem as happy as they might be. To what extent does this characterization describe you?

1	2	3	4	5	6	7
not at						a great
all						deal

Appendix C

State Self Esteem Scale

This is a questionnaire designed to measure what you are thinking at this moment. There is, of course, no right answer for any statement. The best answer is what you feel is true of yourself at this moment. Be sure to answer all of the items even if you are not certain of the best answer.

Again, answer these questions as they are true for you RIGHT NOW.

1. I am worried about whether I am regarded as a success or failure.

1	2	3	4	5
not at all	a little bit	somewhat	very much	extremely

2. I feel self-conscious.

1	2	3	4	5
not at all	a little bit	somewhat	very much	extremely

3. I feel displeased with myself.

1	2	3	4	5
not at all	a little bit	somewhat	very much	extremely

4. I am worried about what other people think of me.

1	2	3	4	5
not at all	a little bit	somewhat	very much	extremely

5. I feel inferior to others at this moment

1	2	3	4	5
not at all	a little bit	somewhat	very much	extremely

6. I feel concerned about the impression I am making.

1	2	3	4	5
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not at all a little bit somewhat very much extremely

7. I am worried about looking foolish.

1 2 3 4 5

not at all a little bit somewhat very much extremely

Appendix D

Positive and Negative Affect Schedule

This scale consists of a number of words that describe different feelings and emotions. Read each item and then mark the appropriate answer in the space next to that word. Indicate to what extent you feel this way right now, that is, at the present.

Use the following scale to record your answers.

	Very slightly or not at all	A little	Moderately	Quite a bit	Extremely
Interested	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Distressed	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Excited	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Upset	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Strong	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Guilty	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Scared	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Hostile	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Enthusiastic	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Proud	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Irritable	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Alert	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Ashamed	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Inspired	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Nervous	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

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Determined	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Attentive	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Jittery	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Active	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Afraid	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Appendix E

Flourishing Scale

Below are 8 statements with which you may agree or disagree. Using the scale below, indicate your agreement with each item by indicating that response for each statement.

	Strongly disagree	Disagree	Somewhat disagree	Neither agree nor disagree	Somewhat agree	Agree	Strongly agree
I lead a purposeful and meaningful life	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
My social relationships are supportive and rewarding	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
I am engaged and interested in	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

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my daily

activities

I actively

☐☐☐☐☐☐☐

contribute

to the

happiness

and well-

being of

others

I am

☐☐☐☐☐☐☐

competent

and capable

in the

activities

that are

important to

me

I am a good

☐☐☐☐☐☐☐

person and

live a good

life

I am

☐☐☐☐☐☐☐

optimistic

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about my
future

People ☐ ☐ ☐ ☐ ☐ ☐ ☐

respect me

Appendix F

The Social Comparison Scale

Please select a number at a point which best describes the way in which you see yourself in comparison to the couple presented in the Facebook profiles.

Select one number on each line according to how you see yourself in relationship to others.

In relationship to the couple presented in the Facebook profiles I feel:

Inferior 1 2 3 4 5 6 7 8 9 10 Superior

Incompetent 1 2 3 4 5 6 7 8 9 10 More competent

Unlikeable 1 2 3 4 5 6 7 8 9 10 More likeable

Left out 1 2 3 4 5 6 7 8 9 10 Accepted

Different 1 2 3 4 5 6 7 8 9 10 Same

Untalented 1 2 3 4 5 6 7 8 9 10 More talented

Weaker 1 2 3 4 5 6 7 8 9 10 Stronger

Unconfident 1 2 3 4 5 6 7 8 9 10 More confident

Undesirable 1 2 3 4 5 6 7 8 9 10 More desirable

Unattractive 1 2 3 4 5 6 7 8 9 10 More attractive

An outsider 1 2 3 4 5 6 7 8 9 10 An insider

Appendix G

Social Media Usage

Please indicate the extent to which you agree with each of the following items

	Strongly disagree	Disagree	Somewhat disagree	Somewhat agree	Agree	Strongly agree
I feel disconnected from friends when I have not logged into Facebook	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
I would like it if everyone used Facebook to communicate	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
I would be disappointed if I could not use Facebook at all	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Social Comparisons, Singlehood, and Well-being

I get upset ☐ ☐ ☐ ☐ ☐ ☐

when I can't

log on to

Facebook

I prefer to ☐ ☐ ☐ ☐ ☐ ☐

communicate

with others

mainly

through

Facebook

Please select ☐ ☐ ☐ ☐ ☐ ☐

somewhat

agree for this

item

Facebook ☐ ☐ ☐ ☐ ☐ ☐

plays an

important

role in my

social

relationships

I enjoy ☐ ☐ ☐ ☐ ☐ ☐

checking my

Social Comparisons, Singlehood, and Well-being

Facebook

account

I don't like ☐ ☐ ☐ ☐ ☐ ☐

to use

Facebook

Using ☐ ☐ ☐ ☐ ☐ ☐

Facebook is

part of my

everyday

routine

I respond to ☐ ☐ ☐ ☐ ☐ ☐

content that

others share

using

Facebook

How often do you use social media (e.g. Facebook, Instagram, Twitter, Pinterest, LinkedIn,

Snapchat, WhatsApp, other)?

☐ Several times a day

☐ About once a day

☐ A few times a week

☐ Every few weeks

☐ Less often

Social Comparisons, Singlehood, and Well-being

☐ Never

How often do you use Facebook?

☐ Several times a day

☐ About once a day

☐ A few times a week

☐ Every few weeks

☐ Less often

☐ Never

How often do you post to Facebook?

☐ Several times a day

☐ About once a day

☐ A few times a week

☐ Every few weeks

☐ Less often

☐ Never

To what extent do you agree with the following statements:

	Disagree strongly	Disagree a little	Neutral; no opinion	Agree a little	Agree strongly
My Facebook profile	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Social Comparisons, Singlehood, and Well-being

reflects who I

am in an

authentic way

My Facebook ☐ ☐ ☐ ☐ ☐

profile

reflects who I

am in a

positive way

Appendix H

The Satisfaction with Relationship Scale

Please note: Regardless of your relationship status (even if you are single), please fill out the following questionnaire.

The following questions aim to get more insight into the satisfaction with your current relationship status. Therefore, the words “current status/ situation” refer either to being single or being in a relationship, depending on your current relationship status. We ask you to consider these questions specifically in this sense and do not think of “current status” as a general term that might include other aspects of your life. Please focus on your current partnership or singlehood while answering the questions.

1. In general, how satisfied are you with your current status?

Not at all A little To quite some extent To a great extent

2. How often do you wish you hadn't gotten into this situation?

Not at all A little To quite some extent To a great extent

3. How happy are you with your current status?

Not at all A little To quite some extent To a great extent

4. To what extent does your current status meet your expectations?

Not at all A little To quite some extent To a great extent

5. Do you enjoy your current status?

Not at all A little To quite some extent To a great extent

Appendix I

Profile Verification Questions

NOTE: each of these questions will appear on a separate page.

The task you have just completed required you to view the profile page of a female and a male.

Please choose the name of the female Facebook user using the options below.

- ☐ Samantha Wilson
- ☐ Hannah Stevens
- ☐ Jane Russell
- ☐ Leah Jackson

The task you have just completed required you to view the profile page of a female and a male.

Please choose the name of the male Facebook user using the options below.

- ☐ Dave Calvert
- ☐ Owen Kearns
- ☐ Ryan Cameron
- ☐ Drew Barnes

What is the nature of the relationship between Hannah Stevens (the female Facebook user whose profile you saw) and Ryan Cameron (the male Facebook user whose profile you saw)?

- ☐ Siblings
- ☐ Friends
- ☐ Romantic relationship

Social Comparisons, Singlehood, and Well-being

How frequently do Hannah and Ryan communicate over Facebook?

- ☐ Frequently (a few times a week)
- ☐ Rarely (a few times a month)
- ☐ Never

What tone do Hannah and Ryan use when they talk to each other through Facebook?

- ☐ Positive and happy
- ☐ Negative and unhappy

Overall, how would you rate the quality of Hannah and Ryan's relationship?

- ☐ Very good
- ☐ Good
- ☐ Fair
- ☐ Poor
- ☐ Very Poor

Based on their Facebook profiles, how satisfied do you think Hannah is in her relationship with Ryan?

- ☐ Very Satisfied
- ☐ Satisfied
- ☐ Somewhat Satisfied
- ☐ Neutral
- ☐ Somewhat Dissatisfied

Social Comparisons, Singlehood, and Well-being

☐ Dissatisfied

☐ Very Dissatisfied

Based on their Facebook profiles, how satisfied do you think Ryan is in his relationship with Hannah?

☐ Very Satisfied

☐ Satisfied

☐ Somewhat Satisfied

☐ Neutral

☐ Somewhat Dissatisfied

☐ Dissatisfied

☐ Very Dissatisfied

Based on her Facebook profile, how attracted to alternative partners do you think Hannah is?

☐ Very attracted to alternative partners

☐ Somewhat attracted to alternative partners

☐ Not attracted at all to alternative partners

Based on his Facebook profile, how attracted to alternative partners do you think Ryan is?

☐ Very attracted to alternative partners

☐ Somewhat attracted to alternative partners

☐ Not attracted at all to alternative partners

Appendix J

Demographics

Age: _____ years

What gender do you identify as? _____

What is your ethnicity? _____

How long have you been in your current relationship status?

_____ years

_____ months

What is your religious affiliation? _____

Appendix K

Open Science Framework

https://osf.io/czp9f/?view_only=66d9541f8bde4e5992d2616e716c4ffa