Posting #selfie on Instagram: What are People Talking About?

Sarah J. Woodruff[1]*, **Sara Santarossa**[1], **and Jillian Lacasse**[1]
[1]Department of Kinesiology, University of Windsor, Windsor, Ontario, Canada
*Corresponding Author: woodruff@uwindsor.ca, (519)253-3000, ext. 4982, @WoodyPhD

Due to the rise in popularity with Instagram and posting selfies, and the potential negative outcomes on psychosocial health, the purpose of this descriptive study was to investigate the nature of the comments/captions left by users on *#selfie* photographs. A secondary objective was to investigate the characteristics of the author posting the *#selfie* image. Approximately 4,500 posts were analyzed for word content and networking, and author's sex, age, location, number of posts, and the number of followers and following were collected. The most common words associated with *#selfie* were to gather more followers and/or likes, followed by image descriptors, feelings, or were Instagram-specific. Among the *#selfie* authors, being female (p = 0.023) and the number of posts (p <0.001) were associated with having a following to follower ratio greater than 1. This is the first analysis of the *#selfie* conversation on Instagram, however, further research is needed to determine the motivation for posting *#selfies* and/or the impact of posting *#selfies* and gaining more followers/likes.

Keywords: selfies, Instagram, friend to follower ratio, social media, Netlytic

Since Instagram's first selfie hashtag *(#selfie)* emerged in 2011, selfies have become the most popular photograph posted on Instagram (Jang, Han, Shih, & Lee, 2015). According to the Merriam-Webster Dictionary (2016), the term *selfi*e is defined as "an image of oneself taken by oneself using a digital camera especially for posting on social networks". Time Magazine (2012) declared selfie as one of the Top 10 Buzzwords of 2012 and the Oxford Dictionary (2013) proclaimed it as the *Word of the Year* in 2013.

LITERATURE REVIEW

People tend to take several photographs of themselves before posting the "best" one (Alblooshi, 2015; Porch, 2015). Most people will try to present themselves in a positive manner (Toma, 2013) and/or one in which they look "good" (Siibak, 2009). For example, it

has been reported that regular selfie posters took an average of 4.9 selfies/week and posted an average of 1.39 selfies on social media (Re, Wang, He, & Rule, 2016). Individuals who post selfies tend to be younger (Kim & Chock, 2017; Weiser, 2015), women (Sorokowski et al., 2015; Sorokowski et. al., 2016), have higher self-esteem (Alblooshi, 2015), and have more followers (Barry, Doucette, Loflin, Rivera-Hudson, & Herrington, 2015). Given the rise in popularity in selfies it is important to explore the online conversation of #selfie.

Motivations for Posting Selfies

Much of the research surrounding social media and selfies to date has been within the area of motivation. The uses and gratifications (U&G) framework is a useful theoretical tool that helps explain how media (including social media) are chosen and utilized to achieve the needs of individual users (Katz, Blumler, & Gurevitch, 1973). For example, Smock and colleagues (2011) used the U&G framework to explain how Facebook users' motivations predicted their use of different features (e.g., wall posts, status updates, etc.) and Malik and colleagues (2016) reported that gratifications for sharing photographs on Facebook include affection, attention seeking, disclosure, habit, information sharing, and social influence. Among a Korean sample, Sung, Lee, Kim, and Choi (2016) recently used a U&G framework to study the motivation behind posting selfies and narcissistic personalities, and suggested four gratifications associated with selfie posting: attention seeking, communication, archiving, and entertainment. Moreover, Kearney (2018) utilized this U&G framework for analysing selfie posting behaviour on social media with eight themes: self-presentation, attention seeking, communication, archiving time, entertainment, habit, escape, and status seeking. Results of 156 respondents suggested that female selfie posters seek to satisfy self-presentation needs more than males, and specifically related to Instagram, selfies satisfy the needs of self-presentation, habit, attention-seeking, entertainment, and status seeking.

With respect to status seeking, it has been anecdotally suggested that young girls/adolescents will do almost anything for likes and followers, often times following or friending someone they don't know (Sales, 2016). Popularity is measured by likes/comments on social media, and girls oftentimes strategically choose which photo to

post at a certain time of the day (when they know more people are online in order to like/comment on their post; Sales, 2016). A one-month longitudinal study (Barry et al., 2015) suggested that the frequency of selfies posted was weakly correlated to the number of followers, however, no such investigation has examined the characteristics of the users who have chosen to tag their photo with *#selfie*.

A second motivation for posting selfies may be related to impression management (Goffman, 1956), which is comprised of impression motivation (i.e., when people become encouraged to control how others see them) and impression construction (i.e., when people determine the impression they want to make and choose how to personally create that particular impression) (Leary & Kowalski, 1990). Pounders, Kowalczyk, and Stowers (2016) interviewed 15 women (aged 19-30 years) and reported impression management to be pivotal in understanding the consumer selfie-posting process, in addition to sub-themes of happiness (need to appear happy at all times) and physical appearance (need to be positive, need to feel pretty and look good). Further, Pounders et al. (2016) argue that participants were motivated to post selfies to enhance their self-esteem, which can occur through the number of likes the photograph receives. Limited research, in the form of unpublished thesis (Porch, 2015) and conference proceedings (Scissors, Burke, & Wengrovtiz, 2016), suggested that caring about who provides feedback, the total number of likes/comments, and/or the positive/negative connotation of the comment is important to the poster of the selfie. Not receiving (enough) likes or comments on a post, can result in participants feeling badly (Porch, 2015) and/or low self-esteem (Scissors et al., 2016). Interestingly, girls (compared to boys) cared more about receiving likes than comments on social media and paid close attention to the number of likes they received (Chua & Chang, 2016). It has also been suggested that girls and women's photographs tend to receive more comments (Mendelson & Papacharissi, 2010) and appearance-related feedback (de Vries, Peter, de Graaf, & Nikken, 2016) compared to boys and men. An investigation of 1.1 million photos on Instagram reported that the presence of a face in the photograph are 38% more likely to receive likes and 32% more likely to receive comments (Bakhshi, Shamma, & Gilbert, 2014). However, no such work has investigated the type/nature of the comments left on selfies.

Rationale and Purpose

Instagram is a social networking site that has seen a surge of popularity in recent years. Instagram is primarily an image-driven social media site mainly used as a mobile application, in which users take a photograph with their mobile camera, and then choose a filter to edit/enhance their photograph before posting it. Instagram users can choose to have a public (i.e., anyone can view content) or private account (i.e., must first ask permission before they are able to follow and view content). A study conducted with over 350,000 Instagram users found that people typically post one photograph per week on Instagram (Manikonda, Hu, & Kambhampati, 2014). In April 2018, there were over 340 million photographs tagged with *#selfie*. Therefore, due to the rise in popularity with Instagram and posting selfies, various motivations, and the potential negative outcomes on psychosocial health, the purpose of this descriptive study was to investigate the nature of the comments/captions left by users on *#selfie* photographs. A secondary objective was to investigate the characteristics of the author of the *#selfie* post.

METHODS
Data Collection Procedures

Using the Netlytic program (Gruzd, 2016), an open sourced software, all tagged media with the *#selfie* hashtag on Instagram were downloaded (i.e., when the post was tagged, not necessarily when it was posted). The download occurred on April 14, 2016 (captures all posts every hour until the maximum allowed posts are reached, which occurred after approximately 8 hours). Netlytic (Gruzd, 2016) captured all public profiles but may have returned publicly shared photos from users with otherwise private profiles (e.g., if they originally shared the photo/file from another social network via a direct link/URL).

An output file (in Excel) was created that reported the link to the image (which has been tagged with *#selfie*), publication date, author of the comment (users who commented on the image or left the photo caption), title/description (the actual comment/caption left by the author on the image), the geographical location of the author (latitude/longitude if available), and to whom the post was directed (if applicable). From this Excel file, supplemental data were collected by linking to the image to take note of the user who

posted the image with *#selfie* and recorded their total number of posts to date, number of followers, and number of people they were following. Additionally, sex and age (if posted in their Instagram biography) and whether the account was public/private were manually collected and documented. A following to follower ratio (FFR) was calculated for each user (number of followers/number following) and a dichotomous variable was calculated, those with a ratio >1 (i.e., their followers surpassed the number of users they are following) and those with a ratio <1 (i.e., they were following more users than were following them).

Data Cleaning and Analyses

Initially the database downloaded from Netlytic (Gruzd, 2016) included 4,558 records of comments/captions on *#selfie* images. Within Netltyic (Gruzd, 2016), an analysis of the nature of the conversation was assessed by counting the number of unique words within the 4,558 records and a network and name analysis was computed. Upon retrieving the supplemental data, the data cleaning procedures of the users who posted the *#selfie* image involved using listwise deletions when sex was missing, when multiple entries for one individual existed, or when the individual's account was identified as a robot or fan/not for personal use account ($n = 1, 428$ deleted). Finally, a binary logistic regression analysis was performed to examine sex and number of posts (as predictors) on FFR (dependent variable) among the *#selfie* sample. Using the potential predictors sex, number of posts, and the sex x number of posts interaction, models were explored in a blockwise fashion to determine best fit. The best fit model was identified and rerun. Data were analyzed using SPSS version 22 for Windows (IBM Corp, 2012).

RESULTS

Among the 4,558 records downloaded, there were 60,924 unique words associated with the comments/captions left on the *#selfie* image. The top 30 most commonly used words are described in Table I. The words were further categorized as being (1) associated with creating more followers/likes ($n = 4,633$; 13 unique words), (2) image descriptors ($n = 2,727$; 8 unique words), (3) feelings ($n = 1,968$; 5 unique words), or (4) Instagram-specific terms ($n = 1,391$; 4 unique words). The social network analysis revealed that there were 4,095 individual names found within the dataset, with 459 nodes (i.e., users) and 814 ties

(i.e., linkages between the users via mentioning someone in the post/comment). The chain network/direct interactions analysis indicated 583 nodes (i.e., users) and 601 ties (i.e., direct replies between users).

Table 1
Most Commonly Used Words Associated #selfie

Category	Word	Frequency
Likes/follows (n = 4,633)	#like4like	672
	#followme	548
	#follow	510
	#likeforlike	416
	#follow4follow	402
	#l4l	317
	#followforfollow	305
	#f4f	283
	#likeforfollow	281
	#tagsforlikes	272
	#likes	225
	#like	213
	#followback	189
Image descriptors (n = 2,727)	#me	567
	#girl	390
	#smile	385
	#picoftheday	331
	#photooftheday	328
	#fashion	288
	#style	218
	#tbt	220
Feelings (n = 1,968)	#love	732
	#happy	354
	#fun	225
	#cute	355
	#beautiful	302
Instagram-specific terms (n = 1,391)	#instagood	553
	#instalike	338
	#instadaily	289
	#igers	211

A total of 3,166 (male = 973, female = 2,159) users that posted photographs with *#selfie* were available after data cleaning. Table 2 describes the number of posts, following, followers, FFR, and the percentage of participants with a FFR above and below 1 for the

entire sample and by sex. Using sex and number of posts as predictors was found to be the best fit model, $X^2(3)=34.46$, $p<0.001$. Nagelkerke's R^2 of .015 indicated a relationship between predictors and FFR and prediction success overall was found to be 63.1%. The Wald criterion demonstrated that being female ($p = 0.023$) and number of posts ($p<0.001$) increased the probability of having a FFR > 1.0. The odds ratio (Exp(B)) for number of posts was 1.0, indicating that when number of posts is raised by one unit (one post) the odds ratio is 1 times as large.

Table 2
Total Number of Posts, Followers, Following, Followers/following ratio (FFR), and the Percentage of Participants with a FFR Above and Below 1 Among the #selfie Sample and by Sex

	Total (*n* = 3,166)	Males (*n* = 972)	Females (*n* = 2,159)	Difference by sex
Number of posts	495 (*SD* = 1,281), range 1 - 42,211	534 (*SD* = 1,840)	477 (SD 928)	$p = 0.254$
Followers	3036 (*SD* = 17,863), range 1-414,000	2,724 (*SD* = 12,165)	2,921 (SD 18,273)	$p = 0.795$
Following	613 (*SD* = 1,053), range 0 - 9,261	689 (*SD* = 1,098)	571 (SD 1,010)	$p = 0.003$
Followers/ following ratio (FFR)	32.4 (*SD* = 783), range 0 − 41,450	29.5 (*SD* = 420)	14.2 (SD 146)	$p = 0.132$
FFR >1 : FFR <1	37% : 63%	40% : 60%	36% : 64%	$p = 0.023$

DISCUSSION

This study investigated the nature of the discussion surrounding *#selfies* on Instagram using an open access software tool for analyzing social networks. Little research has been conducted with Instagram and we believe this is the first analysis to investigate the nature of the online conversation among a large sample of Instagram selfies. As such, people who post *#selfie* images on Instagram seem to be doing so to receive more followers and/or likes as analysis of the comments/captions revealed 13 of the top 30 words fit within these areas. This supports the notion toward the importance of receiving feedback on posts (Chua & Chang, 2016; Porch, 2015; Scissors et al., 2016). Although the purpose of the present study was not to seek out individual motivations for posting the *#selfie* from the user, as others have done (Alblooshi, 2015; Pounders et al.,

2016; Sung et al., 2016), the findings support the U&G framework research for attention and status seeking (Kearny, 2018, Smock et al., 2011; Sung et al., 2016).

Several past articles suggest that the type of FFR ratio (as used in the present analyses) determines how "cool" you are online (Business Insider, 2014) and/or or is a good indicator of popularity (Alshawaf & Wen, 2015). Sales (2016) refers to the notion that "high school" popularity has transferred over to social media because of the actual associated numbers (e.g., people can quantify friends, followers, likes). Numerous apps are currently available to track social networking statistics, in real time, which are becoming increasing popular among adolescent girls (Sales, 2016). Although we were not able to assess age in the current analysis, it would be prudent to include in any future studies. With the rise of social media mavens (i.e., those that spread trends and ideas through social media; Alshawaf & Wen, 2015) and becoming "insta-famous," many individuals are trying to create an online identity or personal brand. Garnering followers and likes helps to establish the relationship between poster and followers and the online material (Suler, 2008). It is possible that posting selfies may be one method individuals are using to gather more followers or likes, thus trying to increase online popularity. However, future research needs to explore this idea as Pounders et al. (2016) suggested that the number of likes one receives could detrimentally impact self-esteem, as self-esteem is both a motivator and outcome of posting selfies.

On average, the sample of users that posted *#selfie* images had posted 495 images, however, the number ranged from zero to 42,211 images. There were no differences observed for the total number of posts between male and females, however, females were more likely to have a FFR>1, compared to males. Further, the binary regression model indicated that when the number of posts was raised by one unit (one post) the odds ratio of having a FFR >1 was one times as large. A subsequent model (not presented herein) was done to determine if the odds ratio changed significantly with the unit of 10 or 100 posts (rather than a single post), but no difference in outcomes was observed. Therefore, it is interesting that the number of posts equally increases and decreases the odds of having a FFR >1 among the sample of *#selfie* posters. It is likely that something else associated with the image could be making a larger impact on the FFR besides simply the number of posts. It would be worthwhile to assess other potential factors in future studies, such as

the tone of the post, type of image, styling of the photograph, filters, and/or perceived expertise of the poster.

This study is not without limitations. This study included a relatively small sample of *#selfie* posts (out of a possible >340 million) and could be subject to a sampling bias (day of the week, seasonality), however, we assumed the data were collected on a random day and would be similar with multiple data collections. Secondly, due to the nature of the Netlytic software (Gruzd, 2016), we were unable to link the word database to the supplemental data (sex, followers, following, etc.) to make more specific associations. In summary, comments/captions left on *#selfie* posts were associated with trying to gather more followers and/or likes and we believe that this is due to trying to achieve online popularity (i.e., having more people following you than you are following) and attention seeking behavior. Among the sample of users who posted *#selfie*, females and the number of posts were associated with having a FFR >1. We believe that this is the first analysis of the *#selfie* conversation, however, further research is needed to determine the motivation for posting *#selfies* and/or the impact of posting *#selfies* and gaining more followers/likes.

References

Alblooshi, A., (2015). *Self-esteem levels & selfies: The relationship between self-esteem levels and the number of selfies people take, post, and the uses and gratifications of taking and posting selfies* (Unpublished master's thesis). Middle Tennessee State University, Murfreesboro, TN.

Alshawaf, E., & Wen, L. (2015). Understanding digital reputation on Instagram: A case study of social media mavens. In *ECSM2015-Proceedings of the 2nd European Conference on Social Media*. Porto, Portugal.

Bakhshi, S., Shamma, D.A., & Gilbert, E. (2014). Faces engage us: Photos with faces attract more likes and comments on instagram. Proceedings of the *32nd annual ACM conference on Human factors in computing systems*. Toronto, Canada.

Barry, C. T., Doucette, H., Loflin, D. C., Rivera-Hudson, N., & Herrington, L. L. (2015). "Let me take a selfie": Associations between self-photography, narcissism, and self-esteem. *Psychology of Popular Media Culture*, Advance online publication. doi: 10.1037/ppm0000089

Business Insider (2014, June 11). *One simple number determines how cool you are on Instagram*. Retrieved from http://www.businessinsider.com/instagram-cool-ratio-2014-6.

Chua, T. H. H., & Chang, L. (2016). Follow me and like my beautiful selfies: Singapore teenage girls' engagement in self-presentation and peer comparison on social media. *Computers in Human Behavior, 55*, 190-197. http://dx.doi.org/10.1016/j.chb.2015.09.011

de Vries, D. A., Peter, J., de Graaf, H., & Nikken, P. (2016). Adolescents' social network site use, peer appearance-related feedback, and body dissatisfaction: Testing a mediation model. *Journal of Youth and Adolescence, 45*(1), 211-224. doi: 10.1007/s10964-015-0266-4

Goffman, E. (1956). *The Presentation of Self in Everyday Life*, Anchor Books: New York, NY.

Gruzd, A. (2016). Netlytic: Software for Automated Text and Social Network Analysis [software]. Available from http://Netlytic.org

IBM Corporation. (2016). IBM SPSS Statistics for Windows, Version 22 [computer software]. Armonk, New York.

Jang, J. Y., Han, K., Shih, P. C., & Lee, D. (2015). Generation like: Comparative characteristics in instagram. Paper presented at the ACM Conference on Human Factors in Computing Systems (CHI), 4039-4042.

Katz, E., Blumler, J. G., & Gurevitch, M. (1973). Uses and gratifications research. *The Public Opinion Quarterly, 37*(4), 509-523. https://doi.org/10.1086/268109

Kearney, A. (2018). Uses and Gratification of Posting Selfies on Social Media. Retrieved from Rochester Institute of Technology (RIT) Scholar Works. Available from http://scholarworks.rit.edu/theses/9717/

Kim, J. W., & Chock, T. M. (2017). Personality traits and psychological motivations predicting selfie posting behaviors on social networking sites. *Telematics and Informatics, 34*(5), 560-571. https://doi.org/10.1016/j.tele.2016.11.006

Leary, M. R., & Kowalski, R. M. (1990). Impression management: A literature review and two-component model. *Psychological Bulletin, 107*, 34-47. http://dx.doi.org/10.1037//0033-2909.107.1.34

Malik, A., Dhir, A., & Nieminen, M. (2016). Uses and gratifications of digital photo sharing on Facebook. *Telematics and Infomatics, 33*(1), 129-138. https://doi.org/10.1016/j.tele.2015.06.009

Manikonda, L., Hu, Y., & Kambhampati, S. (2014). *Analyzing user activities, demographics, social network structure and user-generated content on Instagram.* Retrieved from http://149.169.27.83/instagram-icwsm.pdf.

Mendelson, A. L., & Papacharissi, A. (2010). Look at us: Collective narcissism in college student Facebook photo galleries. In *The networked self: Identity, Community and Culture on Social Network Sites.* Retrieved from http://zizi.people.uic.edu/Site/Research_files/Look%20at%20meAMZP.pdf.

Merriam-Webster Dictionary. *Selfie.* Retrieved from http://www.merriam-webster.com/dictionary/selfie.

Oxford Dictionary. *The Oxford Dictionaries word of the year 2013 is 'selfie'.* Retrieved from http://blog.oxforddictionaries.com/2013/11/word-of-the-year-2013-winner/.

Porch, T. (2015). *Society, culture, and the selfie: Analysis of the impact of the selfie practice on women's body image* (Unpublished Honors dissertation). Emory University, Atlanta, GA.

Pounders, K., Kowalczyk, C. M., & Stowers, K. (2016). Insight into the motivation of selfie posting: Impression management and self-esteem. *European Journal of Marketing, 50*(9/10), 1879-1892. https://doi.org/10.1108/EJM-07-2015-0502

Re, D. E., Wang, S. A., He, J. C., & Rule, N. O. (2016). Selfie indulgence: Self-favoring biases in perceptions of selfies. *Social Psychological and Personality Science, 7*(6), 579-587. doi: 10.1177/1948550616644299

Sales, M. J. (2016). *American Girls: Social media and the secret lives of teenagers*. New York: Penguin Random House LLC.

Scissors, L., Burke, M., & Wengrovitz, S. (2016). What's in a Like?: Attitudes and behaviors around receiving Likes on Facebook. In Proceedings of the *19th ACM Conference on Computer-Supported Cooperative Work & Social Computing* (pp. 1501-1510). San Francisco, USA.

Siibak, A. (2009). Constructing the Self through the Photo selection - Visual Impression Management on Social Networking Websites. *Cyberpsychology: Journal of Psychosocial Research on Cyberspace, 3*(1), article 1. Retrieved from https://cyberpsychology.eu/article/view/4218/3260

Sorokowski, P., Sorokowska, A., Frackowiak, T., Karwowski, M., Rusicka, I., & Oleszkiewicz, A. (2016). Sex differences in online selfie posting behaviors predict histrionic personality scores among men but not women. *Computers in Human Behavior, 59*, 368-373. http://dx.doi.org/10.1016/j.chb.2016.02.033. 0747-5632

Sorokowski, P., Sorokowska, A., Oleszkiewicz, A., Frackowiak, T., Huk, A., & Pisanski, K. (2015). Selfie posting behaviors are associated with narcissism among men. *Personality and Individual Differences, 85*, 123-127. http://dx.doi.org/10.1016/j.paid.2015.05.004

Smock, A. D., Ellison, N. B., Lampe, C., & Wohn, D. Y. (2011). Facebook as a toolkit: A uses and gratification approach to unbundling feature use. *Computers in Human Behavior, 27*, 2322-2329. https://doi.org/10.1016/j.chb.2011.07.011

Suler, J. (2008). Image, word, action: Interpersonal dynamics in a photo-sharing community. *Cyberpsychology and Behavior, 11*(5), 555-560. doi: 10.1089/cpb.2007.0153

Sung, Y., Lee, J. A., Kim, E., & Choi, S. M. (2016). Why we post selfies: Understanding motivations for posting pictures of oneself. *Personality and Individual Differences, 97*, 260-265. https://doi.org/10.1016/j.paid.2016.03.032

Time Magazine. *Top 10 everything 2012*. Retrieved from http://newsfeed.time.com/2012/12/04/top-10-news-lists/slide/selfie/.

Toma, C. L. (2013). Feeling better but doing worse: Effects of Facebook self-presentation on implicit self-esteem and cognitive task performance. *Media Psychology, 16*, 199-220. doi: 10.1080/15213269.2012.762189

Weiser, E. B. #Me: Narcissism and its facets as predictors of selfie-posting frequency. *Personality and Individual Differences, 86*, 477-481. https://doi.org/10.1016/j.paid.2015.07.007

Funding and Acknowledgements

Online Connections

To follow these authors in social media: Sara J. Woodruff: @WoodyPhD and
Sara Santarossa: @ess_santaHK