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Adolescents' perceptions of SNS use

Introduction

Using the internet to socialise has become an integral part of everyday existence for many individuals (O’Keeffe & Clarke-Pearson, 2011). Social Networking Sites (SNS) have increased in prevalence since the creation of Facebook in 2004, with sites such as Instagram, SnapChat and Twitter created in its wake. These sites are being increasingly used by both adults and adolescents (Livingstone et al., 2017), yet much of the research (e.g., Jozani et al., 2020; Naslund et al., 2020) explores older adolescents and young adults, rather than younger adolescents. With adolescence referring to the transitional stage from childhood commencing with pubertal development and ending with the physical and social independence of adulthood (typically between 10-24 years of age; Sawyer et al., 2018) this is a large age range where many developments occur; thus, it is important to understand more about younger adolescents (13-18 years) SNS perceptions and understanding.

Immersed within a digital world, young adolescents are increasingly engaging with SNS use (Turner, 2015). In fact, Ofcom (2019) identified that younger adolescents’ SNS use in the United Kingdom has remained stable over the past five years with an average of 70% of adolescents owning their own profile. They report that the continued popularity of SNS, as well as the evolution of newer sites such as TikTok, suggests that these sites are integrated within adolescents’ lives and digital ecology even prior to them meeting the minimum age restriction for these sites, which is 13 years old.

Research that has explored 13- to 18-year-olds engagement with SNS predominantly on the amount of time adolescents spend online and the risks associated with this, often failing to explore and recognise the benefits of engaging with SNS. Further, frequency of SNS use is debated within the literature in terms of how impactful it really is with regards to experiencing the risks and benefits (Domingues-Montanari, 2017). Crucially, research has not explored adolescents’ risk concern and to what extent this may inform their perceptions of

the benefits. This study aims to investigate how adolescents' levels of concerns about the risks of SNS use may predict their perceptions of the benefits of SNS.

Risk concern and protection motivation theory

Perceptions of risks and benefits are embedded within Rogers' protection motivation theory (1975; Rogers & Prentice-Dunn, 1997): individuals' perceptions are shaped by how likely they perceive a risk, how severe it may be, and how effective protective measures may be. Where the likelihood and severity of something occurring are viewed to be high and protective measures are viewed to be low than individuals often perceive the risks as outweighing the benefits (Rogers, 1983). Wildavsky and Drake (1990) extend this theory by arguing that risk concern moderates risk and benefit perceptions; the more concerned an individual is about a risk, the more likely that they are to perceive the likelihood and severity as high and the protective measures as low. Further, this individual is likely to perceive less benefits (Rogers, 1983).

Much literature identifies that adolescents' perceptions of risks and benefits are also informed by their risk concern (Bentheim et al., 1993; Millstein & Halpern-Felsher, 2002). These findings have been found across multiple domains, including smoking (Millstein & Halpern-Felsher, 2002), underage drinking (Goldberg et al., 2002), and illegal substance misuse (Grevenstein et al., 2015). Despite evidence of this theory's applicability within adolescence and across domains, there has been limited application of this to understand adolescents' perceptions of SNS use.

Adolescent risk concern and perceptions of SNS use has had some research coverage (Lareki et al., 2017; Youn & Hall, 2008) but only in specific relation to the risks. To date, an understanding of how risk concern relates to perceptions of SNS benefits in adolescence is lacking. This study will use Rogers' protection motivation theory (1975; Rogers & Prentice-

Dunn, 1997), as a theoretical model, to understand how perceived benefits of SNS use may be related to concerns around the risks of SNS use.

Benefits of SNS use

As children age into adolescence there is a greater emphasis placed upon friendships, thus elevating the importance of social networks (Brown, 2004; Hayes et al., 2021; Steinberg & Morris, 2001; Throuvala et al., 2019; Wurtele, 2017). With adolescents facing geographical and financial restrictions, establishing online social capital enables connections across distances (Bargh et al., 2002; Ellison et al., 2007). Large percentages of adolescents report utilising SNS for the social benefits, including: feeling connected to their friends' lives (81%), enhancing friendship diversity (69%), and supporting each other (68%; Anderson & Jiang, 2018). In order to access these benefits, disclosure is required (English & John, 2013).

Disclosure online can be beneficial. Restrictions of face-to-face interaction (i.e., shyness or anxiety) are reduced online due to a lesser likelihood of rejection (Stritzke et al., 2004). In accordance with Roger's risk motivation theory (1975; Rogers & Prentice-Dunn, 1997; Wildavsky & Drake, 1990), the reduction of non-verbal cues online (online disinhibition effect; Suler, 2004) may lessen the likelihood and severity of unsuccessful interaction. Thus, less confident individuals may feel less concerned about disclosing online, subsequently developing friendships, which can in turn enhance self-esteem (Bargh et al., 2002; Sherman & Cohen, 2006). For example, disclosing creative skills, such as artwork or music online may receive positive feedback (e.g., 'likes' and comments) that subsequently enhances self-esteem (Burnette et al., 2017; Donath & Boyd, 2004). Seeking support and advice online is also achievable via disclosure, enhancing feelings of belonging and community which may negate negative online experiences (Bargh et al., 2002; Donath & Boyd, 2004).

Managing impressions that others form through self-presentation behaviours can be more systematic online than offline as it is less immediate; the individual has time to construct an identity (Rosenberg & Egbert, 2011). With the introduction of image-based apps, such as Instagram and SnapChat, systematic self-presentation has become popular (Ellison et al., 2006; Livingstone, 2008; Espinoza & Juvonen, 2011). Receiving positive feedback for the real and ideal selves can enhance self-esteem and general wellbeing (Burke et al., 2011; Donath & boyd, 2004; Forest & Wood, 2012). Positive feedback can affirm positive self-concept goals, enhancing self-efficacy and self-esteem (Yang et al., 2017). For example, adolescents report feeling encouraged to present their creative side online (74%) due to increased feelings of confidence (69%; Anderson & Jiang, 2018). These creative aspects of self-presentation techniques can also enhance digital literacy skills, potentially benefitting users in future careers or hobbies (Choi & Behm-Morawitz, 2018).

Disclosing online may be beneficial. Online disinhibition, social capital, and self-presentation may enhance the outcomes of friendship quality, wellbeing, and self-esteem (Best et al., 2014; Ellison et al., 2007). Despite recognition of these SNS benefits, research conducted with adolescents largely focuses upon the risks (Koutamanis et al., 2015; Leung, 2014) and this is reflected within portrayal of SNS in the media (Weinstein, 2018) and policy (Livingstone & Haddon, 2012). Adolescents may mirror this risk concern and thus (in relation to risk concern moderating risk and benefit perceptions; Wildavsky & Drake, 1990) perceive the likelihood and severity of the risks as being greater than the benefits. In fact, adolescents refer to the risks of SNS use sooner than they do the benefits (O'Reilly et al., 2018). Rarely are adolescents' perceptions of the benefits considered. Where the risks are more frequently highlighted, adolescents may have a skewed perception of the benefits due to heightened risk concern.

Risks of SNS use

The very nature of SNS use requires self-disclosure; individuals must decide on the extent to which they choose to broadcast (disclose to anyone online), such as do they disclose publicly (to anyone within their network) or privately (to a specific individual or group), which allows them to balance being open in comparison to over-disclosing (Venkatanathan et al., 2014). For instance, disclosing information privately in face to face conversation can foster a close relationship, while the same disclosure online may be viewed as over-disclosure especially if this information is shared with an unintended audience (e.g., reposted; Bazarova & Masur, 2020).

Adolescents are more likely to disclose information, and in greater detail, than adults (Christofides et al., 2012). This disclosure may likely be broadcast, rather than public or private; for example, EU Kids Online have identified that 43% of SNS users aged 9-16 years do not set their profiles to private (Livingstone et al., 2011), meaning that their posts are open to anyone who looks. Even where adolescents may be concerned about the risks and elevate protection measures (Rogers & Prentice-Dunn, 1997; Wildavsky & Drake, 1990), they are still at risk of exposure due to links with mutual friends or to other users screenshotting and saving their activity (Livingstone, 2014).

As highlighted above adolescents are at a greater risk for over-disclosure through disclosing information inappropriately and misjudging the potential audience or outcome (Bazarova & Choi, 2014), but also because they often fail to perceive the long-term impact of their online activity (i.e., their digital footprint; McBride Murry et al., 2011; O’Keeffe & Clarke-Pearson, 2011). Managing online disclosure, with consideration of potential future implications, is not prioritised by adolescents (Anderson & Jiang, 2018; Jordán-Conde et al., 2013). For example, in a descriptive report of adolescents’ SNS behaviours, only 23% of adolescents prioritised managing online disclosure in response to comments about their future

(PEW Report; Madden et al., 2013). This apparent lack of concern may predict perceptions of over-disclosure as being neither likely nor severe and thus limit the protective measures adolescents use (Rogers & Prentice-Dunn, 1997; Wildavsky & Drake, 1990).

Others' online over-disclosure behaviours, such as posting online and tagging others (Besmer & Lipford, 2009; Smith & Kidder, 2010), may be perceived as risky by adolescents. Where adolescents consider this possible behaviour than they may feel concerned about such an unpredictable risk, particularly if such behaviours are likely amongst their online friends (Rogers & Prentice-Dunn, 1997; Wildavsky & Drake, 1990).

Social capital, the formation and maintenance of social networks (Putnam, 1993), requires some level of disclosure. SNS provides a platform to bridge social capital, which refers to forming new relationships (Ellison, Steinfield & Lampe, 2007). Disclosing to strangers, however, is clearly risky. Drawing upon Roger's risk motivation theory (Rogers & Prentice-Dunn, 1997), adolescents typically identify strangers as severely risky and thus use security settings to protect themselves from the risks of disclosing to strangers online (Livingstone, 2006, 2014; Mesch & Talmud, 2007). However, adolescents are less likely to use security settings when bonding with their online friends (Livingstone, 2008), potentially due to a lack of concern about disclosing to friends (Wildavsky & Drake, 1990).

Bonding social capital, which refers to strengthening "trust-based ties" with attached individuals (p.1499, Young & Lee, 2013; Putnam, 2000), is the most common use of SNS (Ellison et al., 2007). Problematically, bonding online leads to a greater sense of mutual trust and an increase in the likelihood of self-disclosure, even if the friendship does not hold the same strength offline (Boucher et al., 2008; Patchin & Hinduja, 2010; Zhao, 2006). Misplaced trust can expose the user to friendship and romantic difficulties, as well as experiences of cyberbullying (Livingstone & Haddon, 2012; Sengupta & Chaudhuri, 2011).

These experiences can impair wellbeing and lead to long-term mental health issues (Livingstone & Haddon, 2012).

During adolescence, self-presentation behaviours are increasingly utilised in order to manage impressions of others form of the self (Ellison et al., 2006; Gardner & Steinberg, 2005). Online, adolescents can feel pressured to craft a particular identity online which may encourage presenting the false or ideal self (43%; Anderson & Jiang, 2018). Presenting the self in a way that others may perceive as inauthentic can expose the user to cyberbullying (Dredge et al., 2014). Importantly, receiving negative feedback on posts that present the real self is associated with lower self-esteem (Jackson & Luchner, 2018; Rui & Stefanone, 2013; Tokunaga, 2011), while receiving positive feedback on posts that present a false self is also associated with lower self-esteem and more negative self-concepts which is likely due to an awareness of the distortion (Jackson & Luchner, 2018; Schlenker & Leary, 1982). During adolescence, external feedback is strongly valued and used to develop and refine self-concept; concern for these risks may thus increase during this period (Ybrandt, 2008; Wildavsky & Drake, 1990).

As illustrated above, over-disclosure can increase the risks associated with social capital and impression management. These risks may then produce negative outcomes such as friendship difficulties, cyberbullying, or issues later in life (Maghsoudi et al., 2020). Adolescents may be concerned about these risks. When the social and developmental volatility of adolescence (Blakemore, 2012; Magnusson et al., 1985) and the permanency of one's digital footprint (McBride Murry et al., 2011) are considered it is possible that adolescents view the likelihood and severity of SNS risks as very high. If so, their perceptions of the benefits may be low (McCaul, Schroeder & Reid, 1996).

Research Focus

For adolescents, SNS use has become an important aspect of socialisation. Research supports that appropriate levels of disclosure can be beneficial for social capital and self-presentation, promoting positive outcomes. On the contrary, over-disclosure can expose the user to risks associated with social capital and self-presentation. Risk concern may predict perceptions of the benefits. Importantly, there is limited research investigating adolescent perceptions of SNS use and that which does focuses upon the risks more so than the benefits. Investigating levels of adolescents' online risk concern and whether this predicts their perceptions of the benefits will inform an understanding of how adolescents view SNS use.

The present study aims to explore adolescents' (aged 13-18) risk concern and how this may predict perceptions of the benefits of SNS use. Given that during adolescence there is increasing importance placed on their friendships and motivation for positive evaluations (Blakemore, 2008), this work will assess if adolescents' risk concern will be related to their perceptions of SNS use as being beneficial (in line with Roger's, 1975, protection motivation theory). Adolescents' perception of SNS benefits are assessed by asking them to judge SNS behaviours or outcomes as positive, negative, both positive and negative, or neither positive or negative; findings will be used to create a perceptions of the benefits of SNS use score. It is predicted that for adolescents with higher levels of risk concern, their perceptions of the benefits of SNS use will be lower.

Developing an understanding of how adolescents perceive the benefits of SNS use and to what extent risk concern may predict this, will support parents, practitioners, and policymakers in appropriately supporting and informing adolescent SNS use.

Method

Participants

A sample of 426 adolescents, aged 13 to 18 years ($M = 13.92$, $SD = 1.35$; 53.5% female), were recruited from five secondary schools across the south of England, United Kingdom.

Participants identified their hometowns within Surrey ($n = 135$); Essex ($n = 119$); Berkshire ($n = 86$); London ($n = 72$); Buckinghamshire and Hampshire ($n = 5$). Participants were excluded from the analyses if they completed less than 80% of the items on the risk concern scale or the risks and benefits perception task; this resulted in a final sample size of 342 adolescent participants. Participants' ethnicity was predominantly White (80.8%), followed by Mixed (6.8%), Black (4%), Asian (2.3%) and Other (0.2%). Ethical approval was granted following a full review through a U.K. institution research committee, and the study was conducted in accordance with British Psychological Society guidelines. Following ethical approval, schools were contacted by the lead researcher and invited to participate. Upon confirming interest to participate, the schools received information letters for teachers and parents, explaining the rationale, procedure, and intended impact of the study. Parents provided consent through opt-out parental consent letters. Before beginning the online survey, all adolescents were verbally informed of the study and provided their consent.

To understand how participants were using and accessing SNS, the authors asked them about device ownership, which SNS sites they access, how often they access them and where they access them (Livingstone et al., 2011; Mascheroni & Ólafsson, 2015). On average, adolescents personally owned three different devices ($SD = 1.22$), they reported that their parents also owned three different devices ($SD = 1.22$), and there were on average five devices that could connect to the internet per household ($SD = 1.40$). Adolescents were asked at approximately what age they first used these devices (irrelevant of internet connection; $M = 8.02$ years, $SD = 1.20$), as well as approximately when they first accessed the internet

(before starting school: 20.4%; when in primary school: 75.4%; when in secondary school: 4%; when in college/sixth form: 0.3%). Further findings regarding adolescents' SNS access are provided in Table 1.

Table 1.

Frequency of adolescents (N=342) who own a SNS profile, who access personal SNS accounts daily or weekly, and who access at particular locations.

	Profile ownership		Regularity of access		Location of access				
	Yes	No	Daily	Weekly	Home (Bedroom)	Home (Other room)	Friend's house	On-the-go	School
Instagram	279	63	256	86	338	311	272	202	131
SnapChat	247	95	248	94	307	288	261	222	156
Facebook	69	273	70	8	123	95	50	42	25
Twitter	56	286	74	16	116	99	50	55	27
Other*	68	274	42	1	n/a				

Measures

The authors constructed our survey within the Qualtrics platform, which allowed participants to complete the survey online and simultaneously record responses. Participants completed the survey within their school ICT suite, using either individual computers with a mouse or a tablet using the touch screen to respond to the questions and tasks. The survey incorporated an informed consent introductory page, followed by descriptive items, and a debrief on the final page. The measures included a risk concern scale to measure adolescents' SNS risk concern in general and a judgement task to assess perceptions of behaviours and outcomes of SNS use as beneficial or not. All responses were recorded by Qualtrics and kept securely on a password-protected account; data was exported to SPSS for analysis.

To test survey validity, aesthetic design, and scoring method, the survey was piloted with a small group of adolescents (N = 8; aged 16-18 years). Following completion of the scale, participants engaged in a discussion with the lead researcher where they provided feedback; this feedback was then used to improve the scale. Predominantly, the pilot participants feedback concerned the aesthetic design of the scale, which was subsequently slightly adapted. Participants judged that items used within the judgement task were appropriate and had no further suggestion of items (SNS behaviours or outcomes) to include.

SNS risk concern.

The authors developed a 15-item SNS risk concern scale. Using Buchanan and colleagues (2007) online risk concern scale as a basis, seven items were selected that were related to SNS use and modified items where it was necessary to make the link to SNS explicit (e.g., amended 'email' to 'direct message'; 'Are you concerned that a direct message you send may be read by someone else besides the person you sent it to?'). Nine of Buchanan et al.'s items were not included due to being unrelated to SNS use (e.g., 'that an email containing a seemingly legitimate internet address may be fraudulent?'). In addition, a further eight items were constructed to relate directly to the research focus (i.e., linked to SNS risks identified in the introduction; e.g., 'are you concerned about other people seeing the photos you post?'). Adolescents rated their degree of risk concern on a 5-point Likert scale, with responses being: 'Not at all', 'Slightly', 'Somewhat', 'Moderately' and 'Extremely'. No items were reverse coded; mean scores were calculated (range 1 to 5) with higher figures indicating greater SNS risk concern. This scale had high internal reliability, $\alpha = .88$. See Appendix A for a full list of items.

Perceptions of the benefits of SNS use.

In accordance with the literature, a task to explore adolescents' perceptions of the benefits of SNS use was developed. The task included 30 items around themes of online disclosure,

social capital and self-presentation (as these are prominent benefits identified within the literature), including online SNS behaviours and outcomes (items are presented in Table 2). Seven of the 30 items were filler items relating to digital literacy due to their neutral nature (e.g., ‘learning how to upload media’); these items were not incorporated within the statistical analyses. Participants were asked to judge, for each item, if the item was a positive, negative, both positive and negative, or neither positive nor negative aspect of SNS use. Given this scale was being developed to focus on the perceptions of benefits of SNS use, items that participants judged as neither positive nor negative or where they did not make a judgement were not included in the analyses. For participants, where an item was judged as positive it was scored as +1, negative as -1, and both as 0.

A principal component axis analysis was conducted on the 23 items with oblique rotation (direct oblimin) to reduce items into factor loadings based upon explaining their cumulative variance (Schreiber, 2021) in order to reduce data to create subscale scores (Schneeweiss & Mathes, 1995). The scree plot presented at least three components to be retained above Kaiser’s criterion of 1 (Appendix B). Appendix C presents the factor loadings following rotation in accordance with the clustering of the loadings above a value of .20. Items represented within each component include those related to social capital, particularly bonding social capital (factor 1, 13 items; e.g., “Maintaining a close connection to each person on your friend’s list”), related to social comparison (factor 2, six items; e.g., “Seeing what your friends have commented on”), and related to disclosure to family members (factor 3, four items; e.g., “Family members being able to see your statuses and comments”). Table 2 presents the items per factor.

Subscales were created by averaging the item scores within each component identified above (range -1 to +1) with higher scores indicating more positive benefit perception of SNS use. All scales presented good internal reliability: social capital, $\alpha = .827$; disclosure to

family, $\alpha = .780$; social comparison, $\alpha = .761$.

Table 2.

A summary of all items factored into either social capital, social comparison or disclosure to family.

Factor (Completion rate <i>n</i>)	Items
Social capital (317)	Being tagged in other's posts in general Maintaining friendships offline Maintaining a close connection to each person on your friend's list Asking for advice Seeking support Making group plans based around a common hobby or interest Making plans with friends to do something offline Joining groups related to your interests and hobbies Expressing yourself to a wider network of people than you do offline Expressing your feelings online Discussing interests and hobbies Expressing your personality online How you feel about yourself based upon your friends' posts
Social comparison (214)	Being tagged in other's posts without knowing Connecting with a wider network of friends Seeing what your friends have commented Seeing what your friends have 'liked' How you feel about yourself based upon who you have on your friends list How you feel about yourself based upon your own posts
Disclosure to family (159)	Connecting with family members Family members being able to see what you 'like' Family members being able to see your statuses and comments Connecting with your parents

Procedure

Participants were seated in either their school's ICT suite, with desktop computers, or in their classrooms with an iPad or laptop. The online survey was adaptable for tablet use, so the layout of the questions did not change whether participants used a desktop, laptop, or tablet. Participants were in groups of 20-30, but were seated individually with their device. Participants who were registered as special educational needs (SEN) were accompanied by their designated support assistant or another member of staff from the school, if required. Presence of support staff was noted by the child's unique identifier in case this was later required (e.g., data an outlier).

Participants were verbally informed about the study, that their results were completely anonymous, and that they could withdraw at any time throughout the study without providing a reason. Participants were then provided with the opportunity to withdraw or ask questions prior to commencing the study. Participants were also able to read the written information displayed at the start of the survey which repeated the verbal description and provided the researchers' contact details. Participants were clearly informed that they could skip questions if they wished and may stop at any point, but they would not be able to return to previous pages of the survey once they have moved on to delete or change answers, nor could answers be identified and removed following completion of the survey. Participants provided their consent by selecting the appropriate option on the screen; those who chose to withdraw were directed to the class teacher. The survey progressed in a fixed order: demographics, information on access to SNS, reporting of their SNS use, completion of the SNS risk concern scale, and completion of the perceptions of SNS benefits task. Lastly, participants were shown the debrief information. The survey took approximately fifteen minutes. Once participants had finished, they were provided with a written debrief which outlined the aim of

the research and contact details. Participants were also provided with the opportunity to ask questions at this stage.

Results

To assess the research aim of exploring adolescents' risk concern and their perceptions of the benefits of SNS use, a series of hierarchical regression analysis was conducted. These analyses assessed if adolescents' levels of SNS risk concern predicted adolescents' perceptions of the benefits of SNS use, after accounting for age, gender (binary: 0 males, 1 females), and number of devices owned. The number of devices owned (that connected to the internet) was included in analyses as research suggests that greater device ownership may predict perceptions (George et al., 2018; Hundley & Shyles, 2010; Wartella, 2002). The bivariate correlations are presented in Table 3.

Before assessing the main research question, a multiple regression analyses was conducted to understand if any of the descriptor predictor variables accounted for variability in the main predictor variable of interest (risk concern). Age, gender and total number of devices owned were entered simultaneously as the predictor variables and the risk concern score was the outcome variable. Including these predictors significantly improved the model, $F(1, 143) = 1248.55, p < .001$ from chance, accounting for 90.6% of the variance. Specifically, being male, $\beta = -1.42, t = -19.75, p < .001$, was independently associated with lower SNS risk concern (females had greater risk concern). Age, $\beta = .007, t = .203, p = .839$, and total devices owned, $\beta = .055, t = 1.48, p = .139$, did not predict SNS risk concern. Given that gender was a significant predictor of risk concern, the interaction between risk concern and gender was included within subsequent analyses to assess if gender moderates the association between risk concern and SNS perceived benefits.

Table 3.

Mean (SD) and Bivariate Pearson correlations for number of types of internet devices owned, risk concern scores, and perception of risks and benefits (social capital, social comparison, and disclosure to family) scores.

	Mean (SD)	Internet devices owned	Risk concern	Social capital	Social comparison	Disclosure to family
Age	13.95 (1.37)	-.155**	.02	-.158**	-.069	-.037
Internet devices owned	4.81 (1.35)		.096	.091	.024	.022
Risk concern	2.45 (.92)			.027	.034	.015
Social capital	.54 (.38)				.396**	.113
Social comparison	.53 (.57)					.210*
Disclosure to family	.53 (.56)					

* $p < .01$, ** $p < .001$.

Three hierarchical multiple regressions were conducted to predict the outcome variables of: benefit perceptions representing social capital, social comparison, and disclosure to family. Within block 1, age, gender, and total number of devices were entered into the model. In block 2, the interactive predictor of risk concern and gender was entered into the model. In block 3, the perceived benefits of SNS use scores that were not the outcome variable were entered. Table 4 presents a summary of the findings. Finally, where the

interactive predictor is significant within a model, it was assessed if gender moderated the relationship between risk concern and our outcome variable by conducting the analyses separately for males and females with entering age and number of devices in block 1, followed by risk concern in block 2. These findings are presented in Table 5.

Table 4.

Regression analyses summary for predictors of social capital, social comparison, and disclosure to family scores.

	Social capital			Social comparison			Disclosure to family		
	β	t	p	β	t	p	β	t	p
Block 1 change statistics	$R^2 = .02, F(3, 144) = .105, p = .371$			$R^2 = .06, F(3, 144) = 2.80, p = .042$			$R^2 = .10, F(3, 144) = 5.10, p = .002$		
Age	.03	.94	.35	1.01**	2.80	.01	-.17***	-3.91	<.001
Gender	.12	1.37	.17	-.07	-.65	.51	.01	.37	.711
Total devices	.01	.22	.82	.05	1.18	.24	-.03	-.82	.412
Block 2 change statistics	$R^2 = .03, F(3, 142) = .54, p = .587$			$R^2 = .06, F(2, 142) = .45, p = .640$			$R^2 = .13, F(2, 142) = 2.83, p = .062$		
Age	.02	1.09	.28	.11	2.86	.01	-.16	-3.94	.001

Table 5.

Regression analyses summary for predictors of disclosure to family.

	Disclosure to family			Block change statistics	
	β	t	p	Significance	R^2
Males					
Block 1				$F(2, 128) = 2.42, p = .093$.19
Age	-.12	-1.95	.053		
Total devices	.04	.66	.511		
Block 2				$F(1, 117) = .01, p = .910$	
Age	-.12	-1.95	.054		
Total devices	.04	.64	.527		
Risk concern	.01	.11	.910		
Females					
Block 1				$F(2, 122) = 10.36, p < .001$	
Age	-.20	-4.56	<.001		
Total devices	-.04	-.78	.438		
Block 2				$F(1, 121) = 4.67, p = .033$	
Age	-.18	-4.30	<.001		

Perceptions of the benefits

Social capital.

As illustrated within Table 4, including risk concern predictors in block 2 did not improve the model after factoring in age, gender, and number of devices in block 1. However, including the other perceived benefits did improve the model; specifically, the more positive adolescents were about social comparison and disclosure to family the more positive they were about the use of social capital behaviours online. The final model accounted for a total of 12.9% of the variance and was significantly better than chance, $F(2, 140) = 8.06, p < .001$.

Social comparison.

As with social capital, including risk concern predictors in block 2 did not improve the model after factoring in age, gender, and number of devices in block 1. Further, including the other perceived benefits (block 3) did not improve the model. In fact, it was block 1 with the descriptive predictors where the model was better than chance and accounted for a total of 5.5% of the variance and was significantly better than chance, $F(3, 144) = 2.80, p = .042$. Findings showed that age was the only significant predictor, whereby perceptions of social comparison as an SNS benefit was more positive by the older participants.

Disclosure to family.

As with the other outcome variables, including risk concern predictors in block 2 did not significantly improve the model after factoring in age, gender and number of devices in block 1, albeit it was approaching significance ($p < .01$). Importantly, when including the other perceived benefits of SNS use in the model, there was significant improvement in the model from block 2; specifically, within the final model significant predictors included age (younger participants were more positive about the benefits of disclosure to family), gender (males were less positive about the benefits of disclosure to family), risk concern by gender (see below), and perception of social capital benefits with SNS use (the less positive adolescents were about social capital the more positive they were about disclosing to family online). The

final model accounted for a total of 19.8% of the variance and was significantly better than chance, $F(2, 140) = 5.90, p = .003$.

Given the significant interactive predictor, as planned two hierarchical regressions were conducted to understand the moderation of gender moderates the interaction between risk concern and perception of disclosure to family as a benefit for SNS use (see Table 5). Findings showed that for adolescent females only that including risk concern in the model, improved the model after accounting for age and number of total devices. For these females, greater SNS risk concern was associated with more positive perceptions of disclosure to family as a benefit of SNS use.

Discussion

This study aimed to explore adolescents' SNS risk concern and their perceptions of the benefits of SNS use. Our findings demonstrate that, within England, females are more concerned about the SNS risks than males. In general, adolescents' SNS risk concern does not predict the perceptions of the benefits, although for females, their risk concern did predict their perceptions of disclosing to family online. Interestingly, adolescents who perceived social capital as positive also perceived social comparison as positive; and vice versa. However, those who perceive social capital as positive are more likely to perceive disclosure to family online as negative; and vice versa. The theoretical considerations of these findings are discussed.

Risk concern

Females appear more concerned about the SNS risks than males. During adolescence, females seek social opportunities for the development of autonomy sooner than males (Rice & Dolgin, 2005; Steinberg & Silverberg, 1986). SNS use can be risky in terms of misinterpreted communication, unrealistic expectations of quantity or quality of connections, and exposure to cyberbullying/friendship difficulties (Livingstone & Haddon, 2012).

Although males do also experience these risks, adolescent females' greater social exploration during adolescence may expose them more so than adolescent males (Steinberg & Silverberg, 1986). In line with Roger's risk motivation theory, females may therefore perceive the severity and likelihood of SNS risks more greatly than males and feel more concerned about them (Rogers & Prentice-Dunn, 1997; Wildavsky & Drake, 1990). Therefore, females may be more concerned than males about encountering such risks.

Findings showed that females who were more concerned about the SNS risks were more positive about disclosing to family online. This contrasts with previous research which has identified that boys are more positive about disclosing to family online (Shin & Kang, 2016). As Wildavsky and Drake (1990) propose, those high in risk concern may perceive protective measures as low. Past research shows that females are more likely to restrict their online behaviour when they are concerned about the risks (Barn et al., 2013; Marrett et al., 2011); this may be because they lack confidence in utilising more active protective measures. In terms of disclosing to family members, females may restrict their online behaviours by only disclosing to family members. Family members are trustworthy and so females may feel less concern and more protected by communicating with them.

Contrary to expectations, adolescents' SNS risk concern did not influence their perceptions of social capital or social comparison. Perhaps, adolescents do not perceive online social capital and social comparison behaviours as risky for they are an extension of their offline social lives (Khan et al., 2016). Adolescents may feel skilled at managing their online social lives (Reich, Subrahmanyam & Espinoza, 2012). In considering this in relation to Rogers' (1975; Rogers & Prentice-Dunn, 1997) protection motivation theory, adolescents may thus perceive the risks as low and their own protective measures as high; therefore, they may be more positive about these aspects of SNS use (Wildavsky & Drake, 1990).

Benefit perceptions

Concerning the benefits, the factor loadings identified items relating to social capital, social comparison, and disclosure to family. According to descriptive results, adolescents perceived these items as more positive than negative. This illustrates the positive perception that adolescents have of SNS use in relation to social capital, social comparison, and disclosure to family.

Those who communicate successfully online report greater self-esteem (Ellison, Steinfield & Lampe, 2007, 2012), sense of belonging (Zhao et al., 2012), and confidence (Holland et al., 2007; Valenzuela et al., 2009); these notions are also important in developing the self (Orth & Robins, 2014). In fact, Davis (2012) found that adolescents who communicated more successfully online also reported a greater sense of self. Equally, those with a greater sense of self are more likely to reap social capital benefits online, due to being confident with their ability to form and maintain friendships (Steinfield et al., 2008). With regards to our findings, adolescents may perceive social capital and social comparison online as positive due to accessing these benefits.

Despite adolescents' positive perceptions of social capital and social comparison, it was found that those who perceive social capital more positively are less likely to perceive disclosing to family as positive; and vice versa. Research widely reports that adolescents increasingly seek social autonomy (Blakemore, 2015). Disclosing to family members online may impair efforts to gain this autonomy; adolescents may therefore be concerned about this (Wildavsky & Drake, 1990). Equally, it is known that adolescents engage in explorative, and sometimes risky, behaviours online (Eleuteri et al., 2017; Vannucci, 2020), which adolescents would not want family members to see. Engaging in these behaviours can benefit popularity (Bryce & Fraser, 2014; Mascheroni et al., 2015; Sasson & Mesch, 2014). Thus, adolescents who are more orientated towards social capital may be motivated to behave in

this way; in which case, they may perceive disclosing to family members online less positively as they may receive negative feedback (Coyne et al., 2014; Shin & Kang, 2016) and feel embarrassed in front of their friends (Ouvrein & Verswijvel, 2019; Verswijvel et al., 2020).

Limitations and future research

This study does present some limitations. Firstly, a new measure to assess perceptions of SNS benefits was developed; albeit, this was built upon past research findings that identified SNS benefits. Interestingly, one of the identified benefits in the literature, self-esteem, was not identified through the PCA analyses. Literature has found that self-esteem has both positive and negative relationships with SNS, but it is also often related positively with bonding social capital and with impression management. As a result of this, items included that related to self-esteem loaded onto social capital and social comparison factors instead, in particular on the social comparison factor. More work is needed on understanding the benefits from adolescent perspectives in terms of self-esteem.

Also, it is surprising that concerns for the SNS risks did not predict perceptions of the benefits of SNS use more broadly. Potentially, this is due to the scale used to measure SNS risk concern, which theoretically captures broader concerns in society and may not capture adolescents' own specific concerns as well. It is known from Rogers' (1979, 1985) motivation theory, that risk and benefit perceptions are embedded within individuals own concepts of protection and risk. Considering the SNS risk concern scale used within this study was initially used with older participants, the concerns presented within its items may not be applicable to adolescents. It would be interesting to consider this within future research. In particular, a SNS risk concern scale created by adolescents may be more successful in capturing the SNS concerns that apply to their perceptions of the risks.

Our findings suggest that older adolescents may be less likely to perceive the benefits of disclosing to family online. Shin and Kang (2011) found that older adolescents are more likely to disclose online, with females typically disclosing more online than males (Valkenburg & Peter, 2011). Throughout adolescence, there is an increasing priority to establish friendship intimacy, particularly for females (Galambos, 2004). Within a digital age, SNS provides the opportunity to develop this intimacy further (Rose & Rudolph, 2006). However, with intimacy comes privacy (Lenhart & Madden, 2007) and it is known that adolescents seek social autonomy migrating away from family members to peers (Blakemore, 2008). In which case, disclosing to family members may be perceived as risky by adolescents who seek greater friendship intimacy but also seek less parental involvement within their social lives. In order to understand this further, however, future research should explore the interaction between age and sex.

Future research should also explore adolescents' perceptions of the benefits of SNS use in greater depth to understand the positives of SNS use, not just the risks. Also, a greater consideration of gender differences in SNS use would be important to investigate in case of other nuances within adolescents' SNS use. Future research should consider the SNS use and perceptions of younger children who are just beginning to use SNS to explore any potential developmental differences.

Conclusions

This study is unique in its exploration of adolescent, 13- to 16 years, SNS risk concern and to what extent this may predict their perceptions of the benefits. The findings suggest that adolescents perceive SNS use as socially beneficial, irrespective of the risks. Females are more concerned about the SNS risks than males, and their concern is associated with less positive perceptions of disclosing to family members online. Adolescents who perceive social capital as positive are more likely to perceive social comparison behaviours online as

positive; and vice versa. Although, those who perceive social capital as positive are less likely to perceive disclosing to family members online as positive; and vice versa. This is important to consider within e-safety education, policy, and intervention development. Guidance within policies should refer to the social opportunities of SNS, as well as consider risks that are more applicable to adolescents.

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Appendix A Risk scale items.

In general, how concerned are you ...

about your privacy while you are using SNS?

about people online not being who they say they are?

about your profile ever being hacked?

about people you do not know obtaining personal information about you from your online activities?

that a direct message you send may be read by someone else besides the person you send it to?

that a direct message you send someone may be inappropriately forwarded to others?

about direct messages you receive not being from whom they say they are?

about a comment or 'like' you post being misinterpreted?

that a comment or 'like' you post could cause someone else offence?

that your online activity could be viewed negatively by a future employer?

about how other people may perceive you as a person based upon your online profile(s)?

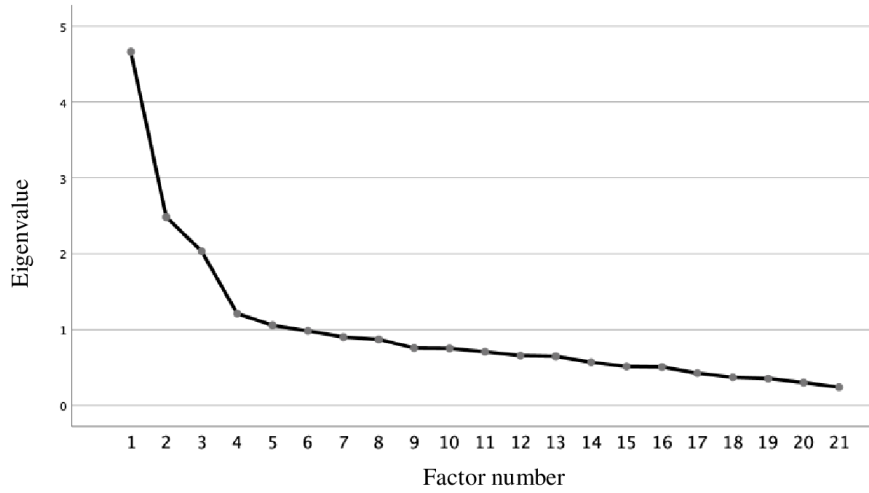
by how much time you spend on SNS in general?

by how much time you spend on SNS instead of studying?

about other people seeing the photos you post?

about people you don't know seeing the photos you post?

Appendix B Factor analysis; scree plot presenting factors above Kaiser's criterion of 3.0.



Appendix C. Factor analysis; cluster loadings of risk and benefit perceptions task items.

Bold figures highlight the final factor loading of the item.

Item	Factor 1	Factor 2	Factor 3
9	.598		
10	.574		
27	.564		
8	.535		
3	.516		
15	.506		
6	.493		
16	.453		
7	.426		
4	.361		
2	.347		-.269
13		.732	
30		.717	
5	.201	.648	
19		.587	-.222
21			-.725
11			-.708
22			-.524
12			-.516
1			-.482
14	.208		-.449