



Influences of Social Media Use on Adolescent Psychosocial Well-Being: 'OMG' or 'NBD'?

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Influences of Social Media Use on Adolescent Psychosocial Well-being:
'OMG' or 'NBD'?¹

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A thesis presented to the faculty
of the Graduate School of Education of Harvard University
in partial fulfillment of the requirements
for the degree of Doctor of Education

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Ad-Hoc Committee:
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¹ OMG and NBD are popular Internet-era acronyms; these initialisms are shorthand for Oh My Gosh/God (OMG) and No Big Deal (NBD).

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By my last round of thesis edits, I was hearing voices. It was not a perceptual anomaly. Rather, after years of my committee's patient and persistent mentorship, their advice cocooned me even in their physical absence. As I sat alone at my desk, I heard Beth beseeching me to use ever-more precise language, reminding me that clear writing sharpens the writer's thinking as well as the reader's. When I started to feel as though I might lose my way, I heard Bob urging me – as he has time and again – to go back to my data; to start with and stay with youths' voices. All the while, I searched consistently for the kinds of controversy that I often shied from in earlier years of my academic training. Regardless of the topic, I knew that Howard would push me to find tension in the existing knowledge, to communicate it to my audience, and to take a well-informed stand. My committee members share a love for the craft they taught me. They have been wonderful teachers and I am grateful to be their student.

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Abstract

Daily social media use is routine for most contemporary adolescents. However, as social technology use rises, we are still largely unclear about the nature of adolescents' multifaceted experiences and the mechanisms that may disrupt well-being. In two studies, I use qualitative and quantitative methods to examine the relationship between adolescents' social media use and their psychosocial well-being. I conducted a survey and social browsing experiment (n=588), followed by semi-structured interviews with a purposeful sub-sample of youth (n=28).

In Study 1, I present an architecture of emotional life infused with social technologies. Adolescents' survey self-reports portray social media use as a predominantly positive experience. Exploratory principal component analysis further indicates that positive and negative emotions form orthogonal response components. In interview narratives, youth describe affect influences across four functional dimensions: *self-expression* is an opportunity for both feeling validated and feeling judged; *exploration* facilitates inspiration but also distress; *relational interactions* contribute to closeness and to disconnection; and *browsing* leads to entertainment and boredom, as well as to admiration and envy. Together, these analyses suggest that the relationship between social technology usage and well-being – whether enhanced or degraded – is not confined to an 'either/or' framework, but that the emotional see-saw of social media use is weighted by *both* positive *and* negative influences.

In Study 2, I use an experiment to assess the merit of a pervasive yet seemingly untested theory about *browsing*: that the “highlight reel” nature of social media is itself a cause of disruptions in well-being. Positive-only portrayals of others’ lives hypothetically disrupt well-being because they evoke negative social comparisons and contribute distorted perceptions of others’ happiness. I randomly assigned teens to a highlight reel browsing experience or to one of two interventions designed to reduce distorted impressions. Browsing conditions do not cause differences in comparison or post-browsing emotions. However, regardless of condition, negative comparisons predict immediate declines in affective well-being. The interventions moderate the relationship between social comparison and affect, thereby reducing the toll of negative comparison. I discuss implications of adolescents’ differential susceptibility to browsing highlight reels and to light-touch interventions.

General Introduction

Public unease about new media is reinforced often and easily. As an example: in November 2016, an article in *The New York Times* covered the Centers for Disease Control and Prevention's recent report on death rates among children and adolescents (Tavernise, 2016). For the first time, the rate of adolescent suicides surpassed the rate of deaths from car accidents (a function of both the rising suicide rate and the declining number of deaths from traffic accidents). Four sentences into the *Times* article, readers are alerted to the alleged role of social technologies:

The number [of suicides] is an extreme data point in an accumulating body of evidence that young adolescents are suffering from a range of health problems associated with the country's rapidly changing culture. The pervasiveness of social networking means that entire schools can witness someone's shame, instead of a gaggle of girls on a school bus. And with continual access to such networks, those pressures do not end when a child comes home in the afternoon. (Tavernise, 2016, para. 3)

To blame social media for adolescent mental health trends strikes me as alarmist and simplistic. And yet, the narrative compels an anxious public. Adolescents' networked lives often mystify the adults around them. Uncertainty contributes to concern. Concurrently, academic interest in digital youth has yet to translate into clarity about the relationship between social media use and psychosocial well-being (Best, Manktelow, & Taylor, 2014).

The controversy is due in part to a growing but fragmented evidence base (e.g., see Allen, Ryan, Gray, McInerney, & Waters, 2014; Pantic, 2014). Empirical studies reveal a number of psychosocial benefits related to social media use. At the same time, another body of research mounts evidence of potential risks. Individually, studies examine specific outcomes of interest with varied participant groups. The result is a potpourri of findings about relevant outcomes. Each study may be robust alone, yet the investigations collectively fail to provide conclusive practical guidance or theoretical clarity.

On the positive side, networked technologies expand opportunities for disclosure and belonging – both of which are meaningful processes and central to positive development during adolescence (Davis, 2012). In an age of heavily regulated schedules and few public places for gathering, digital spaces can provide adolescents with valued settings for social connection (boyd, 2014). Contemporary youth leverage social media to participate in civic life and political movements (Kahne, Middaugh, & Allen, 2015; Rundle, Weinstein, Gardner, & James, 2015). Lonely and socially anxious adolescents can benefit from the alternative venue for relationship building (Bonetti, Campbell, & Gilmore, 2010). Networked technologies also offer around-the-clock access to support communities (Jingbo, Martinez, Holmstrom, Chung, & Cox, 2017; Weinstein et al., 2016) and open new pathways for learning and creative expression (Ito et al., 2009; Pepler, 2013).

Acknowledging the benefits of social media is not a denial of challenges. As teens navigate social life with and through social apps, they also face a number

of potential stressors. Hostility is enacted through networked technologies to harass, impersonate, and publicly humiliate (Davis, Reich, & James, 2016; Lenhart et al., 2011; Weinstein & Selman, 2016). Managing intimate relationships can require negotiating smothering quantities of communication, breaches of digital privacy, and unwanted requests for access to sexts (Fox, Osborn, & Warber, 2014; Lippman & Campbell, 2014; Walrave, Heirman, & Hallam, 2014).

Adolescents and young adults² who are heavier social media users (i.e., those who spend more time using SNSs on a daily/weekly basis) evince poorer psychological functioning, on average, than peers who are lighter social media users (Sampasa-Kanyinga & Lewis, 2015; Wright et al., 2013). Young adults who spend more time on social media each week are also more likely to believe that others are happier and have better lives (Chou & Edge, 2012). Among a nationally-representative sample of 1,787 U.S. 19 to 32-year-olds, those who used higher numbers of social media platforms faced higher odds of both depression and anxiety symptoms (Primack et al., 2017).

Associations are not evidence of causality: correlations may simply reveal that those with poor well-being also use social media most heavily. However, Kross and his colleagues' (2013) experience-sampling method study adds weight to concerns that social media use causes or exacerbates ill-being. The researchers text-messaged 82 young adult participants five times per day over a two-week

² Unless otherwise specified, I use 'young adults' in reference to college-aged persons (~18-23 years) and I use the terms 'adolescents,' 'youth,' and 'teens' to describe grade-school-aged teens (~13-17 years).

period. At each text message point during the study's duration, they collected in-vivo assessments of Facebook use and well-being. A report of heavier participant Facebook use at one text message point predicted declines in that participant's affective well-being at the time of the next text message. Additionally, heavier overall Facebook use during the two-week period predicted greater declines in life satisfaction controlling for participants' baseline satisfaction at the start of the study.

Kross and his colleagues' (2013) findings may certainly apply to youth, though the results from their study focus on young adults and their Facebook use. Contemporary adolescents use multiple social network sites (SNSs) that afford different communication experiences and outcomes (Lenhart, 2015). For example, adults' uses of Facebook for directed, person-to-person communication (e.g., direct messages, wall posts, and 'likes') are associated with 'bridging social capital' (Burke, Kraut, & Marlow, 2011), while adolescents' and young adults' uses of Snapchat for casual and playful communication are more associated with bonding social capital (Piwek & Joinson, 2017³). In addition, recent research with a representative sample of 120,115 English (U.K.) adolescents found that the relationships between quantity of digital media use and well-being outcomes are better described by quadratic rather than linear functions; according to the investigators, moderate digital screentime is not associated with ill-being and may instead be beneficial for youth (Przyblski & Weinstein, 2017).

³ The majority of participants in Piwek & Joinson's study are aged 16-20 years.

Adolescents differ from adults in important ways related to both subjective experiences and social behavior, which may explain potentially divergent social media patterns. Adolescence is the period between childhood and adulthood – a developmental phase that begins around the onset of puberty and concludes with the adoption of adult social roles (Blakemore, Burnett, & Dahl, 2010). Identity formation is a central task of adolescence (Erikson, 1968; Marcia, 1980). Adolescents typically grapple with quintessential questions about who they are and who they want to become, as well as what roles they will hold in society.

Hormonal changes during puberty catalyze outwardly observable physical maturation; the biological events of puberty also trigger neurological development in three major areas of the adolescent brain: the reward system, the regulatory system, and the relationship system (Steinberg, 2014). Changes to the limbic system (the neural structures associated with reward-related activities) outpace development of the prefrontal cortex (the brain's regulatory system, which functionally facilitates impulse control) (Casey, Jones, & Hare, 2008). Adolescence is therefore characterized by heightened emotional responses alongside inchoate neural architecture to support self-regulation. As Steinberg (2014) summarizes,

During this time teenagers become more emotional (experiencing and displaying higher “highs” and lower “lows”), more sensitive to the opinions and evaluations of others (especially peers), and more determined to have exciting and intense experiences – something psychologists refer to as

“sensation seeking.” (p. 70)

During adolescence as compared to other periods of life, the presence of peers also has differential consequences for behavior. Gardner and Steinberg’s (2005) oft-cited experiment demonstrates this *peer effect*. To study how peers influence harmful risk-taking behavior, the researchers used a driving simulation with participants in three age groups: adolescents (13-16 years, mean age=14), young adults (18-22 years, mean age=19), and adults (24 years and older, mean age=37). They randomly assigned participants to play a driving game either alone or with two same-aged peers in the room. The instructions directed participants to drive a computerized vehicle in the game for as long as possible without crashing. At simulated intersections, traffic lights changed from green to yellow and then to red. Players risked a potential crash if they were still driving when the light turned red.

The adult participants’ risk-taking behavior was relatively stable whether they played the game alone or with peer companions (Gardner & Steinberg, 2005; see also Albert, Chein, & Steinberg, 2013). However, both groups of younger participants showed significant increases in risk-taking when peers were present. Young adults’ driving was roughly two times riskier when they played the game with peers in the room; adolescents’ driving was more than six times riskier in the social (versus solo) condition. As illustrated by this study, adolescents’ appraisals of risk and reward can be influenced by the mere presence of their peers.

Gardner and Steinberg (2005) argue that peer effects result from the

enhanced sensitivity of adolescents' neural reward systems. The presence of peers ostensibly signals the potential for a pleasurable experience and primes the neural reward system. Notably, peer effects can take hold even when peers are present only digitally. Van Hoorne, Crone, and Leijenhorst (2017) randomly assigned 15 to 17-year-old participants (n=76) to play an online gambling game either alone or with observation and advice from a supposed online peer. The peer's digital presence did not affect adolescents' reasoning skills. However, participants' behaviors were markedly riskier in the social condition – evidenced by higher gambling bets – as compared to the solo condition.

Social networking sites are characterized by the ever-present potential to 'see' and 'be seen' by peers. Adolescents differ from adults in how they respond to the presence of peers. The characteristic heightened emotional responsivity of adolescence is also noteworthy: for teen social media users, even seemingly mundane networked experiences may exert meaningful influences on well-being. Based on the aforementioned evidence, I view adolescence as a distinct developmental period. To understand adolescent social media use, I therefore contend that researchers should intentionally study adolescent populations and incorporate youths' perspectives on their own lived experiences.

In less than one decade, the landscape of contemporary social technologies has been transformed. Today, adolescent social media use is commonplace: 89% of U.S. 13 to 17-year-olds use one or more social network sites and 92% are online daily (Lenhart, 2015). A 2009 poll found that 22% of teens checked social

apps more than 10 times per day (Common Sense Media, 2009). Approximately five years later, nearly half of eighth graders (48%) checked social media sites more than ten times on a typical weekend day and 8% opened their SNS apps more than 100 times per day (Underwood & Faris, 2015).

During my fieldwork⁴ in preparation for this project, I regularly witnessed adolescents' uninhibited laughter in response to playful and clever social media interactions. In my conversations with youth, I heard frequently about the joys of self-expression and of leveraging social apps to pursue wide-ranging interests. Teens described humorous Instagram posts as "guaranteed" to cheer them up; they credited Snapchat exchanges for the development of cherished relationships; they used Facebook in ways that made geographically distant friends and family members feel close and involved. I also became a keeper of painful stories about social exclusion in a networked era. Teens shared pervasive anxieties about social judgment, often in conjunction with the latest iteration of social media metrics. They itemized concerns about the short and long term consequences of digital footprints.

⁴ During two years of preparation for this dissertation project, I engaged in ongoing empirical research as well as application-oriented activities. I worked with an independent nonprofit organization, Common Sense Media, on the design and development of a school-based program (*Connecting Families*) to support families' efforts to raise digital youth. To understand salient challenges related to adolescents' digital media use, I collaborated with educators, curriculum developers, and families. I also conducted a series of focus groups (n=16) on networked adolescents' social experiences; participants comprised middle school students, high school students, and parents of adolescents across three different states. Further, I regularly observed and participated in both parent events and youth discussions about social media, including in school, community, and summer program settings.

The costs and benefits I observed informally are neither surprising nor are they absent from the empirical literature. But it is yet unclear how they fit together in the daily experiences of networked adolescents. Over the past several years, I devoured research on digital youth. And yet I still inevitably fumbled over several simple questions from parents, educators, and clinicians. For example: Are adolescents unhappy because of social media? Do some youth benefit from social apps while others experience only distress? How can we assess the effects of social media on a particular teen? And, perhaps most often, should I (attempt to) keep my child disconnected?

The first study in this dissertation represents my effort to contribute a holistic account of adolescent emotional life with social technologies. I puzzled over how to study the multiple positive and negative influences, particularly because social media experiences are tailored, varied, and dynamic. I frame my inquiry with Valkenburg and Peter's (2013) Differential Susceptibility to Media Effects Model (DSMM). The DSMM highlights individual differences related to co-acting influences of disposition, development, and nested social contexts. I examine affective well-being as a necessarily multifaceted and dynamic construct, and I view positive and negative affect as distinct dimensions rather than opposite ends of a continuum (Bradburn, 1969; Dodge, Daly, Huyton, & Sanders, 2012).

I collected mixed-methods data from a single suburban public high school in the Northeastern United States. My dataset comprises survey responses from 588 teens and in-depth interviews with a purposeful sub-sample of 28 teens. In the

survey, participants reported on the general landscape of their affective experiences with social media. The descriptive analysis of their responses provides a simple yet illuminating glimpse into youth perceptions of social apps. To examine sources of variation across reports, I use exploratory principal component analysis.

Results from the principal component analysis facilitated my approach to *maximum variation sampling* for the interview phase (Miles, Huberman, & Saldaña, 2014). I spoke with teens whose survey responses positioned them throughout the affect distribution. In each interview, my co-interviewer and I reviewed a wide range of emotions and discussed with teens whether, when, and how different emotions arise in conjunction with social media use. We asked participants about the evolution of their social media experiences; interviewees also narrated their impressions as they actively browsed Instagram and Snapchat. Because the interview sample includes youth with purposefully varied reports of their general social media emotional experiences, the similarities across their narratives can be especially revealing.

Based on my quantitative and qualitative analyses in Study 1, I present an architecture of adolescent emotional life infused with social technologies. Exploratory principal component analysis indicates that positive and negative emotions form orthogonal components of adolescents' responses. As my inductive thematic analysis of the interviews further reveals, positive and negative affects can be conceptualized as present across four functional dimensions of social media

use. *Self-expression* is an opportunity for both validation and concerns about others' judgments; *exploration* facilitates inspiration but also distress; *relational interactions* contribute to closeness and to disconnection; and *browsing* leads to entertainment and boredom, as well as admiration and envy. All of the interviewees describe constellations of positive and negative influences of social media. Together, my analyses suggest that the relationship between social technology usage and well-being – whether enhanced or degraded – is not confined to an 'either/or' framework, but that the emotional see-saw of social media use is weighted by *both* positive *and* negative influences. Joint examination of adolescents' experiences within and across the dimensions can yield robust individual portraits of networked life.

Well-being is described as akin to a see-saw that tips and changes based on the dynamic nature of an individual's experiences (Dodge et al., 2012). I find that social media use is nuanced and multidimensional, and I draw on my analyses in Study 1 to propose SNS influences that positively and negatively weight a 'see-saw' of affective well-being. As a result, I suggest application of the see-saw framework as a balanced approach to assess social media experiences.

Any of the negative functional dimensions can theoretically tip the see-saw such that social media use becomes problematic rather than beneficial. In Study 2, I focus on one dimension – browsing – and the related experience of negative social comparison. Social browsing is arguably the most common daily SNS activity and it is the most frequently implicated in studies of social media and

well-being (e.g., Kross et al., 2013; Lup, Trub, & Rosenthal, 2015; Steers, Wickham, & Acitelli, 2014). My second study is a targeted examination of a mechanism that purportedly links social browsing to reduced psychosocial well-being: highlight reel-style portrayals of others' lives.

In the days leading up to my first round of data collection for this dissertation, an 'Instafamous' Australian teenager shuttered her social media accounts. Essena O'Neill abandoned the follower base that she so deliberately built – but first, she shared a final message with her 500,000+ followers: “Social Media Is Not Real Life” (Rodulfo, 2015). O'Neill commenced a mass-deletion of her Instagram posts. In the process, she temporarily re-captioned old photographs to convey the extent of her social media performances. “Not real life,” she posted under a serene-looking beach photograph from roughly two years earlier, “Only reason we went to the beach this morning was to shoot these bikinis because the company paid me and also I looked good to society's current standards” (Cuccinello, 2015, image 1). To accompany a smiling selfie, she added a self-mocking narration of her original intentions:

‘Please like this photo, I put on makeup, curled my hair, tight dress, big uncomfortable jewellery [sic].... Took over 50 shots until I got one I thought you might like, then I edited this one selfie for ages on several apps-just so I could feel some social approval from you.’ THERE IS NOTHING REAL ABOUT THIS. (Sowray, 2015, image 5)

In a longer post to her personal website, O'Neill explained her social media departure. She wanted her followers to know that her stream of smiling Instagram photos was false evidence of an enviable life (McCluskey, 2015). She simultaneously sought to spare herself from browsing daily others' social media representations: "I no longer want to spend hours and hours of my time scrolling, viewing and comparing myself to others" (Cuccinello, 2015, para. 3).

One week after Essena O'Neill's social media announcement, my sister (then a 19-year-old college sophomore) emailed me a link to a post by lifestyle blogger Emily Schuman. Though the blogpost included no mention of O'Neill, Schuman (2015) had a similar message for her followers. The title of the post – "Social media versus Real life" – echoed the distinction woven throughout Essena O'Neill's messages. Schuman wrote:

I know firsthand what I share on my social channels and blog is not a complete portrayal of my life. The snippets I choose to share are the best of the best of what's going on – and such a small portion, relatively, of the minutes and moments that make up my days. Regardless of whether or not someone is a professional creator/curator of content, feeling negative comparisons to someone's social media page is something that affects everyone these days (myself included). I think it's important to keep a few things in mind. The first is to remember that almost everything you see is an idealized version of someone's life ... [Second,] While I feel a self-imposed pressure to constantly provide new content, it's important to live in

the moment and appreciate a special event outside the lens of Instagram....
Lastly ... It can be a bit scary when you find yourself stuck in a scroll-hole
of stalking, feeling envious of someone else's representation of themselves.
(Schuman, 2015, para. 1-5)

The consequence of curated social media posts is also a prominent theme in
Kate Fagan's (2015) chilling portrait of Madison Holleran, published several
months earlier. Holleran was a 19-year-old student-athlete at the University of
Pennsylvania when she died by suicide in January of her sophomore year. In the
feature story, Instagram emerges as a villain. By Fagan's account, Instagram
ostensibly served two problematic functions for Holleran. First, browsing others'
Instagram posts conferred a skewed impression of others' lives and happiness.

[Madison] seemed acutely aware that the life she was curating online was
distinctly different from the one she was actually living. Yet she could not
apply that same logic when she looked at the projected lives of others.

Before going home for winter break, she asked [classmate] Ingrid, who was
also struggling at Penn, 'What are you going to say when you go home to
all your friends? I feel like all my friends are having so much fun at
school.' (Fagan, 2015, para. 6)

Second, Holleran's Instagram self-presentation offered a distorted portrayal of her
own well-being.

The life Madison projected on her own Instagram feed was filled with shots
that seemed to confirm everyone's expectations: Of course she was loving

her first year of college. Of course she enjoyed running. Her mom remembers looking at a photo on her feed and saying, ‘Madison, you look like you're so happy at this party.’

‘Mom,’ Madison said. ‘It's just a picture.’

Everyone presents an edited version of life on social media. People share moments that reflect an ideal life, an ideal self. . . . Fifty years ago, we spoke via the telephone, sharing only the details that constructed the self we wanted reflected. With Instagram, one thing has changed: the amount we consume of one another's edited lives. (Fagan, 2015, para. 1-4)

Individually and jointly, O’Neill, Schuman, and Fagan’s accounts offer a profoundly troubling view of social media. To be sure, these three stories are anecdotal, and they offer a negatively-skewed (and, I believe, incomplete) rendering of SNSs. Yet they captured my attention because of their unambiguous assertion: the distorted nature of social media portrayals is a destructive influence. Essena O’Neill presents as desperate to reveal the performative, heavily curated nature of her own self-presentation. Emily Schuman acknowledges that while her own her posts are “not a complete portrayal of my life,” she can nonetheless find herself in a “scroll-hole” envying others’ social media representations. The partial, positively-skewed nature of social sharing was also a destructive force for Madison Holleran, who reportedly viewed others’ social media portrayals as confirmation of their happiness. Following Study 1, I recognize that social browsing is but one facet of social media use that influences adolescents’

experiences. At the same time, I wondered: does social browsing threaten well-being *because* the content often comprises highlight reels of others' lives?

The argument has merit theoretically. People have an interpretative tendency to view even thin slices of social information as representative and complete (Kahneman, 2011). SNSs offer selective portrayals of others' lives that tend to favor positive, desirable self-presentations (DeAndrea & Walther, 2011; Ellison, Heino, & Gibbs, 2006). Social browsing therefore comprises 'thin' and often positively-skewed slices of social information. The *correspondence bias* suggests a tendency to infer others' behaviors are a function of stable personality traits, rather than situational cues (Gilbert & Malone, 1995). Applying the correspondence bias to the context of social media, an Instagram post that depicts the poster smiling is more likely judged as an indication that she is happy and has a great life rather than as an indication that she simply had an enjoyable experience. The *availability heuristic* is the well-supported claim that default judgments are based on immediately recalled examples (Tversky & Kahneman, 1973). To this end, social browsing equips social media users with easily-recalled, positively-skewed information about others' lives. Chou and Edge (2012) find that heavier social media users – who therefore interact more frequently than lighter users with others' digital representations – are indeed more likely to believe that other people are happier and have better lives.

I continue to encounter media declarations that social media highlight reels are problematic (e.g., Dentith, 2015; Palmer, 2016). In 2014, the idea received

explicit attention in the academic literature. Steers, Wickham, and Acitelli (2014) published a study titled, "Seeing everyone else's highlight reels: How Facebook usage is linked to depressive symptoms." Steers and her colleagues examined the association between Facebook use and depressive symptoms. In keeping with previous research (e.g., Sampasa-Kanyinga & Lewis, 2015), the authors find that time spent on Facebook is positively associated with depressive symptoms. Using data from a two-week diary study, they further find that social comparisons mediate the relationship between time on Facebook and depression. The authors conclude:

Spending a great deal of time on Facebook (or viewing Facebook more frequently) is positively related to comparing one's self to others, which is in turn associated with increased depressive symptoms.... Perhaps more Facebook views and/or spending a greater amount of time on Facebook on a daily basis both allow participants greater opportunity to spontaneously socially compare themselves to their peers, which in turn is associated with an increase in daily depressive symptoms. (p. 723)

Browsing others' highlight reels may thus contribute to negative comparison and ill-being. However, the researchers did not access participants' accounts and therefore do not know the nature of the content that triggered social comparisons. The study is also limited by its reliance on correlational data and, for those interested in adolescents' experiences, by its focus on young adults and their Facebook use.

Identifying the mechanisms by which social media use influences psychosocial outcomes is valuable theoretically and practically. If the highlight reel nature of social browsing indeed contributes to ill-being, it represents a targeted area for intervention. Alternatively, if the highlight reel hypothesis is not supported empirically, there is an equally pressing need to re-focus attention on other potential mechanisms.

My second study is an effort to contribute empirically-based insights about the relationship between browsing highlight reels and adolescents' psychosocial well-being. I use a social browsing experiment to test systematically whether browsing highlight reels causes worse emotional outcomes immediately post-browsing. I randomly assigned teens to browse highlight reel-style Instagram profiles or the same profiles modified with one of two interventions to counter positive-only highlight reel impressions. In Study 2, I examine between-group differences in participants' post-browsing social comparisons and positive and negative affects. To examine within-person affect changes, I also include a measure of participants' baseline emotions (i.e., at the start of the study).

I find that browsing highlight reels does not specifically cause differences in post-browsing positive affect, negative affect, or social comparison. However, regardless of condition, individual differences in negative comparison as a response to the browsing simulation do predict changes in adolescents' affective well-being. My browsing interventions also moderate the relationship between social comparison and negative affect, effectively reducing the toll of social

browsing for teens who report higher levels of negative comparison. Although the three aforementioned examples (i.e., O'Neill, Schuman, Holleran) cite highlight reels and social comparison as a concern of females, the findings apply to both male and female teens.

My results suggest individual differences in susceptibility to psychosocial disruptions from social media use. I contribute evidence that negatively comparing oneself to others' social media presentations is a specific source of susceptibility. Adolescents also differ in their responses to interventions. Modifications that improve outcomes for some social media users may detract from the experiences of other youth, which underscores the complexity of designing effective interventions at scale.

As a methodological note, I collected data for Studies 1 and 2 concurrently. The social media experience questions that form the quantitative portion of Study 1 immediately preceded the social browsing experiment that I describe in Study 2. I also conducted a total of 28 interviews. I include 26 interviews in the analysis for Study 1 and 24 interviews in the analysis for Study 2. The two interviews excluded from Study 1 are with teens who did not use any social media at the time of their interviews. Few teens across the full sample remained off of social media entirely (n=18; 3.1%). I conducted interviews with non-users to engage with a fuller breadth of adolescent perspectives. However, given my analytic focus on social media experiences, I did not include analysis of their interviews in Study 1. For Study 2, I report findings from 24 interviewees who form two relevant sub-

groups: those who reported higher than average negative comparison in response to the simulated Instagram profiles (i.e., above the survey sample mean) and those who reported lower than average negative comparison (i.e., below the survey sample mean).

I rely heavily on self-report data in both of my studies. People are often the best witnesses to their private experiences (Paulhus & Vazire, 2007). Self-reports are “uniquely suited to tasks such as obtaining individuals’ personal theories about their experiences and their feelings” and are therefore widely utilized in empirical research across multiple disciplines (Norwick, Choi, & Ben-Shachar, 2002, para. 5). Yet people are also imperfect witnesses to their thought processes (Nisbett & Wilson, 1977). The validity of self-report data is potentially threatened by self-reporters’ conscious and unconscious biases, including socially desirable responding, acquiescence bias (‘yea-saying’), the limitations of autobiographical memory, and common method variance (Chan, 2009; Paulhus & Vazire, 2007; Turkkan, 1997). Given my interest in adolescents’ subjective experiences with social media, there is no sufficient substitute for self-reports. However, I incorporated a number of methods to reduce validity threats.

To minimize bias due to socially desirable responding, I utilized several demand reduction techniques in both data collection phases (i.e., surveys and interviews). My protocol and instructions maximized confidentiality and underscored the non-evaluative nature of questions, as well as the absence of right or wrong answers (Chan, 2009; Paulhus & Vazire, 2007). In addition to prompting

for self-reports, I asked teens to report on their perceptions of others' social media experiences, which provided a response context with reduced motivational basis for impression management (Paulhus & Vazire, 2007). In my analysis for Study 1, I examine self-reports in conjunction with these other-oriented reports.

To minimize acquiescence response bias during interviews, my protocol incorporated multiple discussion anchors (Paulhus & Vazier, 2007). I asked participants generally about their experiences and prompted for examples to support their descriptions; I used a 'walkthrough' approach in which the interviewee and interviewer co-viewed and discussed the interviewee's interpretations of live social media content on his or her personal accounts (as in Duguay, 2016); and I included an open-ended think-a-loud exercise in which all participants reacted to the same Instagram simulation from the experiment. The personal and simulated social media artifacts served a dual-function, as they also reduced the burden of accurate autobiographical recall (Baxter, Courage, & Caine, 2015; Tourangeau, 1997). On the survey, I asked participants to report on their global affect experiences with social media. I then elicited non-memory-based self-reports via my coupling of the browsing simulation and well-established, validated affect scales.

The multiple, mixed-method self-report measures confer a degree of convergent validity. Although common method variance ostensibly remains a concern (particularly given that my varied approaches still share a fundamental reliance on self-reports), I collected the interview and survey data at different time

points. As I have described, I also leveraged a random assignment design in Study 2. And I book-ended the reported data collection with informal observations, discussions, and focus groups with parents, teachers, and adolescents within and outside of my study site. These ongoing engagements grounded my study analyses and interpretations.

More generally, I ascribe to the view that self-reports can provide meaningful data on well-being and affect. Though self-reports are subjective, well-being and affect are characteristically experiential. I am not attempting to objectify external evidence of well- or ill-being, but rather to deepen our collective understanding of how adolescents view their own experiences. Sandvik, Diener, and Seidlitz (1993) also offer systematic evidence for the validity of self-reports concerning well-being and affect. The researchers studied 130 college students over the course of a semester. They obtained multiple standard self-report measures on general subjective well-being and affect, as well as a number of alternative measures: written interviews, daily affect reports on 42 occasions over a six-week period, and non-self-report measures from a minimum of seven informants per participant (including at least three friends and at least three family members of each participant). Sandvik and his colleagues found moderate to high correlations (most in the .5-.7 range) between the standard self-reports and each of the aforementioned alternative measures. While I am sympathetic to skepticism about self-reports, I use them deliberately in the current investigations.

I also want to clarify my focus on ‘social media.’ The term *social media*

refers primarily to a group of Internet-based applications that allow users to create and exchange content (Kaplan & Haenlein, 2010). Social network sites (SNSs) are a form of social media that enable users to create personal profiles, invite others to follow those profiles, and exchange messages (Kaplan & Haenlein, 2010).

Facebook, Instagram, and Twitter are examples of SNSs. Facebook was founded in 2004 and opened to high school students in 2005; Twitter launched in 2006; Instagram was available beginning in 2010. Snapchat – an app for ephemeral messaging and sharing – was released in 2011. Although some may argue that Snapchat does not meet traditional criteria for social network sites, a number of teens refer to it as such. Youth also use various terms (e.g., social media, social apps, social networking, social networking sites) interchangeably. I adopt a broad conception of social media throughout this work and veer from technical definitions in an effort to reflect the multiple terms used by adolescents. The boundaries between digital activities are often hazy. However, my focus excludes Massively Multiplayer Online Games, music streaming, and non-social video/media streaming services (e.g., Netflix).

Social apps, and adolescents' uses of them, are changing rapidly.

Unsurprisingly, academic research is struggling to keep pace. I began this work with the recognition that I set off to chase a moving target. New apps that have yet to be developed will permeate the adolescent stratosphere, perhaps even before I complete this dissertation. While I hope that my findings will have lasting resonance, I contextualize the studies as snapshot of adolescent social media use in

2015-2017.

Today's youth navigate adolescence with and through social technologies. In the pages that follow, I attempt to bring empirical data to bear on a looming question: how does social media use intersect with networked adolescents' psychosocial well-being?

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STUDY 1

The Social Media See-Saw:

Positive and Negative Influences on Adolescents' Affective Well-Being

Abstract

Social media use is nearly universal among U.S.-based teens. How do daily interactions with social apps intersect with adolescents' affective well-being? Survey self-reports (n=568) portray social media use as a predominantly positive affect experience. Exploratory principal component analysis indicates that positive and negative emotions form orthogonal components of teens' responses. In-depth interviews with a sub-sample of youth (n=26), selected for maximum variation, further reveal that positive and negative affect can be organized across four functional dimensions. *Self-expression* facilitates both validation and concern about others' judgments; *exploration* confers inspiration but also distress; *relational interactions* contribute to closeness and but also to disconnection; and *browsing* leads to entertainment and boredom, as well as admiration and envy. Together, these analyses suggest that the relationship between social technology usage and well-being – whether enhanced or degraded – is not confined to an 'either/or' framework, but that the emotional see-saw of social media use is weighted by *both* positive *and* negative influences. Joint examination of the dimensions can yield robust individual portraits of networked experience.

“There's never a day that goes by where I'm not constantly on social media. I wouldn't say I'm addicted or anything like that, it's just part of my routine. It's just what I do.” Carlos,⁵ Age 17

“Social media really impacts my life a lot, from morning to night.” Hanna, Age 17

Social media are intertwined with daily life – for school-aged teens in developed countries, interacting with and through social network sites (SNSs) is ‘just part of [the] routine.’ Among U.S.-based 13 to 17-year-olds, 89% use one or more SNSs and 92% are online daily (Lenhart, 2015). A majority of youth also use smartphones, which allow them access to SNSs as they move through their homes, schools, and communities (Lenhart, 2015). Yet although the widespread popularity of SNSs is well-established, the influence of social media on adolescents’ well-being remains controversial (Best, Manktelow, & Taylor, 2014; Pantic, 2014).

Hanna and Carlos (quoted above) are both juniors who attend a suburban public high school in the Northeastern United States. They are among the sample of students from their school whose survey reports about social media inform the current investigation; they are also part of a purposeful sub-sample of students whose interview narratives contextualize and clarify the study’s quantitative findings.

⁵ I use pseudonyms in lieu of participants’ given names.

Hanna's comment reflects an unambiguous personal assessment that SNSs impact her daily life. In this study, I examine the nature of Hanna and her peers' networked experiences. Specifically: how do social media intersect with adolescents' everyday affective well-being?

Background

Social Media and Well-Being

Well-being is a complex construct, defined and measured in myriad ways (Ryan & Deci, 2001). Social media studies tend to describe well-being as a general outcome of interest and examine effects related to psychological indicators, including depression (Tandoc, Ferrucci, & Duffy, 2015), perceptions of happiness and life satisfaction (Chou & Edge, 2012), stress and quality of life (Bevan, Gomez, & Sparks, 2014), and body image (Haferkamp & Krämer, 2011; Meier & Gray, 2014). Yet despite a growing number of investigations, the relationship between social media use and well-being remains a source of contention (Best et al., 2014; Pantic, 2014).

Previous studies with adult populations document associations between overall time spent on social media and ill-being (Wright et al., 2012), as well as linear associations between number of SNSs used and both depression and anxiety symptoms (Primack et al., 2017). Heavier Facebook users are more likely to believe others are happier and have better lives (Chou & Edge, 2012). Correlation does not imply causation: individuals with poorer mental health may also be

heavier users of SNSs and/or heavier social media users may use SNSs for different purposes than lighter users. However, Kross et al. (2013) use an experience-sampling method (ESM) to demonstrate that Facebook use does predict subsequent reductions in affective well-being and overall declines in life satisfaction during a two-week period. At the same time, Jelenchick, Eickhoff, and Moreno (2013), who also use ESM, do not find a relationship between SNS use and clinical depression.

More recent research with adolescents suggests a non-linear relationship between quantity of social media use and well-being. In a large-scale, representative survey of English youth ($n=120,115$), the links between digital media use and mental well-being are described by quadratic functions, which support a ‘Goldilocks Hypothesis’: moderate screentime (including specifically for smartphone and social media use) “is not intrinsically harmful and may even be advantageous in a connected world” (Przybylski & Weinstein, 2017, p. 204). These researchers suggest that further investigation of *how* adolescents’ varied digital media experiences relate to well-being would be helpful.

Indeed, adolescents’ SNS experiences are influenced by the nature of their networked interactions. Elevated Facebook-related appearance exposure, though not overall Facebook use, is correlated with weight dissatisfaction, drive for thinness, and thin ideation among adolescent girls (Meier & Gray, 2014). Receiving positive peer feedback on profiles enhances adolescents’ self-esteem and well-being, whereas negative feedback decreases these outcomes

(Valkenburg, Peter, & Schouten, 2006). Studies with both young adult and adolescent populations also underscore the importance of individual differences. For example, individual differences in envy (Tandoc et al., 2015) and fear of missing out (“FoMO”; Beyens, Frison, & Eggermont, 2016) mediate the relationships between social media use and depression and stress, respectively. Recent research therefore suggests nuanced effect patterns and bidirectional influences of SNSs on well-being.

Other studies highlight a multitude of positive well-being experiences related to adolescents’ SNS uses. Youth can leverage opportunities for self-expression, which enable self-reflection, catharsis, and validating feedback (Stern, 2008). Adolescents also use social media for interest-driven learning (Ito et al., 2010) and to strengthen friendships (Reich, Subrahmanyam, & Espinoza, 2012). Online peer communication facilitates adolescents’ self-disclosure and sense of belonging to support identity development (Davis, 2012). And SNSs can provide around-the-clock access to social support (Weinstein et al., 2016) and mental health services (Aguilera & Muench, 2012).

In sum, adolescent social media use is not intrinsically harmful. Rather, different facets of teens’ SNS experiences can positively and negatively influence their well-being. Existing studies tend to examine targeted aspects of social media use, which contribute a collection of potentially relevant SNS practices and outcomes. However, it remains yet unclear how various positive and negative SNS experiences fit together in the lived experiences of networked youth. For example,

does risk in one area of a teen's SNS use (e.g., envious browsing) indicate that social media necessarily presents a challenge rather than an opportunity for his well-being? If a teen is concerned about negative peer feedback, do her worries displace the potential benefits of self-expression? While it is unlikely that any single study can capture the full complexity of adolescents' SNS use and their emotional outcomes, a more holistic view will extend current knowledge of teens' multifaceted experiences.

Affective Well-Being

Affect is a defining component of well-being (Diener, Suh, Lucas, & Smith, 1999). Broad approaches to well-being research often include non-affect components, such as behavioral and psychosomatic experiences (e.g., van Horn, Taris, Schaufeli, & Schreurs, 2004). Yet in the context of subjective well-being, affect remains a defining element. As Diener and Suh (1997) summarize, "subjective well-being consists of three interrelated components: life satisfaction, pleasant affect, and unpleasant affect. Affect refers to pleasant and unpleasant moods and emotions" (p. 200).

Positive and negative emotions are separate components of well-being (Bradburn, 1969). The multi-dimensional nature of affect is well-established (Watson & Tellegan, 1985; Watson, Clark, & Tellegan, 1988) and positive and negative affect, which constitute "distinct dimensions, rather than opposite ends of the same continuum" (Dodge, Daly, Huyton, & Sanders, 2012, p. 223), are only

moderately correlated (Watson & Clark, 1997). Affective well-being therefore comprises both frequent positive emotions and comparably infrequent negative emotions (Diener & Larsen, 1993). Much like a ‘see-saw,’ well-being tips and changes based on the dynamic nature of an individual’s experiences – including his or her psychological, social, and physical resources and the challenges he or she faces (Dodge et al., 2012). If positive and negative affect indeed represent distinct dimensions in the context of SNS experiences, research requires attention to both the positive and negative components of experience.

Differential Susceptibility

Valkenburg and Peter’s (2013) Differential Susceptibility to Media Effects Model (DSMM) frames the current investigation. DSMM focuses on individual, micro-level media effects. The integrative model posits media effects as conditional and transactional. Effects depend on three types of differential susceptibility: dispositional (e.g., gender, temperament), developmental, and social (i.e., nested ecological contexts (Bronfenbrenner & Morris, 2006)). The DSMM also proposes three media response states: cognitive (attention), excitative (arousal), and emotional (affect). Response states are mediators between media use and effects. In the current study, I focus specifically on Valkenburg and Peter’s (2013) emotional response state, which is closely connected to affective well-being. The emotional response state “encompasses all affectively valenced reactions to media content” (p. 228).

Valkenburg and Peter (2013) use a music mixing console metaphor to describe the DSMM. Each response state is like a slider that shifts for different experiences. The susceptibility variables both predict media *use* and “stimulate or reduce media *effects*” (Valkenburg & Peter, 2013, p. 231) by moderating the relationship between media use and response state. Differential susceptibility influences adolescents’ SNS experiences and how they make sense of them. For example, one teen gravitates to Instagram celebrities who post appearance-oriented content, while another teen does not; of two teens who both follow fashion accounts, one may feel positively inspired while the other feels envious.

Adolescence is itself a source of differential susceptibility that merits focused study. Developmentally, adolescence is a time of social, cognitive, and biological change (Steinberg, 2014). As adolescents navigate identity formation (Erikson, 1968; Marcia, 1980), peer feedback and acceptance take on increased import (Brown, 1990). At the same time, peers differ with respect to developmental trajectories and competences (Meeus, 2011). Socially, the teens in the current study share an important micro-system context: their school. Yet their experiences are also unequivocally affected by unique interactions within and across nested environments (Bronfenbrenner & Morris, 2006).

The Current Study

To understand social media from adolescents’ standpoints, I foreground youth voices. My two-part strategy draws on survey responses from 568 high

school students to inform an in-depth interview study with a purposeful subsample of 26 teens. In Phase 1, I use the quantitative (survey) data to explore teens' general portrayals of SNS emotional outcomes and to select a sample of interviewees with varied experiences. In Phase 2, I examine interview narratives to identify salient dimensions of adolescent SNS use and how these functional dimensions connect, positively and negatively, with affective well-being.

Phase 1: Quantitative (Survey)

Method

Data Collection

Five hundred and eighty-eight teens ($M=15.26$ years, $SD=0.97$; 292 Male) completed an online survey via Qualtrics. Participants represent approximately 90% of the 9th grade, 86% of 10th grade, and 51% of 11th grade students at a suburban public high school in the Northeastern United States. The responses included in the current study comprise 568 teens who use one or more SNSs. Parents received a letter about the study and provided passive consent; students provided active assent to both initial survey participation and to use of their responses for the study (opt-out rate=3.9%). Students completed the survey on school-provided Chromebooks during Health (9th and 10th graders) or English (11th graders) class. Eighty-five and five-tenths percent of students identified as white, 8.0% Asian, 3.4% African American, 2.2% Hispanic, 1.0% Pacific Islander, and 3.7% Other; 1.4% preferred not to specify.

Compared to nationally representative data on U.S. 13 to 17-year-olds⁶ (Lenhart, 2015), teens in the current study are heavier users of the Internet and SNSs. Ninety-eight percent of teens in the current sample report that they are online either “almost constantly” (49%) or “several times a day” (49%) compared to 80% who go online “almost constantly” (24%) or “several times a day” (56%) in the national sample. In Figure 1, I present side-by-side data on SNS use.

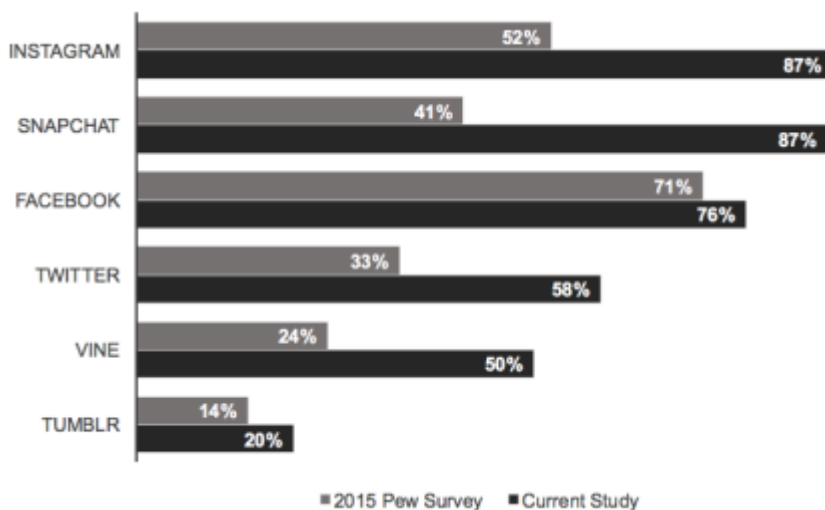


Figure 1. Percent of teens who use six popular social media platforms: Current study vs. nationally representative sample (Lenhart, 2015).

⁶ I collected survey data for the current study between November 2015 and March 2016; the Pew Research affiliates conducted their survey between September 2014 and March 2015.

Teens also reported how they generally feel when using the SNS most important to them. The survey included 11 binary descriptor items compiled from existing literature and prior fieldwork: amused, anxious, bored, calm, closer to friends, happy, interested, irritated, jealous, left out, and upset. On a separate survey screen, participants responded to the same question from the perspective of others, i.e., ‘how do others generally feel?’ The second question provides a comparison with reduced likelihood of social desirability response bias. Participants also self-reported demographic information and indicated interest in interview participation (n=200 students indicated openness to participating in an interview).

Analysis

I analyzed the affect items descriptively to obtain an overall pattern of responses; I conducted Independent-sample *t*-tests to compare means by gender and to explore differences between responses about oneself versus those for peers. To facilitate dimensionality reduction of the binary affective experience data, I used exploratory logistic principal component analysis (PCA). By transforming the data into a set of uncorrelated principal components, PCA reduces dimensionality while retaining maximal variation in the dataset. I ran PCA for the current study using the *Stata* statistical software package. I examined PCA results for components that met both Kaiser’s eigenvalue >1 criterion and the scree

criterion⁷ (Jolliffe, 2002).

Findings

Affective Experiences: Descriptive Reports from Survey Data

In Table 1, I present frequencies of the affect descriptors. Participants identify multiple descriptors to characterize their social media experiences ($M=3.9$, $SD=1.9$). Portrayals of SNS affect are predominantly positive: a majority of participants report generally feeling happy (72.0%), amused (68.5%), closer to friends (59.3%), or interested (57.8%) while using SNSs. A minority of youth indicate generally feeling upset (6.7%), irritated (7.9%), anxious (10.2%), jealous (16.9%), or left out (15.3%). Sixty-nine and nine-tenths percent of participants describe their general SNS experience using only positive descriptors. On average, female students select more descriptors than male students ($M_{\text{females}}=4.4$, $SD=1.8$; $M_{\text{males}}=3.5$, $SD=1.9$); females are more likely to report all emotions except ‘calm,’ for which there is no significant gender difference ($p<0.05$ for all other descriptors). Participants are more likely to report negative emotions for peers ($p<0.001$), though their responses reflect the same generally positive portrayal: a majority (>60%) select each happy, amused, closer to friends, and interested, and a minority (<40%) select each jealous, left out, upset, anxious, or irritated.

⁷ In a scree graph (also called a ‘scree plot’), eigenvalues are graphed in descending order on the y-axis against component number on the x-axis. Researchers visually examine the figure for an “elbow” in the graph, which demarcates the number of components to retain (Jolliffe, 2002, p. 115-117). The *scree criterion* refers to this visual identification of the elbow’s bend, after which the slopes between points are less steep and resemble the ‘scree’ formed by fallen rubble at the base of a mountain. Although visual assessment is somewhat subjective, scree plots are typically examined in conjunction with eigenvalues.

Table 1

Frequencies of SNS Affect Descriptors about Oneself and Peers, by Gender and Overall

Emotion	<i>About Oneself</i>			<i>About Peers</i>		
	Overall (n=568)	Females ¹ (n=273)	Males (n=280)	Overall (n=568)	Females (n=274)	Males (n=280)
Happy	.720	.798	.661	.657	.690	.643
Amused	.685	.729	.650	.644	.679	.614
Interested	.578	.637	.532	.606	.661	.564
Closer	.593	.645	.554	.627	.661	.604
Calm	.445	.432	.468	.259	.245	.282
Bored	.289	.319	.261	.231	.252	.211
Anxious	.102	.136	.068	.201	.182	.214
Irritated	.079	.125	.032	.213	.208	.218
Upset	.067	.103	.029	.174	.186	.157
Jealous	.169	.227	.107	.375	.412	.332
Left Out	.153	.209	.093	.398	.453	.343

¹554 participants in the SNS-user group self-reported gender

Principal Component Analysis

PCA with the 11 affect items listed above resulted in three components that met Kaiser's eigenvalue >1 criterion. Visual examination of the scree plot supported the three-component solution, which explained 49.7% of the variance. The first component, "Negative Emotions," accounted for 23.6% of variance. Four items – upset, left out, jealous, irritated – loaded >0.40 on Negative Emotions (a fifth item, anxious, loaded 0.39). The second component, "Positive Emotions," accounted for 16.3% of variance and comprised four items that loaded >0.40: happy, amused, interested, and closer to friends. An apparent third component,

“Neutral Emotions” (eigenvalue=1.06), explained 9.7% of variance and included two items – calm and bored – loaded >0.40. In Table 2, I present loadings for the three-component solution.

Table 2

Social Media Affect Experiences (Principal Component Analysis)

	1*	2*	3*	Item mean (n=568)
Happy	.191	.474	-.079	.720
Amused	.059	.470	-.010	.685
Interested	.141	.456	-.027	.578
Closer to friends	.030	.424	-.064	.593
Calm	-.032	.324	.640	.445
Bored	.145	-.181	.751	.289
Anxious	.392	-.084	-.002	.102
Irritated	.428	-.071	-.098	.079
Upset	.448	-.092	-.042	.067
Jealous	.424	-.040	-.077	.169
Left out	.448	-.084	.040	.153
Variance explained (%)	23.64%	16.35%	9.67%	

Note: Loadings from principal component analysis. Total variance explained is 49.7%.
1*: Negative emotions, 2*: Positive emotions, 3*: Neutral emotions

Phase 2: Qualitative (Interviews)

Method

Data Collection

Following the survey phase, a co-Interviewer and I conducted interviews with 26 teens (16 female). I selected a maximum variation sub-sample based on examination of the PCA results alongside demographic data. *Maximum variation*

sampling involves identifying cases or individuals with diverse patterns of experience (Miles, Huberman, & Saldaña, 2014). In the current study, variation pertained specifically to teens' reports of their general SNS affect experiences. As Figure 2 depicts, interviewees' survey responses distribute them across the affect dimensions. Reflective of the survey population, a majority of interviewees (n=17) self-identified as White. To keep researchers blind to participants' previously reported affect, interviewees were randomly re-ordered after selection and assigned new ID numbers.

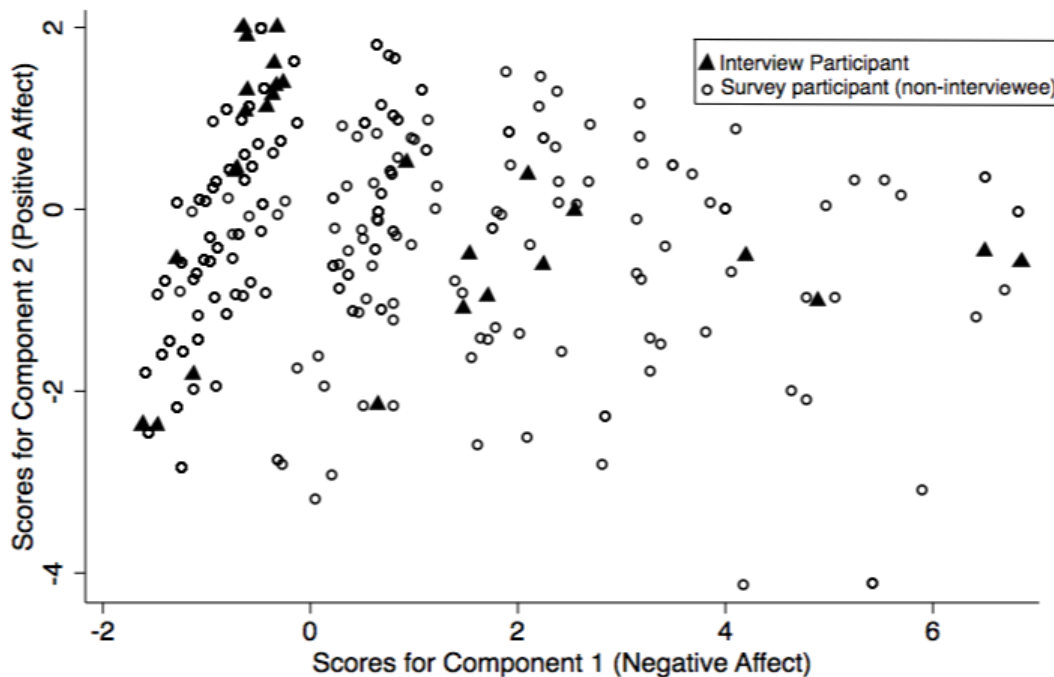


Figure 2. PCA scores for interview and survey participants.

I designed the interview to understand the experience of each participant (Willig, 2013) and, specifically, how social media use intersects with emotional outcomes. My semi-structured protocol therefore included open-ended prompts (Miles, Huberman, & Saldaña, 2014) and prioritized *descriptive* and *evaluative* questions (Spradley, 1979). Participants were asked to provide general accounts of their experiences (descriptive) and insights into their feelings (evaluative). The interview included 1) general biographical questions about SNS use, 2) directed questions related to each survey affect descriptor, and 3) walkthroughs of Instagram and, time permitting, Snapchat (as in Duguay, 2016) (see Appendix A for full interview guide).

Participants were asked to choose a private location for the interview. We conducted interviews via Google Hangouts, which meant teens could arrange their interviews without reliance on others for transportation. Parents/guardians provided signed consent and teens provided signed assent. Interviews averaged 1h15m. Audio recordings were transcribed verbatim, de-identified, and uploaded to *Dedoose* (a web-based application for qualitative analysis). Within 24 hours, I also prepared and uploaded interview profiles with background information, discussion threads, and procedural notes.

Analysis

I coded and analyzed the interview data using inductive thematic analysis (TA; Boyatzis, 1998). I began with a line-by-line reading of transcripts and

interview notes. During this process, I kept “jottings” to capture emerging trends and potential codes (Emerson, Fretz, & Shaw, 2011), and then used the jottings to compile a comprehensive list of nascent code concepts. I next conducted a more focused round of in vivo coding, using words from the participant’s own language as codes, with three transcripts. In vivo coding allows researchers to honor the participant’s voice, stay close to the data, and highlight key language (Saldaña, 2015). I focused on SNS experiences reported by teens as influential to positive and/or negative affect. My analysis included, for example, “I think sometimes [Instagram] can make me feel sad. Like seeing what other people are doing and I feel like I’m not doing something as fun.” I did not focus on background information, such as “I learned about Facebook 'cause my mom had one.”

To generate overarching pattern codes for influential dimensions of SNS experience, I next considered patterns and groupings among the in vivo codes. This process resulted in six emic codes with corresponding positive/negative valence sub-codes: identity expression, peer feedback, relational interactions, discovery and exploration, content valence, and social positioning. I developed a codebook that included four elements for each code: (1) name/label, (2) operational definition with inclusion criteria, (3) illustrative examples, and (4) exclusions. In Table 3, I present an example of codebook criteria for the Relational Interactions codes (see Appendix B for complete codebook).

Table 3

Sample Code: Relational Interactions (R)

	R1. Positive (Closeness)	R2. Negative (Disconnection)
Definition & Inclusion Criteria	SM contributes to positive emotions related to relational connection and feelings of closeness. Includes friendships, family relationships, and romantic relationships, via: a) direct communication and disclosure; b) keeping in touch and/or feeling generally connected; c) metrics that support/substantiate the friendship development; d) learning about friends' interests and lives	SM contributes to negative emotions by disrupting relational connection and/enhancing stress or insecurity about relationships, including via: a) misinterpretations, uncomfortable interactions, and/or feeling ignored during direct SM communication; b) learning of exclusion and/or 'FOMO'; c) metrics that de-value the friendship (e.g., dropping streaks; unfollowing) d) learning upsetting information about friends' behavior/interests
Example Cases	<p>"I feel happy a lot when I'm on social media, with every social media I would say. 'Cause I could be chatting with friends, I could be seeing snaps that my friends sent me on Snapchat and they could be doing something really cool or fun or something really funny."</p> <p>"Instagram... say I'm looking at my friends, or my friend just posted a new photo and it's them playing hockey. 'Oh, I never knew they played hockey.' So, like I'm learning something new about them. So, obviously I'm getting closer to them, in a way. And it's just, finding out more about them. I enjoy that."</p> <p>"It's kind of cool to be able to share a silly picture with really close friends... It's kind of cool to have a whole compilation of more lighthearted things in one area."</p>	<p>"[If] your group of friends is all hanging out and you're not included and you see a picture of them on Instagram or Snapchat, it is hurtful to see that and be very excluded. It has happened to me before and it's just an awful feeling.'</p> <p>"[with SM gossip] Everyone finds out, then everyone is just like, oh that's a terrible thing, and everyone just knows about it. But back when we didn't have a lot of social media it would take like a long time [for fights to spread] so you could try to fix your mistakes."</p> <p>"Well, some people get annoyed. They get super angry, and they'll be like, 'We lost our streak.'"</p>
Exclusions	Neutral interactions that are not described in relation to positive experiences/closeness and connection (e.g., 'we have a streak'; 'it's good to show who you're friends with')	Stress about being misunderstood if the stress is related to more general self-expression (use E/I2, <i>expression - negative</i> , rather than R2).

Achieving inter-rater reliability is a defining aspect of Boyatzis' (1998) TA approach. Boyatzis rejects the notion of reliability as verification. Rather, reliability indicates consistency of observation, application, and interpretation; training a coding partner also sharpens code definitions. I worked with a TA-trained research assistant. We independently coded two transcripts, met to examine areas of disagreement, and made corresponding codebook revisions. Most notably, we dissolved the original "peer feedback" code and integrated its components into either "identity expression" or "relational interactions." We repeated the process three times with fresh sub-sets of transcripts until we achieved Krippendorff's alpha reliability estimates >0.75 for each of the 10 sub-codes (Hayes & Krippendorff, 2007) (see Appendix C for inter-rater reliability report). Each researcher then served as the primary coder for 50% of the transcripts, and shadow-coded the remaining transcripts to review ambiguous cases and monitor for omissions and definitional drift.

Subsequently, I reviewed excerpt groups by code to examine category scope and contours. I revisited excerpts by participant, alongside interview profiles, to consider how coded excerpts fit into broader narratives. My coding partner and I revisited code labels (e.g., reframing "social positioning" to "social browsing") and refined category definitions. We then re-reviewed excerpts and notes and co-constructed code profiles that summarize, by interviewee, positive and negative SNS experiences (presented in Table 5, below).

Findings

Participants' narratives highlight affect experiences across four functional dimensions of SNS use: self-expression, relational interactions, exploration, and browsing (including both general content browsing and social browsing). I examined positive and negative experiences for each of the dimensions, resulting in a total of 10 assessed sub-dimensions for each interviewee. In Table 4, I summarize positive and negative sub-dimension frequencies for the interview group; in Table 5, I present defining dimensions by interviewee. Every interviewee's SNS experience is characterized by both positive and negative affects across multiple dimensions. Twenty interviewees describe 8 or more of the sub-dimensions (range=6-10).

Table 4

Positive and Negative Affects, by Dimensions of SNS Experience, for Interview Sample

	Positive			Negative		
	<i>Present</i>	<i>Absent</i>		<i>Present</i>	<i>Absent</i>	
	★	⊙	○	★	⊙	○
Relational Interactions	14	12	0	10	14	2
Content Browsing	6	18	2	2	18	6
Interest-Driven Exploration	11	12	3	6	12	8
Self-Expression	12	9	5	16	7	3
Social Browsing	3	11	12	5	18	3

Key: ★ defining element; ⊙ present/active element; ○ absent

Relational interactions are the most common positive defining affect experience – all interviewees describe SNS interactions that support closeness. Relational interactions also contribute to negative affect (e.g., feeling disconnected, left out) for 24 of the 26 interviewees. Stress related to how others judge self-expression is the most common negative defining affect experience. Yet SNS self-expression also presents as a source of positive SNS affect for 21 of the 26 interviewees. Both browsing categories influence positive and negative affect for a majority of interviewees, though the emotional effects of browsing are comparably less pronounced than affect experiences across other functional dimensions (i.e., relational interactions, exploration, self-expression).

Self-Expression: Both Validation and Concern About Others' Judgements

The opportunity for self-expression is realized as a chance to “write yourself into being” (boyd, 2008, p. 129). Teens⁸ attribute positive affect to sharing their experiences, interests, and humor, as well as to curating and revisiting their digital footprints. Ron explains, “I feel good when I post something. I feel kinda happy.... Every time I have an idea, I get really excited about it, I wanna put it out there.” Paola describes SNS footprints as a valued record of development: “You can look back at all your old photos ... and you can just see how you’ve developed over all of that [time]. And that’s cool ... I think it’s cool to see how you progress over [time], like how your personality changes, if

⁸ I use the term ‘teens’ in the current section (i.e., Findings) to refer the group of teens in the interview sample.

it does.” Thomas similarly portrays SNSs as “nostalgic” and Tony finds happiness reminiscing with “memorable photos.”

At the same time, teens worry about how others judge their self-expressions. Anxieties include immediate concerns about peer judgments and longer-term concerns about unknown future consequences. Paola admits feeling “hesitant” “every time I post.” “I worry a lot,” Paola explains, about the possibility that peers “don’t like something about [my post] or they do like something about it and they’ll screenshot it and ... it could go anywhere.” Paola manages her concern about peer feedback by seeking approval from friends before she posts anything on social media. Tony also worries about the possibility that someone will “screenshot” one of his posts; he sees every post as a potential “virus” that is “never gone.” Thomas feels “self-conscious when I’m posting a photo because ... you’re being judged.”

For some teens, the stress of social judgment seems at first to color their entire experience of SNS expression. As Selena explains,

If I post something [on Instagram] ... I'll keep checking to see what people are saying or liking or doing. I wouldn't say it's a feel-good app, like you'd be happy when you're posting. More like ... [you feel] anxious to see what people are gonna say for your posts.

Selena is one of several interviewees who routinely deletes photos that do not reach a threshold number of likes (her minimum is “at least 200”). Lily also

references the toll of judgment: “I hate posting on my personal account ‘cause I feel like everyone judges that so hard.”

However, Selena and Lily’s expression anxieties are restricted to particular contexts. Both teens also have established SNS spaces where self-expression is positive and validating. Selena’s VSCO⁹ page is a space where she can be carefree and authentic.

I’m happy with [my VSCO] ‘cause it’s me. So I’ll look at myself and I’ll be like, ‘That’s *exactly* who I am.’ Even though I can’t post it on some other social media ... you can scroll through [my VSCO] and be like, ‘That’s Selena, That’s Selena.’

Selena feels free to express herself on VSCO because she has a considerably smaller audience of followers. She also likes that VSCO lacks common feedback functions.

Other teens, like Lily, use duplicate Instagram accounts – called “finsta” or “spam” accounts – for a similar purpose. Finstas are limited intentionally to private follower audiences of “close friends.” Lily describes her finsta as “a safe place to rant about life ‘cause it’s all your friends.” Lily feels as though she can “express myself more” on her finsta account because there is “definitely less judging.” Valerie, who similarly worries about judgment on her “real” account, also finds an opportunity for authentic, validating expression on her finsta. She explains,

⁹ VSCO is a social app for editing and sharing photography.

[On my finsta,] I just kind of post whatever I want, any of the time. I don't have to worry about how it looks ...it's kind of like a little community, I guess.... [It's] not perfect. We talk about school, like, 'oh I just had this test, it was really hard.'

Valerie echoes the positive experience of curating a digital footprint related specifically to her finsta. Carlos says he “definitely” cares about what he posts on Instagram and constrains his expression; however, he has a Twitter account with a differentiated audience where he feels like he can “just [be] tweeting whatever I feel, whenever.” As outlined in Table 5, teens who highlight validating expression also tend to describe stress about judgment and vice-versa.

Relational Interactions: Both Closeness and Disconnection

Social media intersect with teens' close relationships by facilitating a) the potential for constant, direct communication, b) friendship displays and metrics, and c) an opportunity to follow others' posts. In each case, interactions can support closeness and contribute feelings of disconnection.

“Mundane” direct conversations through SNSs are described as more “casual” than texting. Tim attributes the development of intimacy with his current girlfriend to Snapchatting, which “led me to become comfortable with her.” The perception that friends are always accessible through social media also contributes to a sense of connection. For Elliot and his peers, SNSs provide “a presence of

having other people with you at the same time when they're not actually physically near you.”

Teens also describe drawbacks of communicating through social media. Tim becomes overwhelmed by the volume of Snapchats he receives, which “gets annoying, especially when so many people – like 10, 12 people are snapchatting you at the same time, constantly.” Tim echoes a repeated sentiment that it is “impolite to have someone send you something and not to respond.” Concerns about being impolite lead to “that compulsive need to respond.” Interviewees also describe miscommunication-based conflicts and ongoing concerns about how others interpret SNS interactions.

Teens affirm closeness through public displays of friendship and SNS metrics. Effusive comments (text and/or emoji) are a typical response to friends' Instagram posts, which contribute to reported happiness and sense of belonging. Yet, posts can also be a source of conflict if they are not judged as sufficiently flattering. Additionally, when public displays of warmth are directed at one friend or group, other friends often feel marginalized.

Snapchat streaks – the most commonly discussed “metric” at the time of data collection – similarly contribute to both closeness and disconnection. Streaks individually track consecutive days of Snapchat communication. They provide an excuse for interaction, both confirming and facilitating closeness. As Paola explains,

With the streaks, you see the number getting higher and higher. There's plenty of kids that I never thought I would speak to and now they're my best friends.... Through Snapchat we'll talk and be like, 'oh let's hang out there,' and then that one hangout will lead to multiple hangouts eventually. Yeah, social media helps a lot with that.

Thomas similarly underscores the validation of a long streak: "You feel like, 'Wow, I've been talking to this person a lot. I guess it's like we're really close, we really enjoy talking to each other.' Cause if you talk to someone for 200 days straight, that's something, right?"

However, streaks can become a "chore." Several interviewees, including Paola and Bann, enlisted friends to manage their streaks for them while they were traveling without regular Internet access. Claire finds streaks "really stressful" because "you have to constantly be on your phone and making sure that you don't lose a streak with someone." To preserve streaks, teens occasionally mass send or receive pictures of the floor, a practice that preserves the metric but results in an influx of messages from friends without any substantive communication. Because peers often go to great lengths to avoid losing streaks, interviewees describe streak "dropping" as an ambiguous signal – either an unintentional oversight or a potent way to communicate anger.

Another source of disconnection stems from a similarly difficult to interpret SNS experience: seeing friends post together. Claire explains,

[If] your group of friends is all hanging out and you're not included and you see a picture of them on Instagram or Snapchat, it is hurtful to see that and be very excluded. It has happened to me before and it's just an awful feeling.

Almost all of the interviewees (23 of 26) experienced feeling left out because of SNS posts, which is a common reason for feeling “hurt” and “upset” as a function of social media use. Joseph first learned that several friends were distancing themselves when he saw a picture of the group at an amusement park and realized he had not been invited. These teens reported struggling to determine if a post is intentionally shared to hurt them or if they are being overly sensitive about friends spending time with other people.

Yet while seeing others' posts contributes to disconnection, it also bolsters closeness. Following others on SNSs provides a valued way to keep in touch with distant friends and family, which is an oft-cited source of positive emotions. In addition, SNSs allow friends to “share interests,” which “adds a different dimension to what you can talk about.” Learning about classmates' interests makes Snoopy feel more connected to her school community and facilitates in-person conversation. Bann similarly explains, “There's a lot of people that have these secret skills that they don't show in school.... And I think it's really cool. It's like, ‘Wow. They're *so good* at dancing. I never would've thought!’”

Exploration: Both Inspiration and Distress

On social media, youth find inspiration as they pursue existing interests and new areas of learning. Carlos describes interest-driven exploration as a key component of digital life: “What you follow and what you read and stuff on social media, those are your interests. You’re never going on social media typically without being interested in something.” Carlos uses SNSs daily to explore sports and politics. Other teens describe exploration for wide-ranging interests, including cooking recipes, sports and conditioning exercises, religious scriptures, and DIY (Do It Yourself) projects.

April finds inspiration from several SNS sources, including her favorite accounts: “theorists” who “explain the science behind certain [video] games.” April also follows accounts related to her interest in makeup application. But April’s exploration is not limited to these “light-hearted” topics – she explains that her exploration also comprises “heavier topics or sad things.” For example, April uses social media to learn more about #BlackLivesMatter marches. “It really hits me hard,” April explains, “cause some of these things are just so unthinkable.”

Thomas similarly describes both inspiration and distress related to exploration. Thomas uses Instagram and Tumblr to support his passion for the arts. Thomas explains, “Social media ... opened my eyes to new parts of the world. And I enjoy using social media ... [it’s] as if it’s opening another door.” When Thomas browses his Instagram during our interview, he quickly encounters a post that illustrates inspiration. The image is a “beautiful” drawing of a girl who is

wearing a rose crown. Thomas remarks, “I love drawing; seeing other people draw.... [This drawing] looks like something straight out of a photograph. And the way people make this, draw like this – it’s inspired and it’s incredible. The attention to detail – every stroke counts. I like this photo.”

Yet Thomas, like April, finds that the new “door” opened by social media also leads to upsetting encounters with current events. “Sometimes the news is really disturbing or really sickening that how [*sic*] us as humans have developed. Because there have been murders and so much destruction. And it’s just horrible to see. I’m upset at us as humans...”

Exploration is also distressing when teens encounter accounts that actively discourage positivity. Joseph is a musician who is regularly inspired by the “music-y” accounts he follows. Yet he also describes the “risk” of encountering depression-related content during his exploration:

There are people who make Instagram pages for the sole purpose of expressing how depressed they are, or something like that, which can get graphic. So, that’s the only risk I have with going on Instagram Explore and finding other random pages ... I did come across some pages dedicated to self-harm. That was bad.

Finding depression accounts has not been a challenge for Joseph recently but was particularly distressing during a challenging period in middle school.

Josephine describes similar encounters:

There was one [account] that I looked at a couple of times that – they must have changed their name, but it was an Instagram account ... of a girl who had depression and anorexia. And she would post like, ‘This was such a terrible day, it sucked. It was terrible. It was awful. I didn’t eat anything. I ate one chip and I felt like throwing up.’

At the same time, social media exploration can also lead teens to individuals who use SNSs to spread messages of positivity. Tony, for example, seeks out accounts of people who “do all these positive things” and inspire him to “try to live every day to the fullest. Those are the people that I like, and those are the people that I follow.”

Browsing: Both Admiration and Envy; Both Entertainment and Boredom

Browsing, the backbone of teens’ daily social media experiences, is characterized by an interplay of entertainment, boredom, admiration and envy.¹⁰

Alex summarizes her mixed emotions as she browses social media,

¹⁰ Envy is a multifaceted construct with an extensive history and corresponding literature. My use of the term envy in the current study approximates van de Ven, Zeelenberg, and Peter’s (2009) *benign envy*. Benign and malicious envy both involve feelings of inferiority and frustration that stem from upward social comparisons. However, malicious envy (also called ‘envy proper’) is associated with corresponding hostile intent and negative behavioral motivation while benign envy is not. Importantly, inferiority and frustration characterize benign envy; these unpleasant affects distinguish from admiration both the construct and its experiential valence. In addition, while jealousy and envy are etymologically distinct and routinely distinguished in psychological literature, the words are often used interchangeably outside of academic research (see Smith & Kim, 2007; van de Ven, Zeelenberg, & Peter, 2009)—indeed, they appear conflated in my interview data. When I use the term envy in the current study, I refer broadly to feelings of inferiority and/or longing that stem from social comparisons to others’ SNS representations.

You'll definitely feel self-conscious about the way you look and the things you do because all these other accounts that are nothing like you that are so popular [and] everyone loves [them]. You feel kind of insecure that you're not like that. But then there's other times when it just keeps you entertained. Oh, like Vine! [Vine] always makes me laugh. No matter how often I go on, it I'm constantly smiling about the videos. I think it's *so* funny. It's just the different extremes, I guess. You're always feeling different emotions while you're just looking through.

Feeling envious of others' wealth – and, in particular, of posts shared from interesting and beautiful places – is a shared experience across interviewees. Male and female teens both also report feeling envious of others' bodies (e.g., someone who is “in great shape” or “thin and pretty”). Elizabeth, for example, describes casual envy of physical appearance as a routine element of her social browsing. She also evinces appearance envy while browsing her Instagram feed (“I'm kinda jealous that [the people featured] look really good in it”).

For teens with more pronounced experiences of envy, social browsing highlights personal insecurities, circumstances, or desires. Valerie's experience of seeing others' sibling relationships is illustrative:

I can get jealous of sibling relationships, if that makes sense. Cause my siblings are autistic, so it's like, I don't have as close a relationship as I would want to. But it's not their fault. It's no one's fault, of course. But sometimes I can get jealous of that. Like, on Snapchat where people are

[sharing] what their siblings are doing, I don't think I could do that.... That kind of like, *hits*.

Julia is away for the summer working full time to help her family. She explains, “Just seeing people traveling with their friends, at a pool and I'm just here working, not doing anything ... that's a little hard.” On social media, “It's harder to see that someone has a lot of money and you know that's just their life. So it's easier to just be jealous of them.... 'Cause it could have just came [*sic*] to them easily.” At the same time, Julia describes a collection of positive experiences related to her browsing, including posts from bloggers, internet memes,¹¹ and comedy accounts that consistently make her “laugh and smile.”

Teens describe browsing for the specific purpose of lifting their spirits. Rose “always” browses Tumblr if she wants to laugh, “especially if I’m having a stressful day or something – it’ll help me laugh and help me unwind a bit.” Funny and cute animal posts are a repeatedly cited source of amusement, as are memes. But when content is no longer novel, teens get bored with browsing. As Paola explains, “[I get] bored a lot.... Once I remember I was on it for like an hour straight and I just kept scrolling through and I hit rock bottom.”

¹¹ Richard Dawkins (1976) originally used the word ‘meme’ in his book *The Selfish Gene*. Whereas genes are spread through the gene pool, Dawkins used the term ‘meme’ in reference to ideas and behaviors that spread by imitation through human culture. Dawkins suggested the metaphor of a virus. Similarly, internet memes refer to ideas that spread “virally” from person to person via the Internet. According to Beal (2017), “The proliferation of social media has led to internet memes spreading very quickly and reaching more people. Many Internet memes use humor and appeal largely to the adolescent and post-adolescent demographic.... One of the most famous Internet memes is ‘LOLcat,’ which features cute pictures of cats with witty or funny captions.” However, Internet memes differ from Dawkins’ original conception of genes and memes in that they are often modified deliberately (Solon, 2013).

Table 5

Components of SNS Affect Experience, by Interviewee

Pseudonym, Age/Gender	Positive (+)					Negative (-)				
	SE	RI	EX	CB	SB	SE	RI	EX	CB	SB
1. <i>Elizabeth</i> , 17F	★	★	⊙	⊙	⊙	○	⊙	○	⊙	★
2. <i>Julia</i> , 15F	⊙	⊙	⊙	★	★	★	★	○	○	★
3. <i>Selena</i> , 17F	★	⊙	⊙	⊙	⊙	★	⊙	⊙	○	⊙
4. <i>Tony</i> , 16M	★	★	★	⊙	⊙	★	⊙	⊙	⊙	○
5. <i>Thomas</i> , 17M	★	★	★	⊙	⊙	⊙	⊙	★	○	⊙
6. <i>Ron</i> , 18M	★	⊙	⊙	⊙	★	⊙	⊙	⊙	⊙	⊙
7. <i>Bann</i> , 17M	★	★	⊙	⊙	★	⊙	⊙	★	⊙	⊙
8. <i>Lily</i> , 15F	★	★	⊙	★	⊙	★	★	○	⊙	⊙
9. <i>Josephine</i> , 16F	⊙	⊙	★	⊙	⊙	★	★	★	⊙	⊙
10. <i>Valerie</i> , 14F	★	★	★	★	⊙	★	★	⊙	⊙	★
11. <i>Carlos</i> , 17M	★	★	★	⊙	○	⊙	○	⊙	○	⊙
12. <i>Hanna</i> , 17F	★	⊙	★	⊙	○	★	★	○	⊙	○
13. <i>West</i> , 14M	⊙	★	⊙	⊙	○	⊙	⊙	⊙	○	⊙
14. <i>April</i> , 15F	⊙	★	★	⊙	○	○	⊙	★	⊙	⊙
15. <i>Tim</i> , 17M	⊙	★	⊙	⊙	○	⊙	★	⊙	○	⊙
16. <i>Paola</i> , 16F	★	★	⊙	⊙	○	★	⊙	○	⊙	⊙
17. <i>John</i> , 15M	○	⊙	⊙	⊙	⊙	★	★	⊙	⊙	○
18. <i>Alex</i> , 15F	○	★	★	⊙	⊙	★	○	★	★	★
19. <i>Elliot</i> , 17M	⊙	★	★	⊙	○	★	⊙	⊙	⊙	⊙
20. <i>Claire</i> , 14F	★	⊙	⊙	○	⊙	★	★	⊙	⊙	⊙
21. <i>Joseph</i> , 16M	⊙	⊙	★	★	○	★	★	★	⊙	⊙
22. <i>Snoopy</i> , 16F	⊙	★	○	⊙	○	★	⊙	○	⊙	⊙
23. <i>Rose</i> , 14F	○	⊙	⊙	★	○	○	⊙	⊙	⊙	★
24. <i>Betsy</i> , 15F	○	⊙	○	★	⊙	★	⊙	○	⊙	⊙
25. <i>Alice</i> , 15F	○	⊙	★	⊙	○	★	⊙	⊙	⊙	⊙
26. <i>Marie</i> , 15F	⊙	⊙	○	○	○	⊙	★	○	★	⊙

Key: SE=Self-expression; RI=Relational interactions; EX=Exploration;
 CB=Content browsing; SB=Social browsing
 ★ defining element; ⊙ present/active element; ○ absent

Discussion

The present investigation comprises a holistic study of adolescents' social media experiences and their affective well-being. Previous studies point to facets of social media interactions, such as envy (Tandoc et al., 2015) and negative peer feedback (Valkenburg et al., 2006) that adversely influence well-being outcomes. At the same time, other research highlights positive well-being experiences, including support for close relationships (boyd, 2014; Davis, 2012), identity expression (Stern, 2008, boyd, 2008), and interest-driven learning (Ito et al., 2009). Yet, an essential question remained largely unanswered: how do positive and negative SNS experiences fit together in the lives of networked youth?

To this end, I examine teens' emotional outcomes related to their use of social technologies. I illustrate how positive and negative experiences take shape across four functional dimensions of social media use: self-expression, relational interactions, interest-driven exploration, and browsing. These dominant dimensions of SNSs emerged inductively in the current study; all have been examined in previous research, though the current investigation is among the first to explore them jointly and in connection to affective well-being.

My analyses provide several related insights for research and practice. First, exploratory PCA indicates that positive and negative emotions cohere to form orthogonal dimensions of SNS affect reports. This finding aligns with previous research, which establishes positive and negative affect as distinct dimensions of subjective well-being (Watson et al., 1988; Watson & Tellegan, 1985). One teen's

social media experience can involve high positive and high negative affect, another teen may have high positive and low negative affect or vice versa, and yet another teen may experience low affect overall related to SNS use.

Second, adolescents' survey responses portray SNS use as a generally positive experience. Affective well-being typically comprises frequent positive and comparably infrequent negative experiences (Diener & Larsen, 1993). Yet in the specific context of SNSs, teens' rosy portrayals may nonetheless surprise those who imagine networked adolescence as inherently stressful. As this set of interviews reveals, teens neither avoid nor deny negative affect experiences related to SNSs. Relatedly, it is noteworthy that the first component around which responses cluster loads on negative affects: the greatest source of variance in youths' reports pertains to differences in unpleasant emotions during their typical SNS usage.

Third, all interviewees discuss both positive and negative affect across multiple dimensions of SNS use. To understand a teen's total experience, we therefore need to understand the constellation of her positive *and* negative experiences related to expression, relational interactions, exploration, and browsing. To adopt a modified version of Dodge et al.'s (2012) see-saw metaphor, the current findings establish component parts of the SNS affective well-being see-saw (Figure 4, below).

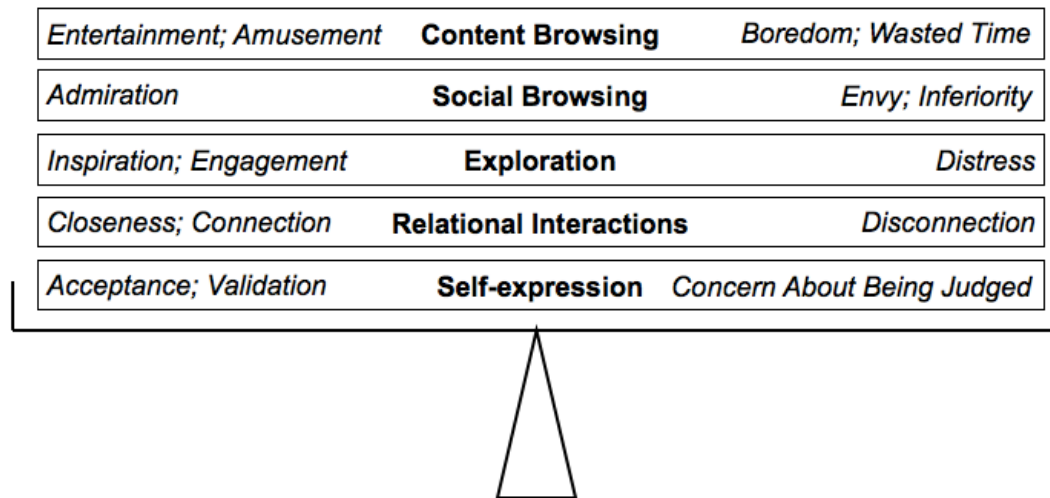


Figure 4. See-saw of affective well-being related to SNS use.

As the see-saw illustrates, the presence of one negative element is not indicative of a wholly negative experience, nor is the absence of one negative element confirmation that SNS use is positive or benign.

The see-saw metaphor also suggests the importance of weight: in addition to presence or absence, whether the see-saw tips positively or negatively depends on the weight of each element. What, then, determines weight? Teens' interview descriptions point to the importance of both prevalence and prominence. A low level of envy might be influential because it consistently characterizes a teen's browsing, which is a daily event (prevalent). Elizabeth, for example, described appearance envy as a frequent element of her social browsing. Envy may alternatively be infrequent but influential if it is memorable and considerably

upsetting (prominent). Valerie's description of coming across certain portrayals of "sibling relationships" illustrates a prominent experience. In Valerie's words, seeing others' sibling posts "hits" her. (See Appendix D for a demonstration of how the see-saw framework can be applied diagnostically to assess an individual's SNS experiences.)

SNSs indeed reflect and amplify the positive and challenging aspects of teens' lives. Individual differences (e.g., appearance and body esteem) and social-contextual factors (e.g., family circumstances) are fundamentally intertwined with prevalence and prominence, which in turn contribute to emotional response (Valkenburg & Peter, 2013). Robust assessment of risk and protective factors that meaningfully 'tilt the see-saw' represents an area for future research.

For example, prior research suggests that envy (Tandoc et al., 2015) and FoMO (Beyens et al., 2016) may negatively weight the see-saw. How do teens with pronounced envy (a negative experience related to browsing) and/or FoMO (a negative experience ostensibly related to relational connection) fare in other dimensions of their SNS use? Situating particular responses within the context of multidimensional SNS experiences can contribute to the identification of influential components. In addition, examining the see-saw composition for youth with poor well-being can clarify how SNS use is associated with ill-being (e.g., Kross et al., 2013; Sampasa-Kanyinga & Lewis, 2015).

Limitations and Future Directions

The current study foregrounds adolescents' perspectives on their own experiences. As Stern (2008) notes, "critical scholars might fault this approach for overemphasizing youth authors' agency"; however, we cannot understand the "full story" (p. 99) of adolescents' experiences without their voices. Studies with experimental approaches and standardized measures can further our understanding of youths' affective well-being related to SNSs.

More pressing are issues of generalizability: this study is critically limited by its focus on the experiences of students in a relatively homogenous, affluent suburb. Focusing on teens who attend a single school enables a contextualized examination. Yet the composition of the study population raises questions about whether the findings pertain for youth whose demographic characteristics differ, as well as for those who live in more diverse communities. To be sure, community context powerfully influences teens' experiences across SNS dimensions. For example, when youth are surrounded by high levels of community violence, networked self-expression and peer interactions hold potentially fatal consequences (Patton, Eschmann, & Butler, 2013; Patton, Lane, Leonard, Macbeth, & Smith-Lee, 2016). The current study provides a springboard for research on the emotional outcomes of teen SNS use. Building on this work requires attention to diversity in its many forms.

Conclusions

Social technologies, like most prior disruptive innovations, are both heralded and demonized. Amidst debates about the societal impact of SNSs, adolescents of the ‘App Generation’ continue to develop with and through social media (Gardner & Davis, 2014). For the parent attempting to weigh the benefits and consequences of limiting a child’s social media use; for the clinician whose treatment plan requires effective assessment of a patient’s SNS experiences; for the researcher committed to advancing scholarship on digital well-being: what is the architecture of adolescents’ emotional lives with SNSs?

The principal contribution of this work is an initial blueprint of networked teens’ affect experiences. Rather than an ‘either/or’ model (i.e., social media either support or detract from affective well-being), the findings instead support a ‘both/and’ model: teens experience different constellations of *both positive and negative* influences of social media. Emotions take shape related to teens’ SNS self-expression, relational interactions, interest-driven exploration, and browsing. Teens may have negative experiences related to one functional dimension (e.g., relational interactions) and positive affect in other dimensions (e.g., interest-driven exploration). They can also have positive and negative experiences related to a single dimension, as in the case of an adolescent whose relational interactions support closeness and contribute to feelings of disconnection. Cutting a teen off from social media might therefore spare him from seeing photo-evidence of exclusion while simultaneously blocking a valuable source of supportive

friendship interactions. The see-saw of affective well-being is also dynamic: SNS use may tip toward negative affect one day and positive affect the next day.

Understanding contemporary adolescents' experiences requires ongoing, deliberate attention to multiple components of the SNS see-saw.

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STUDY 2

Green-Eyed on Instagram: Negative Comparison Predicts the Immediate Influence
of Social Browsing on Adolescents' Affective Well-Being

Abstract

Browsing Instagram is a daily practice for many teens, yet the relationship between social browsing and psychological well-being remains controversial. Recent research finds that negative social comparisons mediate the relationship between social browsing and ill-being outcomes, such as depression. I examine the role of negative comparisons in the relationship between Instagram browsing and adolescents' affective well-being immediately post-browsing. Five-hundred and seven teens participated in an online survey that included an Instagram browsing experience. I randomly assigned participants to a 'highlight reel' browsing condition or to one of two browsing interventions designed to reduce affective consequences of negative comparison. Participants completed the Positive and Negative Affect Scales (PANAS) pre- and post-browsing and reported social comparisons in response to the featured accounts. Regression analyses controlling for Time 1 emotions indicate that regardless of browsing condition, teens who reported more negative comparison in response to the browsing simulation had significantly worse post-browsing affect than peers who reported less negative comparison. I do not find main effects of browsing condition. However, browsing condition moderates the relationship between negative comparison and affective well-being: the interventions reduced post-browsing negative affect for those at higher levels of negative comparison. Results suggest differential susceptibility to both social browsing and social media interventions.

Social media use is commonplace among U.S.-based teens: 89% of 13 to 17-year-olds use one or more social network sites (SNSs) and 92% are online daily (Lenhart, 2015). Nearly three-quarters of teens (73%) have access to smartphones, which facilitate constant access to SNSs (Lenhart, 2015). Instagram, a visually-oriented SNS for sharing photos and short videos, is used daily by a majority of U.S. teens (Lenhart, 2015; Piper Jaffray, 2016). Instagram was launched in 2010 and currently ranks 17th among the most popular websites worldwide (Alexa Internet, 2017); the site has over 500 million active users (Instagram, 2016).

As the public adopted SNSs like Instagram en masse, researchers turned their attention to the influences of social media on psychosocial functioning. Yet the relationship between SNSs and well-being remains controversial (Best, Manktelow, & Taylor, 2014; Pantic, 2014). SNSs support well-being via social connectedness (Cornejo, Tentori, & Favela, 2013; Neubaum & Krämer, 2015), opportunities for identity expression (Grieve & Watkinson, 2016), and interest-driven learning (Ito et al., 2009). At the same time, heavier social media use predicts declines in life satisfaction and self-esteem (Kross et al., 2013). Notably, the aforementioned beneficial functions of SNSs relate to *active* uses of social media (e.g., connecting, expressing, exploring), whereas *passive* social media use is most often implicated in studies of disruptions to well-being (Kross et al., 2013; Lup, Trub, & Rosenthal, 2015; Steers, Wickham, & Acitelli, 2014). Further,

passive social media use – though not active social media use – predicts declines over time in young adults’ affective well-being (Verduyn et al., 2015).

Passive social media use, also called social browsing, involves scrolling through others’ digital posts (Lup et al., 2015). Social browsing is a dominant SNS activity and a focal practice in studies of SNSs and well-being disruptions (e.g., Krasnova, Wenninger, Widjaja, & Buxmann, 2013; Lup et al., 2015; Steers et al., 2014). The posts encountered during social browsing generally constitute others’ curated, favorable self-presentations (DeAndrea & Walther, 2011; Ellison, Heino, & Gibbs, 2006). Although the desire to present oneself favorably certainly predates social media (e.g., Goffman, 1959), SNSs provide readily-accessible tools for impression management (DeAndrea & Walther, 2011; Lang & Barton, 2015; Marwick, 2015). As individuals curate desirable portrayals, their social media representations collectively form a corpus of positively-skewed depictions of others’ lives (Steers et al., 2014). Browsing others’ highlight reels is a daily custom for networked teens: how and why does social browsing influence well-being?

Background

Social Comparison

Because SNS feeds are extensive sources of self-relevant information, they offer a “perfect basis for social comparison processes” (Hafkerkamp & Krämer, 2011, p. 309). Social comparison is a component of social information processing;

people engage in social comparison when they evaluate an aspect of their lives by comparison with others (Suls & Wheeler, 2013). Festinger (1954) originally proposed social comparison as a function of the dual motivations for accurate self-evaluation and self-improvement. Festinger argued that people prefer objective comparison metrics, but rely on social comparison when nonsocial metrics are unavailable. Subsequent expansions of social comparison theory broaden the application of Festinger's theory: social comparison transpires across multiple domains (e.g., related to abilities, opinions, judgments) and stems from a breadth of motives including but not limited to accurate self-evaluation (Kruglanski & Mayseless, 1990; Wheeler, 1991).

Social comparisons can be 'upward' or 'downward' (Suls & Wills, 1991). Upward comparisons reference those believed to be superior or better off, whereas downward comparisons reference those believed to be inferior or worse off. Upward and downward comparisons can each produce positive or negative emotions (Buunk, Collins, Taylor, Van Yperen, & Dakof, 1990). The affective consequences of social comparison depend on context, including both individual disposition and situational factors (Eid & Larsen, 2008; Lyubomirsky & Ross, 1997). For example, upward comparisons can trigger positive emotions when the outcome is perceived as personally achievable, but can trigger negative emotions when the outcome seems unattainable (Kramer, Ingledew & Iphofen, 2008). Social comparison is not therefore inherently problematic or distressing. However,

comparison detracts from subjective well-being when it evokes responses such as envy (Hill & Buss, 2008; Smith, Parrott, Diener, Hoyle, & Kim, 1999).

Envy, a feeling of inferiority that can arise when upward comparisons lead to negative assessments of one's own circumstances, has a long history and a complex literature (Smith & Kim, 2007). Envy is a characteristically unpleasant experience: as Epstein (2003) writes, "of the seven deadly sins, only envy is no fun at all" (p. 1). Aristotle described envy as pain from seeing the good fortune of similar others (Sanders, 2014). Academic studies focus traditionally on 'envy proper' – also termed 'malicious envy' – which is defined by corresponding feelings of hostility and ill-will toward the target of one's envy (Cohen-Charash, 2009; Smith & Kim, 2007). However, social comparison can also lead to 'benign envy.' Benign and malicious envy similarly involve feelings of inferiority and frustration following social comparison, though benign envy lacks corresponding hostile intent (Parrott & Smith, 1993; van de Ven, Zeelenberg, & Pieters, 2009).

When asked to describe an experience of envy, approximately half of van de Ven and colleagues' (2009) U.S.-based participants (n=70) described an experience of benign envy while the other half of the sample recalled an experience of malicious envy. The envy forms are experientially distinct and evoke different behavioral motivations; however, they both are reasonably described as unpleasant affect experiences that result from the perception that another person enjoys desired attributes, possessions, and/or circumstances. It is

this negative influence of social comparison to which Theodore Roosevelt referred to when he famously cautioned, “Comparison is the thief of joy.”

Social Browsing and Well-Being

Although Roosevelt pre-dated contemporary social technologies, his observation is well-aligned with empirical research on SNSs. The polished and ‘ideal’ style of SNS self-presentations contributes a stream of information apt for upward social comparison (Ellison et al., 2006; Haferkamp & Krämer, 2011). Recent studies indicate that negative comparison – upward social comparison that leads to negative assessments of one’s own circumstances (Frison & Eggermont, 2016) – plays a critical role in the relationship between social browsing and well-being disruptions (Frison & Eggermont, 2016; Steers et al., 2014; Tandoc, Ferrucci, & Duffy, 2015). Quantity of social media use does not alone predict depression (Jelenchick, Eickhoff, & Moreno, 2013). However, social comparison during SNS use mediates the relationship between Facebook logins and depressive symptoms (Steers et al., 2014). General reports of negative comparison during browsing (e.g., “When I read my newsfeed I often think that others are having a better life than me”) also predict decreases in life satisfaction over time (Frison & Eggermont, 2016). Further, envy in response to browsing (e.g., “When on Facebook, I catch myself envying...”) mediates the relationship between passive following and life satisfaction (Krasnova et al., 2013). Likewise, the relationship between adults’ passive Facebook use and declines in their affective well-being

over time is initially statistically significant yet becomes non-significant once one controls for reported feelings of envy (Verduyn et al., 2015). Controlling for envy,¹² SNS use may instead lessen depression (Tandoc et al., 2015).

The aforementioned studies point to the importance of negative comparison in the relationship between social browsing and reduced well-being. However, participants in the studies (i.e., Frison & Eggermont, 2016; Krasnova et al., 2013; Steers et al., 2014; Tandoc et al., 2015) reported social comparisons in response to their own browsing experiences. Because the study designs did not afford access to the content of participants' social browsing, it is unclear whether negative comparison is influential as a difference in individuals' responses to their social browsing and/or as a difference in the content they browse.

In addition, heavier social media users are more likely to believe that others are happier and have better lives (Chou & Edge, 2012). It is feasible that those who are more prone to negative comparison also happen to be heavier SNSs users. In another study of young adults (n=145), tendency toward social comparison is positively correlated with Facebook use such that young adults who score high (versus low) on a measure of social comparison orientation tend to be heavier Facebook users (Vogel et al., 2015).

However, it is also possible that social browsing enhances negative comparison and dissatisfaction. Kross and colleagues (2013) used an experience-

¹² Tandoc, Ferrucci, and Duffy's (2015) measure of envy integrates multiple definitional components, including upward comparison, inferiority, and frustration. Their assessment does not distinguish malicious versus non-malicious behavioral motivation.

sampling method to demonstrate that young adults' Facebook use predicts subsequent declines in affective well-being and that more Facebook use overall predicts declines in life satisfaction during a two-week period. Chou and Edge (2012) suggest that social media use may distort browsers' perceptions because of two cognitive biases: the availability heuristic and the correspondence bias. The availability heuristic suggests a tendency to base judgments on immediately recalled examples (Tversky & Kahneman, 1973). To this end, social browsing equips the browser with easily-recalled, positively-skewed information about others' lives. The correspondence bias posits a tendency to infer that others' behaviors are a function of stable personality traits, rather than situational cues (Gilbert & Malone, 1995). In keeping with the correspondence bias, an Instagram post that depicts the poster smiling is more likely judged as an indication that she is happy and has a great life rather than as an indication that she simply had a particularly enjoyable experience.

In theory, distorted perceptions should then be more pronounced for parasocial relationships, for which people do not have 'available' counter-examples from personal experience. Indeed, more frequent Instagram use is directly associated with depressive symptoms among those whose followers include high proportions of strangers, though not among those whose followers include few strangers (Lup et al., 2015). Lup, Trub and Rosenthal's findings point to the influence of content: the composition of an individual's SNS feed and, therefore, *what* she browses influences the effects of her social media use. In a lab

experiment, participants who viewed social media profiles of physically attractive individuals reported more negative body image and less positive emotions post-browsing than their peers who viewed unattractive profiles (Haferkamp & Krämer, 2011). Attractive profiles – like the profiles of parasocial ties – are ostensibly more likely to evoke negative comparisons and envy.

Teens are among the heaviest social media users (Lenhart, 2015; Perrin, 2015). However, studies concerning SNSs and well-being focus predominantly on adults and/or university students¹³ (Chou & Edge, 2012; Haferkamp & Krämer, 2011; Lup et al., 2015; Krasnova et al., 2013; Kross et al., 2013; Tandoc et al., 2015; Vogel et al., 2015). Adolescence is characterized by heightened focus on peers' behaviors (Steinberg, 2014) and teens may be particularly susceptible to negative effects of SNSs (O'Keeffe & Clarke-Pearson, 2011). Adolescents are also prone to social comparison, which plays a role in identity development (Krayner et al., 2008). Evidence that teens are among the heaviest SNS users therefore begs questions about the specific nature of youths' social browsing experiences.

Study Hypotheses

Two viable but untested hypotheses follow from extant literature. First, it is individual differences in response to social browsing that accounts for the negative influence of SNS use on well-being. If a group of adolescents browses a social

¹³ Frison and Eggermont's (2016) research is an exception: the authors study SNS experiences of Flemish high school students.

media profile, differences in the extent of the group members' social comparisons predict immediate post-browsing affective well-being. Adolescents who experience more negative comparison will have less positive affect and more negative affect post-browsing (*Hypothesis 1*).

Second, the highlight reel nature of social media portrayals contributes to reduced well-being. Browsing others' highlight reels distorts perceptions of others' happiness (e.g., related to the availability heuristic and the correspondence bias), which in turn worsens the browser's mood. Adolescents who browse others' positive-only 'highlight reels' will therefore experience worse post-browsing affect than those whose social browsing a) targets the availability heuristic via inclusion of posts about others' bad days, or b) targets the correspondence bias with an explicit reminder that others' SNS posts reflect situational cues rather than stable personality traits (*Hypothesis 2*). If Hypothesis 2 holds but Hypothesis 1 does not, the aforementioned mediating role of negative comparison may primarily reflect differences in the *content* of a persons' social browsing rather than *individual differences* in response to browsing.

On the other hand, it is reasonable to suspect that browsing others' highlight reels might improve, rather than disrupt, affective well-being. Kramer, Guillory, and Hancock (2014) demonstrated the potential for emotional contagion through SNSs. Emotional contagion is the phenomenon of social affect transfer (Levy & Nail, 1993). Emotional contagion is at play when interaction with someone who expresses happiness triggers a mood boost in his conversation

partner; negative emotions are also transferable, as when contact with someone who is upset dampens the other person's mood (Neumann & Stack, 2000).

Kramer, Guillory and Hancock (2014) conducted a large experiment with 689,003 Facebook users; they manipulated the emotional valence of participants' social browsing experiences. People assigned to view reduced quantities of positive content on their newsfeeds used more negative words and fewer positive words in their subsequent status updates. The researchers observed the opposite pattern when they reduced negative content on participants' feeds. Browsing others' positive highlight reel portrayals – as compared to others' mixed-valence social media posts – may therefore boost positive affect.

Hypotheses 1 and 2 are not necessarily oppositional. It is feasible that both individual response differences *and* content differences influence post-browsing affective well-being. In the study of young adult Facebook users referenced above, Vogel et al. (2015) found that those who scored high (vs. low) on SCO fared worse with respect to affective outcomes after browsing. Similarly, perhaps adolescents who engage more heavily in negative comparisons are differentially affected by the content of the social browsing experience (*Hypothesis 3*).

Research Questions

Expanded knowledge about the mechanisms by which social browsing influences well-being contributes opportunities for targeted interventions. In the

current study, I use an experimental design to examine the three aforementioned hypotheses.

Research Question 1: Does negative comparison in response to social browsing predict immediate changes in adolescents' post-browsing affective well-being?

Hypothesis 1: Controlling for pre-browsing affect, adolescents who report more negative comparison in response to an Instagram browsing experience fare worse in post-browsing affect than peers who report less negative comparison.

Research Question 2: Can interventions that target the highlight reel nature of social browsing improve adolescents' post-browsing affective well-being?

Hypothesis 2: Adolescents who browse positive-only Instagram portrayals (Condition 1) experience worse post-browsing affective well-being than those who are primed to consider the correspondence bias while browsing (Condition 2) and those who view more balanced Instagram portrayals, which provide 'available' counter-examples (Condition 3).

Research Question 3: Are adolescents who engage more heavily in negative comparison differentially affected by changes to the context or content of a social browsing experience?

Hypothesis 3: Browsing experience (Condition) moderates the relationship between social comparison and adolescents' affective well-being. The adverse

effect of negative comparison on emotions is reduced when the browsing experience is less likely to evoke upward comparisons.

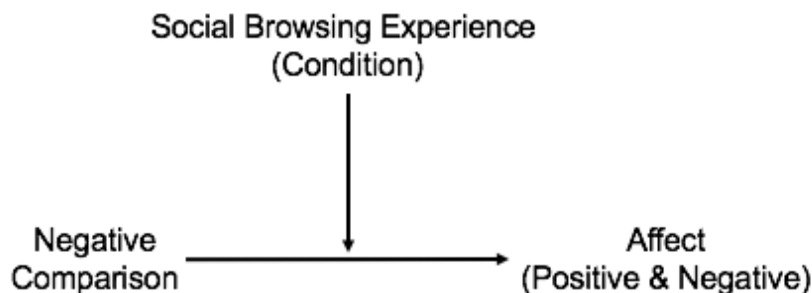


Figure 1. Hypothesized moderation relationship (H3).

Method

Participants and Data Collection

I collected data for the current study in a single public high school in a suburban school district in the Northeastern United States. I used a passive parental consent and two-step active student assent procedure, which was approved by the governing university's Institutional Review Board as well as by school district administrators. Working with school administrators, I sent parents a letter with study details and data collection plans along with information about how to opt teens out of participation. I obtained students' active assent to both initial participation in the survey and to the use of their responses for the research study. Students completed the study's online Qualtrics survey in their health (9th and 10th graders) and English (11th graders) classes during designated class periods

convenient to the school and host teachers.

Five hundred and eighty-eight students (M=15.26 years; SD=0.97; 292 Male, 280 Female) participated in the survey via school-provided Chromebooks. Participants represented 90% of 9th grade students, 86% of 10th grade students, and 51% of 11th grade students. The study opt-out rate was 3.9%. For the current investigation, I limited the analytic sample to those who completed all relevant study questions and measures (n=507). I summarize characteristics of the analytic sample group in Table 1 (below).

Table 1

Participant Characteristics for Full Study Analytic Sample and Interview Sub-Sample (Gender, Age, Grade, Ethnicity, and Condition Random Assignment)

		Study Sample (n=507)	Interviewees (n=24)
Gender	<i>Male</i>	261 (51.6%)	11 (45.8%)
	<i>Female</i>	239 (47.2%)	13 (54.2%)
Age		M=15.3; SD=1.0	M=15.7; SD=1.2
Grade	<i>9</i>	213 (42.1%)	6 (25.0%)
	<i>10</i>	179 (35.5%)	8 (33.3%)
	<i>11</i>	113 (22.4%)	10 (41.7%)
Ethnicity	<i>White</i>	439 (86.6%)	17 (70.8%)
	<i>Asian</i>	41 (8.1%)	6 (25.0%)
	<i>Other</i>	18 (3.6%)	1 (4.2%)
	<i>African American</i>	16 (3.2%)	1 (4.2%)
	<i>Hispanic</i>	12 (2.4%)	
	<i>Native American</i>	6 (1.2%)	
	<i>Pacific Islander</i>	4 (0.8%)	
	<i>Prefer not to specify</i>	7 (1.4%)	
Condition	<i>1. Highlight Reel</i>	172 (33.9%)	8 (33.3%)
	<i>2. Prime</i>	172 (33.9%)	9 (37.5%)
	<i>3. Full</i>	163 (32.2%)	7 (29.2%)

Study Design

On the survey, participants reported on their personal social media use, browsed two simulated Instagram feeds, indicated social comparisons in response to each of the feeds, and completed affect measures at baseline and post-browsing. The browsing simulation comprised Instagram feeds likely to elicit upward social comparisons: attractive strangers (Haferkamp & Krämer, 2011; Lup et al., 2015). All participants viewed one male and one female profile, which were displayed in random order. I compiled the photographs (17 per feed) from the publicly available Instagram accounts of an “on the rise” teen model (female) and a teen college athlete selected by *Seventeen Magazine* as one of the “hottest guys of college sports” (male) (Hall, 2013; Sutton, 2016).

I embedded a randomizer within the survey flow to assign participants randomly to one of three groups (between-subjects setting). One group (n=172) browsed positive-only versions of the Instagram feeds (i.e., ‘highlight reels’). A second group (n=172) browsed the same feeds preceded by a prime designed to remind them about the highlight reel nature of others’ social media presentations. For the prime condition, participants viewed a message on prior screen that read: “Please remember that most people post only their best moments and most flattering pictures on social media. They have struggles and bad days, too.” A third group (n=163) browsed more balanced versions of the feeds that included non-positive content, specifically posters’ acknowledgments of having ‘bad days.’ I obtained the 6 bad day posts integrated into the feeds for Condition 3 (n=3 per

feed) from public Instagram posts to the hashtag “#badday.” Prior to inclusion in the simulation, I ran a pre-test with 25 reviewers on Amazon Mechanical Turk to confirm intended perceptions regarding whether or not posts indicated that the poster ‘had a bad day.’

Measures of Key Variables

Affect. Participants completed the Positive and Negative Affect Scales (PANAS) as a measure of emotions (Watson, Clark, & Tellegan, 1988). The PANAS includes 20 adjectives (10 positive, 10 negative; 5-point Likert scale). Scoring produces separate Positive Affect (PA) and Negative Affect (NA) scores. To measure change in emotions as a function of the exposure to the highlight reels, participants completed the scale twice: before (T1) and after (T2) exposure to the simulated Instagram feeds (within-subjects setting). PA2 and NA2 are dependent variables (Cronbach’s $\alpha_{\text{positive emotions}}=.906$, $\alpha_{\text{negative emotions}}=.872$). PA1 and NA1 are covariates (Cronbach’s $\alpha_{\text{positive emotions}}=.886$, $\alpha_{\text{negative emotions}}=.841$).

Social comparison. Participants responded to two negative social comparison questions per Instagram feed (4 questions total; 5-point Likert scales): he/she has a better life than me, he/she is happier than me. I selected the items based on review of prior operationalizations of negative comparison; both questions are directed versions of the items used in Chou and Edge’s (2012) study and included in Tandoc, Ferrucci, and Duffy’s (2015) measure of Facebook envy. Items are ‘directed’ in the sense that they direct social comparisons to the browsed

feeds rather than to a generalized other. To calculate a composite comparison score for each participant, I averaged the four items ($M=3.48$, $SD=0.54$).

Social media use. Past research indicates that quantity of social media use may influence well-being (e.g., Chou & Edge, 2012; Kross et al., 2013). To both examine and control for social media use, I asked participants to report number of social media accounts with daily use ($M=2.86$, $SD=1.38$), as well as the age of their first SNS account ($M=11.69$ years, $SD=2.24$).

Analysis

I examined all main study variables for deviations against multivariate normality. Negative affect (NA1, NA2) was skewed; I used a log-transformation to normalize its distribution. I then tested proposed hypotheses using a series of OLS regression analyses. In keeping with the PANAS, my analyses examined positive affect and negative affect as distinct outcomes. I controlled for baseline affect (instead of using change scores) to model flexibly the relationship between pre- and post-browsing affect, rather than assuming the relationship equal to 1. In Step 1, I included T1 affect, age, gender, and social media use. In Step 2, I added condition group to the model; in Step 3, I added social comparison. For Step 4, I generated and added interaction terms between dummy coded condition variables and the comparison composite. Between Steps 2 and 3, I ran an additional regression to examine the influence of condition group on comparison.

Follow-up Interviews

With a trained co-interviewer, I conducted 24 follow-up interviews: 12 interviews with teens whose negative comparison scores were higher than the analytic sample average, and 12 interviews with teens whose negative comparison scores were lower than the sample average. The interview protocol included open-ended “think-alouds” while browsing the Condition 3 simulated Instagram feeds, followed by specific questions about the browsing interventions (e.g., “Do you think it would make a difference if someone reminded you, prior to browsing the feeds, that these are normal people who have bad days, too? Why or why not?”). During the interview phase, we were blind to participants’ social comparison scores from their surveys. I summarize characteristics of the interview sub-sample in Table 1 alongside characteristics of the full study sample.

Results

Bivariate Correlations

Prior to the regression analyses, I examined bivariate correlations to explore the relationships of demographic characteristics to social comparison and affect. In Table 2, I present means, standard deviations, and inter-correlations of key study variables. Age is positively correlated with number of daily SNSs (i.e., the number of SNSs that participants report using on a daily basis) and positive affect. Females tend to use more daily SNSs and to report higher negative comparison and negative affect than males. Number of daily SNSs is positively

correlated with negative comparison, positive affect, and negative affect. I therefore included age, gender, and daily SNSs as control variables in all subsequent analyses.

Table 2

Means, Standard Deviations, and Bivariate Correlation Coefficients of Study Variables (n=507)

	M	SD	1	2	3	4	5	6	7	8	9
1. Age	15.25	0.98	1	0.08 [†]	0.18 ^{***}	0.25 ^{***}	0.05	0.14 ^{**}	0.14 ^{**}	0.01	0.01
2. Gender (Male=1)	0.52	0.50		1	-0.26 ^{***}	-0.04	-0.15 ^{***}	0.06	0.10 [*]	-0.12 ^{**}	-0.14 ^{**}
3. N Daily SNSs	2.86	1.38			1	0.02	0.11 [*]	0.11 [*]	0.09 [†]	0.13 ^{**}	0.14 ^{**}
4. Age of first SNS	11.68	2.02				1	-0.02	0.09 [*]	0.05	-0.01	-0.00
5. Negative Comparison	3.48	0.54					1	-0.10 [*]	-0.15 ^{***}	0.27 ^{***}	0.29 ^{***}
6. Positive Affect (T1)	24.60	7.81						1	0.86 ^{***}	0.12 ^{**}	0.12 ^{**}
7. Positive Affect (T2)	22.71	8.38							1	0.09 [*]	0.10 [*]
8. Negative Affect ¹ (T1)	2.57	0.28								1	0.85 ^{***}
9. Negative Affect ¹ (T2)	2.50	0.27									1

¹log-negative affect

[†] $p < 0.10$, ^{*} $p < 0.05$, ^{**} $p < 0.01$, ^{***} $p < 0.001$

Hypothesis Testing

In Table 3, I present results of the regression analyses. H1 stated that individuals who engage in more negative comparison in response to browsing others' Instagram feeds fare worse in post-browsing affective well-being. Controlling for baseline affect, those who engaged in more negative social comparison had both less positive T2 affect ($\beta=-.07$, $t(500)=-3.22$, $p=0.001$) and more negative T2 affect ($\beta=0.05$, $t(500)=2.07$, $p=0.039$). Confirming H1, these findings indicate that the extent to which an individual engages in negative comparison predicts changes in his or her affective well-being.

In Table 4, I present estimated differences in T2 positive affect and *log*-negative affect for prototypical teens at three levels of negative comparison. Based on the associated parameter estimates, a prototypical teen who judges the individuals in the featured Instagram accounts as 'about as happy' as she is and with lives 'about as good' as her own (i.e., no reported negative comparison; composite score=3) scores 1.14 scale points higher – approximately 14% of a standard deviation – on positive affect than a prototypical peer with the same pre-browsing affect who instead views the featured teens as 'somewhat happier' and with 'somewhat better' lives (i.e., moderate negative comparison; composite score=4). The difference between prototypical teens with no reported negative comparison versus high reported negative comparison (i.e., viewing the individuals featured in the Instagram accounts as 'much happier' and with 'much better' lives; composite score=5) corresponds to a difference of 2.28 scale points

in positive affect – 29% of a standard deviation. For negative affect, the difference between a prototypical teen with no reported negative comparison is associated with an estimated difference of -0.03 *log*-scale points (9.5% of a standard deviation) versus moderate negative comparison and -0.05 *log*-scale points (19% of a standard deviation) versus high negative comparison.

Table 3

Results of Regression Analyses: Significant Predictors of Post-browsing (T2) Affect

T2 Positive Affect															
	Model 1			Model 2			Model 3			Model 3b			Model 4		
	b	SE	β	b	SE	β	b	SE	β	b	SE	β	b	SE	β
Intercept	-3.31	2.97		-3.30	2.99		.30	3.16		.19	3.14		.43	3.52	
T1 Positive Affect	.92	.02	.86***	.92	.02	.86***	.91	.02	.85***	.91	.02	.85***	.91	.02	.85***
Gender (Male=1)	.86	.39	.05*	.86	.39	.05*	.70	.39	.04†	.70	.39	.04†	.71	.39	.04†
Age	.19	.20	.02	.19	.20	.02	.23	.20	.03	.23	.20	.03	.23	.20	.03
N Daily SNSs	.02	.15	.00	.02	.15	.00	.05	.15	.01	.04	.15	.01	.05	.15	.01
Condition															
2 (Prime)				.13	.46	.01	.15	.45	.01				.52	2.92	.03
3 (Bad days)				-.04	.46	-.00	-.14	.46	-.01				-1.58	3.24	-.09
Comparison							-1.16	.36	-.07***	-1.14	.35	-.07***	-1.22	.62	-.08*
Condition*Comparison															
2*Comparison													-.11	.82	-.02
3*Comparison													.42	.93	.08
R^2	.752			.752			.758			.757			.758		
T2 Negative Affect															
	Model 1			Model 2			Model 3			Model 3b			Model 4		
	b	SE	β	b	SE	β	b	SE	β	b	SE	β	b	SE	β
Intercept	.44	.12		.45	.12		.40	.12		.39	.12		.25	.13	
T1 Negative Affect	.80	.02	.83***	.80	.02	.83***	.79	.02	.82***	.78	.02	.82***	.78	.02	.82***
Gender (Male=1)	-.02	.01	-.03	-.02	.01	-.03	-.01	.01	-.03	-.01	.01	-.03	-.01	.01	-.03
Age	.00	.01	.01	.00	.01	.00	.00	.01	.00	.00	.01	.00	-.00	.01	-.00
N Daily SNSs	.00	.00	.01	.00	.00	.01	.00	.00	.01	.00	.00	.01	.00	.00	.01
Condition															
2 (Prime)				.02	.02	.03	.02	.02	.03				.27	.10	.50**
3 (Bad days)				-.02	.02	-.04	-.02	.02	-.03				.25	.11	.45*
Comparison							.02	.01	.05†	.03	.01	.05*	.07	.02	.15***
Condition*Comparison															
2*Comparison													-.07	.03	-.48**
3*Comparison													-.08	.03	-.48*
R^2	.696			.697			.703			.700			.708		

† $p \leq 0.10$, * $p \leq 0.05$, ** $p \leq 0.01$, *** $p \leq 0.001$

Table 4

Estimated Values and Differences in T2 Affect for Prototypical Female Teens at Three Levels of Negative Comparison

Negative Comparison	T2 PA	T2 <i>log</i> -NA
Mean (Standard Deviation)	$M=22.71$ ($SD=8.38$)	$M=2.50$ ($SD=0.27$)
None	22.49	2.49
Moderate	21.35	2.52
Scale point change	$\Delta -1.14$	$\Delta +0.03$
High	20.21	2.54
Scale point change	$\Delta -2.28$	$\Delta +0.05$

H2 predicted that individuals who browse positive-only Instagram feeds are more likely to have worse emotional states post-browsing than those who a) are primed to consider the correspondence bias while browsing and/or b) browse more balanced versions of the Instagram feeds, which provide available counter-examples to the perception that others' lives are only positive. However, random assignment to any one of the three conditions does not cause differences in T2 positive or negative emotions. That is, the three conditions are not significantly different from each other nor from zero for PA ($F(2, 493)=0.07$; $p=0.93$) or *log*-NA ($F(2, 493)=2.07$; $p=0.13$). There is also no main effect of condition assignment on comparison ($F(2, 493)=1.71$, $p=0.19$).

H3 predicted that browsing condition moderates the relationship between social comparison and emotional well-being, such that random assignment to one of the intervention conditions reduces the relationship between negative comparison and T2 emotions. There are significant comparison by condition

interactions on T2 *log*-negative affect for Conditions 2 and 3 ($\beta=-.48$, $t(500)=-2.63$, $p=0.009$, $\beta=-.48$, $t(500)=-2.44$, $p=0.015$, respectively) relative to Condition 1.

In Table 5, I present estimated differences in T2 *log*-negative affect by randomly assigned browsing condition for prototypical teens at three levels of negative comparison. For a prototypical teen who does not report negative comparison, post-browsing *log*-negative affect is lower (i.e., affective well-being is better) when randomly assigned to the highlight reel condition as compared to the intervention conditions; in contrast, a prototypical teen with either moderate or high reported negative comparison fares worse when randomly assigned to the highlight reel condition versus an intervention condition.

In Figure 2, I present a simple slopes analysis. Post-hoc tests indicate no difference in estimated slopes or intercepts between Conditions 2 and 3. I do not find significant interaction effects for positive affect, and therefore find support for H3 with regard to negative emotions, though not with regard to positive emotions.

Table 5

Estimated Differences in T2 Negative Affect for Prototypical Female Teens, by Condition

Negative Comparison	1. Highlight Reel	2. Prime	3. Non-highlight Reel
None	2.468	2.524	2.487
Moderate	2.542	2.525	2.484
High	2.615	2.525	2.481

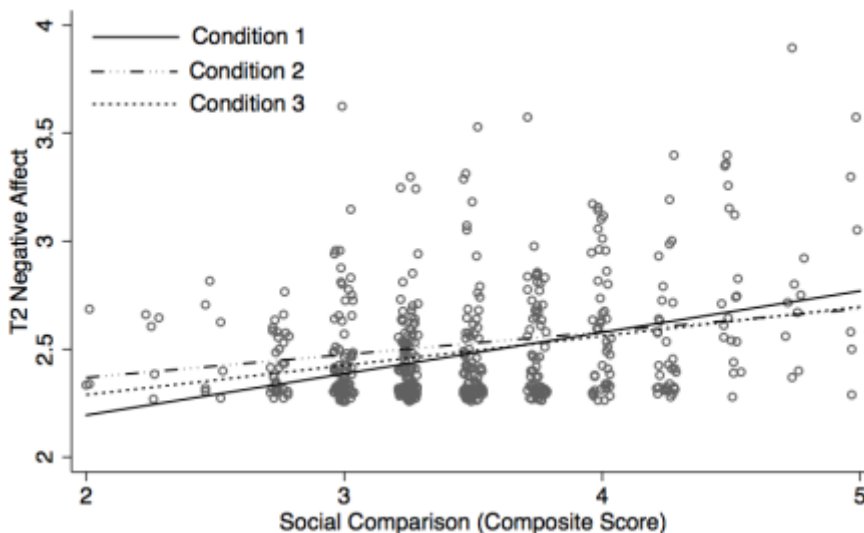


Figure 2. Simple slopes: Interaction of condition and social comparison on post-browsing log-negative affect.

Follow-up Interviews

To further contextualize the quantitative findings, a co-interviewer and I conducted 24 follow-up interviews. The interviews provided an opportunity to explore how and why the effects vary as a function of social comparison – that is, whether participants with higher reported negative comparison respond differently to the browsing interventions than participants with lower reported negative comparison.

Based on survey responses, I clustered interviewees into two analytic groups: a *higher comparison* group (n=12 interviewees who reported moderate-to-high negative comparison, all of whom have comparison composite scores above the mean score of the full analytic sample) and a *lower comparison* group (n=12 interviewees who reported no-to-low negative comparison, all of whom have

comparison composite scores below the mean score of the full analytic sample). In Table 6, I summarize interviewees' assessments of the utility of the browsing interventions. Below, I describe headline findings alongside prototypical responses from three teens in each analytic group.

Lower Comparison Group

A majority of those in the lower negative comparison group (9/12) dismissed the personal value of the browsing interventions and indicated that reminders (i.e., that others generally share only their best moments on social media) would not improve their social browsing experiences. For these individuals, the expectation that social media portrayals are typically highlight reels is already well-established. That is, they are already cognizant that others curate and share skewed information about their lives.

For example, one female in the lower comparison group deemed the interventions unnecessary because she believes teens are already aware of the highlight reel nature of SNSs. In her view, everyone wants to share positive moments on SNSs and people do not typically post when they are unhappy – social media therefore inherently comprise highlight reels and should be viewed as such. She explained:

[The interventions would] not really [make a difference], because ... [on] social media *everybody* posts what you want people to see. And I don't know why you would want people to see that you're having a bad day or

you broke your phone. You wanna post good things that happen to you or fun times.... People, if they go somewhere and have a miserable time, they're probably not going to post a picture from there. But if you go to a really fun party then everyone uploads pictures with their friends.

A male teen, also in the lower comparison group, similarly assessed the interventions as undue because of his view that SNS posts are by nature unrepresentative highlights of others' experiences:

I think I'm a very rational, intelligent person. I know that when someone's posting a picture of them [*sic*] on top of a mountain in Africa or in Aruba, or touching an elephant, it's like, okay, this is a high point. Obviously you've got to remind yourself that what you're seeing is the tip of the iceberg of what somebody's actual life is. And that's important to remember, too, when you're talking to that person or commenting on a photo or something like that. So I think I always have that in the back of my head.

A third teen in the lower comparison group suggested the interventions are unnecessary because bad days are a universal experience. Although others' lives might look perfect on Instagram, she routinely assesses social media presentations as partial representations. She explained,

I know that people have bad days. I understand that. Ya, I think I would feel the same [with or without the interventions].... Sometimes [people] look like they have a perfect life when you're just going through their

[Instagram] feed, but in the back of your mind you know that they are still human and they have like bad days.

Higher Comparison Group

On the other hand, responses from a majority (8/12) of those in the higher negative comparison group indicate that the interventions would alter their browsing experiences as intended. In contrast to the idea of “always” keeping in mind that “what you’re seeing is the tip of the iceberg,” their responses instead suggest that the highlight reel nature of social sharing may be forgotten or overlooked while browsing SNSs.

For example, one female teen in the higher comparison group explained that she views social media representations as reliable indications of others’ happiness. If she encounters evidence of a bad day while browsing someone’s social media profile, she will believe the person has bad days. In contrast, if she does not see evidence of imperfection, she assesses positive-only posts as an indication that the person is always happy. In her words,

I mean I guess I believe that people have bad days too – but if I didn’t scroll up to see that they have a bad day, I wouldn’t think that. ‘Cuz their Instagrams are just like – they’re all happy in their posts.

She therefore deemed as influential the browsing interventions (particularly the direct inclusion of non-positive posts).

Another (male) teen in the higher comparison group similarly indicated that the interventions would change his browsing experience. Although he noted that he does not dwell on others' SNS posts, the interventions would nonetheless alter his interpretation to others' positive-only sharing:

[The interventions] would make me look at their page [*sic*] more open-mindedly. But I wouldn't – I'm not gonna think about their page later on. And I'm not gonna go back to their page that night and like, obsess over it. I'm just gonna be like, 'oh, good for you,' and I'm gonna continue on.

A third (female) teen in the higher comparison group echoed the view that positive-only social media presentations indeed confer an impression that their poster has a perfect life and seems genuinely "happy and carefree." The interventions would therefore temper her global assessments of others' perfection. She explained,

The people who have the perfect lives, they seem happy and carefree. They always look *so* perfect. There's nothing wrong in the photos I guess I would say.... I don't know what an example would be, but it seems like they are the most unattainable person. They're the best you can be. But they're probably not, I guess? It'd be nice to get a glimpse of that [from the interventions].

The difference in teens' perceptions of SNSs as unrepresentative highlight reels versus representative portrayals also presents during browsing think-alouds. We asked participants to share "any thoughts that pop into your head" while

browsing the simulated profiles. Highlight reel distortions evidenced as global judgments about the profile owners based on their Instagram profiles. For example, one female participant (higher negative comparison group) commented based on the first two pictures that the profile target, “has a nice life.” Without prompting, she subsequently explained,

I guess a lot of these photos would make me feel like questioning my worth, jealous of her. 'Cause it seems like she has a great life. She's pretty, she has nice friends, she has enough money to go on vacationing at that beach or something. [It] makes you feel like [it's] unattainable, the life she has.... Yeah, I can tell you that she looks like she has a good life. That she looks like she enjoys what she does.... Yeah, I would both be jealous of them [the male and female] if I was involved in their feeds and not just looking at this for a social media survey ... 'cause it's like, if I knew them, then I'd be jealous of them having that life. Like why couldn't I have had that life? Why do they get it and not me, I guess.... They both look like they have great lives, perfect lives, and that they have fun and all that stuff.

Global judgments contrast with responses that are limited to particular posts. For example, another female participant (lower negative comparison group) contributed the following comments during her browsing: “that’s a pretty cool picture,” “not something I would post,” “that’s cute,” “that’s an artsy picture.”

Table 6

Interviewee Characteristics and Assessments of Intervention Utility, by Social Comparison Score and Group

Lower Negative Comparison Interviewee Group (SC Composite <3.5)						(9/12 No)
	Age (Years)	Grade	Ethnicity ¹	Gender	Social Comparison	Designation ²
1.	17	11	S	M	3.00	No
2.	16	10	S	F	3.25	No
3.	15	10	S	M	3.00	Yes
4.	17	11	O	M	2.75	No
5.	15	10	W	F	3.25	No
6.	17	11	S	M	3.25	No
7.	14	9	W	M	3.25	No
8.	17	11	W	F	3.25	No
9.	17	11	W	M	3.00	No
10.	15	10	W	M	3.00	Yes
11.	15	9	W	M	2.75	Yes
12.	16	11	W	M	3.00	No
Higher Negative Comparison Interviewee Group (SC Composite >3.5)						(8/12 Yes)
13.	15	10	W, S	F	4.25	Yes
14.	14	9	W	F	4.00	Yes
15.	16	10	W	M	3.75	Yes
16.	16	11	W	F	4.00	Yes
17.	15	10	A	F	4.00	No
18.	17	11	W	F	4.25	Yes
19.	15	10	W	F	4.00	Yes
20.	16	11	S	F	4.00	Yes
21.	18	11	W	M	3.75	No
22.	14	9	W	F	3.75	Yes
23.	15	9	W	F	4.00	No
24.	15	9	W	F	3.75	Yes

¹W: White, A: African American, S: Asian, O: Other

²Intervention Assessment Designation: Yes=Assesses interventions as helpful; No=Assesses interventions as unhelpful

Discussion

In the present work, I leverage an experimental design to examine the influence of social browsing on teens' affective well-being. Over 500 (n=507)

teens browsed simulated Instagram feeds, reported social comparisons in response to the feeds, and completed pre- and post-browsing measures of positive and negative affect. Results support theories and findings that propose negative comparison as a basis for harmful effects of passive social media use (Chou & Edge, 2012; Frison & Eggermont, 2016; Steers et al., 2014; Tandoc et al., 2015). Teens who engaged in more negative comparison in response to the browsing experience had significantly worse post-browsing affective well-being (less positive emotion and more negative emotion) than peers who engaged in less negative comparison (H1 supported).

Prior studies implicate negative comparison in the relationship between SNS use and well-being. Young adults' general reports of negative comparisons and envy related to SNSs mediated the relationship between passive SNS use and clinical depression (Tandoc et al., 2015), as well as overall life satisfaction (Krasnova et al., 2013). Yet the current investigation is the first to contribute evidence that browsing colored by negative comparison predicts immediate reductions in adolescents' affective well-being. Results additionally reveal that negative comparison is influential as an individual difference rather than simply as a function of different browsed content, which corroborates findings reported by Vogel and her colleagues (2015). Teens who browsed the same Instagram feeds varied with respect to their negative comparisons in response to the stimuli – and these differences predicted differences in post-browsing emotions. More generally,

the findings therefore suggest differential susceptibility to social media effects (Valkenburg & Peter, 2013).

I also used an experimental design to test whether the highlight reel nature of SNS portrayals affects well-being disruptions (Chou & Edge, 2012; Steers et al., 2014). Chou and Edge (2012) posit social media users employ heuristics when they form impressions of the people in their social networks; the correspondence bias and the availability heuristic arguably contribute distorted perceptions that worsen subjective well-being. If heuristics indeed contribute to negative SNS effects, they also present a relevant target for SNS browsing interventions. To test this hypothesis, I randomly assigned teens to browse (1) a positive-only ('highlight reel') version of two Instagram profiles, (2) the same profiles preceded by a prime designed to target the correspondence bias and remind teens of others' often-distorted, rosy portrayals on SNSs, or (3) more balanced versions of the same feeds, designed to target the availability heuristic and provide readily available counter-examples.

The randomly assigned browsing conditions did not cause differences in affective well-being (H2 not supported). Null effects of condition could be interpreted either as evidence that the manipulations were insufficient or that browsing highlight reels does not specifically reduce well-being. However, the moderation effects and the interview narratives both suggest another possibility. The browsing interventions significantly mitigated the toll of negative comparison on negative affect (H3 partially supported). Moderation effects therefore indicate

teens' differential susceptibility to browsing highlight reels, as well as to social browsing interventions. Teens who were randomly assigned to the highlight reel condition and reported high negative comparison fared worst with respect to affective well-being. Conversely, the interventions seemed to contribute a metaphorical 'grain of salt' and reduced the relationship between negative comparison and post-browsing emotions. Given that envy results from negative comparisons that lead to unpleasant feelings (van de Ven, Zeelenberg, & Pieters, 2009), the interventions arguably temper the experiential envy that can result from social browsing.

Interview responses further reveal that teens' awareness of the highlight reel nature of SNSs varies across individuals and may serve a protective function. Teens who viewed social portrayals more critically – bearing in mind that social media posts *are* generally curated and positively-skewed – present as less susceptible to negative influences of social browsing. These teens already presume that what they see on social media is, as one participant described, “the tip of the iceberg of what somebody's actual life is.” As quantitative findings suggest, the interventions were less influential for teens with lower reported negative comparison. Teens for whom intervention is irrelevant may experience the intervention attempts as annoying or infantilizing – akin to adding extra salt to an already salted dish.

Simultaneously, teens who reported higher levels of negative comparison also tended to view SNS profiles as more accurate information sources. Their

social browsing, in turn, contributed to perceptions that the profile owners are enviable and, in one teen's language, "the most unattainable." Affective consequences of social comparison depend on an individual's response; negative emotions stem from perceptions that the outcome is personally unattainable (Eid & Larsen, 2008; Krayer et al., 2008). The interviews therefore contribute a viable explanation for the moderation effect. That is, the browsing interventions target the perception of others' unattainable perfection, which mitigates negative affect consequences among those who report higher negative comparison – potentially because these teens are indeed vulnerable to viewing the profile owners as unattainable exemplars. Future research can build on the current work with more systematic investigation of these different SNS perceptions. Specifically, do teens who view social media presentations as representative slices of others' lives systematically fare worse than teens who view social media as inherently rosy and one-sided? And how do different perceptions of SNS presentations influence negative comparison?

The findings also suggest areas in which targeted intervention might be helpful practically. Social comparison varies dispositionally, but also intra-individually (Aspinwall, 1997; Aspinwall & Taylor, 1993; Gibbons & Buunk, 1999). Participants in this study who experienced more negative comparison related to their browsing faced a greater risk of well-being disruptions. However, content modifications served a protective function. Unfollowing or unsubscribing from accounts that routinely trigger negative comparison is a simple yet

potentially meaningful intervention. Actively considering the highlight reel nature of SNSs – as simulated by the prime (Condition 2) – may also reduce the toll of negative comparison for those prone to compare themselves against others' social media feeds.

Limitations

For the current study, I focused intentionally on a teen-aged sample. The results therefore provide insight into the adolescent social media experience, but require further investigation to examine generalizability to other age groups. In addition, social comparison varies as a function of culture (Aspinwall & Taylor, 1993). The generalizability of the current study is therefore also limited by its focus on teens from a single, relatively affluent and largely homogenous community within the United States. Future research should examine social browsing effects both with more diverse populations of youth and across geographic and cultural contexts.

The Instagram profiles used in the current investigation simulate para-social browsing. However, teens also leverage SNSs to connect with offline friends (Reich, Subrahmanyam, & Espinoza, 2012), and their affective responses may differ in response to browsing profiles of social rather than para-social ties (as indicated by results from Lup et al., 2015). Relatedly, differences between highlight reel-style profiles and more balanced profiles may evoke different response patterns when the profiles belong to teens' close friends. For example,

positive emotional contagion may be more likely when browsing friends' highlight reels rather than when browsing strangers' highlight reels.

The Instagram simulation in the current study reflects a relatively low 'dose' of social browsing as participants completed the entire survey experience in 30 or fewer minutes. It is therefore unsurprising that pre-browsing affect accounts for much of the observed variability in post-browsing affect. However, negative comparison is nonetheless a significant predictor, and may exert a more pronounced influence on affect when teens browse Instagram for hours rather than minutes. Finally, research designs that can control for baseline negative comparisons and further disentangle the relationships among negative comparison, envy, and ill-being outcomes will contribute to a more robust understanding of causality, as well as of dispositional differences.

Conclusions

Social apps afford around-the-clock access to curated streams of social information. With the expansion of mobile connectivity, teens browse social media as they move through the public and private spaces of their daily lives. The current study contributes to ongoing efforts to understand the relationship between teens' social media use and their well-being. My findings provide systematic evidence that negative comparison in response to social browsing predicts immediate changes in teens' emotional well-being. Negative comparison therefore represents an influential source of differential susceptibility: for teens who engage

in more negative comparison in response to social browsing, SNS use presents a greater threat to well-being. Teens' perceptions of SNS posts as representative portrayals rather than skewed, highlight reels of others' lives may contribute to negative social browsing experiences. At the same time, targeted interventions hold promise for mitigating the toll of social browsing among 'green-eyed' social media users. Future research can examine factors that contribute to envious browsing, as well as interventions that enable teens to leverage the benefits of social technologies without disruptions to their psychological well-being.

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General Conclusion: Implications and Recommendations

In the fall of 2016, I was invited to speak at a school-wide faculty meeting at the high school where I conducted my research. Most teachers in attendance knew about my project in broad strokes, and they were interested in the findings and potential implications for their work with students. Before I began the presentation, I asked teachers to place themselves in their students' positions and consider how teens generally feel when they use social media. I presented the same list of response options that I gave to students on the survey: amused, anxious, bored, calm, closer to friends, happy, interested, irritated, jealous, left out, and upset.

We used an online poll to which forty-two teachers submitted responses. To mirror the student version, I requested that teachers 'select all that apply.' The faculty collectively proposed jealous (85%), left out (80%), and anxious (80%) as teens' top three social media affect experiences. As I described in my report of Study 1, students instead selected happy (72%), amused (69%), and closer to friends (59%) as their top three descriptors – and approximately 70% of students selected only positive terms.

My initial intention was not to devote a considerable portion of my dissertation work to descriptive research. Yet I became increasingly concerned that deficits in our grasp of youths' social media experiences contribute to confusion in the academic literature and unease amongst the public. I embarked on

what became a multi-year journey to develop an empirically-based account of networked adolescence.

When I projected the faculty's predictions alongside their students' responses, one teacher jokingly called out, "Nailed it!" and others in the audience laughed audibly. "We seem to have a gap in our understanding of teens' networked experiences," I ventured. "Teens portray their social media use as quite positive. Yet adults who interact with teens daily assume that youths' social media experiences are constant sources of stress. What are we missing?"

Perhaps adults' impressions are accurate and teens' responses intentionally or unintentionally misrepresent their realities. I interrogated this possibility, but I do not believe that the positive portrayal misleads. Still, I related to the teachers' intrigue at their erred forecast. When I first examined the survey responses, I was sufficiently surprised by the rosy depiction to wonder whether I had accidentally reverse-coded the response options when I created the online survey. (I had not.)

I am fortunate to work with a number of educators who doubled as my thought-partners throughout this project. After puzzling over my initial review of the survey data, I called the high school's Principal. He is a tech-positive administrator among the first in his state to welcome and launch a 'one-to-one' laptop program at his school. He is also similarly fascinated with the implications of SNSs and consistently supported this project. The Principal shared my puzzlement at the survey findings, and facilitated the process for me to arrange a focus group discussion with students. Several weeks later – once my updated plans

were IRB-approved – I returned to the school to meet with a group of 12th grade students.

The focus group provided a first formal opportunity to explore my questions about the validity of the affect findings. Scheduling constraints had effectively excluded the senior class from my survey data collection, which initially was disappointing to me. However, the seniors' nonparticipation now seemed an advantage because the 12th grade students had no personal stake in explaining the survey responses of their younger school mates. I asked the focus group to consider critically the 9th-11th graders' overall reports of their SNS affective experiences.

I invited students in the focus group to weigh-in as informants. I shared my wording of the affect question and asked them to consider how they would respond, as well as how they imagined that their 9th-11th grade classmates responded. I then shared the actual survey responses and explained that I suspected adults might be surprised by the positive portrayal of social media experiences; I wondered if they could help me make sense of the response pattern.

The seniors were adamant that their classmates' reports seemed reasonable and honest. I asked them how they would respond to skeptics. Among their suggestions:

1: Remind adults that they hear disproportionately about teens' challenging social media experiences. As a (male) student in the focus group observed,

[When I guessed what the responses would be,] I went with what was correct. Because I think a lot of times when adults think about social media, they'll think about the vocal minority of people with bad experiences. You usually won't hear about – you know, you always have people who have good experiences with [social media], but they're not going to go telling people about the good experiences they have with it. So you'll only *hear* about the bad experiences.

2: Teens want to be happy; give teens more credit as regulators of their emotions.

From the perspective of a (female) student in the focus group:

I think teenagers now spend a lot of their time on social media. In the hallways, during class, people are on Instagram, on Snapchat. And if we were *generally* feeling anxious or jealous, we would be very unhappy people. So I think that the fact people think that's how [teens] generally feel all the time is kind of odd ... sometimes you do feel jealous or, I don't know, any of those things. But I think generally you *do* feel happy or amused or interested in what's going on.... I don't know how to explain that to people who don't understand that!

3: Adults take social media “a lot more seriously” than teens. Adults are misled because they incorrectly project their experiences on to youth. As a (female) student in the focus group explained,

From what I see from my parents, aunts and uncles, and my friends’ parents, I feel like they take [social media] a lot more seriously than kids do. Like kids will just post some fun thing, where [adults are] very much like: ‘This big event is happening in my life, I need to fully write an essay about it and make sure everybody understands exactly what I’m saying.’ That’s always what pops up on my feed whenever it’s somebody in my parents’ generation. And it happens a lot. I don’t know; I think they take things a lot more to heart, like whatever people say about them. I know my mom has been angry about what somebody said on social media and I’m like, ‘I would have just brushed that off – it doesn’t matter; people don’t care that much about it.’ But I feel like [adults] are a lot more invested in it than I think kids generally are. I think kids kind of brush it off when it happens, better than people assume.

I offer the above explanations as part of my ongoing effort to foreground teens’ perspectives. I do not intend to argue, for example, that adults take social media more seriously than teens simply because one teen suggested it might be the case. Rather, I find that most teens in my study portray social media as a generally positive experience and other teens affirm the validity of this representation. As I discuss with respect to my account in Study 1, positive experiences stem from

teens' uses of social media as a means of validating self-expression, relational interactions that range from playful to substantive to support closeness, admiration and entertainment related to browsing, and inspiring interest-driven exploration.

At the same time, even teens who experience multiple benefits of social apps are not immune to the challenges of networked life. Each dimension that contributes to positive experiences also has a negative side. Among the risks of adolescents' social media use are anxiety about social judgment, encounters with distressing content, negative social comparison, and feelings of isolation and disconnection. The relative weights of different positive and negative experiences are dynamic for the individual and vary across youth.

Although a majority of teens in my study describe their social media experiences as generally positive, non-trivial proportions of youth report typically feeling jealous (17%) and left out (15%) when using social media. These two most commonly reported negative experiences occur for both male and female adolescents. The minority of youth who *generally* experience distress related to their social media use likely require more pressing attention from researchers and practitioners. Particularly concerning are uses of social media to glorify and fuel pro-ana and pro-mia (pro-anorexia, pro-bulimia), self-injurious, and depressive thoughts and actions (e.g., see boyd, Ryan, & Leavitt, 2011; Perloff, 2014; Wilson, Peebles, Hardy, & Litt, 2006; Zdanow & Wright, 2012). My study drew youth from a normative (non-clinical) high school context. The risks of maladaptive exploration presented, though not in a sufficient manner for thorough study.

Although the current work does not address questions about social media use related to psychological distress and/or symptoms, future research with clinical populations can contribute refined assessment of the ‘see-saw’ for youth in recovery.

Based on the focus group’s counsel, I added ‘self-consciousness’ to the interview protocol though I had not included it in the initial survey list. My interview data underscore the commonality of self-consciousness and concerns about social judgment, most often in connection with self-expression oriented SNS activities. Jealousy, exclusion, and self-consciousness, which I identify as three common challenges related to social media use, are not new adolescent experiences. Although stakeholders may worry about how to support youth in navigating the ‘brave new world’ of social apps, adults can evidently begin by scaffolding the same perspectives and coping skills relevant to the abiding challenges of interpersonal relationships.

In Study 2, I build on the descriptive work of Study 1 with a targeted focus on one dimension of social media use: social browsing. I use an experiment to examine highlight reel presentations systematically as a theoretical basis for the relationship between social browsing and reduced well-being. My results suggest that highlight reels do not cause, but rather interact with the effects of social comparison. Regardless of browsing condition, negative comparison significantly predicts immediate post-browsing declines in affective well-being. With respect to teens who engage in routine comparison as a pervasive component of their social

browsing, whether due to dispositional or situational factors, my findings suggest that social media use may indeed present a daily risk. However, browsing conditions moderate the relationship between negative comparison and affect: random assignment to light-touch interventions reduces the toll of negative comparison. More generally, the interaction effects suggest differential susceptibility to both the risk of browsing highlight reels and to in-vivo interventions.

Teens who view social portrayals with a critical eye – bearing in mind that social media posts *are* generally curated and positively-skewed – present in interviews as less susceptible to adverse influences of social browsing. In the introduction to this dissertation, I referenced a post by lifestyle blogger Emily Schuman. Schuman (2015) describes her recognition of the highlight reel nature of her own social media posts:

I know firsthand what I share on my social channels and blog is not a complete portrayal of my life. The snippets I choose to share are the best of the best of what's going on – and such a small portion, relatively, of the minutes and moments that make up my days. (para. 1)

When youth are aware of the highlight reel nature of others' social media representations, and actively apply that awareness to their social browsing, they appear less susceptible to noxious social comparison. Cultivating critical awareness of social media portrayals thus represents a potential focus for media literacy education. Barring teens from social media is, I believe, an impractical

solution with considerable social costs for those who are barred. Instead, sources of differential susceptibility merit separate inquiry and ongoing attention as researchers, educators, and app designers envisage interventions for at-risk youth.

To be sure, many questions remain. Among them, and of particular interest to developmental scientists, is how to study the effects of social media use on adolescent development. Differential susceptibility presumes third variable effects. My investigations affirm the nuanced, dynamic, and multifaceted nature of youths' social media experiences, as well as the importance of individual differences. It is noteworthy that the social browsing study involves a third variable effect and, moreover, that the effect indicates moderation rather than mediation.

Mediating variables explain how and why an observed relationship between two variables holds (Baron & Kenny, 1986). If I had found that negative social comparisons reduced affective well-being and browsing condition mediated the relationship, my analyses would have suggested that the nature of SNS content (i.e., highlight reels) explains the relationship between browsing comparisons and ill-being. I would have expected to find significant relationships between each pair of the three variables (condition, comparison, and affect), though the significance of the relationship between comparison and affect would have been reduced after the addition of condition. Had I failed to account for condition, I still would have detected a significant effect and concluded that negative comparisons predict declines in affective well-being. However, I would have neglected the mechanism of influence.

But I do not find a main effect of the interventions: randomly assigned conditions do not predict differences in post-browsing affect (“Hypothesis 2”). While mediating variables explain how and why a relationship between an independent variable and a dependent variable occurs, moderating variables account for when the relationship holds – that is, whether and under what conditions a relationship exists (Baron & Kenny, 1986). Had I not tested for the proposed interaction effect, I may have incorrectly concluded that the interventions ‘failed’ (or, more precisely, that they had no significant effect on the outcome of interest). However, inclusion of the interaction variables allows a different story to emerge. The interventions indeed reduce the toll of browsing on affective well-being *when* teens engage in higher levels of negative comparison. Because I also demonstrate that higher levels of negative comparison predict reductions in adolescents’ post-browsing affective well-being, the interventions arguably signal and serve youth who face heightened risk of negative effects from social browsing.

Moderating variables clarify the limiting conditions related to an effect of interest and contribute to more complete theoretical understandings (Judd, Yzerbyt, & Muller, 2012). If one considers the concept of moderation effects as more broadly relevant to youths’ social media experiences, adolescents’ varied responses to SNS activities are to be expected. Indeed, moderation is an established principle in traditional media effects research. Wilson’s (2011) review

of research on media violence and aggression in youth includes a section titled “Moderating Variables.” Wilson writes,

No researcher would argue that media violence affects all young people in the same way. Indeed, the small-to-medium effect sizes in meta-analyses suggest that there is a great deal of variation in outcomes among samples of children and teens. The impact of violent programming, music, or even videogames depends on a host of factors including the nature of content, personal characteristics of the individual, and the environment in which media are experienced. (p. 257)

My findings suggest that moderation is similarly relevant to SNS effects and interventions, and I therefore believe that research about social media use could productively attend to potential moderating variables. The inclusion of moderating variables reflects a researcher’s acknowledgment that behavior and experiences are complex; individuals are not the same, and failure to identify relevant subgroups may obstruct predictive relations (MacKinnon, 2011). For intervention research, moderating variables are pertinent to specificity of effects (i.e., understanding for which groups the intervention has greatest effects or has no effects) (MacKinnon, 2011). In treatment studies, ignoring moderators “may mean inclusion of many subjects for whom the interventions are not appropriate, perhaps are even harmful, and both reduced power for statistical testing and attenuated effect sizes” (Kraemer, Stice, Kazdin, Offord, & Kupfer, 2001, p. 854).

Researchers who limit their analytic approaches to a search for main effects may

consequently draw incomplete or incorrect conclusions about the effectiveness of proposed interventions.

Which existing models can orient researchers to relevant sources of variation in youths' experiences and outcomes? While no single study will sufficiently reconcile social media's effects on adolescents or, more generally, on human development, I believe the bioecological model (Bronfenbrenner, 1977; 2005; Bronfenbrenner & Morris, 2006) offers a framework for considering adolescent development in this context. The bioecological model draws attention to individual differences in the study of human development (Hook, 2009).

Although Bronfenbrenner's last iteration of the model predated the proliferation of contemporary social networking sites, the framework is well-suited to analysis of SNS experiences. In an effort to promote nuanced empirical investigations that can help researchers make sense of enigmas, I conclude by outlining principal ideas of the bioecological model and describing how my findings might inform its application to social media research.

At the core of the bioecological model is the Process-Person-Context-Time (PPCT) framework. Youth are said to make sense of themselves and their worlds through reciprocal interactions with their environments (Bronfenbrenner & Morris, 1998). These *proximal processes* – bi-directional interactions between individuals and the people, objects, and symbols in their environments – are “the engines” of development (p. 798). Proximal processes are most influential when they are consistent and recurrent (Bronfenbrenner, 1995). Among the range of

proximal processes, Bronfenbrenner describes reading, playing with peers, athletic activities, making plans, and caring for others (Bronfenbrenner & Morris, 2006).

Although SNSs are a relatively recent innovation, I posit social media use as a quintessential proximal process for contemporary youth. Adolescents' interactions with social media are indeed dynamic, daily, and recurrent in nature. As my findings reflect, social media do not simply affect adolescents by mere existence. Rather, it is youths' interactions with social technologies that propel their influence. In my account of Study 1, I describe four functional dimensions of social media use: self-expression, relational connections, exploration, and browsing. Bronfenbrenner maintained that the frequency of proximal process interactions also contributes to their effects. In Figure 1, I propose these interaction practices (my dimensions) and properties (e.g., frequency, duration) as dual components of social media use as a proximal process.

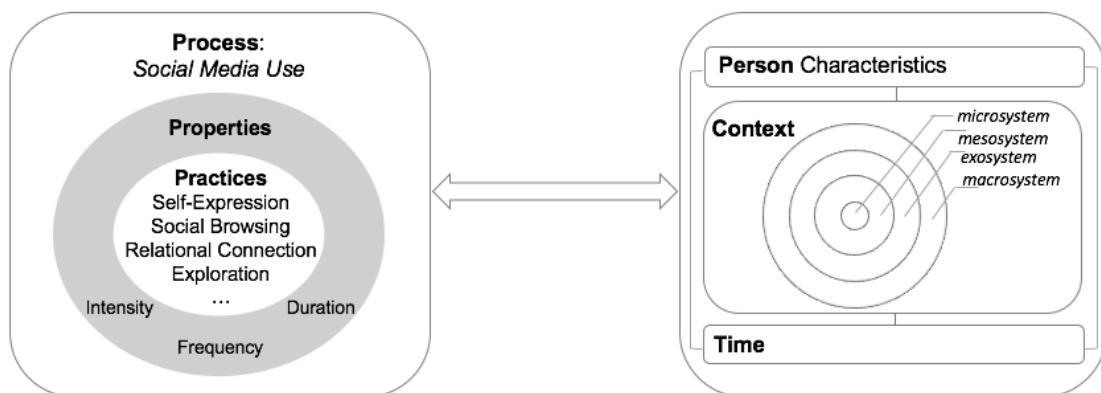


Figure 1. Social media use as a proximal process.

Although proximal processes drive development, they alone are insufficient for understanding the multifinality of developmental outcomes – that is, how and why a particular experience can lead to different outcomes for different youth (Bronfenbrenner & Morris, 2006). The effects of proximal processes vary systematically based on characteristics of the *person* and her *contexts*. As Bronfenbrenner and Morris explain,

The form, power, content, and direction of the proximal processes affecting development vary systematically as a joint function of the characteristics of the developing person; of the environment – both immediate and remote – in which the processes take place; the nature of the developmental outcomes under consideration; and the social continuities and changes occurring over time throughout the life course and the historical period during which the person has lived. (p. 996)

Bronfenbrenner distinguishes three types of *Person* characteristics influential to the effects of proximal processes: demand characteristics, resources, and dispositions (Bronfenbrenner & Morris, 2006). Demand characteristics, which are relatively observable ‘on demand’ and therefore influence others’ perceptions and social responses, include attributes such as gender, age, and appearance. Resource characteristics include intelligences and past experiences. Dispositional differences in temperament, motivation, and persistence also influence bi-directional interactions, as well as their sustainment over time. Proximal processes

are consistently influenced by the interconnected constellation of a person's biological, cognitive, emotional, and physical characteristics.

In Study 2, I demonstrate that individual differences in social comparison to the browsing stimuli predict post-browsing affective well-being. While I use an episodic measure of comparison, one's tendency toward social comparison may prove relevant as a dispositional difference. In addition, although the relationship between negative comparison and post-browsing affect holds for both male and female adolescents, I find that females tend to report more negative comparison than their male peers. My analysis thus indicates a related influence of gender, which Bronfenbrenner considered a demand characteristic. I also argue that applied knowledge about social media portrayals (i.e., as curated representations) influence youths' social browsing. My findings therefore sample, though certainly do not exhaust, the myriad 'person characteristics' which influence adolescents' social media experiences.

The effects of proximal processes also vary as a function of ecological *Context* (Bronfenbrenner, 2005). Bronfenbrenner describes the ecological environment surrounding the *Person* as a series of nested structures, analogous to a set of Russian nesting dolls. The innermost structure represents the environments closest to the individual – the *microsystem* – where the individual interacts with activities and other people. Adolescents' microsystems often include school, peer groups, family relationships, home, neighborhood, religious community, and sports teams. The adolescents in my studies share an important microsystem: their

school. This shared microsystem setting facilitates my examination of other sources of variation across adolescents' SNS experiences. Yet as I describe, the largely homogenous composition of the student body, coupled with the school's relatively affluent suburban community context, is also a limitation to my study's generalizability. Indeed, adolescents' immediate environments and neighborhood contexts can influence the nature and risks of their networked experiences (e.g., Stevens, Gilliard-Matthews, Dunaev, Woods, & Brawner, 2016).

When people and/or settings of the microsystem interact, these interactions take place at the *mesosystem* level (Bronfenbrenner & Morris, 2006). Parent-teacher conferences are an example of a mesosystem interaction. When an adolescent does not participate in such meetings, subsequent interactions with his parent and his teacher may nonetheless be affected by the parent-teacher relationship. In the case of social media, parents' interactions with older siblings (e.g., about screentime; SNS behaviors) may represent a salient mesosystem influence; communication between an adolescent's caregiver(s) and his or her school (e.g., about school cyberbullying policies) may also constitute an influence at the mesosystem level.

There are also settings that do not contain the developing person, yet which nonetheless "impinge upon or encompass the immediate settings in which that person is found and thereby influence, delimit or even determine what goes on there" (Bronfenbrenner, 1977, p. 515). The *exosystem* includes societal institutions (e.g., government, mass media), as well as linkages between settings when one or

more of the settings does not include the developing person. For example, funding decisions at the district level may influence a school's student-teacher ratios, which in turn affect the adolescent's classroom experience. Similarly, a parent's SNS-related experiences at work (e.g., witnessing hiring or firing decisions due to digital footprints) may indirectly influence a child's social media experiences.

Beyond the exosystem is the *macrosystem*. The developing individual is also influenced indirectly by broader cultural scripts, ideologies, and social structures. Bronfenbrenner (1977) describes these macrosystems as cultural "blueprints" (p. 515). He illustrates the blueprint concept with the example of school classrooms: the structural similarities across different classrooms scattered geographically throughout a society confer the impression that all were designed from the same blueprint for education. The value of free speech exemplifies a macrosystem factor which ostensibly influences the broader context surrounding American teens' SNS expression and interactions.

To summarize, an individual *person* is nested within the *context* of multiple, interconnected systems. Individuals' social interactions, as well as their interactions with objects and symbols in these contexts, are the bi-directional *proximal processes* that drive development. Together, these three components initially formed the Person-Process-Context model (Bronfenbrenner & Crouter, 1983). However, Bronfenbrenner (1995) subsequently recognized socio-political events as profoundly influential to ecology, and he expanded the model to include "the critical component of 'time'" (p. 622).

My interview period coincided with an unprecedentedly hostile 2016 U.S. Presidential Campaign; a mass murder at gay nightclub in Orlando, Florida; recurring police shootings of unarmed black men; international attention on the Black Lives Matter movement; the vote by British citizens to exit the European Union (“Brexit”); and a terrorist attack in Nice, France. Teens explicitly referenced each of these events in the course of my interviews – all in conjunction with descriptions of their affective social media experiences. My interview transcripts cannot be scrubbed of historical markers. Data on youths’ social media experiences will likely be dated not only by technologies of the moment, but also by the events of the study period.

Adolescents’ multifaceted interactions with social technologies may influence and be influenced by characteristics of the *person*, each individual’s *contexts*, and *time*. I endeavored, in this work, to study the individual experience of a networked adolescence. Based on my analyses, I describe functional dimensions of SNS use pertinent to emotional outcomes. Yet a close examination of teens’ narratives also suggests that experiences within and across the dimensions result from intersecting interplays of individual characteristics and contextual influences, both proximal and distal. Learning whether and how the bioecological model for research serves to deepen our understanding of adolescents’ networked lives is an area I plan to study next.

Conclusion

The empirical work of my dissertation teases apart the relationship between adolescent social media use and psychosocial well-being. I contribute, first, a descriptive study of social media experiences that intersect with adolescents' well-being and, second, an experimental investigation in which I test a theory of social browsing effects. In both Studies 1 and 2, individual differences emerge as central to understanding youths' varied experiences and their corresponding effects.

For future research on social media, I propose differential susceptibility as a framing concept. More specifically, I advise attention to potential moderating variables, including individual characteristics (e.g., age, gender, dispositions) and social-contextual factors. To facilitate systematic examinations of nuanced relationships and multiple, co-acting, bi-directional influences, I believe the bioecological systems model of human development (Bronfenbrenner & Morris, 2006) offers a useful conceptual framework, and I suggest consideration of social media use as a *proximal process*.

In my introduction to this dissertation, I noted that adolescents' networked lives often mystify the adults around them. Against a backdrop of uncertainty, alarmist and overly simplified media portrayals of social technologies are both salient and compelling. It is my intention neither to calm nor to alarm. Rather, I hope my dissertation will help clarify the nature of adolescents' diverse, multifaceted experiences with social technologies and contribute to ongoing study of variation in youths' experiences and outcomes.

A networked adolescence is inevitably characterized by the tilts and shifts that have long shaped emotional life. For contemporary youth, the social media see-saw is simply part of the playground.

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Appendix A: Interview Guide

Part 1: General Questions About SNS Use

How does social media fit into your life?

- What SNSs do you currently use? How often do you go on each of these accounts? Can you tell me about how you use each/how they're similar or different? Which social media platform do you use most right now?
- How often do you *post* or *share* something on each app? What kind of image do you present on social media?
- Why do you use social media?

How old were you when you first started using social media?

- What was the first platform/account that you created?
- Has the way that you use social media changed at all since you started using it?

Overall, what are the best parts of having social media? What are the most challenging or tricky parts?

- Would you say that you *like* having social media? Why or why not?

Have you ever taken a break from using social media? (*note: e.g., de-activated accounts or tried not to look at your account(s) for a period of time*)? For how long, and for what reason?

- How would you feel if someone told you that you couldn't use social media for the next week?

How did you learn about how to use social media (e.g., what to do or not do)?

- Are there any ways that you've learned how to be responsible online? (How and/or from whom?)

Think in your head about a few of your *favorite* people who you follow on social media. What makes them your favorites? (If it doesn't come up: what kinds of posts/snaps do they share?)

If you think about people who you follow on social media who really get on your nerves – what is it about the way that they use social media that irritates you?

Do you ever (or have you ever) unfollow(ed) or unfriend(ed) anyone? Why/why not?

Do you follow any people on social media who you think are particularly *good*

role models? What do you think makes them good role models?

Do you follow any people on social media who you think are particularly *bad* role models? What do you think makes them bad role models?

Part 2: Affect Experiences

If you had to pick one social media site that is most important to you right now (e.g., over the past week? month?), which would you pick? What makes this site most important?

When you're using [most important SNS platform], how do you *generally* feel?

- Why? What about using [platform] makes you feel this way?

Now that I have a sense of how you *generally feel*, I want to ask you about a bunch of different emotions/feelings and I'm curious if you've *ever* felt this way when you use any social media. You might have mentioned some of these emotions before, but I want to ask you about your experiences in more detail now. Some are about positive emotions, and some are about more tricky emotions. As I mentioned earlier, we also can skip any questions that you'd rather not answer.

- Do you ever feel or have you ever felt [emotion]? (if yes): What kinds of things make you feel [emotion] when you're using social media? Can you tell me about a specific time when using social media made you feel [emotion]? How/why do you think it makes you feel [emotion]?
 - Happy?
 - Upset?
 - Bored?
 - Anxious?
 - Amused?
 - Self-Conscious?
 - Closer to your friends?
 - Jealous?
 - Interested?
 - Left out?
 - Irritated?
 - Calm?

How do emotions on SM compare to emotions offline?

[For the negative emotions] What do you do when you see something that makes you feel jealous / left out / upset / anxious / irritated / self-conscious? {note: not necessary to list them all – can mention the ones described above and/or say, 'tricky emotions or experiences'}

What advice would you give to a younger sibling or friend if he or she were just starting to use social media?

Part 3: Inventory

*Provided that interviewee indicates openness to browsing his/her own social media accounts during the interview, co-catalogue the 3 most recent posts on his or her Instagram feed. Ask interviewee to scroll through and describe/discuss anything that catches his or her attention.

*If possible and time permits, also have him or her look at Snapchat and describe a few specific stories and/or general impressions of new snaps.

Can you tell me about this post/story?

- What is the content?
- Who is the poster? (E.g., Is it someone who you know? A close friend? A stranger?)
- What is your reaction to this post? How do you feel seeing it?
- Are you going to ‘like’ it or comment? Why or why not? (If Snapchat, will you reply?)
- Would you ever post a picture/story like this? Why or why not?

Part 4: Reaction to Simulated Profiles

The last part of the interview is a think-aloud response to the simulated survey feeds. [Have Carly/Alex feeds open in the other window so that pictures are already loaded]. I’m curious about any reactions that you have – feel free to share anything that pops into your head as you look through their feeds.

(After browsing)

- What do you know about Alex/Carly from browsing their feeds?
- Do you think [Alex/Carly] is a good role model for other kids? Why or why not?
- Do you know any people like [Alex/Carly]?
- How do you feel after looking through a feed like Alex’s or Carly’s?

About the intervention conditions:

- Does it make a difference to see the ‘bad day’ posts? How would your impression be different with/without these posts?
- Do you think it would make a difference if someone told you, prior to browsing the feeds, that these are normal people who have bad days, too? Why or why not?

That is the end of our interview; thank you so much for your time.

- Is there anything that I didn't ask about that you wanted to share?
- Do you have any questions for me?

Researcher's note: This interview guide intended to be used as a semi-structured protocol. Participants may answer questions that have not yet been asked and/or interviewer may otherwise rearrange the order or wording of questions to maintain interview flow. Additionally, certain questions may be omitted if interviewees have not had certain experiences or prefer not to discuss particular topics.

Appendix B: Codebook

Discovery (D)

D1. Discovery – Positive (→ Exploration)

<i>Definition & Inclusion Criteria</i>	<p>Social media (SM) support development of existing interests and/or facilitate new areas of learning. This includes discovery (or rediscovery) around:</p> <p>a) specific topics (e.g., cooking, sports, car mechanics);</p> <p>b) learning about the world (e.g., other countries, news);</p> <p>c) exposure to inspiration and new ideas</p>
<i>Anchor Cases</i>	<p>‘I always find new things or things I want to try.’</p> <p>‘[the best part about SM is] the fact that you can ... find these new things to look into and pursue interests that you can potentially do yourself. Having the entire world at your fingertips.’</p> <p>‘I follow a lot of traveling accounts on Instagram and Twitter. [I like] city lights.... I feel happy whenever I see the Patriots post a picture of the team working out.’ (note: following sports/The Patriots is one of his interests)</p> <p>‘What you follow and what you read and stuff on social media, those are your interests. You’re never going on social media typically without being interested in something. Because I’m not going to follow an account that I’m not interested in.’</p> <p>(on seeking out artistic inspiration on SM) ‘I feel as though I'm more of an artistic person, so I enjoy seeing images like the golden hour of the sunset. So I enjoy photography and maybe a little drawing... and see what inspires me because I've had a few inspirations.’</p>
<i>Exclusions</i>	<p>Learning about friends’ interests. <i>Explanation:</i> Learning about friends directly supports relational closeness, therefore code as R1.</p>
<i>Additional Notes</i>	<p>*Nature cases (though could be considered edge case) are included in this category related to the idea of discovering the world & exploring interests around natural beauty</p> <p>*Celebrities can be included in this category when the focus is on content (e.g., fashion, style, music)</p>

D2. Discovery – Negative (→ Boredom)

<i>Definition & Inclusion Criteria</i>	<p>SM does not lead to engaging discovery – instead, browsing results in boredom/disengagement.</p> <p>This includes:</p> <p>a) When browsing SM content results in feeling bored/disengaged (e.g., repetitive content);</p> <p>b) SM displaces time to pursue ‘meaningful’ interests and/or learning (e.g., SM as a waste of time; SM interferes with schoolwork or other pursuits) [note: this is a ‘lighter’ form of interference via displacement]</p>
<i>Anchor Cases</i>	<p>‘When I’m on social media for a long time and I feel like, ‘oh, no, how can I waste my time that long!?,’ I will feel anxious.’</p> <p>‘I hit rock bottom and you can’t scroll anymore...so like if I scroll through it too long then I’m just gonna get even more bored. And like I get a headache sometimes, it just bothers me.’</p> <p>‘Sometimes, just because some of my friends will respond really quickly and it will be just their face, or they’re not doing anything, and it’s like ‘okay, I’ve seen you on your bed 10 times already in the past 6 minutes.’ It’s just like ‘send something different.’</p>
<i>Exclusions</i>	<p>Unwanted connections (code as R2)</p> <p>Cases that mention using SM <i>because</i> he/she is bored (i.e., to alleviate boredom)</p>

Relational Interactions (R)

R1. Relational Interactions – Positive (→ Closeness, Connection)

<i>Definition & Inclusion Criteria</i>	<p>SM support relational connection and feelings of closeness. This includes friendships, family relationships, and romantic relationships, via:</p> <ul style="list-style-type: none"> a) direct communication and disclosure; b) keeping in touch and/or feeling generally connected; c) metrics that support/substantiate the friendship development; d) learning about friends' interests and lives
<i>Examples and Anchor Cases</i>	<p>‘I feel happy a lot when I'm on social media, with every social media I would say. 'Cause I could be chatting with friends, I could be seeing snaps that my friends sent me on Snapchat and they could be doing something really cool or fun or something really funny.’</p> <p>‘Instagram ... say I'm looking at my friends, or my friend just posted a new photo and it's them playing hockey. ‘Oh, I never knew they played hockey.’ So I'm learning something new about them. So obviously I'm getting closer to them, in a way. And it's just finding out more about them. I enjoy that.’</p> <p>‘I honestly don't think my relationship with my now girlfriend would have been as strong if we didn't have those conversations on Snapchat to begin with.’</p> <p>‘When they [friends] post for your birthday and write cute captions you're like ‘aww, thanks!’’</p>
<i>Exclusions</i>	<p>Neutral interactions that are not described in relation to positive experiences/closeness and connection (e.g., ‘we have a streak’, ‘it's good to show who you're friends with’)</p> <p>Demonstrating relationships as part of presenting one's image – code as (E) Expression rather than (R) Relational Connection.</p>
<i>Additional Notes</i>	<p>*If friends send funny/silly content, double code with V1. E.g., Elizabeth sends ‘really, really ugly snaps with friends, double or triple chins,’ and thinks it is ‘hilarious.’</p> <p>*For Snapchatting, make sure to attend to context and affect experiences. References to streaks that support connectedness can be coded as R1 if they are clearly described as influencing the relationship/closeness. (Examine contextual cues!)</p>

R2. Relational Interactions – Negative (→ Disconnection)

<i>Definition & Inclusion Criteria</i>	<p>SM disrupt relational connection and and/or enhance stress or insecurity about relationships, including via:</p> <ul style="list-style-type: none"> a) misinterpretations, uncomfortable interactions, b) learning about exclusion via SM; FOMO; c) metrics that de-value the friendship (e.g., dropping streaks; unfollowing); d) learning upsetting information about friends' behaviors/interests
<i>Examples and Anchor Cases</i>	<p>'[If] your group of friends is all hanging out and you're not included and you see a picture of them on Instagram or Snapchat, it is hurtful to see that and be very excluded. It has happened to me before and it's just an awful feeling.'</p> <p>'If my friends hadn't invited me somewhere and they're posting all the great time they're having without me.'</p> <p>'[With SM gossip,] everyone finds out. Then everyone is just like, 'oh that's a terrible thing,' and everyone just knows about it. But back when we didn't have a lot of social media, it would take a long time [for fights to spread], so you could try to fix your mistakes.'</p> <p>'Well, some people get annoyed. They get super angry, and they'll be like, 'We lost our streak!''</p>
<i>Exclusions</i>	<p>Stress about being misunderstood if the stress is related to more general self-expression – use E/I2 rather than R2.</p>

Expression & Identity Feedback (E/I)

*The E/I codes should only be used for social media expression – do not use for direct communication through SM (in those cases, default to R1/R2 or no code). For E/I, there must be a real or potential audience.

E1. Expression & Feedback – Positive (→ Validation, Sense of Authenticity)

<i>Definition & Inclusion Criteria</i>	<p>SM provide a welcome opportunity for self-expression and impression management. This includes positive experiences related to:</p> <ul style="list-style-type: none"> a) creating/curating an online identity; b) sharing personal interests (who I am, what I care about); c) digital footprints as a source of nostalgia
<i>Examples and Anchor Cases</i>	<p>‘When you’re on Tumblr you can just share whatever you want and things that are important to you.’</p> <p>‘I post on that [account] a couple times a week... I don't know how to explain it! I just got it and I think I'm funny, so I like mine a lot. And a lot of people think mine's funny.’</p> <p>Selena describes scrolling through her VSCO and feeling like, ‘that’s me.’ This experience of expressing the ‘real me’ sticks out as a strong positive for Selena – perhaps the most positive thing about SM. She also describes posting a video of herself singing and getting positive feedback from her followers – this was a ‘happy’ experience. Both are E/I1 examples.</p> <p>The best part about having SM is ‘letting people know about your life.’</p> <p>Thomas feels ‘really connected’ to Instagram because he’s posted at least 200 photos and he enjoys posting and likes to look back at his old photos to ‘see how far I’ve come and where I’ve been ... old memories, it’s nostalgic.’</p> <p>Lily has a meme account that she uses to post ‘my humor.’ She feels happy and understood when others really appreciate her jokes and what she’s ‘about.’</p>
<i>Exclusions</i>	<p>‘It’s easier to communicate about sensitive topics.’ Supporting disclosure in direct communication is not included in that E/I1 category. If the disclosure supports relational connection, code as R1.</p>

E2. Expression & Identity Feedback – Negative (→ Concern About Others’ Judgments)

<p><i>Definition & Inclusion Criteria</i></p>	<p>SM expression is restrictive, limiting, and/or stressful. This includes:</p> <ul style="list-style-type: none"> a) worrying about what to express or share; b) anxiety about social feedback or judgment (including ‘likes’) c) stress about what others share about you; d) concern about negative immediate/future/ implications of digital footprints
<p><i>Examples and Anchor Cases</i></p>	<p>[One of the most challenging things about SM is] ‘the pressure it puts on you, pushing you to be like other people and be like everybody else and fit a certain standard [and] not really express yourself.’</p> <p>‘Yeah, when I post a picture, sometimes I’m like, I hope this breaks 200 likes. And I’ll post it at night and I’m getting to the time I’m about to sleep and it’s at 180... and I’m like dangit, I didn’t hit my mark...’</p> <p>‘I do feel anxious when I’m posting photos [about] whether or not people will like it or not. I guess I’m afraid of judgment.’</p> <p>[One of the most challenging things about SM is] ‘the way things can spread. One wrong word, one wrong doing, one wrong action can really stick with you.’</p> <p>[One of the hardest parts of SM is] ‘watching your mouth, definitely.’ This is important because it’s ‘obvious colleges are looking’ and also to avoid getting in trouble.</p> <p>‘Like whether or not it was a good decision to share that photo or post something. Will I regret it later?’</p> <p>‘Definitely, with posting a picture and not knowing if anyone is going to like it. Will they think I’m ugly / the filter is bad?’</p>
<p><i>Exclusions</i></p>	<p>‘If someone I hate gets a lot of likes’ suggests envy of social status/standing, rather than than personal stress over identity feedback. It is therefore coded as S2 rather than E/I2.</p> <p>If a specific friend un-follows to communicate that he or she is mad, code instead as R2.</p>

Content Valence (V)

V1. Content – Positive Valence (→ Entertainment)

<i>Definition & Inclusion Criteria</i>	SM browsing sparks positive emotion(s) because the content is entertaining – especially lighthearted, amusing and/or uplifting
<i>Examples and Anchor Cases</i>	<p>‘On Facebook there are really funny videos, and, on Twitter, funny tweets.... [Examples are] a dog rolling around with a funny face, people dancing to a song and something goes wrong, or a text post of someone’s personal story that turns out to be hilarious.’</p> <p>Alice follows a dog page that is ‘so cute’ and makes her ‘so happy.’</p> <p>‘Yeah, I always feel – I laugh so hard sometimes.’ ‘[Social media is] definitely an outlet I’ll use. If I’m feeling down, it will make me laugh. Like I know it will.’</p> <p>Elizabeth’s friends Snapchat her funny pictures (e.g., of the kids in their camps or of ‘something and that’s hilarious’) *double code with R1)</p> <p>‘If I’m on YouTube or on Instagram and I’m watching a video – I watch a lot of cooking videos on YouTube and those are definitely amusing to watch.’ (double code with D1)</p> <p>‘I always get amused on Tumblr, because I follow things that make me laugh because I like to laugh.’</p>
<i>Exclusions</i>	Cases that are related to feelings/reactions around expressing themselves (e.g., to post or not to post) should be coded as E1/E2.
<i>Additional Notes</i>	Code should capture ‘feel good’ content and entertainment.

V2. Content – Negative Valence (→ Distress)

<p><i>Definition & Inclusion Criteria</i></p>	<p>SM use sparks negative emotions because the content is heavy, distressing, irritating, and/or upsetting. This includes:</p> <ul style="list-style-type: none"> a) irritating content that falls in the category of ‘stuff I don’t want to see on my feed’; b) general meanness/hate (when it isn’t directed at the interviewee); c) content that makes the interviewee feel upset, e.g., finding out via SM that a friend passed away, others’ depression-oriented content
<p><i>Examples and Anchor Cases</i></p>	<p>‘There are people who make Instagram pages for the sole purpose of expressing how depressed they are, or something like that, which can get graphic. So, that’s the only risk I have with going on Instagram Explore and finding other random pages.... I did come across some pages dedicated to self-harm. That was bad.’</p> <p>‘I use Twitter a lot for news and [get upset] if I see something that’s upsetting news or I see someone passed away or something.’</p> <p>‘Yeah, when someone posts something on Instagram that maybe I don’t agree with or they say something that’s kind of offensive or something you don’t want to see or hear about.’</p> <p>‘Whenever I see sad things coming up [while browsing current events/BLM]’</p> <p>The older brother of one of Carlos’ friends (who is ‘very Republican’) recently posted something bashing democrats. Carlos is ‘totally fine’ with people having different views, but he feels like, ‘why do you need to go out of your way hating a group of people? Just go about your life.’</p>
<p><i>Exclusions</i></p>	<p>Boring content, which was included as V2 in an earlier codebook iteration because it seemed like the ‘opposite’ of enjoyment/engagement/entertainment, might involve disengagement and boredom—use D2 as appropriate</p>
<p><i>Additional notes</i></p>	<p>‘When people are narrow-minded on social media.’ Explanation: Seeing ‘narrow-minded’ posts is often discussed related to general people on the Internet being hateful towards certain groups. This is an EC.</p> <p>We are including political disagreements in this category for our coding, but we note that they seem substantively different from the other cases in this code category.</p>

Social Browsing – Social Cognition (S)

S1. Browsing & Social Cognition – Positive (→ Admiration)

<i>Definition & Inclusion Criteria</i>	<p>SM contributes to positive emotions related specifically to browsing others' SM posts. This includes:</p> <ul style="list-style-type: none"> a) general prosocial cognition; b) feeling good for/happy for others (enjoying seeing others happy); c) non-judgmental interest in general social learning and/or others' lives
<i>Examples and Anchor Cases</i>	<p>'I just like learning more about people, seeing what they share with other people. I am a people person.'</p> <p>'Yeah, it [looking through SM] makes me feel happy. Seeing someone else happy kind of makes me happy.'</p> <p>'You can get a more close sense of people who you may not talk to all the time. It's cool to see what they care about, what they're really passionate about. Like this is interesting – I didn't know they like this obscure band.'</p> <p>'I like to see what other people are doing, it's just interesting to me... just cause it's so different than mine [i.e., my life], because everyone's lives are in a different place.'</p>
<i>Exclusions</i>	<p>'I have to say, staying connected with every day. Someone could be on Instagram and you're not, and they see this awesome post from the Olympics and you could miss it' suggests general interest in learning about the world/events. Therefore, code as D1.</p>
<i>Additional Notes</i>	<p>When others are close friends, interest in learning about others' lives should be double coded with R1.</p>

S2. Browsing & Social Cognition – Negative (→ Envy)

<i>Definition & Inclusion Criteria</i>	Social cognition on SM is characterized by negative social comparisons. This includes: a) feeling like others' lives are better; b) jealousy/envy
<i>Examples and Anchor Cases</i>	<p>‘Ya, seeing things of people who you want or people who live an awesome life and you want to do that/be like that.’</p> <p>‘When other people [on SM] are having a better life than me.’</p> <p>‘If I do come across someone, like if it’s January and I see someone posting of themselves on the beach and they’re in great shape and happy – they might not be happy, but I’m just like, ‘oh I wish I was them.’</p> <p>‘You want to be like that person, so you’re jealous of them, too.’</p> <p>‘On Instagram, people will post pictures of them at the beach and it will make me a little self-conscious of the way I look. Because I don’t look like them.’</p>
<i>Exclusions</i>	Judgments that fall into the ‘I wouldn’t share that’ category.
<i>Additional Notes</i>	Code is generally intended to capture feelings related to inferiority and/or insecurity.

Appendix C: Inter-Rater Reliability Report

Krippendorff's alpha (KALPHA) coefficients for inter-rater reliability coding

Code	Krippendorff's Alpha
D1. Discovery – Positive/Engaged + Inspired Exploration	0.84
D2. Discovery – Negative/Bored + Disengaged	1.00
R1. Relational Interactions – Positive/Connection + Closeness	0.79
R2. Relational Interactions – Negative/Disconnected	0.87
E1. Expression & Feedback – Positive/Validated + Authentic	0.89
E2. Expression & Feedback – Negative/Judgment + Inauthentic	0.92
V1. Content Valence – Positive/Entertained	0.88
V2. Content Valence – Negative/Heavy + Distressed	0.95
S1. Browsing + Social Cognition – Positive/Admiration	0.86
S2. Browsing + Social Cognition – Negative/Envy	1.00

Appendix D: Application of the See-Saw Framework as a Diagnostic Tool

To demonstrate how the see-saw framework can be applied in the service of assessing an individual's SNS experiences, I present see-saw examples for two teens. Carlos (Grade 11) and John (Grade 10) are both male teens from my interview study. I examined their coded experiences across the functional dimensions (e.g., Table 5 in Study 1) alongside interview profiles with more holistic assessments of their networked experiences. Each block corresponds to a 'present' influence; bolded text signals a 'defining' element.

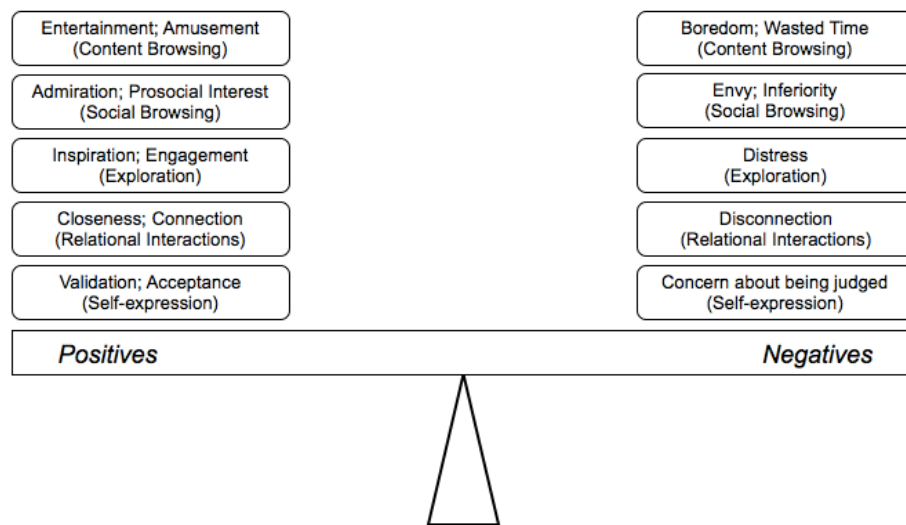


Figure 1. See-saw of affective well-being: Potential influences of each functional dimension on affective well-being.

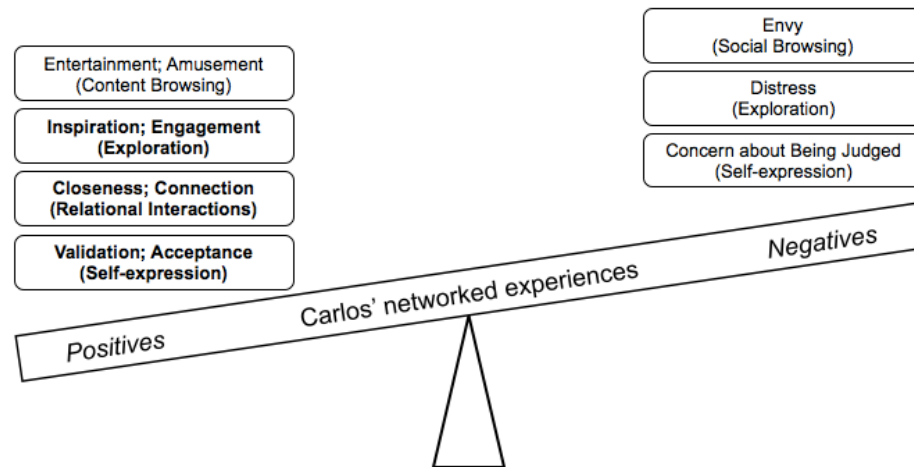


Figure 2. See-saw for Carlos at the time of his interview: Positive tilt.

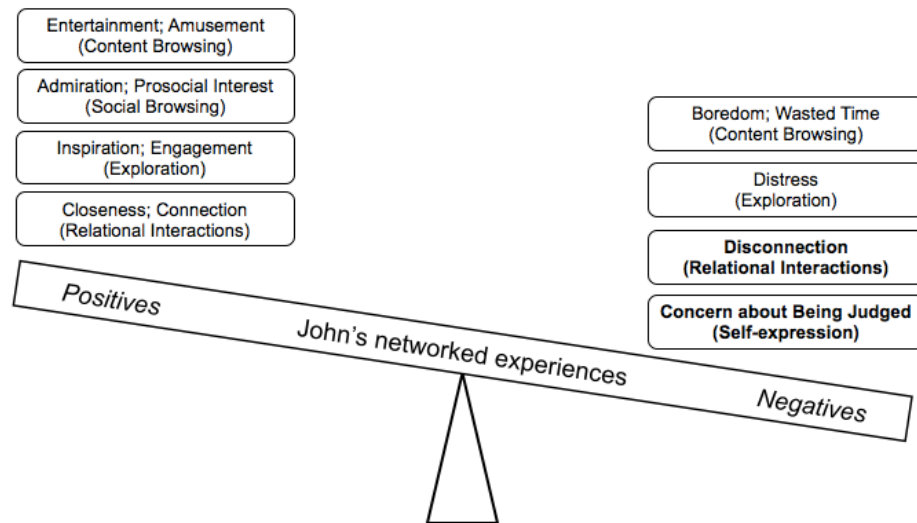


Figure 3. See-saw for John at the time of his interview: Negative tilt.