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Title	'Catfishes: How do they reel us in?' Exploring adolescent vulnerabilities to online grooming
Type	Article
URL	https://clock.uclan.ac.uk/47215/
DOI	##doi##
Date	2023
Citation	Boland, Laura and Worthington, Rachel Elizabeth (2023) 'Catfishes: How do they reel us in?' Exploring adolescent vulnerabilities to online grooming. <i>Forensic Update</i> , 1 (143). pp. 12-22. ISSN 1356-5028
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It is advisable to refer to the publisher's version if you intend to cite from the work. ##doi##

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'Catfishes: How do they Reel Us in?'
Exploring Adolescent Vulnerabilities to Online Grooming

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Abstract

The practice of adopting a fake online persona ('catfishing') is commonly adopted by cyber criminals to facilitate contact with victims, yet there is a dearth of research exploring what makes an individual vulnerable to being catfished. This study explored the risk factors and vulnerability of young people to catfishing. 42 participants aged 13-17 completed an online questionnaire exploring problematic internet use, self-esteem, social isolation, parental involvement and online safety awareness, and The Catfish Test. Participants were asked to identify each profile as real or fake. The results of the study are discussed alongside implications for practice.

Introduction

"One day I just logged on and I got a friend request, so I accepted it. And that's how it all started"

– Jonathan, 13 (Whittle et al, 2014a).

The rise of social media has provided unlimited social contact, allowing people to connect from all over the world. In the UK, 71% of 12-15 year olds have a social media profile 85% own a Smartphone, and 74% take it to bed with them (Ofcom, 2020). However, with an estimated 80,000 sexual 'predators' online (Home Office, 2019), it is argued that children could be easily targeted for online predation (Ranguelov, 2010).

Prevalence of Online Grooming

Every three minutes, a child is sexually abused online (Internet Watch Foundation [IWF], 2020) with a 70% increase in police reports of online grooming over the last three years (National Society for the Prevention of Cruelty to Children [NSPCC], 2021). It is estimated that one in nine people under the age of 18 has experienced some form of sexual solicitation online (Madigan, 2018). Furthermore, out of 129 cases of a sexual offence against adolescents, 64% involved online contact with the victim for over a month prior to offending (Tener et al, 2015). Thus, online grooming offenders are known to develop a relationship with a child for the purposes of exploitation and abuse (Child Exploitation and Online Protection [CEOP], 2017). However, despite this research and investigation of internet crimes is limited compared to offline offending (Dozortseva & Medvedeva, 2019).

'Catfishing' as Bait

One of the ways online grooming offenders avoid detection is through the adoption of a false online persona. This practice, termed 'catfishing', allows online grooming offenders to disguise themselves, both as existing people and invented characters (Tener et al, 2015). 20-50% of online perpetrators employ some form of identity deception to build trust with adolescents (Bergen, 2014) lying about their age and gender and posing as a young person to allow interactions with under-aged users (Whittle et al, 2014a; Rashid et al, 2013; Ashcroft et al, 2015). This disparity between online and offline behaviour is known as 'the disinhibition effect' allowing individuals to be unidentifiable (Suler, 2005; Whittle et al, 2013a) whereby the perception of being anonymous online gave them more confidence in speaking to young people (Davidson et al, 2010).

Thus with 'catfishing' considered to be the leading cause of harm of any cybercrime (Ramalingam & Chinnaiah, 2018), the need for intervention is becoming increasingly pertinent. However, what remains unclear is what may contribute towards adolescent vulnerability to catfishing.

Adolescent Vulnerability Factors

Research has demonstrated that offline vulnerabilities can translate into online risk for adolescents (Whittle et al, 2013a) with the following factors proposed as vulnerability markers in adolescent social media users:

Problematic Internet Use

Research has demonstrated that the more risk-taking behaviours a young person has online, the more likely they are to experience victimisation (Ybarra et al, 2011). Examples of risk-taking behaviours may include: having multiple unknown online contacts, engaging in conversations with unknown online users, and engaging in sexual discussions and behaviours online (Whittle et al, 2013c). Moreover, prolonged and frequent social media use (i.e. talking for 2 hours or more), can lead to risk-taking behaviours, such as talking to strangers (Gómez et al, 2017) with the risk of online grooming victimisation being positively correlated with the amount of time spent online (Forni et al, 2020). In addition, problematic internet use has also been associated with an increased risk of online sexual solicitation (Rial et al, 2018).

Self-Esteem

Sociometer theory attributes self-esteem as the driving force in forming offline and online relationships (Liu & Zhang, 2016) whereby self-esteem is deemed to be determined by how much acceptance a person get from others (Burrow & Rainone, 2017). Individuals with low self-esteem may base their social decision making on acceptance (Anthony et al., 2007), and will seek out relationships where they feel accepted (Liu & Zhang, 2016). However, when low self-esteem is coupled with offline rejection this can act as a catalyst to online risk-taking (Lewis, 2020) whereby it is argued that online grooming offenders may seek out individuals with low self-esteem and use compliments and flattery to exploit them (Davidson et al., 2010). Samples of cybercrime victims show greater anxiety, low self-esteem, and poor body image compared to non-victims (Andrea & Álvarez-García, 2021; Kim & Chock, 2015).

Social Isolation

Alongside low self-esteem, social isolation is considered a risk factor to online grooming in adolescents (Davidson et al., 2010; O’Leary et al., 2017). Individuals who perceive

themselves as socially isolated may seek social support online, which can cause increased problematic social media use (Meshi & Ellithorpe, 2021). In interviews, online grooming offenders described their victims as “insecure”, “lonely” and “lacking adult contact” (Davidson et al, 2010), and in interviews with victims themselves, 63% gave loneliness as a reason for engaging with the offender (Whittle et al, 2014b).

Parental Involvement

Parental guidelines and supervision around internet use act as key protective factors to online grooming (Valcke et al, 2010), reducing the likelihood of befriending strangers online (Shin & Ismail, 2014). However, parents often show less vigilance about their children’s online activity and communication compared to offline (Whittle et al, 2013c). In a sample of adolescents, 42.7% reported arguing with their parents over spending too much time on devices, however, only 30% reported having limitations on their internet use (Forni et al, 2020). Adolescents with no parental control showed more frequent internet use and online risk-taking behaviour (Gómez et al, 2017) and only 47% of parents are friends with their children on Facebook (Pew Research Center, 2015).

Online Safety Awareness

Online safety education in schools is often the most popular tool used to communicate and protect against online risk-taking (Polanin et al, 2021). However, victims of online grooming described these lessons as insufficient in outlining the signs to look out for and others describe a lack of engagement with the curriculum, whilst some had not received internet safety education at all (Whittle et al., 2014b). Finally, although adolescents are aware of the risks of speaking to a stranger online, they show limited awareness of the use of fake profiles and deceit (Chiu & Quayle, 2022), increasing their vulnerability to such behaviours. Thus, it is possible that a lack of online safety awareness could predispose individuals to online victimisation. For example, previous studies have shown only 18% of children can correctly identify whether they were talking to an adult or a child (Rashid et al, 2013).

Thus, the aims of the current study were to explore how able adolescents were to identify catfishes online and to explore what factors may exist in relation to catfishing vulnerability in adolescents (aged 13-17) in order that suggestions could be made to better protect

adolescents from catfishing vulnerability. Exploratory analysis was undertaken to explore the prevalence of adolescents to differentiate between 'real' and 'fake' online. In addition, it was predicted that:

1. There will be a significant positive correlation between problematic internet use and social isolation with catfishing vulnerability.
2. There will be a significant negative correlation between self-esteem and online safety awareness with vulnerability to catfishing.

Method

Participants

Participants aged 13-17 were recruited through volunteer sampling on Facebook, Instagram, Twitter and TikTok (all sites with a minimum age requirement of 13 years). Participants were excluded from the study if they did not have a Facebook account or had a learning or intellectual disability that prevented them from consenting to or understanding the research without assistance, or if they had a severe mental disorder that may make participation distressing. Participants with previous experience of catfishing or online grooming victimisation were asked not to participate to protect them from harm (British Psychological Society [BPS], 2021).

Materials

Problematic Internet Use

Problematic Internet use was split into two factor loadings: Online Risk-Taking (using items from the EU Kids Online Survey (Livingstone et al, 2011) and Amount of Internet Use, with a total score range of 0-28.

Self-Esteem

Three items were used to measure self-esteem from the Young Minds Matter Adolescent Self-Esteem Questionnaire (Hafekost et al, 2017). A higher score indicates high levels of self-esteem, with scores ranging from -6 to +6.

Social Isolation

Measured using the Friendship Scale (Hawthorne, 2006) whereby a higher score indicates higher levels of social isolation. A third item “how many close friends do you have?”, with scores ranging from 0-3, was also used to measure social isolation, with a higher score indicating higher levels of social isolation. Scores for the total 3 items range from -4 to +7.

Parental Involvement

2 items measured parental involvement from the EU Kids Online Survey (Livingstone et al, 2011) alongside an additional question of “what rules/restrictions are in place?”. The response options for this are “time limits”, “limits on what information I can share”, “limits on what I can post” and “limits on who I can add/talk to online”. A third item of “are you friends with your parents/guardians on social media?” was measured on a scale of 0-2. This item was created in accordance with findings that having a parent as a friend on Facebook enhanced the parent-child relationship (Kanter et al, 2012). A higher score on all items indicates high levels of parental involvement, with total scores on all items ranging from 0-6.

Online Safety Awareness

3 items measure internet safety awareness: “people cannot hurt me online” (reverse scored) and “I am aware of the dangers of social media” and “have you ever received any online safety lessons”. Total scores range from -4 to +5, with higher scores indicating higher levels of internet safety awareness. These items were created in line with findings that not understanding the risks of social media can increase vulnerability to online grooming (Wood & Wheatcroft, 2020).

The Catfish Test

Created for the purposes of the study, The Catfish Test consists of eight Facebook profiles, four of which depict real social media profiles created by an authentic user, and four of which were created by the researcher. The real profiles belong to people known to the researcher and thus, can be confirmed as authentic. All users gave informed consent to having their profiles used in the study. For these profiles, the inspect element feature on Google was used to change their name and remove names of their Facebook friends,

location and any other identifying information. This is for the protection of the user so they cannot be contacted by participants after the study. For the fake profiles, the researcher created four Facebook accounts with each account adopting a fake persona. This was due to research findings that online grooming offenders often disguise themselves as teenagers to make contact with victims, passing off other user’s images as their own (Ashcroft et al., 2015; Bergen et al, 2014). Each fake profile used photos of real people (obtained from Shutterstock), a date of birth, and a first and last name from a random name generator to prevent researcher bias. For authenticity, additional fake Facebook accounts were created to leave comments and to tag the fake personas in posts, as these are elements young people look for when analysing Facebook profiles (Groenestein et al, 2018). The inspect element feature was also used to show posts as having more likes and reacts, and to change the date that posts were made to make them appear older. A real-life catfish could manipulate these features, either through websites and apps that increase the number of likes a user receives, or by creating multiple accounts themselves. Furthermore, two of the fake personas were shown to share lots of popular posts several times in a short space of time, as research has identified that fake profiles share others’ posts more and post more frequently (Gupta & Kaushal, 2017).

Each profile was presented to participants as a series of screenshots that could be scrolled through at their own pace. After viewing each profile, participants were asked if they knew the person depicted in the profile and if they believed the profile to be real or fake. For real profiles, a judgement of ‘real’ is scored as 0 and a judgement of ‘fake’ is scored as 1. This is reverse coded when a profile is fake. As such, the lowest possible score is 0 and the highest possible score is 8. A higher score on The Catfish Test indicates higher levels of catfishing vulnerability, as it demonstrates limited ability to distinguish real and fake profiles from each other.

Table 1: Characteristics of Facebook profiles used in The Catfish Test

Profile	Real or Fake?	Persona	No. of posts (shown to	No. of friends/followers	of Mean no. of likes per post
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1	Real	White, British, male, 22 years old	14	880	31.21	
2	Real	White, Ukrainian, female, 21 years old	5	Private	10	
3	Fake	White, British, male, 18 years old	14	631	31.79	
4	Fake	White, British female, 17 years old	18	233	14.83	
5	Fake	White, Ukrainian, female, 19 years old	13	Private	62.62	
6	Real	White, British male, 22 years old	2	169	11	
7	Real	Asian, Indian, female, 22 years old	20	910	16.95	
8	Fake	White, British, female, 14 years old	4	Private	15	

Procedure

All participants completed the survey on an online survey platform (Qualtrics, 2022). Participants were initially presented with the participant information sheet and asked to create a unique participant code that can be used to withdraw their data. Participants were then presented with the parent information sheet which they are asked to show to their parent/guardian. All participants had to confirm they had obtained parental consent on an assent form in order to proceed with the study. Participants then completed demographic characteristics of age and gender before being presented with the Adolescent Vulnerability Questionnaire to measure each independent variable. Following this, participants completed The Catfish Test, which was randomly ordered to prevent demand characteristics. Participants were debriefed at the end of the study. All participant facing

documents (i.e. information sheet, assent form, questionnaire and debrief) were verified as accessible to 13-17 year olds by an online readability test (ReadabilityFormulas.com).

Data Analysis

All analysis was conducted on SPSS Statistics (version 27). Each participant score on The Catfish Test was added to create a total score (catfishing vulnerability variable), and mean score was then created for the sample (scores of 4+ indicate high vulnerability). A multiple regression analysis with the 5 predictor variables and the dependent variable of catfishing vulnerability was then performed to test the hypotheses.

Ethics

Ethical approval was granted by the University Ethics Committee prior to recruitment. In accordance with ethical guidelines, all raw data was anonymised to protect participants' privacy and confidentiality (BPS, 2021).

Results

Data Cleaning and Preparation

Boxplot analyses revealed 1 outlier on the upper whisker for Social Isolation, 3 outliers on the lower whisker and 1 on the upper whisker for Internet Safety Awareness, and 3 outliers on the upper whisker for Parental Involvement. Mahalanobis distance analysis showed there were no multivariate outliers. 90% Winsorisation failed to remove outliers, and thus the original scores were used for the final analysis. Little's MCAR Test revealed Missing Completely At Random Data patterns ($\chi^2 (27) = 35.26, p = .132$) and listwise deletion was performed for all missing values, resulting in a total of 42 participants. Tests of normality produced a problematic negative skewness for Problematic Internet Use ($z = -2.03, p = .016$) and Internet Safety Awareness ($z = -2.25, p < .001$) and problematic positive skewness for Social Isolation ($z = 1.98, p < .001$) at the 1.96 cut-off level (Tabachnick & Fidell, 2013). Bootstrapping was performed on the multiple regression to overcome the violation of normality assumptions (Hesterberg, 2011).

Exploratory Analysis: Catfishing Vulnerability Scores

Through analysing descriptive frequencies/statistics, a mean score of 3.29 (SD = 1.22) was found for Catfishing Vulnerability across the sample. With scores ranging from 0 to 8, a score of 4+ was required to be considered high vulnerability. In the observed sample, scores ranged from 1-6 with the majority of participants scoring 3 or 4.

Table 2: Frequencies and percentages of scores on The Catfish Test

Score	No.	%
0	0	0
1	2	4.8
2	10	23.8
3	12	28.6
4	12	28.6
5	4	9.5
6	2	4.8
7	0	0
8	0	0

Hypothesis Testing: Multiple Regression Analyses

A bootstrapped multiple regression using 1000 bootstrapped samples was conducted to determine whether problematic internet use, self-esteem, social isolation, internet safety awareness and parental involvement were predictors of catfishing vulnerability. The regression model was a significant improvement over the no effects model [$F(5, 36) = 2.48$, $p = .05$] and accounted for 50.6% of variation in catfishing vulnerability scores ($R^2_{\text{adjusted}} = .26$). No significant predictors were found.

Table 3: Multiple regression with bootstrapping for the effects of risk factors on catfishing vulnerability

	B	95% BCa CI	SE (B)	β
Problematic Internet Use	.08	-.02 to .19	.05	.24
Self-Esteem	-.05	-.25 to .12	.10	-.06

Social Isolation	-.01	-.23 to 0.25	.12	-.01
Internet Safety Awareness	-.39	-.79 to -.03	.21	-.37
Parental Involvement	.27	-.01 to 0.54	.16	.25

Discussion

This study investigated how successfully adolescents can identify false online personas (catfishes) and what factors influence vulnerability. Whilst previous literature has focused on online grooming, this study specifically focused on catfishing as a facilitator to online child sexual exploitation. Overall, results indicated that participants did not demonstrate high levels of catfishing vulnerability. Furthermore, the factors problematic internet use, low self-esteem, social isolation, lack of parental involvement and lack of online safety awareness did not predict catfishing vulnerability.

To the researcher's knowledge, this is the first study to investigate catfishing vulnerability as a precursor to online grooming. Research has consistently demonstrated the use of catfishing as a method employed by online grooming offenders to gain access to potential victims (Whittle et al., 2014a; Rashid et al., 2013; Ashcroft et al, 2015). This, alongside research detailing the specific vulnerability markers to online grooming, formed the basis of the current study. Whilst research suggests catfishes are widespread on social media, and mostly go undetected (Tsikerdekis & Zeadally, 2014), these results suggest adolescents are perceptive to the signs of a fake online persona. This was unexpected given previous findings that adolescents cannot identify whether they were conversing with an adult or a child (Rashid, et al., 2013). In light of these findings, it could be interpreted that these assumptions are premature given the limited research focus on catfishing vulnerability. Thus, additional research is needed to determine whether adolescents can effectively identify catfishes online.

Likewise, the vulnerability markers associated with online grooming, such as problematic internet use (Rial et al., 2018), low self-esteem (Andrea and Álvarez-García, 2021; Kim & Chock, 2015; Davidson et al, 2010), social isolation (Davidson et al., 2010; O'Leary et al., 2017), lack of parental involvement (Valcke et al, 2010) and lack of online safety awareness

(Polanin et al, 2021; Chiu & Quayle, 2022) did not emerge as significant predictors of catfishing vulnerability.

Limitations

The findings of the current study should be interpreted within several constraints. Firstly, the study was limited by its sample size. 107 participants commenced the study, but only 42 completed it. This may have been due to the length of design of the study. Research into adolescent news consumption revealed teenagers spend little time clicking on and engaging with content (Boczkowski et al., 2017). As such, the news becomes undifferentiated from the other media they are consuming. Further, research has suggested social media advertisements require repeated viewings before users interact with them, thus the current study may have been limited by its ability to reach the desired population on numerous occasions (Arigo et al, 2018). Future research may consider recruiting participants in person (i.e., through schools, colleges and youth groups), as participants are more likely to be in a mindset to learn and engage (Bartlett et al, 2017).

Furthermore, The Catfish Test used was developed for the current study, and as such requires more research testing to establish it as a reliable measure of catfishing vulnerability. Future researchers may develop and refine the measure further to improve reliability in order to provide a more conclusive picture of catfishing vulnerability.

Implications for Future Research

The findings of the current study should be placed within the broader context of online grooming prevention and protection of under-aged social media users. Interesting findings did emerge from the descriptive statistics of the data collected. The mean score for problematic internet use was 15.76 out of a potential 28+, suggesting high levels of problematic internet use within the sample. The data revealed 38.6% of the sample used social media for more than 5 hours a day. Overall, this suggests high levels of social media use and supports previous research that 20.8% of adolescents use social media for more than 5 hours a day (Scott et al., 2019). Whilst these findings did not suggest higher rates of catfishing vulnerability in this sample, high levels of social media use is associated with other risk factors such as cyberbullying, body dissatisfaction, poor mental health (Bányai et

al, 2017), self-harm and suicidality (Abi-Jaoude et al, 2020). Research suggests these individuals should be targeted by school-based intervention (Bányai et al, 2017).

For self-esteem, the sample showed a mean score of -1.16 (SD=1.73), with scores ranging from -6 to 6 indicating low levels of self-esteem for this sample. Additionally, males showed slightly higher scores for self-esteem (mean= 0, SD= 2.12) compared to females (mean= -1, SD= 1.73), which mirrors previous findings that girls display more negative attitudes towards themselves (Minev et al., 2018). Although self-esteem did not emerge as a significant predictor of catfishing vulnerability, it has been continually identified as a vulnerability marker by both victims and perpetrators of online grooming (Davidson et al., 2010), suggesting more research is needed to determine whether the results of this study are anomalous or indicative of a wider research narrative.

Social isolation scores revealed a mean of 0.28 (SD= 1.62), with scores ranging from -4 to 7 indicating low levels of social isolation across the sample. 45.5% of the sample had 2-5 close friends, with only 1 participant having no close friends. This supports the literature that only 2% of teenagers have no close friends (Pew Research, 2018). However, our findings did not identify social isolation as a significant predictor of catfishing vulnerability, suggesting research should consider alternative vulnerability markers.

Finally, low levels of parental involvement and online safety awareness were expected to predict high catfishing vulnerability, as evidenced by previous research of their association with online grooming victimisation (Gómez et al., 2017; Chiu & Quayle, 2022). Consistent with previous findings, 65.9% of participants said their parents did not have any rules about their social media use (Forni et al., 2020). For internet safety awareness, 81.8% had received online safety lessons, with 80.6% citing school as the place they received lessons. Whilst there was no association between parental involvement and online safety awareness and catfishing vulnerability, this could suggest these measures are ineffective as their intended purpose is to decrease vulnerability. As such, future research should consider the effectiveness of parental and school-based intervention on a child's safety online and should suggest methods of improvement.

Conclusions

In summary, the current study tested the extent to which adolescents could distinguish between real and fake Facebook profiles and the significance of problematic internet use, self-esteem, social isolation, parental involvement, and online safety awareness as predictors of catfishing vulnerability. Whilst no significant predictors emerged within the sample, this was the first study to investigate adolescent ability to identify fake profiles, and the markers of vulnerability to catfishing. Despite shortcomings in the sample size and reliability of measures used, this study presents a unique research focus that should be further explored to provide a more complete picture of catfishing vulnerability, which could in turn, aid in the protection of teenagers online.

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