

The Impact of Social Media Use on Subjective Well-Being of Adolescents

Application for the Angelo Dalle Molle Foundation Prize

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Hanna has got her **Doctoral Degree with summa cum laude** (2009) and **Habilitation** (2013) from the Humboldt-Universität zu Berlin in Germany. She also holds Master of Science Degree in Banking and Finance from the Belarus State University as well as Master of Arts in Economics and Management Science from the Humboldt-Universität zu Berlin. In her research she addresses the issues of **social and individual value of the emerging Social Media applications**. She is the author of **over 25 research articles** published in the *Journal of Information Technology*, *Journal of Wirtschaftsinformatik*, *Identity in the Information Society Journal*, *International Conference on Information Systems* as well as other IS conferences. The paper she co-authored “*It’s All About Networking! Empirical Investigation of Social Capital Formation on Social Network Sites*” has received the **Second Runner Best Paper Award** at the International Conference on Information Systems (ICIS 2011) in Shanghai, China. Her recent research about **Facebook envy** has been granted the **Best Paper Award** at the International Conference on Wirtschaftsinformatik in February 2013 and has been covered by all major news outlets worldwide, including **CNN, NBC, REUTERS, YAHOO!, Fox, mashable, RTL, ProSieben, Spiegel Online, Focus, NZZ** and over a hundred other outlets around the globe. Hanna has also been awarded a **Prize for Good Teaching** for her seminar at the Humboldt-Universität zu Berlin.

Project Description

The Impact of Social Media Use on Subjective Well-Being and Performance of Adolescents

Motivation

With billions of users worldwide, Social Media platforms, like *Facebook*, *Twitter*, *YouTube* or *WhatsApp*, transform the today's societies. We witness significant changes in communication and leisure patterns, with Social Media permeating our daily routines in many different ways. Spurred by the widespread adoption of smartphones, exploding usage of Social Media raises multiple questions,

with many stakeholders and policy-makers asking about the meaning and long-term consequences of growing Social Media use.

Particularly the long-term implications in terms of subjective well-being and cognitive performance have been questioned for adolescents, considering their lack of life experience, developing perception of self and, therefore, their greater vulnerability. As of now, adolescents represent one of the dominant user groups on Social Media. A whopping 93% of German adolescents in the age of 18-25 admit to using WhatsApp, with 87% using Facebook. Even among the youngest, the use of Facebook is record high reaching 64% among 12-13 year olds in the U.S. (Lenhart et al. 2011). Adolescents are not just members, but are also heavy users of Social Media and the “always on” aspect of these technologies is very distinctive for them (Davies 2012): 18-25 year old German users report to spend around 3.5 hours daily with smartphones, investing on average 68 minutes per day into their communication on WhatsApp, 44 minutes into Social Networking and 28 minutes into browsing (Akademia der Media 2013). Against this background, it appears that understanding long-term consequences of Social Media use for the younger generation is of critical importance for an array of stakeholders, including parents, educators and politicians.

Research Gap Addressed By This Proposal

So far, existing research has invested significant efforts into understanding implications of Social Media adoption for users, including young adolescents. On the positive side, studies underline the benefits of social connectedness and social capital as users seek advice and emotional support from friends and relatives on Social Networking Sites (SNSs), like Facebook (Notley, 2008). Adolescents are also shown to enhance their relationships both at school and online by using SNSs (Ahn 2012). In addition, Social Media platforms have the potential to enhance their learning experience, as they facilitate knowledge sharing (Notley 2008). On the negative side, privacy problems, including self-disclosure, sexting and cyberbullying have received significant attention (e.g. Schneider et al. 2013). Few studies also discuss the impact of Social Media use, especially Facebook, on academic performance, reporting mixed results (Junco 2012). Taken together, extant research provides an array of findings regarding the implications of Social Media adoption for users, including adolescents.

Nonetheless, the global picture on the consequences of Social Media participation is still missing and is plagued by considerable controversy.

In particular, we still lack full understanding of the ultimate impact of different Social Media platforms on adolescents’ **subjective well-being** – a “**measure of the quality of life of an individual and of societies**”, and their **cognitive performance**, which both represent a subject of significant public interest (Diener et al., 2003, p. 405). For example, some suggest a positive link between the use of SNSs and users’ life satisfaction (Apaolaza et al. 2013). In contrast, a number of most recent findings - mainly using student samples - provide evidence for the ruining effects of SNSs use, linking it to depression (Pantic et al., 2012), anxiety (Farahani et al. 2011), and even substance abuse (O’Keeffe and Clarke-Pearson 2011). Table 1 summarizes the selection of studies investigating the impact of SNSs, mainly Facebook, on markers of *subjective well-being*, showcasing conflicting nature of current research.

Table 1: Linking SNS Use to Subjective Well-Being: Past Research

Source	Mean Age	Measured Activity on SNSs	Outcome	Desirability of the Effect
Negative Effect on Subjective Well-Being				
Farahani et al. (2011)	21	Use	Anxiety Stress (+)	Unfavorable
Pantic et al. (2012)	18.0	Time spent	Depression (+)	
Krasnova et al. (2013)	24.3	Passive following	Life Satisfaction (-)	
Wenninger et al. (2014)	14.9	Passive following	Life Satisfaction (-)	
Kross et al. (2013)	19.5	Time spent	Affect Life Satisfaction (-)	
Burke et al. (2010)	33.7	Passive following	Loneliness (+)	
Positive Effect on Subjective Well-Being				
Apaolaza et al. (2013)	12-17	Time spent	Life Satisfaction* (+)	Favorable
Wang (2013)	ca. 24	Sharing	Life Satisfaction (+)	
Valenzuela et al. (2009)	20.7	Intensity of use	Life Satisfaction (+)	
Lee et al. (2011)	21.3	Self-disclosure	Life Satisfaction Affect (+)	
Kim et al. (2013)	< 30	Self-disclosure	Happiness (+)	
Valkenburg et al. (2006)	10-19	Tone of feedback	Life Satisfaction** (+)	
Absence of Effect on Subjective Well-Being				
Jelenchick et al. (2013)	18.9	Time spent	Depression	Not significant
Rosen et al. (2013)	30.7	General use	Major Depression	
Lee et al. (2011)	21.3	Time spent	Affective Balance	
Locatelli et al. (2012)	18.7	Positive posts	Depression	
Lee et al. (2011)	21.3	Time spent	Life Satisfaction	

*via Self-Esteem and Loneliness; **via Social Self-Esteem.

We find that existing studies suffer from an array of constraints that may explain existing controversy in findings. Specifically, the following limitations are common:

Measurement issues: Majority of studies in this domain are based on recall-based self-report measures of Social Media participation, with respondents typically asked about their “weekly usage time” (Lee et al. 2011). As a result, collected data can be imprecise and subject to memory distortions. Furthermore, subjective well-being is typically measured only at one point in time, which imposes constraints on reliability of findings.

Lack of causality: With some notable exceptions (e.g. Kross et al. 2013), results reported in past studies imply association between Social Media use and users’ subjective well-being, rather than causality.

Mobile use: 65% of time spent on SNSs, like Facebook, happens in the mobile context (Fox 2013). Nonetheless, little is known about the differences between mobile and desktop use with regard to subjective well-being and grade / cognitive performance.

Focus on SNSs: So far, the majority of studies linking Social Media use to markers of subjective well-being have focused on SNSs, particularly Facebook. However, especially with the arrival of smartphones, other uses of Social Media have gained in importance: For example, younger users spend even more time on WhatsApp (68 min/day) than on SNSs (44 min/day) in Germany (Akademia der Media 2013). In the US, Snapchat – a photo messaging application - is seen as the major competitor of Facebook among 13 and 23 year olds (Dredge 2013).

Participation patterns: Studies typically apply aggregate measures of Social Media participation, such as ‘time on site’ or ‘number of logins’. This approach is troublesome, since pooling different types of activities makes it difficult to discern between closely-related, yet different behavioral patterns (Koroleva et al. 2011). To address this issue, some studies on Facebook differentiate between active and passive use, demonstrating their differential impact: While active use, such as sharing and commenting, has been associated with positive outcomes, such as life satisfaction (Lee et al. 2011), passive use – consumption of the information from others - has been found to lead to negative consequences such as loneliness (Burke et al. 2010), and depressive symptoms (Davila et al. 2012). Despite salience of these differences, research distinguishing between different participation patterns is limited, and in most cases focuses on only one platform.

Underlying reasons: While there is some research evidence on the link between the use of Social Media and users’ subjective well-being, there is little clarity on the underlying dynamics behind these outcomes. Indeed, why would active use of Facebook enhance subjective well-being? And why would passive use lead to depression? Our past research suggests that envy can be one of possible outcomes of passive use of SNSs, and may underlie the negative influence of passive participation (Krasnova et al. 2013). Other reasons include social overload (Maier et al. 2012), or information overload (Koroleva et al. 2010). All in all, however, evidence remains limited, especially for platforms other than Facebook.

Focus on students: Remarkably, most of existing studies are based on student samples (see Table 1). At the same time, adolescents may have different emotional and cognitive reactions to Social Media, as they make their first steps into independence.

Together, these limitations call for a more comprehensive and methodologically sophisticated approach to study the impact of Social Media participation on users’ subjective well-being and cognitive performance.

Research Vision and Plan

This research concept aims to overcome these weaknesses in a multi-stage approach. In the **first step**, the impact of Social Media use will be investigated under controlled experimental conditions. **In the second step**, complex relationships between the usage of different social media platforms and users’ subjective well-being will be investigated.

First, a series of experiments will be conducted to explore the impact of different platforms on users’ cognitive performance, attention, memory, stress levels, and well-being. For example, in one of the experiments, participants will be randomly assigned to conditions, in which they will be asked to use different platforms (e.g. Facebook, Twitter, Instagram, News, YouTube, see Figure 1). Next, respondents will be requested to perform several tasks, such

as concentration grid exercise (Russell and Newton 2008), or text comprehension tasks (Fox et al. 2009) to measure the level of cognitive performance following platform use. Moreover, physiological data will be collected to measure users response in terms of stress levels and arousal, for example by measuring salivary cortisol levels (a common biomarker of stress), or skin-conductance signals (Wise et al. 2010). Further, application of fMRI procedures to monitor activation of brain regions involved in the use of different Social Media channels is possible (Tamir et al. 2012). Data collected at this stage will render insights on the effects of different platforms on users' performance and well-being.

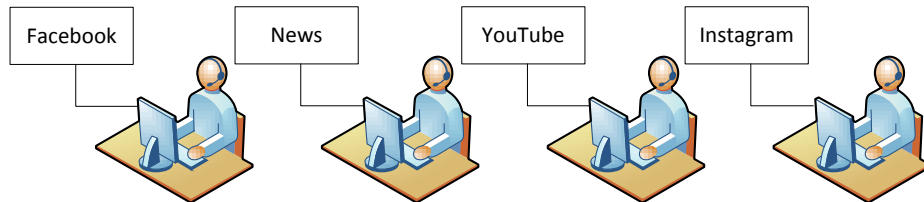


Figure 1: Example of an Experimental Set-up (Step 1)

Next, we seek to implement a mobile application and a browser plug-in to capture time users spend on various platforms, functions they use, and, importantly, their subjective well-being (see Figure 2 and Figure 3). Notably, this approach allows for reliable collection of usage data across multiple platforms (e.g. Facebook, Twitter, WhatsApp, etc.). As a result, explicit and implicit participation data on various Social Media platforms will be combined to explore its link to subjective well-being and performance of adolescent users. Both cognitive and affective markers of subjective well-being will be explored, including happiness, affect, life satisfaction, and loneliness. Technically, users will be asked to report their well-being experiences upon opening / closing a specific application. Integration of tests measuring cognitive performance is also possible.

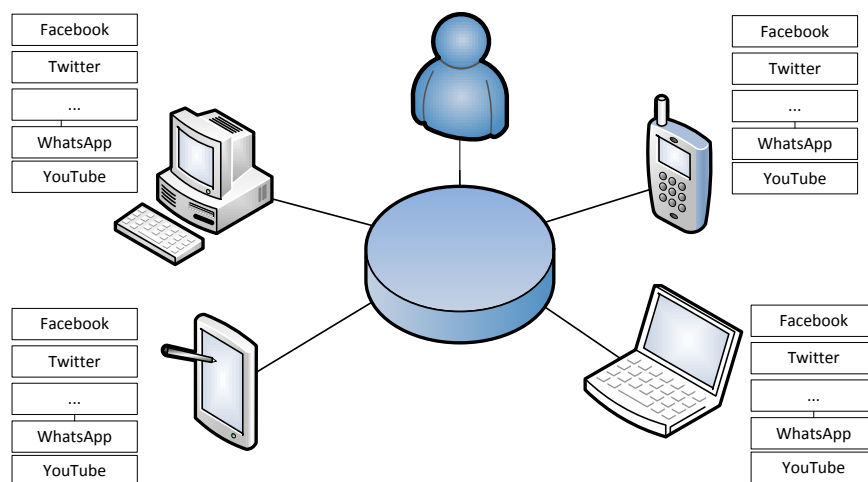


Figure 2: Scope of the Technical Design (Step 2)

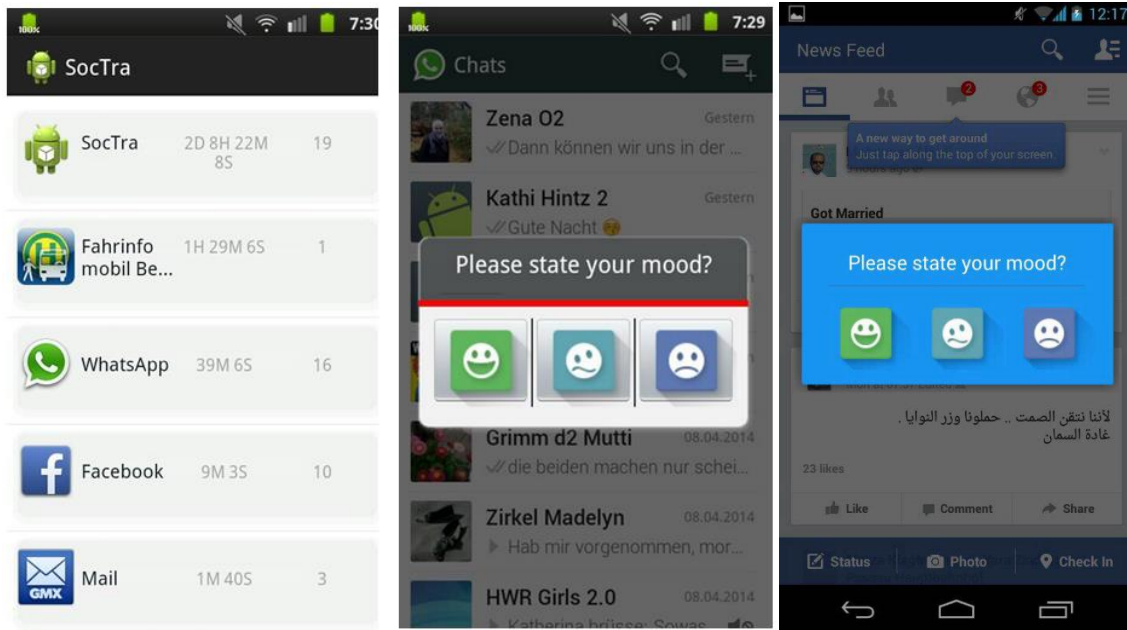


Figure 3: Tentative Interface Design of the Smartphone Application for Android (Step 2)

Collected over an extended time period, this longitudinal data will allow for the comprehensive analysis of causal effects between the use of different platforms and markers of users' subjective well-being. Table 2 provides the summary of anticipated research value, contrasted with limitations of existing research.

Table 2: Added Value of Proposed Research

Limitations of Past Research	Improvements of Current Research Proposal
Measurement issues	Participation data will be captured real time and across multiple platforms. Data on well-being will also be asked upon entering / leaving a specific application allowing for a more reliable measurement.
Lack of causality	Longitudinal data will provide basis for making causal conclusions.
Mobile use	The implementation will cover both desktop and mobile use. Hence, we will be able to control for different types of use.
Focus on SNSs	Multiple platforms will be covered by the application, including Facebook, Twitter, WhatsApp, email use, browsing.
Participation patterns	Application may also allow capturing the use of certain features by users, to allow for a more granular analysis of participation patterns (e.g. active vs. passive).
Underlying reasons	Theoretically relevant factors (e.g. envy, social overload) will be asked for in real time, to allow for a deeper understanding of the dynamics underlying the researched phenomenon.
Focus on students	This research will mainly focus on adolescents (schoolchildren and freshmen students). However, comparison with other demographic groups can also be envisaged: e.g. working adults, silver generation (55+). Different culture groups can also be involved.

Further, collected insights can be used to develop prediction models (to forecast mood disorders or depressive episodes) based on user-generated content and specifics of platform and feature use (see De Choudhury 2013).

Practical Implementation of the Study

100 adolescents will be recruited and rewarded for their participation. Underage respondents will be asked to provide a parental permission. Each respondent will be assigned an individual code to avoid collection of any personalized data. An initial survey will be administered measuring users' well-being, academic performance, and personality markers. Users will then be asked to install an app on their mobile devices, and install a browser plug-in on their home computers. The data will be collected for the period of 2 weeks. In 3, 6 and 9 months, follow-up studies will be conducted with the same group of users.

Timeline

The timeline of this research concept comprises 2-3 years.

Value of Findings

Publication of our study "*Envy on Facebook: A Hidden Threat to Users' Life Satisfaction?*" has generated significant public interest, as reflected in the extensive press coverage (see <http://warhol.wivi.hu-berlin.de/~hkrasnova/Media.html>). Indeed, as Social Media applications increasingly become an integral part of our daily lives, understanding the implications of their use for our well-being is critical. Particularly, adolescents are at risk for "bad" uses of Social Media, as they still struggle to develop their perception of self. Against this background, this research concept aims to provide concrete findings on how the use of different Social Media applications influences well-being and performance of adolescent users. Our findings will provide support for users, parents, educators, and policy-makers in identifying and promoting beneficial uses of Social Media, as well as aligning Social Media initiatives (e.g. in schools). As such, this research concept aims to improve the quality of life of adolescents, by showing them ways on how Social Media can be leveraged for better outcomes.

Credentials of the Applicant

Prof. Dr. Hanna Krasnova has a solid record in the area of Social Media. Her papers have been nominated for the *second best runner paper award* at the International Conference on Information Systems, and for the *Best Paper Award* at the International Conference on Wirtschaftsinformatik. Her research has been cited over 520 times. See: <http://scholar.google.ch/citations?user=1gSol3sAAAAJ&hl=de>.

Publication of the study "*Envy on Facebook: A Hidden Threat to Users' Life Satisfaction?*" with Hanna as the lead author has marked a milestone in Social Media research, contributing to a better understanding of the dark sides of SNSs. This research has received worldwide media coverage, including CNN, NBC, REUTERS, YAHOO!, Fox, mashable, RTL, ProSieben, Spiegel Online, Focus, NZZ and hundreds other outlets worldwide.

See: <http://warhol.wivi.hu-berlin.de/~hkrasnova/Media.html>.

Since then, Hanna continues research in this direction, currently co-authoring a diary study investigating the use of Facebook by teenagers, and its impact on their life satisfaction

“Activity matters: Investigating the influence of Facebook on life satisfaction of teenage users” (Wenninger et al. 2014).

Collaboration Partners

Prof. Dr. Peter Buxmann (Technische Universität Darmstadt) has significant expertise in Social Media and will act as a collaborator on this research. Further collaborators will be identified in the course of the study.

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