The effect of privacy concerns, interaction, trust, age, and gender on self-disclosure behaviours on social networking sites

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Abstract— **Social networking sites (SNSs) are typically associated with positives such as making friends, they also function on a model that involves a security-threating behaviour called user self-disclosure. Despite numerous efforts to understand the motivation behind self-disclosure on social networking websites, factors influencing this phenomenon are still not fully understood. The data for this study was collected through an online questionnaire that was completed by 95 participants. Results from Spearman's correlation, One-way ANOVA, and Student's t-test suggest that privacy concerns, interaction, social trust, trust in the social networking site provider, and gender are significant in predicting self-disclosure on SNSs. The results also show no significant differences in self-disclosure between different age groups, suggesting age as not being a predictor.**

Keywords—self-disclosure, privacy, social networking, privacy concerns, trust, age, gender, interaction

I. INTRODUCTION

Social networking sites (SNSs) have grown in popularity over the last two decades and are currently used as a preferred method of communication by millions of individuals, allowing them to construct their profiles, interact with real-life friends, and connect with unknown peers. Despite these apparent advantages, they also open the possibility of personal information reaching unwanted audiences [1]. The most commonly disclosed personal information in these online settings include location, phone number, interests, and education information, and other biographical and demographical attributes [2]. Such disclosures could pose a threat to the privacy and security of the discloser.

While the personal information disclosed on these platforms can be used to perform social reconnaissance at a harmless level, threat actors such as hackers can utilise the same information to piece together a potential victim's life. By conducting reconnaissance on SNSs, hackers can exploit information regarding a user to construct believable social engineering attacks [3], or even authenticate into a user's various accounts by leveraging the gained information to bypass the accounts' security questions [4]. Indeed, when they disclose the information related to their organization, role, experience and projects, a user would make themselves an ideal target of spear phishing attack for the threat actors who intend to target the user's organization. The value of the target is high if the user plays critical roles such as IT administrator and CFO. Apart from revealing sensitive information about

themselves, [5] adds that, on SNSs, people also often reveal sensitive personal information about others, leaving themselves and their close ones more vulnerable to identity theft as a result of the misuse of the information gleaned from their profiles.

With SNSs becoming a crucial attack vector, it is important to investigate the factors that influence people to self-disclose on these websites. Although numerous academics have explored the effects of privacy concerns, interaction, trust, gender, and age on self-disclosure on SNSs, some of the previous research has yielded opposing results. By discovering the real effect of the above factors on self-disclosure, it is possible to predict these security-concerning behaviours and even develop better security awareness training. The aim of this paper is to investigate the effect of privacy concerns, interaction, trust, gender, and age on self-disclosure on social networking websites.

The remainder of the paper is as follows: section 2 reviews existing research in the self-disclosure on SNSs domain. The research methodology is presented in section 3. The results are given in section 4; while the hypothesis testing and discussion are offered in sections 5 and 6. Section 7 concludes the paper.

II. LITERATURE REVEIW

A. Privacy Concerns

Privacy concerns represent the users' level of concern about the threats to their privacy, which are implied by online environments, specifically SNSs. Several studies have specifically focused on the impact of privacy concerns on self-disclosure behaviours on SNSs. [6] examines the relationship between undergraduate students' disclosure behaviours on Facebook and Myspace and their privacy concerns and fear of uninvited audiences via questionnaires; they discovered that the students handled their privacy concerns by altering the visibility of the information posted, instead of decreasing their levels of self-disclosure. It concluded that privacy concerns had little to no relation to information disclosure on SNSs. Similarly, [7] identify that the users' general privacy concerns were not manifested in their self-disclosure behaviours.

In comparison, multiple studies have highlighted a strong relationship between privacy concerns and general self-disclosure online and on SNS [8][9]. For instance, [10] investigate the effect of online privacy policy, privacy concerns, and trust on the willingness to provide personal information on websites. Using an online questionnaire and

500 participants from both Russia and Taiwan, it was possible to identify a significant negative relationship between privacy concerns and the willingness to self-disclose online.

B. Interaction

Interaction refers to the extent to which SNSs users engage with each other's self-disclosed information through different SNS specific actions. The interaction capabilities granted by SNSs have always been one of the greater benefits that encourages consistent usage. Although these capabilities can have positive effects on users, research has revealed possible correlations between the amount of interaction a SNS user receives on their divulged information and their self-disclosure tendencies.

[11] recognise that interaction on social networking websites provides opportunities for users to self-disclose, in order to increase their social capital. [12] identify that the type and frequency of interaction with other SNS users positively affects the trust the user has in them. [13] outline the strong relationship among social interaction, social rewards, and self-disclosure on SNS. As self-disclosure can stimulate social interaction, it might result in positive feedback that the SNS user perceives as social rewards. [9] suggest that SNS users engaging in more interaction are more likely to disclose personal information, as a result of the high amounts of enjoyment provided by participating in those interactions.

C. Trust

Research focusing on factors influencing personal information sharing on social-networking sites has pointed to trust as being one of the predictors for this phenomenon. [10] explore the effect of websites' privacy policies on self-disclosure, discovering that the relationship between trust in the SNS provider and willingness to self-disclose is significant. Also the content of the privacy policies of a website can dictate the users' personal information sharing behaviours, as it can influence the users' trust in the provider and platform. [14] report similar findings, confirming that trust has a positive impact on self-disclosure on social media sites. They argue that the higher the confidence in the ability of the social media provider to protect the privacy of their account, the more the individual's willingness to share personal data increases. Apart from trust in the SNS provider, [13] identify an additional dimension for trust that can have similar effects on self-disclosure: trust in SNS members. The research of [15] also considered trust as a two-dimensional variable and discovered that the more an individual believes that other SNS users are trustworthy, the more they feel comfortable and willing to share personal information.

D. Age

Research shows that age has a direct negative effect on the amount of personal information users disclose on SNS. [16] demonstrate an exhaustive study about self-disclosure, in a Canadian Facebook community. Their findings pointed towards the following tendency: as the users' age increased, the amount of information on their personal profile decreased. [17] explore the differences and similarities in self-disclosure on Facebook between the adolescents and adults. While the results supported the idea of age having a negative effect on self-disclosure, they also highlighted important behavioural aspects that were specific to one group only, particularly the adolescents group. The tendency was that, as the age increased within the age group, the likelihood of self-disclosure on Facebook amplified. [18] investigate personal information sharing patterns, related to the age and gender of the users, on a popular social network in Russia; they suggest that while self-disclosure decreases with age, the speed of the decrease slows down after the age of 30.

E. Gender

According to [19], females generally use SNSs and instant messaging more often than males, and therefore, it is likely that they self-disclose more. The research of [20], which investigates self-disclosure on Twitter, suggesting that females are generally more willing to disclose personal information than males. The study involved analysing 3,751 tweets, in order to discover the nature and factors influencing self-disclosure. One of the findings was that women did, in fact, present more tweet disclosure. The study of [21] attempting to connect users' motives for using Facebook to their levels of self-disclosure, discovered that, in terms of type of information disclosed, males were more likely to share general contact information than females. Nonetheless, women were posting more family photos and photos with emotional expression. Similarly, [6] indicates that women were more likely to disclose information such as their favourite books and music and their religion, whereas men disclosed their phone number and address more freely.

F. Summary

As shown in this section, five factors, i.e. privacy concerns, interaction, trust, age and gender, affect the amount of self-disclosure that users engage in on SNS. Also, its shows major gaps in the research. Firstly, the literature on the impact of factors such as privacy concerns showed that there are contradicting views regarding the actual effect of them on self-disclosure on social media. Secondly, the majority of the studies seem to only focus and test one, two, or three of the identified factors. Therefore, this paper will address the five factors previously discussed simultaneously.

III. RESEARCH METHODOLOGY

As the goal of this study is to discover the impact of certain characteristics on self-disclosure in SNSs, it is critical for hypotheses to be formed in order for them to be tested during the primary research. Therefore, six one-tailed hypotheses are proposed:

- H1 Privacy concerns have a negative effect on the self-disclosure of personal information on SNSs.

- H2 Interaction has a positive effect on the self-disclosure of personal information on SNSs.

- H3 Social trust has a positive effect on self-disclosure on SNSs.

- H4 Trust in the service provider has a positive effect on self-disclosure on SNSs.

- H5 Age has a negative effect on the amount of self-disclosure of personal information on SNSs.

- H6 People who identify with the female gender engage more often in the self- disclosure of personal information on SNSs.

The primary research of this study was conducted using a quantitative methodology. It provides an opportunity for the researcher to prove or disprove a hypothesis by performing statistical techniques. For data collection, an online questionnaire which was created using Google Forms was

used. The questionnaire consists of four sections. The first section included the information sheet that informs the participants about the study's aims, confidentiality policy, and ethical implications. The second section contained a series of closed-ended demographic questions that were aiming to collect participant information such as age, gender, level of education, and even most used social networking platform. The third section included questions in relation to the participant's self-disclosure behaviours. The final section was comprised of a series of questions regarding the participant's privacy concerns, interaction, and trust views. Due to the nature of the topic, the participants were required to be at least 18 years old and use social media. The questionnaire was shared through multiple means, including authors' own institution, social media, and personal contacts, in order to gain as many valid responses as possible.

IV. RESULTS AND ANALYSIS

In total 95 participants completed the survey. 44.2% of the participants were between 18 and 24 years old, followed by 18.9%, 13.7%, 11.6% and 11.6% for 35-44, 45-54, 25-34 and 55+ respectively. It was expected that the majority of the participants would be young due to the average age of students in universities in the UK. The proportion of male and female participants were similar: 48.4% for male vs 45.4% for female; while the rest were identified as non-binary. For education level, almost half of the participants (i.e. 48.4%) had Bachelor's degree. This is closely followed by "College or equivalent" studies with 34.7%, and 14.7% for people that have completed a post-graduate degree. 2.1% of the participants only completed secondary school or the equivalent. In terms of relationship status, two thirds (i.e. 67.4%) of the participants were either married or in a relationship; while 22.1% were single, whereas 10.5% marked their relationship status as "divorced". In terms of social networking platform usage, Facebook, Instagram, X, and TikTok were 34.7%, 22.1%, 12.6% and 10.5% respectively. The usage of the other 4 platforms, namely Reddit, Snapchat, Tumblr and LinkedIn, was significantly less, with less than 8% each. When asked how often they use their chosen social networking platform, 72.6% of the participants reported that they use it at least once a day, and 23.2% of the participants reported that they use their chosen platform several times a week. Only 3.1% of the participants reported that they use their chosen social networking platform once a week and 1.1% said that they only use it around once a month.

A. Self-Disclosure levels

The participants were asked to indicate their frequency of self-disclosure of different types of personal information on their favourite social networking site using a 5-point Likert scale as shown in Figure 1. Only a quarter of the participants (24/95) claimed they never posted pictures/videos or write about their work and/or education on their favourite social networking site; in comparison, almost a third (30/95) shared those information several times per month. In terms of self-disclosure regarding family and/or friends, only 11% (10/95) of the respondents declared that they never post pictures/videos or write about their family members or friends whilst majority did. When discussing about one's whereabouts, almost a third respondents (30/95) answered that they never share this kind of information; for those who did, they shared the information at least several times a year. For posting pictures/videos or writing about their hobbies or interests, two fifths said that they did it several times in 6

months; in contrast, only 15% never shared this kind of information. When asked how often they post pictures/videos or write about events in their lives or updates, just over one fifths (21/95) responded that they never post this kind of information several times a year. Surprisingly, there were 0 respondents to report that they post this kind of information several times per week. Lastly, when asked how often they post pictures/videos or write about their feelings or emotions, almost one thirds reported that they never post this kind of information; also, less participants shared this type of information when the frequency increases.
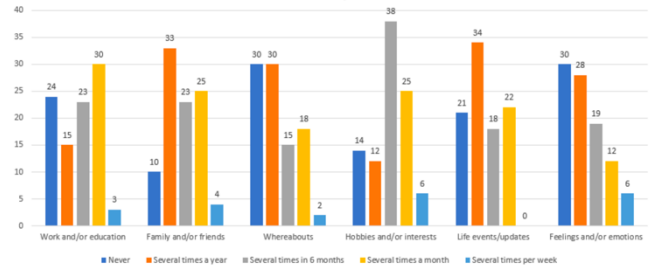

Fig. 1. Self-disclosure frequencies of participants

B. Privacy Concerns

The participants were asked to use a 5- point Likert scale to convey how strongly they agreed with 5 specific statements regarding their privacy concerns with 1 indicating a strongly disagree and 5 strongly agree. As shown in Figure 2, the respondents were concerned the most about the SNS provider using their personal information for purposes that they are not aware of. The respondents had, on average, moderate privacy concerns when asked whether they were concerned that if they posted personal information on social media, other people could use it against them. Moderate levels were also reported when asked how concerned the respondents were that unauthorised people could access their personal information and that other people could find private information about them on social networks. The respondents expressed the lowest levels of privacy concerns when it came to the personal information they share on SNS being misused.
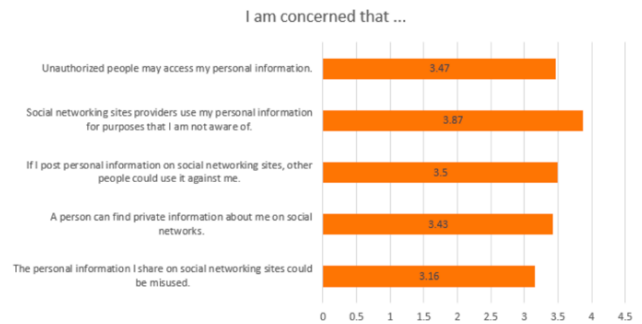

Fig. 2. Participants' average privacy concern scores

C. Interaction

The participants were asked to use a 5-point Likert scale to convey how strongly they agreed with 4 statements regarding their interaction on SNSs. As shown in Figure 3, receiving reactions such as likes on their posts from other social networking site members was the kind of interaction the respondents enjoyed the most, followed by receiving positive comments on their posts from other members. Moreover, having their posts shared by other members of their favourite SNS was the third most enjoyed kind of interaction on SNSs.

The least enjoyed activity had to do with the participant actively seeking out additional information and statistics about the engagement on their social media profiles.
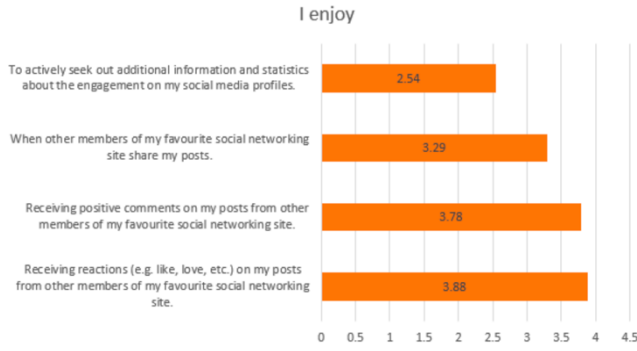

Fig. 3. Participants' average interaction scores

D. Social Trust and trust in SNS provider

The participants were asked to use a 5-point Likert scale to convey how strongly they agreed with 4 statements related to their trust in the SNS provider and the average SNS member. As shown in Figure 4, the respondents believed the most that the privacy of their personal information is actively protected by the SNS provider. However, the trust in the SNS provider score for this statement was moderate. On average, the respondents presented equal trust scores when asked how much they believed that the SNS provider cared about the wellbeing and privacy of their users, and was trustworthy. The least trust was reported when the participants were asked how much they believed that the networking site provider will not misuse their personal information for their own monetary benefits.
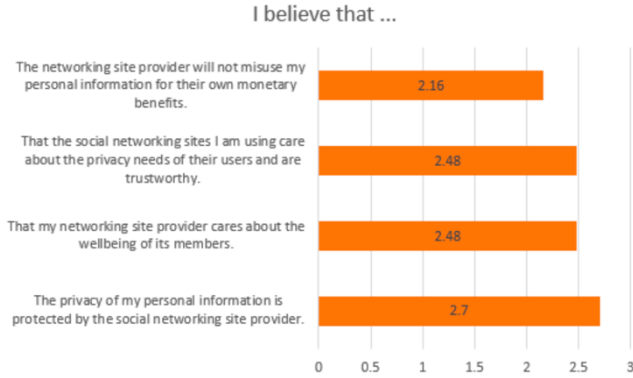

Fig. 4. Participants' average trust in the SNS provider scores

Figure 5 portrays the respondents' average social trust scores for each statement. The participants had a slightly higher trust in the fact that the average member of their favourite SNS is honest when dealing with others. However, this social trust level was still moderate. The participants also reported similar levels of social trust when asked how much they believed that the average member on their favourite social networking site was trustworthy, cared about the wellbeing of other members on the site, and was open and receptive to other people's needs. When it comes to how much the respondents believed that the average member would do their best to help them, the average social trust level was still moderate, but lower than the others.
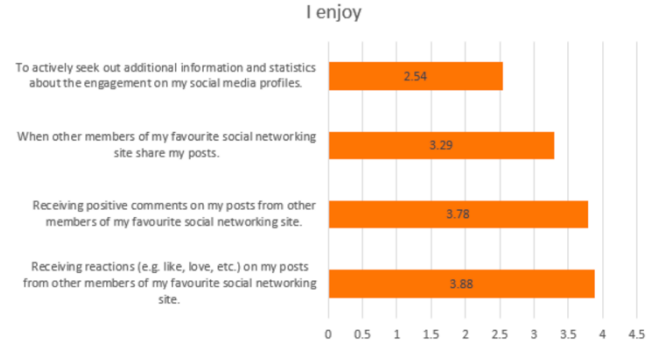

Fig. 5. Participants' average social trust scores

V. HYPOTHESIS TESTING

The Spearman's correlation coefficient was used to check the directional correlations between the self-disclosure levels and the other four variables in the study, namely privacy concerns, interaction, social trust and trust in the social networking site provider (H1,H2,H3,H4). As shown in Table 1, there was a moderate negative and significant correlation between the self-disclosure and privacy concerns, $r = -.489$, $p < .001$. As $p<.05$, the null hypothesis (H0) was rejected, and H1 was supported. Therefore, as the privacy concerns of the social networking site members increase, the amount of self-disclosure decreases. For self-disclosure and interaction, there was a moderate positive and significant correlation: $r = .375$, $p < .001$. The null hypothesis (H0) was rejected ($p < .05$), and H2 was confirmed. Thus, as the interaction of the social networking site members increases, the self-disclosure levels of those members moderately increase as well. There was a moderate positive and significant moderate positive correlation between the social trust and the self-disclosure levels, $r =.397$, $p < .001$. The null hypothesis (H0) was rejected ($p < .05$), and H3 was supported. This means that, as the social trust of the social networking site members increases, the amount of self-disclosure moderately increases as well. There was moderate positive correlation between the trust in the social networking site provider and the self-disclosure levels, which was also statistically significant, $r =.402$, $p < .001$. With $p < .05$, the null hypothesis (H0) was rejected, and H4 was supported. Therefore, the findings show that, as the trust in the SNS provider increases, the amount of self-disclosure of that social networking site member also moderately increases.

TABLE I. RESULTS OF THE SPEARMAN'S CORRELATION BETWEEN SELF-DISCLOSURE AND USER'S CHARACTERISTICS

	Self Disclosure	
	Correlation Coefficient	Sig. (1-tailed)
Privacy concerns	-.489**	<0.001
Interaction	.375**	<0.001
Trust in member	.397**	<0.001
Trust in SNS provider	.402**	<0.001

**. Correlation is significant at the 0.01 level (1-tailed)

The One-way ANOVA test was performed to compare the self-disclosure mean levels of the 5 different age groups that the study gathered data from (H5). The test revealed that there was not a statistically significant difference in the mean self-disclosure scores between the 5 groups, $F(4,90) = 1.73$, $p = 0.15$. Since $p > .05$, the null hypothesis (H0) is accepted, which means that H5 is not supported. Therefore, age has little

effect on the amount of self-disclosure of personal information on SNSs.

Due to the limited sample size when it comes to participants that identified themselves as non-binary, it was not possible to effectively perform an analysis for this category. Therefore, a scholar's t-test was only conducted to compare the self- disclosure levels of males and females with 46 and 43 participants respectively. Since H6 was a directional hypothesis, a one-tailed independent t-test needed to be conducted. The assumption of homogeneity of variances was tested using Levene's F test and the variances were significantly different, $F(82.29) = 4.98$, $p=.028$ ($<.05$). The one-tailed independent sample t-test was associated with a statistically significant effect, $t(82.29)=2.23$, $p=0.014$. As $p<.05$, the null hypothesis (H0) was rejected, and H6 was supported. Therefore, people that identify with the female gender had statistically larger levels of self-disclosure when compared to the male sample.

VI. DISCUSSION

The current study focused on identifying the impact of the following factors - privacy concerns, interaction, trust, age and gender, on self-disclosure on SNSs. The results of the t-test, One-way ANOVA, and Spearman's correlation accepted 5 out of 6 hypotheses tested. Privacy concerns, interaction, social trust, trust in the social networking site provider, and gender were indicated as being significant in predicting self-disclosure on SNSs. However, there were no statistically significant differences in the self-disclosure levels between various age groups, which suggests that age is not a predictor of self-disclosure.

In line with previous research [8][9], this study indicated that privacy concerns have a significant negative effect on the amount of personal information a person discloses on SNSs. SNS users are concerned about the data they post being misused by unauthorised people or even the website provider, which makes them less likely to engage in self-disclosing behaviours. In a study by, a similar hypothesis was confirmed. While they identified a significant negative relationship between privacy concerns and the willingness to self-disclose online, the study also suggested that the content of the privacy policies of a website could diminish a person's privacy concerns and subsequently influence how a person interacts with a website when asked to provide personal information. Although this paper does not discuss privacy policy as an affecting variable, in the future it would be interesting to use privacy policy as a moderating variable within the relationship between privacy concerns and self-disclosure on SNSs.

In relation to previous research findings [11], the current study found that interaction has a significant positive effect on self-disclosure on SNSs. The results suggest that receiving reactions, as well as positive comments on a person's social media posts moderately increases their likelihood of self-disclosure. These findings are also fitting with the results of [22], who discovered a reciprocal effect between self-disclosure and interaction. Basing their work on the Social Cognitive Theory, they argue that online self-disclosure produces stimuli in the shape of personal information, which then attracts social rewards such as positive reactions to the divulged information [22]. In turn, these rewards influence people to self-disclose more, as they try to achieve even higher levels of enjoyment.

Social trust seems to positively influence the amount of self-disclosure SNS members engage in. Our findings indicate that believing that other SNS members are honest, and that they care about the wellbeing of others and are receptive to their needs, increases the likelihood of self-disclosure on SNSs. The findings are in line with the previous studies of [13] and [15]. A possible explanation for these results can be found in the study of [23], which discusses trust as a factor that reduces the perceived risks associated with the act of disclosure of private information.

Trust in the SNS provider was also found to have a moderate and positive relationship with the act of self-disclosure on SNSs: where the more the SNS members believe that their SNS provider actively protects their data, does not misuse it, is trustworthy, and cares about their wellbeing, the more the SNS members self-disclose. Our findings are consistent with the results of [10], [14] and [15] who underlined a similar relationship between the two variables.

With regards to age, this study reveals that age seems to not affect the level of self-disclosure on SNSs. This finding is in contrast to the results of [16], [17], and [24], who discovered a negative correlation between age and personal information disclosure. As it was expected to either confirm our hypothesis or discover a positive correlation between age and self-disclosure, finding insignificant results was surprising and unexpected. [25] emphasise that statistically insignificant results are often caused by modest sample size, which could have also been the case in this study. Having 95 participants might have not been enough to highlight the relationship between age and self-disclosure and might have undermined the internal and external validity of the study [26].

Gender was found to have an effect on self-disclosure on SNSs. The results indicate that people that identify with the female gender have, on average, a higher level of self-disclosure on SNSs. This finding is consistent with the previous research of [20]. Although our study attempted to also address the self-disclosure levels of non-binary people, the limited number of participants identifying themselves as non-binary did not allow an effective analysis.

VII. CONCLUSION

This study contributes to the existing body of knowledge about SNS self-disclosure by providing insights into the numerous factors that can be utilised to predict this security-concerning online behaviour. The results gathered could be used to inspire further awareness-raising efforts that focus on the risks of self-disclosure on SNS and specifically on the SNS users. It could also contribute to clarifying exactly which characteristics in the user should be targeted for improvement, so that more focused efforts on educating people can be done.

Future studies are encouraged to investigate the interrelationship between the factors identified in this study, for example the effect of privacy concerns on the trust in the SNS provider. Another area of future research that was identified when conducting the secondary research was the effect of privacy policy as a moderating variable within the relationship between privacy concerns and self-disclosure on SNS.

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