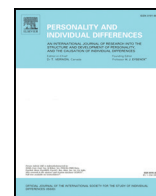




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Social media, texting, and personality: A test of the shallowing hypothesis

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ABSTRACT

The “shallowing hypothesis” suggests that recent media technologies have led to a dramatic decline in ordinary daily reflective thought. According to this hypothesis, certain types of social media (e.g., texting and Facebook) promote rapid, shallow thought that can result in cognitive and moral “shallowness” if used too frequently. The purpose of this study was to test key claims made by the shallowing hypothesis, while simultaneously advancing our general knowledge regarding the effects of social media usage. The relationships between texting frequency, social media usage, the Big Five personality traits, reflectiveness, and moral shallowness were examined in undergraduate students at a Canadian university ($N = 149$). Participants completed an online questionnaire comprised of five measures that assessed their social media and texting behavior, use of reflective thought, life goals, personality dimensions, and demographic characteristics. Correlates of both texting frequency and social media usage were consistent with the shallowing hypothesis and previous literature; participants who frequently texted or used social media were less likely to engage in reflective thought and placed less importance on moral life goals.

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1. Introduction

In our modern society, cell phones are ubiquitous. While the Internet may be responsible for the advent of the Digital Age, cell phones have certainly ensured its prevalence. According to the 2012 Cell Phone Consumer Attitudes Study (Quorus Consulting Group Inc., 2012), about 79% of smartphone users who have downloaded apps use applications to link them to social networks, instant messaging (IM), or blogs. Not only has the usage of these apps increased significantly in recent years, it has also been observed that the popularity of these apps is negatively correlated with the age of smartphone users. Specifically, apps that link to social networks, IM, and blogs are used by about 97% of smartphone users between the ages of 18 to 24 (Quorus Consulting Group Inc., 2012). Due to the inherent mobile nature of these devices, men and women of all ages are able to communicate with one another and access social media anytime and anywhere; however, this ease and frequency of use may have deleterious consequences for society in the long run.

1.1. The shallowing hypothesis

Technology and culture critic Nicholas Carr has hypothesized one such consequence in his Pulitzer Prize nominated bestseller *The Shallows* (2010). According to Carr, recent media technologies featuring always-connected internet access, always-on portable entertainment

media, and always-in-touch electronic social media have led to a dramatic decline in ordinary daily reflective thought (i.e., the process of analyzing and making judgments about what has happened). In what has come to be known as the “shallowing hypothesis,” Carr proposes that the frequent use of ultra-brief social media (i.e., media allowing for social interaction and ultra-brief messages such as texts and tweets) promotes rapid and relatively shallow thought and is associated with cognitive and moral shallowness. In other words, frequent usage of this type of media will be associated with a decline in the use of reflective thought, a decrease in importance placed on life goals related to morality and aesthetics, and an increase in importance placed on life goals related to hedonism and image. Yet despite these potentially serious predictions and the current pervasiveness of cell phones and social media apps, very few studies have attempted to provide direct empirical evaluations of the claims made by the shallowing hypothesis.

A study conducted at the University of Winnipeg by Trapnell and Sinclair (2013) investigated two of the key claims of the shallowing hypothesis; namely, (1) that the frequent use of text-messaging and other ultra-brief forms of electronic communication was associated with lower typical levels of reflective thought, and (2) that tendencies to engage in reflective thought were in decline among the young. After administering a battery of online tests to 2314 psychology students across three annual mass testing samples, they found several correlations that were surprisingly consistent with the shallowing hypothesis; however, the strength of these correlations varied. They concluded that self-reported texting frequencies were consistently and weakly correlated with traits, goals, and attitudes that were characteristic of individuals with low interest and engagement in reflective thought. Furthermore, they discovered that the most significant negative correlates of texting frequency were

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trait reflectiveness, openness to experience, and the three moral life goals: *I want to be a moral human being*; *I want to live my life with genuine integrity*; and *I want to lead an ethical, principled life*. Finally, they presented evidence of a significant linear decline in mean levels of trait reflectiveness and openness to experience among first year introductory psychology students over the previous four years. Since openness to experience was the only Big Five domain to show a significant downward trend, they suggested that a relationship existed between it and trait reflectiveness but acknowledged that it may be unrelated to recent technological changes. The present study was designed to replicate Trapnell and Sinclair's findings, as well as to extend their research by investigating the claims made by the shallowing hypothesis with respect to social media usage.

1.2. Personality factors

In contrast to the relatively little attention given to reflective thought and moral shallowness, research on the effects of personality in relation to texting frequency and social media usage has been quite common. Ehrenberg, Juckes, White, and Walsh (2008) examined the role of personality and self-esteem in university students' use of communication technologies (e.g., making or receiving phone calls, sending or receiving text messages, and using instant messaging). Participants ($N = 200$) reported their average time spent utilizing communication technologies and then completed a 60-item personality inventory as well as a 25-item self-esteem inventory. Multiple regression analyses indicated that individuals who scored high in either extraversion or neuroticism were the most likely to text; the former due to their desire for social interaction and the latter because the medium granted them more time to review and edit their message content.

Correa, Hinsley, and Zúñiga (2010) also examined the relationship between personality traits and social media usage. Participants ($N = 959$) were asked to complete an online survey assessing personality traits, life satisfaction, and socio-demographic characteristics. Hierarchical multiple regression analysis suggested that individuals were more likely to use social media if they self-reported to be anxious and worrisome, innovative and creative, or extraverted; however, these findings differed by age and gender. Extraversion was a stronger predictor of social media use among younger participants and while extraverted men and women were both more likely to use social media, men were more likely to be regular users if they had a greater degree of emotional stability. This relationship between social media usage and emotional stability was not present among the female participants.

Ross et al. (2009) examined the influence of personality variables on certain aspects of Facebook use. Their undergraduate student participants ($N = 97$) were asked to complete a number of online questionnaires assessing computer mediated communication (CMC) competence, personality traits, and three items concerned with (1) basic use of Facebook, (2) attitudes associated with Facebook, and (3) the posting of personally-identifying information on Facebook. They found that individuals who scored high on extraversion belonged to more Facebook groups but did not have a significantly larger number of friends. They concluded that extraverts utilized Facebook as a social tool but not as an alternative to offline social activities or other forms of CMC (e.g., texting) that granted them the ability for instant communication and feedback.

1.3. The current study

Based on the results of these previous studies, the present study was designed to test one assertion of the shallowing hypothesis, that extensive use of ultra-brief social media is associated with declines in reflective thought and increases in moral shallowness. Relationships among texting frequency, personality traits, social media usage, reflective thinking, and moral shallowness were examined in the context of the

shallowing hypothesis and compared with the findings of previous studies. The present study sought to explore the following hypotheses:

H1. Texting frequency will be positively associated with extraversion and neuroticism and negatively associated with reflective thought.

H2. Texting frequency will be negatively associated with life goals in the morality domain.

H3. Life goals reflecting shallowness will significantly predict unique variance in texting frequency, beyond what is explained by the personality variables.

H4. Social media usage will be positively associated with both extraversion and openness to experience but will be negatively associated with neuroticism and reflective thought.

H5. Social media usage will be negatively associated with life goals in the morality domain.

H6. Life goals reflecting shallowness will significantly predict unique variance in social media usage, beyond what is explained by the personality variables.

2. Method

2.1. Participants

The participants were 149 undergraduate students (129 females, 19 males, and 1 transgender) who were registered in the Psychology participant pool of a medium-sized Canadian university and owned a cell phone with texting capabilities. Participants were compensated for their time by receiving .5 bonus points towards an eligible course. All participants were treated according to the ethical guidelines of the American Psychological Association and the Canadian Psychological Association.

2.2. Measures

Participants who accessed the online survey were presented with the following five measures, in the order listed below. Please see supplementary tables available online for descriptive statistics and reliability coefficients for each of the scale measures.

2.2.1. Texting and social media use

Average text frequency (i.e., the average number of text messages they send and receive each week) and peak text frequency (i.e., the number of text messages they send or receive on their highest use day of the month) were assessed. Social media usage was determined using participants' frequency (i.e., the number of times that they visit the website) and duration (i.e., the amount of time they spend on the website during a typical visit) of use of Facebook, Twitter, and Instagram sites. Facebook, Twitter, and Instagram were the only frequently used forms of social media where the majority of participants spent less than ten minutes on the website during each visit.

2.2.2. Big Five Inventory (BFI)

The 44-item BFI (John & Srivastava, 1999) assessed the levels of five different personality dimensions: openness to experience, conscientiousness, extraversion, agreeableness, and neuroticism. Each item presented participants with a short trait-descriptive phrase to be rated on a 5-point scale ranging from disagree strongly (1) to agree strongly (5). BFI subscales showed alphas of .61 to .81.

2.2.3. Life goals inventory

This measure was a modified version of the one used by Trapnell and Sinclair (2013); it contained 58 items assessing various life goals across

several different categories. Each item was rated on a 5-point scale ranging from not at all important (1) to extremely important (5), with the instruction: “Respond to each item by indicating how important it is to you that you achieve the goal in the future.” Cronbach's alpha reliabilities for subscales ranged from .63 to .92 in the present sample. Please see supplementary material available online for a list of sample items representing each of the different content domains.

2.2.4. Reflection questionnaire

The 12-item Reflection scale from the Rumination-Reflection Questionnaire (RRQ; Trapnell & Campbell, 1999) assessed tendencies to engage in reflective and self-reflective states. Each item was rated on a 5-point scale ranging from disagree strongly (1) to agree strongly (5), with the instruction: “Please indicate the extent to which you agree or disagree with each statement.” The Reflection scale had a Cronbach's alpha reliability of .79 in the current study.

2.2.5. Demographic questionnaire

This questionnaire contained five items assessing participants' background information; specifically, their age, gender, ethnicity, major area of study, and year of study.

2.3. Procedure

Participants who signed up for this study through the participant pool website were provided a URL that granted them access to an online survey that was hosted on a secure server maintained by the university's IT services and based in Canada. Those who accessed the online survey were first shown a consent form and advised to print a copy for themselves. In order to proceed, participants had to provide their informed consent by clicking a link on the consent form that stated “I agree to participate in this study.” Participants were then directed to the survey comprised of the five measures listed in the previous section. After participants completed the survey, they were directed to a webpage containing a letter of explanation which included additional information about the study as well as resource information. The entire study took less than 30 min for participants to complete.

3. Results

There was less than 2% missing data for any of the items used in analyses. Additionally, Little's MCAR test indicated that missing data could be assumed to be randomly distributed, $\chi^2 = 4709.46$ ($df = 4651$; $p = .271$). Post-hoc power analyses indicated an obtained minimum power of .85 for the significant hierarchical regression analyses. All scale measures used were adequately reliable, with Cronbach's alpha coefficients greater than .60. Due to the high number of correlations, a more conservative alpha level ($p < .01$) was used to identify correlations as significant. Open data and syntax files for this project are available through the Open Science Framework at <https://osf.io/rfg9c/>.

3.1. Texting analyses

Correlations between texting frequency, trait reflectiveness, the Big Five personality dimensions, and the personal importance of major life goal domains are shown in Table 1. Hypothesis 1 was partially supported. Texting frequency was positively associated with extraversion; however, neuroticism and reflection were not significantly associated with texting frequency in any way. Consistent with hypothesis 2, texting frequency was negatively associated with life goals in the morality domain. Other notable associations with texting frequency were positive correlations with the image and hedonism goal domains.

Personality and life goals were entered as predictors into hierarchical multiple regressions with average texting frequency and peak texting frequency as dependent variables. In each regression analysis, personality variables that correlated significantly (at $p < .01$) with the

Table 1

Correlations between texting frequency, social media usage, trait reflectiveness, the Big Five personality dimensions, and the personal importance of 58 major life goals.

Measure	Texting frequency		Social media usage	
	Average	Peak	Frequency	Duration
<i>Reflectiveness and the Big Five</i>				
Reflection	-.16	-.16	-.32**	-.24*
Extraversion	.38**	.28*	.29**	.35**
Openness	-.17	-.15	-.25*	-.13
Agreeableness	.07	.07	-.04	.01
Conscientiousness	-.03	-.10	-.17	-.10
Neuroticism	-.04	.01	.09	.09
<i>Goal domains</i>				
Hedonism	.32**	.38**	.18	.24*
Image	.25*	.28**	.17	.21
Morality	-.26*	-.14	-.26*	-.25*
Health	.17	.30**	.10	.07
Eroticism	.17	.26*	.04	.12
Aesthetics	-.17	-.17	-.21*	-.09
Achievement	.17	.21*	.03	.07
Wealth	.13	.20	.13	.20
Knowledge	-.07	-.12	-.18	-.14
Autonomy	.10	.16	-.06	-.05
Spirituality	-.11	-.12	-.12	-.01
Closeness	.11	.11	.10	.02
Safety	.05	.11	.07	.02
Universalism	-.06	-.08	-.15	-.13
Community	.00	.01	-.18	.04
Altruism	.01	-.01	-.12	-.07
Fame	.08	.04	.09	.15
Power	.07	.05	.08	.14
Family	.04	.04	.00	.00

Note: $N = 149$ for all analyses.

* $p < .01$ (two-tailed).

** $p < .001$ (two-tailed).

texting frequency outcome were entered simultaneously at Step 1, and life goals measures that correlated significantly with the outcome were entered simultaneously in the second step. The final regression models for these analyses are displayed in Table 2. For average texting frequency, the overall model was significant, $R^2 = .22$, $p < .001$, $f^2 = .10$. In the first step, extraversion ($\beta = .38$, $p < .001$) emerged as the only significant personality predictor of average texting frequency, and morality ($\beta = -.20$, $p < .05$) and hedonism ($\beta = .21$, $p < .05$) made significant unique contributions to the prediction of average texting frequency, beyond that explained by extraversion, $\Delta R^2 = .08$, $\Delta F(3, 144) = 5.00$, $p < .01$. For peak texting frequency, extraversion ($\beta = .38$, $p < .001$) was again the only significant personality predictor, and hedonism ($\beta = .23$, $p < .05$) and health ($\beta = .16$, $p < .05$) significantly improved the prediction of peak texting frequency in the second step,

Table 2

Summary of hierarchical regression results for texting analyses.

DV, step, and significant predictors added	R^2	ΔR^2	sr^2	β
<i>Average texting frequency</i>				
Step 1:	.14***			
Extraversion			.14***	.38***
Step 2:	.22***	.08**		
Morality			.04*	-.20*
Hedonism			.03*	.21*
<i>Peak texting frequency</i>				
Step 1:	.08***			
Extraversion			.14***	.38***
Step 2:	.21***	.13***		
Hedonism			.03*	.23*
Health			.02*	.16*

Note: sr^2 = squared semi-partial correlation coefficient. $N = 149$.

* $p < .05$.

** $p < .01$.

*** $p < .001$.

$\Delta R^2 = .13$, $\Delta F(5, 142) = 4.61$, $p < .001$. Taken together, these findings provide support for hypothesis 3.

3.2. Social media usage analyses

Correlations between social media usage, trait reflectiveness, the Big Five personality dimensions, and the personal importance of major life goal domains are shown in Table 1. Consistent with hypothesis 4, social media usage was positively correlated with extraversion and negatively associated with reflection; however, neuroticism was not significantly related to social media usage and openness was negatively related to frequency of social media use, contrary to what was predicted. In support of hypothesis 5, social media usage was negatively associated with life goals in the morality domain. In addition, frequency of social media use was negatively correlated with life goals in aesthetics domain, and duration of social media use was positively related to hedonism.

Personality and life goals were entered as predictors into hierarchical multiple regressions with social media frequency and duration of usage as dependent variables. In each regression analysis, personality variables that correlated significantly (at $p < .01$) with the social media usage outcome were entered simultaneously at Step 1, and life goals measures that correlated significantly with the outcome were entered simultaneously in the second step. The final regression models for these analyses are displayed in Table 3. For frequency of social media usage, the model was significant at Step 1, $R^2 = .18$, $p < .001$. In this step, extraversion ($\beta = .26$, $p < .001$) and reflection ($\beta = -.23$, $p < .05$) emerged as significant personality predictors of social media frequency. The addition of life goals as predictors in Step 2 did not result in a significant change in R^2 ($\Delta R^2 = .01$, ns), indicating that the inclusion of the life goals predictors did not significantly improve the prediction of frequency of social media usage beyond what was explained by the personality variables. For duration of social media usage, the model was significant at Step 1, $R^2 = .17$, $p < .001$. In this step, extraversion ($\beta = .33$, $p < .001$) and reflection ($\beta = -.20$, $p < .01$) emerged as significant personality predictors of duration of social media use. Again, the addition of life goals as predictors in Step 2 did not significantly improve the prediction of duration of social media usage ($\Delta R^2 = .03$, ns) beyond what was explained by the personality variables. Thus, hypothesis 6 was not supported.

4. Discussion

As predicted by Carr's shallowing hypothesis, students who frequently texted or used ultra-brief social media placed greater importance on "morally shallow" life goals (e.g., image and hedonism) than goals related to morality. Similar to the study conducted by Trapnell

and Sinclair (2013), texting frequency was negatively associated with the importance of life goals in the domains of morality but positively associated with image and hedonism. Texting frequency was positively associated with extraversion, but not significantly associated with reflectiveness when a more conservative alpha level was applied. In addition, the present study found that morality, hedonism, and health life goals uniquely predicted variance in texting frequency beyond that accounted for by extraversion. Furthermore, the present study also extended Trapnell and Sinclair's (2013) findings by examining the effects of social media usage. Consistent with the shallowing hypothesis, lower reflectiveness emerged as a significant predictor of social media usage, and life goals in the domains of morality, aesthetics, and hedonism were associated with greater social media usage in our correlational findings. Finally, the present study revealed a positive relationship between extraversion and texting frequency that is consistent with previous studies (Ehrenberg et al., 2008; Trapnell & Sinclair, 2013), as well as a positive relationship between extraversion and social media usage that has also been found in previous studies (Correa et al., 2010; Ross et al., 2009).

4.1. Limitations

There are a number of limitations to the present study that must be taken into consideration. Carr's hypothesis suggests that our frequent use of ultra-brief social media is responsible for a decline in daily reflective thought as well as the moral shallowing of its most frequent users; however, the results of the current study only suggest correlation, not causation. All of the reported associations are cross-sectional and non-experimental which makes it difficult to determine whether there are alternative explanations for the relationships between variables. It is entirely possible that individuals with more shallow life goals and less desire to engage in reflective thought more readily embrace texting and the use of ultra-brief social media. Future studies should utilize longitudinal and experimental methods in order to more effectively test the shallowing hypothesis and determine the relative influences of socialization, selection, or their interactive effects. Secondly, the overrepresentation of female participants makes it impossible to identify any gender differences in texting frequency or social media usage and the reliance on a university's participant pool to acquire participants makes it difficult to examine the effects of education, age, or social economic status, since these variables tend to be restricted in range in a university sample. Future studies should use larger and more diverse samples. Lastly, the definitions for "texting frequency" and "social media usage" may be too broad when one considers the many possible explanations for the variation found within these two variables. For example, someone who just started a new career may experience an increase in the frequency with which they access social media websites but a decrease in the amount of time spent on the websites as they attempt to quickly check their accounts without being caught by their supervisors. Conversely, someone who recently lost their job may experience a decrease in the frequency with which they access social media websites but an increase in the amount of time spent on the websites as they find themselves bored with the amount of free time they now have. The design of a new questionnaire that more accurately defines and measures texting frequency and social media usage would be of benefit to future studies.

4.2. Implications

The implications of the shallowing hypothesis, which are supported by the findings of the current study, are rather substantial in our modern society where the frequency of cell phone texting exceeds the frequency of all other forms of friendship interaction among teens (Trapnell & Sinclair, 2013). The fact that this represents an age group that is often in the midst of their academic careers with perhaps the greatest reliance on reflective thought is a cause for concern.

Table 3
Summary of hierarchical regression results for social media analyses.

DV, step, and significant predictors added	R^2	ΔR^2	sr^2	β
<i>Social media frequency</i>				
Step 1:	.18***			
Extraversion			.07***	.26***
Reflection			.04*	-.23*
Step 2:	.18	.01		
No significant predictors				
<i>Social media duration</i>				
Step 1:	.17***			
Extraversion			.11***	.33***
Reflection			.04**	-.20**
Step 2:	.19	.03		
No significant predictors				

Note: sr^2 = squared semi-partial correlation coefficient. $N = 149$.

* $p < .05$.

** $p < .01$.

*** $p < .001$.

Phan (2009) found that students' use of reflective thinking was related significantly to their academic performance. He even went so far as to suggest that educators "view reflective thinking practice as a medium that may serve to advance one's academic performance" (p. 946) and stressed the importance of cultivating reflective thinking by assigning authentic assessment tasks and encouraging students to adopt a mastery goal orientation (2009). The relationship between reflection and academic performance has been examined and explained in previous studies:

Reflection in the context of learning is a generic term for those intellectual and affective activities in which individuals engage to explore their experiences in order to lead to new understandings and appreciations. Reflective learning is a process of internally examining and exploring an issue of concern, triggered by an experience, which creates and clarifies meaning in terms of self, and which results in a changed conceptual perspective.

[(Awwad, Nofal, & Salti, 2013, p. 83)]

While the repercussions of a decline in reflectiveness among teenagers and young adults are fairly easy to observe and measure, the problems derived from moral shallowing are more subtle. An individual's morality, or rather the "moral norms" by which they live their life, cannot solely predict whether or not the individual is likely to commit a crime, although an interaction has been found between moral norms and instrumental rationality when investigating an adult's willingness to engage in shoplifting or tax fraud (Kroneberg, Heintze, & Mehlkop, 2010). The more likely and obvious consequences of moral shallowing actually relate to impression formation. Several studies conducted by Leach, Ellemers, and Barreto (2007) have shown morality to be the most important factor in the positive evaluation of the in-group. Similarly, De Bruin and Van Lange (1999) found that information regarding a person's morality had a greater influence on other people's global impression of them than did information regarding the person's intelligence. Finally, a study by Brambilla, Rusconi, Sacchi, and Cherubini (2011) concluded that people were more interested in knowing about a person's morality than they were in knowing about their sociability or competence.

5. Conclusion

Frequent use of ultra-brief social media is associated with negative effects on the user's use of reflective thought and some indicators of compromised moral judgment. This can potentially lead to a decline in academic performance and increased difficulty in the formation of social relationships; two extremely important tasks for teenagers and young adults, the age groups that text and use social media to the greatest degree. Although these implications are based on preliminary speculation, the results of this study should encourage psychologists to seriously consider the shallowing hypothesis and its potential impact on teenagers and young adults regardless. More rigorous testing is needed to

investigate the short- and long-term consequences of overusing ultra-brief social media in order to determine whether it poses a significant threat to intellectual, social, or moral development. If a threat does exist, future research should focus on educating people about the risks posed by ultra-brief social media usage and the need for moderation. If a threat does not exist, future research should continue to examine the effects of ultra-brief social media usage as newer and more "convenient" social networking sites are introduced to the market each and every day; as social media continues to evolve, so too must the research that monitors its effects.

Appendix A. Supplementary data

Supplementary data to this article can be found online at <http://dx.doi.org/10.1016/j.paid.2016.02.043>.

References

- Awwad, F., Nofal, M., & Salti, N. (2013). The impact of electronic portfolio on developing reflective thinking and self-directed learning readiness. *Cypriot Journal of Educational Sciences*, 8(1), 78–104.
- Brambilla, M., Rusconi, P., Sacchi, S., & Cherubini, P. (2011). Looking for honesty: The primary role of morality (vs. sociability and competence) in information gathering. *European Journal of Social Psychology*, 41, 135–143. <http://dx.doi.org/10.1002/ejsp.744>.
- Carr, N. G. (2010). *The shallows: what the internet is doing to our brains*. New York: W. W. Norton.
- Correa, T., Hinsley, A., & Zúñiga, H. (2010). Who interacts on the web?: The intersection of users' personality and social media use. *Computers in Human Behavior*, 26, 247–253. <http://dx.doi.org/10.1016/j.chb.2009.09.003>.
- De Bruin, E., & Van Lange, P. (1999). Impression formation and cooperative behavior. *European Journal of Social Psychology*, 29, 305–328. [http://dx.doi.org/10.1002/\(SICI\)1099-0992\(199903/05\)29:2/3<305::AID-EJSP929>3.0.CO;2-R](http://dx.doi.org/10.1002/(SICI)1099-0992(199903/05)29:2/3<305::AID-EJSP929>3.0.CO;2-R).
- Ehrenberg, A., Juckes, S., White, K. M., & Walsh, S. P. (2008). Personality and self-esteem as predictors of young people's technology use. *Cyberpsychology & Behavior*, 11(6), 739–741. <http://dx.doi.org/10.1089/cpb.2008.0030>.
- John, O. P., & Srivastava, S. (1999). The Big-Five trait taxonomy: History, measurement, and theoretical perspectives. In L. A. Pervin, & O. P. John (Eds.), *Handbook of personality: Theory and research*, vol. 2. (pp. 102–138). New York: Guilford Press.
- Kroneberg, C., Heintze, I., & Mehlkop, G. (2010). The interplay of moral norms and instrumental incentives in crime causation. *Criminology*, 48(1), 259–294. <http://dx.doi.org/10.1111/j.1745-9125.2010.00187.x>.
- Leach, C., Ellemers, N., & Barreto, M. (2007). Group virtue: The importance of morality (vs. competence and sociability) in the positive evaluation of in-groups. *Journal of Personality and Social Psychology*, 93, 234–249. <http://dx.doi.org/10.1037/0022-3514.93.2.234>.
- Phan, H. (2009). Reflective thinking, effort, persistence, disorganization, and academic performance: A mediational approach. *Electronic Journal of Research in Educational Psychology*, 7(3), 927–952.
- Quorus Consulting Group Inc. (2012). *2012 cell phone consumer attitudes study [report]*.
- Ross, C., Orr, E., Sisic, M., Arseneault, J., Simmering, M., & Orr, R. (2009). Personality and motivations associated with Facebook use. *Computers in Human Behavior*, 25, 578–586. <http://dx.doi.org/10.1016/j.chb.2008.12.024>.
- Trapnell, P., & Campbell, J. (1999). Private self-consciousness and the five-factor model of personality: Distinguishing rumination from reflection. *Journal of Personality and Social Psychology*, 76(2), 284–304. <http://dx.doi.org/10.1037/0022-3514.76.2.284>.
- Trapnell, P., & Sinclair, L. (2013). *Texting frequency and the moral shallowing hypothesis. Poster presented at the annual meeting of the Society for Personality and Social Psychology, New Orleans, LA.*