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"Challenge Accepted": Exploring Predictors of Risky Online Behaviour in Emerging Adults

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“CHALLENGE ACCEPTED”: EXPLORING PREDICTORS OF RISKY ONLINE BEHAVIOUR IN EMERGING ADULTS

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Abstract

The aim of this study was to explore the predictors of emerging adults' engagement in risky online challenges. Social-related constructs including need to belong (NB), need for popularity (NP) and perceived peer engagement (PPE) in risky online challenges were the main predictor variables of interest. Further, because past research identifies fear of missing out (FoMO) as a key explanatory variable in the link between social motives and online behaviour, I examined it as a mediator in my analyses. In the present study, emerging adults (N = 332; 56.33% women) aged 18 to 26 years (M_{age} = 21.36) completed an online survey in which they indicated what risky online challenges they had done. They also completed self-report measures on NB, NP, PPE and FoMO. It was hypothesized that emerging adults who experienced a stronger NB (H1), NP (H2) and more PPE in risky online challenges (H3) at Time 1 would engage in more risky online challenges at Time 2. Finally, I proposed that heightened FoMO would mediate each of the aforementioned relationships (H4). Results indicated that 51% of participants had engaged in risky online challenges in the past. H2 and H3 were supported, with NP and PPE in risky online challenges predicting participants' own engagement in online challenges. FoMO, however, was not found to be a mediator for any of the relationships. Results emphasize the worrisome prevalence of risky online challenges and point to the importance of addressing emerging adults' popularity motives and peer norms in prevention efforts.

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Table of Contents

Page

"Challenge Accepted": Exploring Predictors of Risky Online Behaviour in Emerging Adults

According to Statistics Canada (2012), Canadians between the ages of 16-24 spend more time per week on the internet than any other age group. Approximately one quarter (25.4%) of emerging adults reported that they spend 10-19 hours per week on the internet, compared to only 18.9% of those aged 25-44. Also, as compared to older adults (25-44 years), almost double the number of individuals aged 16-24 stated they spend 40 hours or more on the internet per week (3.2% versus 5.9%, respectively); this is equivalent to the amount of time one would spend working a full-time job. Further, in a large-scale study by Kim, Wang, and Oh (2016), approximately 89% of 18-29-year-olds reported that they were social network site (SNS) users. This emphasizes the importance of examining this age group regarding their internet use and its implications.

As technology has become increasingly prevalent in modern society, various SNSs including Facebook, Instagram, and Twitter have become more popular, especially among younger people. YouTube, a website that was created in 2005 (a year after Facebook was created), has become the most commonly-used SNS for uploading and watching videos (Ahern, Sauer, & Thacker, 2015). YouTube is used by millions of young people every day, and approximately 300 hours of videos are uploaded to the website every minute (Ahern et al., 2015). YouTube has many positive features; for example, it has proved to be an excellent learning resource because individuals can post instructional videos about absolutely anything (DeCesare, 2014). Despite this, however, YouTube also has a darker side. This SNS has become increasingly popular over the years for people posting videos of themselves doing sensational, often dangerous, things; one example is *risky online challenges*, such as the Cinnamon Challenge, which involves "the ingestion of a tablespoon of ground cinnamon in 1 minute or less

without fluids" (Ahern et al., 2015, p. 27). Based on visual evidence, this challenge is not often accomplished and it can be very dangerous. As noted by Ahern et al., (2015), it results in individuals coughing and/or gagging and may cause them to aspirate the cinnamon. Despite this challenge being so dangerous, it attracts the attention of emerging adults who want to attempt it and post videos on YouTube of themselves doing it, presumably to gain attention. According to YouTube, the most viewed Cinnamon Challenge video currently has 54 million views. Further, since January 1st, 2019, there have already been 382 Cinnamon Challenge videos uploaded to YouTube. That averages out to approximately four videos uploaded per day for just this one risky challenge.

There have been numerous other risky online challenges since the Cinnamon Challenge. For example, the Tide Pod Challenge involves ingesting a Tide Pod, which contains poisonous chemicals, including bleach (the most viewed tide pod challenge video has over 2 million views). The KiKi Challenge (i.e., In My Feelings Challenge) involves dancing next to a moving vehicle to the Drake song "In My Feelings" (the most viewed video has over 12 million views). Sadly, there have been a number of negative outcomes with this challenge, including people getting hit by oncoming vehicles, running into poles or other objects while dancing, or simply hurting themselves trying to exit a moving vehicle. Another example is the Fire Challenge, which involves individuals dousing themselves in flammable liquid and lighting themselves on fire before jumping into nearby water (the most viewed video has over 528,000 views); this can have serious physical consequences, causing many people to end up in burn units.

There are many videos on YouTube now that discuss the dangers of engaging in these risky online challenges and some that show the people who have been seriously injured or killed doing them. Despite these warnings, videos of individuals engaging in these behaviours continue

to be uploaded to social media daily. According to our pilot data on 174 Canadian first-year university students, 38% reported having engaged in risky online challenges. So far, however, there is no empirical research on the predictors of young people's engagement in these types of risky behaviours. People can be seriously injured while attempting these online challenges, or even be killed. Thus, it is crucial to understand why young people are engaging in these challenges so that we can better design prevention efforts.

Two potential predictors of emerging adults' engagement in risky online challenges are their need to belong (NB) and their need for popularity (NP). Kim et al., (2016) define NB as a "basic psychological need to feel closely connected with others and to be part of social groups" (p. 264). The internet and social media play a role here in that, on SNSs, individuals can fulfil their need to be connected with their peers, no matter where they are. In some ways, individuals' 'friends' on social media act as their social support system, especially when they lack one offline. Likewise, NP is defined by Beyens, Frison, and Eggermont (2016) as "the need to do certain things aimed at increasing one's popularity" (p. 1). Again, social media can play an important role in helping individuals to fulfil this need, by allowing them to seek social attention via views and "likes" on their content posted to SNSs.

Kim et al. (2016) determined that increased NB among college students was associated with increased internet and smartphone use. Similarly, Beyens et al., (2016) found that participants' NB and NP were related to more Facebook use. Further, these relations were mediated by heightened Fear of Missing Out (FoMO), which is defined as "a pervasive apprehension that others might be having rewarding experiences from which one is absent" (Beyens et al., 2016, p. 1). This makes sense, as constantly feeling the need to be connected to one's peers and to act in ways that would increase one's popularity would result in wanting to go

on social media more often to see what peers are doing and to post one's own content. Also, it's understandable that FoMO would mediate the relationship between NB/NP and Facebook use; stronger feelings of NB and NP might increase that apprehension people feel when they are not online, resulting in them feeling like they are missing out on events or that peers are having more rewarding experiences. Consequently, the desire to go online to see what others are doing or to post more photos to give the appearance of having a good time would increase, as a way of reducing feelings of apprehension. Regarding online risky challenges, participation, which helps to ensure that individuals are noticed and included in their online social circles, may help to reduce these feelings of FoMO.

It is also important to consider peer norms for participation in online risky challenges. Descriptive peer norms refer to people's perceptions of how much their peers engage in a given behaviour and are an important predictor of people's own engagement in that behaviour (Dumas, Davis, & Ellis, 2017; Roeser, 2013; Sherman, Greenfield, Hernandez, & Dapretto, 2018). For example, Roeser (2013) found that participants who perceived that their peers were engaging in more risky behaviours also reported that they were more likely to be involved in risky behaviours themselves. This relationship may be partly explained by FoMO in that perceptions of more peer involvement in risky behaviours might be associated with feelings that peers are having more rewarding/exciting experiences and result in heightened engagement in risky behaviour to lessen feeling of FoMO. In relation to online risky challenges, it is possible that if individuals perceive that their peers participate in risky challenges more frequently (whether they do or not), then those individuals will be more likely to participate in risky challenges as well.

The aforementioned findings emphasize the importance of examining young people's social-related motives for engagement in risky online challenges. Thus, I conducted a

longitudinal study targeting emerging adults at two different time points across three months. I hypothesized that emerging adults who experience a stronger NB (H1) and NP (H2), and more PPE in risky online challenges (H3) at Time 1, would engage in more risky online challenges at Time 2. Further, I proposed that heightened FoMO would mediate each of the aforementioned relationships (H4).

Method

Participants

Participants were 332 emerging adults who live in Canada or the United States and who had signed up on Amazon Mechanical Turk (mTurk), an online crowdsourcing portal, to complete surveys for financial reimbursement. Participants ranged in age from 18-26 years (M_{age} = 21.4, *SD* =1.5). Although I advertised for 18-24-year-olds, one 26-year-old completed the survey and because that individual was close enough to the desired age range, that participant was included in the sample. Participants identified as 56.3% female, 41.9% male, and 1.8% neither male nor female (three identified as non-binary, one as gender-fluid, one as transgender, one as "other" but did not specify). Criteria for eligibility in this study were that participants had to be between the ages of 18-24 years and fluent in English. The majority of participants in this study identified as White/European (66.6%), with the remainder identifying as Black North American/African (12.3%), Asian (13%), Hispanic/Latino (6.3%), and Aboriginal/North American Indian (0.6%). The four participants (1.2%) who selected "other" either did not state their ethnicity, or stated they identified with multiple ethnicities.

Procedure

In November 2018, a project invitation was created and posted to mTurk. Interested participants completed the first survey, which took approximately 20-30 minutes. It was available for participants to complete from November 19th until December 17th (last possible response date). The survey contained demographic questions, as well as validated questionnaires including the Fear of Missing Out (FoMO) Scale (Przybylski, Murayama, DeHaan & Gladwell, 2013), The Need to Belong Scale (Leary, Kelly, Cottrell & Schreindorfer, 2013), and The Need for Popularity Scale (Santor, Messervey, & Kusumakar, 2000). Participants were also asked to provide information on their online risk behaviour, specifically the frequency and types of online challenges in which they had engaged, as well as their perception of their peers' involvement in these risky behaviours. To avoid participants giving out identifying information, they were asked to create a participant ID number, which consisted of the first 4 letters of the street on which they grew up followed by their two-digit birth date (e.g. if an individual grew up on Richmond Street and was born on the 18th day of the month, their ID would be "Rich18"). This way, participants' information remained confidential and their responses could be tracked from Time 1 to Time 2.

Participants were contacted again in February 2019 to complete a second and final survey, which also took approximately 20-30 minutes. The newly developed mTurk prime service was used, which allows researchers to run more complex mTurk studies, like those with a longitudinal design. Using mTurk prime features, the invitation to the second survey appeared in the accounts of only those mTurk workers who had completed the first survey. The platform mTurk prime also sent these eligible workers an e-mail notification indicating that the survey was available for their completion. This process is anonymous in that the researchers do not contact participants or gain access to participants' e-mail addresses.

Survey 2 was available for participants to complete from February 26th until March 18th. This survey contained the same measures as the first, minus the demographic questions. Participants were asked the same questions about risky online challenges as Time 1, except they were asked to report their engagement in risky online challenges within the last 3 months (since their completion of the first survey).

Measures

Need to Belong (NB). Participants were asked to indicate the degree to which each of 10 statements regarding their NB is true of them on a 5-point Likert-type scale, with 1 = *not at all* and 5 = *extremely*. Higher scores on this measure indicated a stronger NB. An example of an item from this scale is, "My feelings are easily hurt when I feel that others do not accept me" (Leary et al., 2013). Cronbach's alpha for the measure was .85. Leary et al., (2013) conducted nine studies, which demonstrated good construct validity of the NB scale. For instance, these researchers found that NB was positively correlated with the desire for acceptance by specific individuals in their lives ($r = .61$, $p < .01$), and the tendency to experience embarrassment ($r = .39$, $p < .01$) and hurt feelings ($r = .63$, $p < .01$).

Need for Popularity (NP). Participants were asked to indicate the degree to which each of 12 statements regarding their NP is true of them on a 5-point Likert-type scale, with 1 = *never true*, and 5 = *very often true*. Higher scores on this measure indicated a stronger NP. An example of an item from this scale is, "I have done things to make me more popular, even if it meant doing something I would not usually do" (Santor et al., 2000). Cronbach's alpha for the measure was .95. Santor et al., (2000) found strong convergent validity for NB with perceived peer pressure ($r = .73$, $p < .001$). They also found that high NP was positively correlated with

several offline risk behaviours, such as theft (r = .28, p < .001), drug use (r = .23, p < .01) and sexual attitudes (r = .35, p < .001).

Fear of Missing Out (FoMO). Participants were asked to indicate how true each of 10 statements is of their general experiences on a 5-point Likert-type scale, with 1 = *not at all true of me* and 5 = *extremely true of me*. Higher scores on this measure indicated stronger feelings of FoMO. Participants were asked to consider what really reflects their experiences, rather than what they think their experiences should be. An example of an item from this scale is, "I fear others have more rewarding experiences than me" (Przybylski et al., 2013). Cronbach's alpha for the measure was .90. Przybylski et al., (2013) developed the FoMO scale and examined its relationship with social media use, psychological need satisfaction, general mood, and overall life satisfaction. Researchers (2013) found that FoMO was positively correlated with social media engagement (r = .40, p <.001), and negatively correlated with psychological need satisfaction (r = -.29, p < .001), general mood (r = -.24, p < .001), and life satisfaction (r =-.19, p < .001).

Engagement in Risky Online Challenges. Participants were asked to refer to the following definition of risky online challenges that I developed when answering questions regarding their engagement in these challenges:

> Online challenges refer to challenges that you record yourself doing and upload the videos online; they are considered risky if you are putting yourself in a position that could potentially result in harm or even death (for example, posting a video of yourself ingesting a tide pod, which contains harmful chemicals).

At Time 1, participants were asked to select, from a list of risky online challenges, all the ones which they had engaged in in the past, and list any others they had done that were not mentioned. The number of these reported challenges was used as the measure for frequency of engagement

in risky online challenges, with higher numbers indicating more frequent engagement in challenges. participants were then asked to indicate, on a 5-point Likert-type scale (1 = *not at all* and 5 = *a great deal*) how often they perceived that their peers had participated in these challenges. This was used as a measure for PPE in risky online challenges, with higher scores indicating higher PPE in risky online challenges. At Time 2, participants were provided with the same definition of risky online challenges, and then asked how many times in the past 3 months (since the first survey) they had engaged in risky online challenges. They were then asked to specify which challenges they had done, if they had done any. Appendix A shows a complete list of the questions asked about risky online challenges.

Sensation Seeking (SS). Participants were asked to indicate how much 4 statements applied to them on a 4-point Likert-type scale, with 1 = *strongly agree* and 4 = *disagree*. Higher scores on this scale indicated low SS. An example of an item from this scale is, "I welcome new and exciting experiences and sensations, even if they are a little frightening and unconventional" (Cyders, Littlefield, Coffey, & Karyadi, 2014). Cronbach's alpha for the measure was .77.

Analysis

To test hypotheses, the PROCESS macro (Hayes, 2013) in the statistical program SPSS was used. This macro allows for the testing of mediation models using a bootstrapping method and I used 10,000 bootstrap samples for bias corrected bootstrap confidence intervals. The three independent variables included: (1) NB; (2) NP; and (3) PPE in online risky challenges at Time 1. The mediator was FoMO at Time 1, and the dependent variable was engagement in online risky challenges at Time 2. Gender, ethnicity and SS, as well as engagement in online risky challenges (at Time 1), were controlled for.

Results

Descriptive Statistics

Table 1 gives the Time 1 means, standard deviations, and ranges for the main variables of interest. At Time 1, over half the participants (51%) had engaged in risky online challenges in the past. The greatest number of challenges engaged in at Time 1 was 6, with the most common ones being the Tide Pod Challenge, the Cinnamon Challenge, the KiKi Challenge, the Kylie Jenner Lip Challenge, the Condom (snorting) Challenge, and the Salt and Ice Challenge. At Time 2, only 6 participants reported having engaged in any risky online challenges since the Time 1 survey. The types of challenges participants reported engaging in at Time 2 were the Tide Pod Challenge, the Cinnamon Challenge, the Ice Bucket Challenge, and the newly invented Bird Box Challenge (from the movie "Birdbox", which was released on Netflix December 21, 2018; this challenge involves people doing various activities, like driving, while blindfolded).

Pearson correlations between variables of interest are shown in Table 2. Variables include risky online challenge participation, PPE in risky online challenges, NP, NB, FoMO, SS and age (all at Time 1). Consistent with hypotheses, all of the aforementioned variables were significantly and positively related to participants' frequency of engagement in risky online challenges at Time 1. Time 2 engagement in risky online challenges was not analyzed due to minimal participation (only 3 male and 3 female participants engaged in risky online challenges since the last survey).

An Independent Samples *t*-test was done at Time 1 to determine if gender differences existed in frequency of participation in risky online challenges, however no significant gender differences were found, $t(323) = -.70$, $p = .49$.

Table 1. *Descriptive Statistics for Variables of Interest at Time 1*

	M	SD	Minimum	Maximum
Age	21.36	1.50	18	26
Risky online challenges	.95 (Mdn = 1.0)	1.23	0	6
PPE in risky online challenges	1.72	.85	1	5
NP	2.15	.89	1	5
NB	2.98	.79	1	4.9
FoMO	2.61	.92	1	5
SS	2.42	.78	1	4

Table 2. *Pearson Correlation of Variables at Time 1*

	1	2	3	4	5	6	7
1. Age	-	**-.12***	-.05	-.06	-.09	-.06	.01
2. Risky online challenges		-	**.42****	**.31****	**.12***	**.24****	**-.12***
3. PPE in risky online challenges			-	**.43****	**.14****	**.30****	-.07
4. NP				-	**.47****	**.59****	.00
5. NB					-	**.58****	**.15****
6. FoMO						-	.04
7. SS							-

Note. Bolded number indicate the presence of a significant correlation. * = correlation is significant at the 0.05 level, ** = correlation is significant at the 0.01 level.

Hypothesis Testing

Three mediation models were conducted with Time 1 NP, NB, and PPE in risky online challenges as the independent variables (see Figure 1). Considering that only 6 participants reported having participated in any risky online challenges at Time 2, frequency of risky online challenge engagement at Time 1 was used as the outcome variable. Time 1 FoMO was the mediator, and SS, gender, and age were entered as covariates. Contrary to H1, the direct effect (*c*' path) of NB was not significant. In line with H2 and H3, there were significant direct effects (*c*' path) of NP and PPE on frequency of participation in risky online challenges. Further, contrary to H4, in no model did FoMO mediate the associations between the IV and the outcome variable; this is indicated by the confidence intervals encompassing zero, shown in Table 3. Finally, of the covariates, only SS was a significant predictor of participation in risky online challenges ($b = -.16$, $p < .05$).

Discussion

As hypothesized, it was found that both NP (H2) and PPE in risky online challenges (H3) were significant predictors of emerging adults' own participation in risky online challenges. These results suggest that the desire to gain popularity, as well as peer norms, may play an important role in an individual's likelihood of engaging in risky behaviour. Roeser (2013) found that young people who perceived that their peers were engaging in more risky behaviours (e.g., drug and alcohol use) also engaged in more risky behaviours themselves. Another study by Baumgartner, Valkenburg, and Peter (2011) examined the impact of peer norms on adolescents' participation in risky online sexual behaviours (e.g. sending intimate photos/videos to another person on the internet). These researchers found that descriptive peer norms significantly predicted the frequency in which participants engaged in these risky online sexual behaviours. Thus, even in

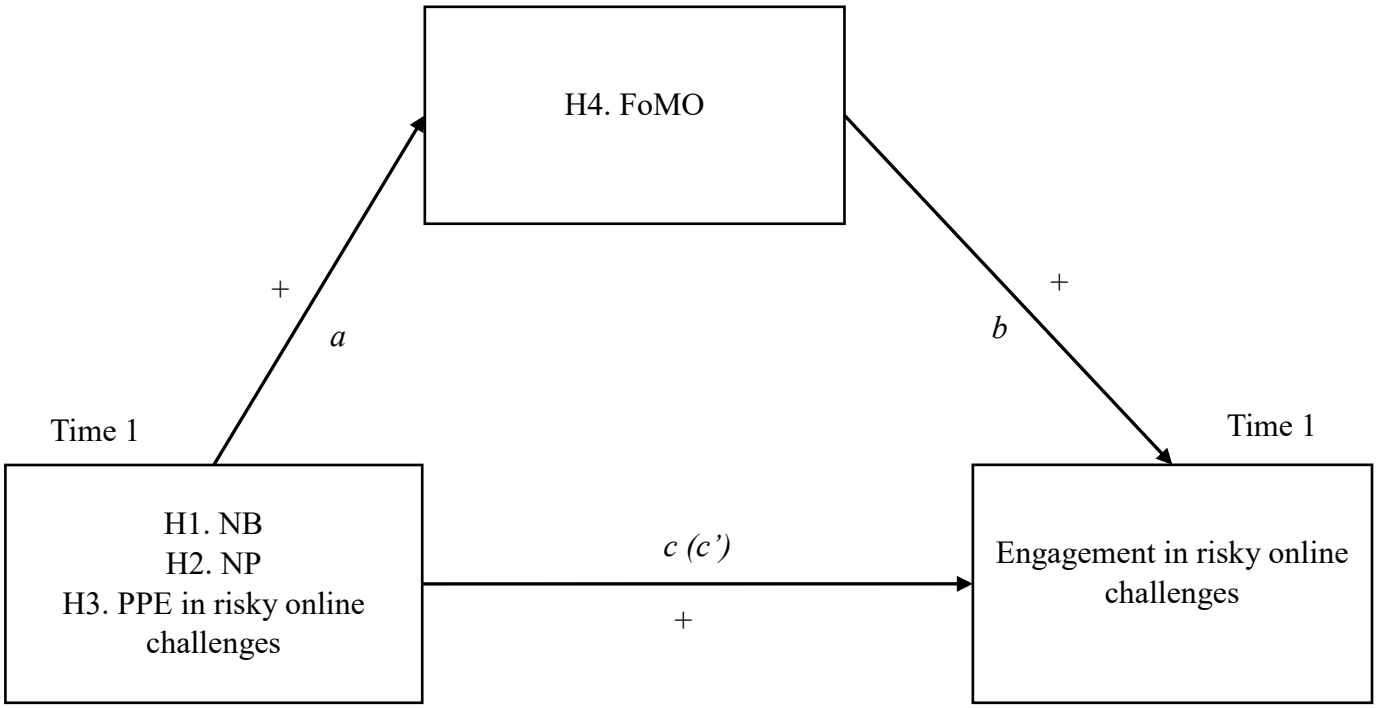

Figure 1. *Mediation Model*. It was hypothesized that stronger NB (H1) and NP (H2), and more PPE of online risky challenges (H3) at Time 1, would predict increased frequency of engagement in risky online challenges at Time 2. Further, it was hypothesized that heightened FoMO would mediate each of the aforementioned relationships (H4). However, due to lack of participation in risky online challenges at Time 2, Time 1 data was used.

Table 3. *Direct and Indirect Effects on Participation in Risky Online Challenges at Time 1*

		FoMO				
Criterion Variable						
Predictor Variable	R^2	c	c’	ab	LL	UL
Risky online challenges	.23					
NP		**.26****	**.21***	.04	-.02	.11
NB		-.03	-.08	.05	-.03	.12
PPE in risky online challenges		**.49****	**.48****	.01	-.00	.03

Note. *c* = total effect of the independent variable on the dependent variable; *c*’ = effect of the independent variable on the dependent variable after including the mediator; ab = unstandardized estimate of the mediated effect; LL and UL = lower and upper limit of bias-corrected 95%. Bolded numbers indicate the presence of a significant total or indirect effect. * = $p < .05$, ** = $p < .01$.

an online context, peer norms are a powerful influence on people's decisions to engage in risky behaviours. These findings support the results found in the present study that PPE in risky online challenges predicts participants' own engagement in risky online challenges.

In a study by Dumas, Davis, and Ellis (2017), it was found that participants' popularity motivations were a significant predictor of their engagement in popularity-related risk behaviour including alcohol use and antiauthority behaviour (Dumas, et al., 2017). Risky online challenges can also be considered popularity-related risky behaviours, as people engage in them to obtain social attention (i.e., popularity) via views and "likes" on social media. Therefore, it would make sense that those who are highly motivated to be popular would be more likely to engage in these risky online challenges. Further, a study by Utz, Tanis, and Vermeulen (2012) looked at predictors of young adults' frequency of SNS usage; researchers defined SNS usage by the number of friends participants had on SNSs, as well as the frequency with which they used SNSs to message friends, browse friends' profiles, enhance their own profiles, and disclose feelings to others. Consistent with the findings in the present study, these researchers (2012) found that NP was the strongest and most consistent predictor of SNS use, more so than any other variable they looked at, including NB, the Big 5 personality traits, narcissism, and self-esteem. Utz et al. (2012) suggest that NP is similar to narcissism, which in past research has been shown to predict SNS use; however according to these researchers, whereas narcissists tend to believe themselves to be superior to others, those with high NP simply have a strong desire to be *perceived* as popular. SNSs allow people to present themselves to the world in any way they want; as these authors (2012) pointed out, using SNSs allows individuals to be continuously connected to an entire world of people that would not otherwise be accessible, which is a huge advantage to gaining popularity. Therefore, it makes sense that, in the study by Utz et al., (2012) and in the

present study, NP was found to be a key predictor of participants' SNS usage and engagement in risky online challenges, respectively. Regarding risky online challenges, people have the ability to make their videos look more appealing so as to appear more impressive to the viewer; it can be assumed that they are posting the videos online for the purpose of reaching a large audience with the hopes that people will view and "like" their video.

In an experiment by Sherman, Greenfield, Hernandez, and Dapretto (2018), the researchers examined the effects of Instagram photo "likes" on participants' brain activity (activation of the nucleus accumbens, or NAcc) and behaviour ("liking" photos). Participants viewed their own or others' photos, which were either neutral (typical images) or risky (images of people drinking/smoking, or dressed inappropriately, etc.); these images had a varying number of "likes", which was manipulated by the researchers. Participants had the option to "like" each photo or not. It was found that participants were significantly more likely to "like" photos that already had more "likes" (referred to as popular photos; Sherman, et al., 2018). Further, it was found that when participants viewed photos with more "likes", it elicited greater activation in the NAcc, suggesting participants experienced a feeling of social reward and pleasure when viewing photos that were more popular (Sherman, et al., 2018). This article is consistent with the findings in the current study, as it demonstrates the influence of popularity on emerging adults' behaviour, and even their brain activity. The overpowering desire young people have to gain as many "likes" as possible may be an indicator of why NP is such a strong predictor of participants' engagement in risky online challenges. From this perspective, it seems clear that a major goal of engaging in risky online challenges is to gain popularity via "likes" and views of one's video. The more "likes" and views people receive, the more popular their videos become;

thus, this would supposedly increase the activation in their brain's reward center, leading them to feel better.

Contrary to my hypothesis that NB would predict participants' engagement in risky online challenges, this relationship did not turn out to be significant. A study by Dumas, Maxwell-Smith, Davis, and Giulietti (2017) examined predictors of emerging adults' deceptive like-seeking behaviours on Instagram (e.g., purchasing "likes"). The researchers found that weaker peer belonging predicted increased engagement in deceptive like-seeking behaviours. Peer belonging measures a person's sense of belonging within their current peer group (Dumas et al., 2017) In the present study, NB was measured, which focuses more on a person's desire to belong and to fit in (Leary et al., 2013). Knowing this, NB may not have been the best measure to use for predicting participants' engagement in risky online challenges. Regardless of people's NB scores, they could still have a strong sense of belonging within their peer group offline. However, someone with a weak sense of peer belonging might feel more motivated to seek that sense of belonging online, thus potentially increasing their likelihood of engaging in risky online behaviour (to gain popularity and feel accepted). After consideration, it is not that surprising that NB did not predict participants' engagement in risky online challenges in the current study. Perhaps if peer belonging had been used instead of NB, weak peer belonging may have predicted participants' engagement in risky online challenges (similar to the findings by Dumas et al., 2017).

Finally, contrary to my hypothesis that FoMO would mediate the relationships between NB, NP, and PPE in risky online behaviours, and participants' own engagement in risky online behaviours, the mediation models were not significant. The study discussed earlier by Beyens et al., (2016) found that FoMO was a mediator for the relationship between participants' NB and

NP and their Facebook use. That study's findings were largely the reason for using FoMO as a mediator in the current study, as no empirical research has been done on risky online challenges and what the predictors of this behavior are. However, the study by Beyens et al., (2016) examined Facebook use in general, whereas in the current study, engagement in risky online challenges was being examined. Reasons for using social media (posting pictures/comments, scrolling through the newsfeed, or viewing friends' profiles) are likely very different than the reasons for engaging in risky online challenges. It makes sense that one would use social media more often if they had a higher NB and NP, because perhaps being on social media (e.g., Facebook) might fulfill that need to be accepted and perceived as popular that they lack offline. Further, increased feelings of NB and NP might exacerbate the anxiety of missing out on something on social media (e.g. a friend posting about a party), thus the more frequently they would use social media to stay up to date and connected. In the present study, the finding that FoMO was not a mediator for engagement in risky online challenges is not surprising, in hindsight. The point of posting videos on YouTube seems to be to get as many views and "likes" as possible because this increases the popularity of the video and its search ranking. The idea of "liking" a video on YouTube is comparable to "liking" a photo on Facebook or Instagram, and the key motive seems to be to gain "popularity" by getting as many "likes" as possible. Being afraid of missing out does not seem to play much of a role in this case. Instead, the connection between NP and participants' own engagement in risky online challenges is not explained by FoMO, likely because the goal of gaining popularity on YouTube is such a strong predictor of doing these challenges.

There were several limitations to the present study. First of all, significantly fewer participants completed the Time 2 survey, and even fewer (only six) participants reported having

engaged in any online challenges since the Time 1 survey. Therefore, this study ended up being a cross-sectional one, rather than a longitudinal study. Three months between surveys is not very long, and the fact that only six people had participated in risky challenges during this period is perhaps not so surprising. Had the surveys been more spaced out, for example had there been six months, or even a year between surveys, more participants would likely have participated in challenges at Time 2. This would have allowed for Time 2 data to be used, and for conclusions to be drawn about whether the independent variables (NB, NP and PPE in risky online challenges) actually predict increased participation in risky online challenges over time. The longitudinal study by Dumas et al., (2017), however, did examine the bidirectional relationship between popularity motives and popularity-related risk behaviours. These researchers (2017) found that stronger popularity motives predicted increased engagement in popularity-related risk behaviours, as previously mentioned; however, when the reverse relationship was examined (increased popularity-related risk behaviours predicting stronger popularity motives), it was not found to be significant. Thus, I predict that in future research on risky online challenges, similar findings might occur.

Another limitation is that all the questions in the survey were self-reported so participants could have answered in socially desirable ways, such as having less NB, NP or FoMO or reporting having engaged in fewer risky online challenges than they have. Further, the age range of participants in this study was larger than originally intended. Initially, it was directed towards 18-19-year-olds only, however it was increased to 18-24 to obtain more participants. Although this allowed for more participants, a younger age group may have resulted in more frequent engagement in risky online challenges. It would be interesting to even look at adolescents in high school, as they seem to be at the peak age for engaging in risky behaviour; research has

shown that when viewing photos of risky behaviour, adolescents, but not college-aged students, show decreased brain activity in areas concerned with cognitive control (Sherman, et al., 2018).

In conclusion, my hypotheses that NP (H2), and PPE in risky online challenges (H3) would predict participants' own engagement in risky online challenges were supported. My hypotheses that NB (H1) would predict participants' engagement in risky online challenges, and that FoMO would be a mediator for each of the previous relationships (H4) did not turn out to be supported. Results emphasize the worrisome prevalence of risky online challenges and point to the importance of addressing emerging adults' popularity motives and perceived peer norms in prevention efforts.

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Appendix A

Risky Online Challenge Questions

Time 1

For the next set of questions, please refer to the following definition of "risky online challenges" when considering your responses. Online challenges refer to challenges that you record yourself doing and upload the videos online; they are considered risky if you are putting yourself in a position that could potentially result in harm or even death (for example, posting a video of yourself ingesting a tide pod, which contains harmful chemicals).

What types of **risky online challenges** have you engaged in in the past? Please select all that apply, or if there are others that aren't listed, please mention them in the "other" box:

- Tide Pod Challenge
- Cinnamon Challenge
- Kiki Challenge/In My Feelings Challenge
- Kylie Jenner Lip Challenge
- Condom 1 Challenge (snorting condom)
- Condom 2 Challenge (condom filled with water)
- The Salt and Ice Challenge
- The Duct Tape Challenge
- The Eraser Challenge
- The Fire Challenge
- The Gallon Challenge
- The Cold Water Challenge
- Neknomination
- Other (please specify ALL other risky online challenges you've engaged in)

How many times have you participated in risky online challenges in the past? Please state as a number and answer to the best of your memory: _____

About how many times have you been nominated to participate in risky online challenges that YOU DID NOT END UP TAKING PART IN? _____

About how many times was there a risky online challenge that you wanted to do, but you were not nominated to participate in, so you **did not** end up doing it? _____

How often do your friends participate in risky online challenges?

- Not at all
- A little
- A moderate amount
- A lot
- A great deal

Time 2

For the next set of questions, please refer to the following definition of "risky online challenges" when considering your responses. Online challenges refer to challenges that you record yourself doing and upload the videos online; they are considered risky if you are putting yourself in a

position that could potentially result in harm or even death (for example, posting a video of yourself ingesting a tide pod, which contains harmful chemicals).

How many times have you participated in risky online challenges **in the past 3 months** (since the last survey)? Please state as a number: _____

If you have participated in any risky online challenges in the past 3 months, which ones did you do (please specify)?

- I did not participate in any challenges in the past 3 months
- I participated in the following challenges: _____

About how many times in the past 3 months have you been nominated to participate in risky online challenges that YOU DID NOT END UP TAKING PART IN? _____

About how many times in the past 3 months was there a risky online challenge that you wanted to do, but you were not nominated to participate in, so you **did not** end up doing it?

_____

Curriculum Vitae

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Place and Year of Birth:	Canada, 1993
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Experience:	Research assistant for Dr. Dumas during 2017/18 academic year
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	A member of the Huron Psychology Association for the 2018/19 academic year (position: Vice President, Communications)
Peer-reviewed Conference Presentations:	Development Conference 2018 at Brock University in St Catharines; presented a poster for research conducted with Dr Dumas, entitled "'Likes' Can be Deceiving: Adolescents' Manipulative Attempts to Gain Attention on Social Networking Sites and Parental Awareness".
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