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Are you a cyberbully on social media? Exploring the personality traits using a fuzzy-set configurational approach

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Abstract

Cyberbullying behavior (CB) on social media is complex because its perpetrators exhibit varied demographic characteristics and personalities. Prior studies have applied Big Five (Big5) and Dark Tetrads (Dark4) personality traits (PTs) along with demographic attributes, using symmetrical modelling, but revealed mixed and inconsistent results. This paper applies an asymmetric modelling approach using complexity and configurational theories to develop configurations of PTs and demography to predict CB. The online survey data have been analyzed using fuzzy set qualitative comparative analysis (fsQCA) technique. Regarding Big5 PTs, our findings reveal that, for instance, people scoring high in conscientiousness, neuroticism, openness and low in agreeableness undertake cyberbullying. For Dark4 PTs, the combination of either psychopathy and sadism or Machiavellianism and psychopathy leads to cyberbullying. As for demographic attributers, educated young married people, irrespective of gender, are likely to commit cyberbullying. Our all-inclusive model reveals that social media bullies, regardless of their gender, marital status, and social media experience, are young, educated, neurotic, conscientious, psychopathic, and sadistic with high Machiavellianism and low agreeableness. Further, we suggest configurations to reduce cyberbullying. The findings are discussed with implications for theory and practice.

Keywords: cyberbullying, social media, Big Five personality traits, Dark Triads/Tetrad, fsQCA

Highlights

- Asymmetric configurations of personality and demography can explain cyberbullying.
- High psychopathy and education are necessary conditions for cyberbullying.
- Persons with low psychopathy are less likely to commit cyberbullying.

1. Introduction

As the world becomes more digitally connected, social media use increases along with cyberbullying (Suciu, 2021). Cyberbullying refers to any harassment (e.g., cyberstalking) that uses digital communication technologies to disseminate offensive content (e.g., text, image, comment, rumor, gossip, and personal or private information) about a person to humiliate them (Stopbullying.gov, 2021). Cyberbullying is a global concern (Jang, Kim, & Jung, 2016), where around 34 % social media users worldwide (Kuadli, 2021) and 44 % in the U.S. (Security.org, 2022) experience it. Cyberbullying may cause physical (e.g., insomnia) and mental health issues (e.g., feelings of stress and anxiety and drug consumption) as well as lower self-esteem (Treebold, 2018). Victims of cyberbullying are more likely to cause self-harm (e.g., Cook, 2021), including suicide attempts and suicides (Broderick, 2013, Jang et al., 2016, O'Brien, 2018).

Antisocial behavior on social media, including cyberbullying, is often explained with personality traits (PTs) because “users’ personalities can be effectively used to improve detecting bullying patterns online” (Balakrishnan, Khan, Fernandez, & Arabia, 2019, p. 255). Understandably, two prominent PT theories are commonly applied. First, studies apply Big Five (hereafter “Big5”) PTs but suggest inconsistency (e.g., Balakrishnan et al., 2019; Howard, Zolnierok, Critz, Dailey, & Ceballos, 2019; Mitsopoulou & Giovazolias, 2015) the second school of thought applies Dark Triad (Dark3) PTs, which includes Machiavellianism, psychopathy, and narcissism. Lately, sadism has been added with triads to form Dark Tetrad (Dark4). The literature review of Moor and Anderson (2019) suggests Dark4 as an effective lens to understand cyberbullying behavior (CB). However, empirical studies again provide inconsistent effects of Dark4 on cyberbullying (Baughman et al., 2012, Buckels et al., 2014). Meanwhile, CB is explained with demographic variables; however, the absence of a consensus is observed here too. For example, Wong, Cheung, and Xiao (2018) assert that cyberbullying is completely gender-driven because males and females behave differently. More specifically, cyberbullying is commonly attributed to males (Howard et al., 2019), whereas Katz et al. (2014) argue that it is gender-irrespective. Further, Gorman (2019) suggests that a person of a lower academic background is likely to commit cyberbullying, whereas Nicol (2012) claims that a non-ignorant but well-educated person can do the same. The recent literature review of Chan, Cheung, and Lee (2021) provides the following summary: “The studies yielded inconsistent findings regarding the effects of sociodemographic properties such as age and gender on bullying” (p. 9).

The fundamental problem of such inconsistencies stems from ignoring the complexity of cyberbullying; thus, examining the net effects of its antecedents does not explain this phenomenon entirely. Moreover, humans possess unique combinations of traits that do not work in isolation. In a complex world, one factor is rarely sufficient to explain people’s behavior; rather, a configuration of factors is extremely likely. For example, high perceived ease of use, usefulness, compatibility, and income as well as low perceived risk combinedly lead to high use of mobile banking app, irrespective of the users’ age (Veríssimo, 2016). In our case, for example, a cyberbully may be a family person (married and a parent) who is well-educated and employed (in white-collar job), and (not lonely but) with hundreds of (online) followers (Gorman, 2019). Different combinations of attributes suggest more plausible and consistent solutions than the net effects of the attributes (March, 2019). Against this backdrop, this study investigates the following primary research question: “Which configurations of Big Five and

Dark Tetrad personality traits with offenders' demographic attributes explain cyberbullying on social media?" We draw from complexity and configurational theories (Rihoux & Ragin, 2008; Woodside, 2017), to propose a complex and holistic model for investigating CB by integrating Big5 and Dark4 PTs with demographic variables in a single framework.

Contrary to linear regression modelling applied in prior studies on the same domain (e.g., Fernández-del-Río, Ramos-Villagrasa, & Escartín, 2021), this study employs an asymmetric and configurational modelling to examine causal configurations (recipes) of the antecedent factors (i.e., conditions) accounting for the outcome variable, CB. Survey data obtained from the MTurk online platform have been analyzed with the fuzzy set comparative qualitative analysis (fsQCA) method, which is considered appropriate for complex configuration analyses (Ragin, 2000).

Our results find that asymmetric configurations of PTs and demographical attributes can explain CB. For example, considering Big5 PTs, high conscientiousness is necessary for cyberbullying, while low agreeableness and high neuroticism and openness are sufficient conditions. Regarding Dark4 PTs, psychopathy is necessary, and its combination with sadism sufficiently predict cyberbullying. With respect to demography, a young married person who is essentially educated is susceptible to committing cyberbullying. Combining personality and demography, the male, educated, and married social media users having less agreeableness but high conscientiousness, Machiavellianism, psychopathy, and sadism are likely to commit cyberbullying.

This study contributes to the current knowledge of cyberbullying literature in several ways. First, contrary to symmetric approaches, this study takes an asymmetric approach by developing and validating a complex model by integrating three sets of dimensions—demography, Big5, and Dark4 PT—leading to cyberbullying. Specifically, supported by the key tenets of complexity theory, we claim that cyberbullying is a 'causally complex' phenomenon where the ideal combinations of demographic attributes with Big5 and Dark4 PTs are required both for high and low CB.

Second, the use of complexity theory in cyberbullying literature is unique, which assists us in identifying complex configurations of the drivers of cyberbullying. These ideal combinations of influencing mechanisms result in a configurational theory of cyberbullying (Misangyi et al., 2017). Third, understanding the demography and PTs in combination using the complexity and configurational theories enlighten us to understand how the complex attributes of perpetrators can lead to cyberbullying on social media—a contemporary issue (e.g., Cao, Khan, Ali, & Khan, 2019) and practice (e.g., Pappas, Kourouthanassis, Giannakos, & Chrissikopoulos, 2016; Rasoolimanesh, Ringle, Sarstedt, & Olya, 2021) in information system (IS) research. We suggest varied combinations of PTs of a social media bully, which provide more plausible explanations than understanding CB as a function of one independent personality attribute (Kircaburun, Jonason, & Griffiths, 2018). It will help researchers and practitioners cope better with rapidly changing non-linear contexts, such as cyberbullying (Jacucci, Hanseth, Lyytinen, Benbya, & McKelvey, 2006).

The rest of the paper is organized as follows. In Section 2, we discuss the extant literature that finds the inconsistent influence of PTs and demographic variables on deviant behavior on social media. Section 3 presents the research model. Section 4 explains the

research method and data analysis. Section 5 reports the results, followed by the discussion, implications, research limitations, and conclusion in Section 6.

2. Literature Review

The literature review primarily focuses on “personality” because it concerns the characteristics that explain a person's behavior. “Personality” has been considered as an important concept and thus has been extensively discussed in IS literature; for an overview see Maier (2012). Balakrishnan et al. (2019, p. 253) mention that “recently, cyberbullying studies have begun to explore the roles of user personalities on cyberbullying perpetration, with the majority focusing on the Big Five and Dark Triad models.”

2.1. Big Five PTs and Cyberbullying

The Big5 PTs (Goldberg, 1990) are among the most comprehensive and popular lenses extensively used in personality research to understand how individual differences affect human behavior. Prior studies suggest the effect of Big5 PTs on individual's IS use (Maier, 2012), e.g., voice shopping (Bawack, Wamba, & Carillo, 2021) and online shopping (Iqbal, Raza, Ahmed, Faraz, & Bhutta, 2021). Big5 PTs also can explain the consequences of IS use e.g., techno-stress (Pflügner, Maier, Mattke, & Weitzel, 2021). As the name suggests, the Big5 PTs encompass five dimensions: extraversion, agreeableness, neuroticism, conscientiousness, and openness to experience. The following sections clarify the Big5 PTs to understand their effects on cyberbullying.

Extraversion (aka extroversion or surgency) is the characteristic of outgoing, assertive, sociable, excitement seeking, playful, expressive, talkative, and spontaneous individuals (Goldberg, 1990). Alternatively, introversion is characterized by a focus on internal feelings rather than on external sources of stimulation (Cherry, 2021). Prior studies (e.g., Balakrishnan et al., 2019) argue that extraverts possess a tendency to engage in interpersonal- and social-orientation activities more frequently using social media. Hence, they are more likely to engage in cyberbullying compared to introverts. They also engage in cyberbullying to increase their social status (van Geel, Goemans, Toprak, & Vedder, 2017). Since extraverts enjoy public attention and social interactions, they are generally less concerned if their extraverted behavior hurts someone else. They possess the tendency to focus on gratification obtained from outside the self and thus tend to commit cyberbullying (Ayas, 2016). In short, prior studies find that higher extraversion is positively associated with higher deviant behaviour on social media including cyberbullying (e.g., Balakrishnan et al., 2019; Mitsopoulou & Giovazolias, 2015).

Agreeableness is the personality trait of kind, cooperative, friendly, trustworthy, emphatic, lenient, courteous, generous, flexible, and warm people with strong moral values (Goldberg, 1990). This trait deters people from engaging in harmful behaviors, including hurting others through cyberbullying, because individuals with high agreeableness tend to be gentle and altruistic (Balakrishnan et al., 2019). Because of their tendency of caring others, agreeable people do not enjoy troubling others and restrain themselves from cyberbullying. Prior studies suggest that higher agreeableness is negatively associated with higher cyberbullying (e.g., Balakrishnan et al., 2019; Mitsopoulou & Giovazolias, 2015; van Geel et al., 2017).

Neuroticism (aka emotional instability) is the trait that explains people who are insecure, emotional, gullible, and intrusive (Goldberg, 1990). Neurotic people tend to struggle more with depression, irritability, fearfulness, and anxiousness. They suffer from feelings of envy and anger more frequently and more severely than other individuals (Felman, 2018). People with elevated levels of neuroticism overreact and get stressed easily, interpreting ordinary situations as complex ones and consequently expressing their frustrations overtly (Bawack et al., 2021). This personality trait stimulates them to behave naïvely, exaggerate, and commit deviant behavior (Mitsopoulou and Giovazolias, 2015, van Geel et al., 2017). Thus, the extant literature suggests that higher neuroticism is a significant contributor to higher cyberbullying.

Conscientiousness is the personality trait of organized, careful, efficient, dependable, precise, persistent, and cautious persons (Goldberg, 1990). People with this PT are typically “able to postpone immediate gratification for the sake of long-term success” (Gordon, 2021). Conscientious people are careful and desire to be responsible to take obligations to others seriously and thus refrain from impulsive behavior and unnecessary risks. Cyberbullying literature supports that people are often involved in antisocial behavior on social media platforms impulsively and carelessly, without seriously assessing the possible consequences (Bányai et al., 2017, van Geel et al., 2017). On the contrary, as conscientious people are very meticulous, they possess greater respect toward other users and are less likely to participative in cyberbullying (Bawack et al., 2021, Mitsopoulou and Giovazolias, 2015).

Openness to experience (aka intellect) is a personality trait that describes people who are curious (Goldberg, 1990), creative, and interested in fantasy and trying new things (Gordon, 2021). Prior studies consider openness as a predictor of cyberbullying because people with this personality possess experiential mentality and like to experience new experiences (e.g., Alonso & Romero, 2017; Celik, Atak, & Erguzen, 2012). Their openness to new experiences and curiosity would overshadow their social obligations, causing them to bully others. However, several studies find that openness and cyberbullying are negatively related (e.g., Mitsopoulou & Giovazolias, 2015).

Despite the importance of these factors in understanding cyberbullying, the extant literature has presented inconsistent findings. For example, Mitsopoulou and Giovazolias (2015) suggest that all Big5 PTs are related with cyberbullying—extraversion and neuroticism have positive effects, whereas agreeableness, neuroticism, and openness have negative effects. However, Balakrishnan et al. (2019) find that only extraversion, agreeableness, and neuroticism have significant relations to acts of cyberbullying. Likewise, Howard et al. (2019) find support only for agreeableness and conscientiousness on trolling. Given the increasing intensity of cyberbullying on social media platforms, the lack of research regarding the individual impact of each Big5 PT constitutes a significant research gap. This absence of conclusive evidence in cyberbullying highlights the need for further research into the Big5 PT factors that may address these inconsistent findings.

2.2. Dark Triad/Tetrad and Cyberbullying

Dark3 PTs, dealing with Machiavellianism, narcissism, and psychopathy, are popular among cyberbullying researchers (e.g., Balakrishnan et al., 2019; Baughman et al., 2012).

Recently, a fourth trait—sadism—has been added with the Triad to form Dark4.

Machiavellianism is a trait that lacks empathy and engages in impulsive and thrill-seeking behaviors (Balakrishnan et al., 2019). Machiavellians are more likely to harm others if the perceived benefits are high and the personal risk is low (Paulhus & Williams, 2002). Extant literature agree that Machiavellianism leads to cyberbullying (e.g., Kircaburun et al., 2018; Moor & Anderson, 2019). **Narcissism** is the passionate and inflated sense of one's own importance. This trait involves a pattern of self-centered, superior feeling, and arrogant thinking (and behavior) and requires an excessive need for admiration by others (Smith & Robinson, 2020). The narcissists tend to harm others when they find their grandiose image is threatened (Paulhus and Williams, 2002, Smith and Robinson, 2020). Studies report that narcissism is associated with cyberbullying (Ang et al., 2011, Baughman et al., 2012), although not consistently (Moor & Anderson, 2019).

Psychopathy is the personality trait of callous, predatory and fearless individuals who lack empathy and strategically manipulate others (Balakrishnan et al., 2019, Paulhus and Williams, 2002). These attributes permit psychopaths to ignore the emotional and psychological distress they cause to others. Thus, psychopathy has been consistently considered to predict antisocial behaviors, including cyberbullying (Balakrishnan et al., 2019, Sest and March, 2017, van Geel et al., 2017). Sadism (aka “everyday sadism”) concerns the enjoyment in inflicting suffering and pain on others (Moor & Anderson, 2019). This trait delineates the predatory motivation of a sadist to cause harm or distress to others and taking pleasure out of it. Studies suggest that sadism determines online deviant behavior (e.g., Sest & March, 2017), albeit to a lesser degree (Moor & Anderson, 2019).

Research generally suggests that Dark3 and Dark4 PTs effectively predict cyberbullying. For instance, it is commonly agreed that, among the Dark traits, psychopathy is most strongly related with antisocial behaviors, followed by Machiavellianism (Moor & Anderson, 2019). However, empirical studies reveal inconsistent results (Chan et al., 2021). For instance, Baughman et al. (2012) suggest that while Machiavellianism, psychopathy, and narcissism are important, sadism is not. Buckels et al. (2014) partially agree and show that Machiavellianism, psychopathy, and sadism, but not narcissism, are significant for cyberbullying. Further, van Geel et al. (2017) find that among the Dark3, both narcissism and psychopathy are significant predictors of cyberbullying; but with Dark4, only sadism (not narcissism and psychopathy) is significant. Contrarily, among the Dark3, Machiavellianism and narcissism but not psychopathy affect “problematic” online social behavior (Kircaburun, Demetrovics, & Tosuntaş, 2019), whereas all Dark4 traits except narcissism contribute to cyberbullying (Kircaburun et al., 2018).

2.3. Demographic Attributes of Social Media Users and Cyberbullying

Prior studies have suggested that demographic variables are related to people's deviant behavior on social media platforms. Regarding gender, extant studies claim that males are more likely to be engaged in cyberbullying than their female counterparts (Howard et al., 2019, Sest and March, 2017). However, Katz et al. (2014) suggest that the role of gender on cyberbullying is inconclusive; males tend to be more likely to post offensive material and indulge in coercive sexting, whereas females are more likely to spread false rumors about others. Similarly, age is a predictor (Castella & Brown, 2011) because “younger participants were found to engage more in cyberbullying activities” (Balakrishnan,

2015, p. 149). Katz et al. (2014) find that “some cyberbullies are young.” Previous studies have also indicated that cyberbullying is positively correlated with the increase of social media usage (Balakrishnan, 2015). Social media users who spend more time online are found to be more likely to be engaged in cyberbullying (Floros, Siomos, Fisoun, Dafouli, & Geroukalis, 2013). Thus, the literature has highlighted gender, age and levels of social media usage as key demographic factors for cyberbullying but with inconsistent empirical findings.

2.4. The Constellation Effect of Personality Traits

Discussion so far clearly suggests that research on the effect of PTs and demographic variables on cyberbullying is inconclusive. One plausible source of such inconsistency could be studying the variables independently rather than collectively. For example, considering Big5 PTs, curious people (open to experience) may ignore their agreeableness personality and commit cyberbullying, although their conscientiousness would enable them to understand the probable consequences. In the online consumer behavior realm, Bawack et al. (2021) claim that an extravert customer who is not only agreeable, conscientious, and open but also less neurotic enjoys high experience performance. Similarly, an extravert who is open to experience and agreeable but at the same time shows less conscientiousness may use a smartphone while driving (Maier, Mattke, Pflügner, & Weitzel, 2020). Here, the combination of the PTs rather than their single effect is more meaningful; just looking at singular traits can mislead. The configurations of personalities indicate the need to identify similar ones for cyberbullying.

Similarly, although the Dark Triad or Tetrad, by name, refers to configurations of three and four variables, respectively, an integrated approach investigating their combined effect is sporadic in IS and cyberbullying literature. Thus, Clancy, Klettke, and Hallford (2019) reveal that the Dark4 attributes independently cannot explain cyberbullying. More specifically, Jakubowicz (2017) suggest that the triads emerged as “the most significant parameter in the growth of Internet hate ... While in the outside world, these traits can occur independently, in the digital space they appear together with ominous regularity” (p. 46, emphasis added). This can be valid for Big5 and demographic variables as well. For example, a perpetrator can be a married and educated male (Nicol, 2012) and/or an extravert and neurotic at the same time (Tehrani, 2016).

Nonetheless, using moderation effects, Sest and March (2017) suggest that psychopathy and sadism together can predict an online perpetrator. Kircaburun et al. (2018) assert that higher Machiavellianism and sadism lead to higher “problematic social media use” through cyberbullying only for male. Similarly, Baughman et al. (2012) find that male experience Dark3 PTs higher than their female counterparts and active in bullying. However, Howard et al. (2019) have not identified any combined effect of gender and Big5 on cyberbullying. More holistically, Balakrishnan et al. (2019) investigate the combined effect of Big5 and Dark3 Triad PTs on cyberbullying through an experiment. They suggest that, among the Big5 PTs, extraversion, agreeableness, and neuroticism are important. They further assert that “as for Dark Triad, psychopathy performed significantly better than Machiavellianism and narcissism” (p. 255). Similarly, van Geel et al. (2017) have applied Big5 and Dark4, and found that agreeableness and sadism are related to cyberbullying. However, these studies have

dealt with a net effect of the variables.

Our review of extant literature reveals the gap how different PTs influence cyberbullying. While there are several studies report the influence of single personality trait on cyberbullying, the overlap among the traits is scarce. We argue that constellations of personality traits offer more accurate answers and valuable additional insights. We also posit that PTs do not influence CB in isolation but, rather, in interplay with demographic attributes and require distinct equifinal configurations. In our research, we build on Big5 and Dark4 PTs as suitable building blocks to combine with demographic attributes of cyberbully to develop specific personality profiles explaining CB.

3. Theoretical Framework and Research Model

Our research is based on complexity and configurational theories (Rihoux and Ragin, 2008, Woodside, 2017) because these can be used “to develop an understanding of ... the relationship between decisions and actions of individuals, collections and collective of individuals ... and the emergent networked world” (Merali, 2006, p. 217). Complexity theory “suggests that the whole is greater than the sum of its parts in complex adaptive systems” (Hurlburt, 2012, p. 28). “Advocates of complexity theory see it as a means of simplifying seemingly complex systems. The actual practice of complexity theory, however, is anything but simple in that there is no one identifiable complexity theory” (Manson, 2001, p. 405). Yet, most of complexity theory is grounded on the studies of Byrne (2002) and Byrne and Callaghan (2013). Byrne (2005) describe two fundamental properties of complexity theory: (i) the complex context is composed of an open system with “transformational potential,” (ii) and it has a “trajectory” towards an outcome and can be transformed to that end. Complex systems have been developed on the grounds that they are composed of many complex, interacting elements (Frenken, 2006).

Ragin (2008) mention that real-world problems are very difficult to explain by the perfect symmetrical relationship between the antecedents and outcomes, as asymmetrical relationships exist in all real-world problems. Studies use it to describe situations where simple linear models cannot adequately address the complex relationships (Anderson, 1999).

Byrne (2005) illustrate the connection between complexity theory and configurations. Citing Ragin (2000) the author have mentioned that “configurations” are combination of characteristics with “trajectories towards an outcome.” Configurations thus “resonate absolutely with understanding complex systems.” The concept of “causal complexity” is highly related to complexity theory. Furnari et al. (2021) define causal complexity as “situations where multiple explanatory factors combine in complex and at times contradictory ways and where there is ‘equifinality,’ or multiple alternative paths to an outcome.” Misangyi et al. (2017) mention that configurations truly represent “causal complexity” of a phenomenon. The authors identified four fundamental elements of configurational perspective: (i) conceptualizing cases as set theoretic configurations, (ii) calibrating cases’ memberships into sets, (iii) viewing causality in terms of necessity and sufficiency relations between sets, and (iv) conducting counterfactual analysis of unobserved configurations. It is observed that Ragin's (2008) fuzzy set qualitative comparative analysis (fsQCA) (which we use in our analysis) embraces the four elements advocated by Misangyi et al. (2017).

Complexity theory (specifically causal complexity) has been widely used in organizational research (Anderson, 1999), social science (Urry, 2005), service industry (Wu, Yeh, & Woodside, 2014), and tourism (Olya & Altinay, 2016). Relatively, the application of complexity theory in IS is not remarkable. Nonetheless, not exhaustively, researchers have applied complexity theory to online shopping (Pappas et al., 2016), software development (Clarke, O'Connor, & Leavy, 2016), software integration (Hurlburt, 2012), IS development (Benbya & McKelvey, 2006), and technological innovation (Frenken, 2006). However, complexity theory has yet to be used to investigate cyberbullying specifically. Based on prior studies (e.g., Anderson, 1999; Pappas & Woodside, 2021) and our literature review (Section 2), we use it to describe CB with a configurational model where simple linear models cannot adequately address the complex relationships.

Woodside (2014) explains the notion of complexity theory (and causal complexity) with six tenets. However, it noted that the number of tenets used to describe complex phenomenon is not fixed and is context dependent. The first tenet of complexity theory suggests that a simple antecedent may be necessary but is rarely sufficient for predicting an outcome (Woodside, 2014). The second tenet (the recipe principle) complements the first tenet and suggests that individual factors rarely operate in isolation; rather, “reality usually includes more than one combination of conditions that lead to high values in an outcome condition” (Woodside, 2013, p. 464). For instance, psychopathy can be a necessary condition for cyberbullying but is not alone sufficient; rather, a male who is not only a psychopath but also a sadist may be a likely offender for cyberbullying (Sest & March, 2017). Therefore, our model postulates a combination of conditions on CB, for example, the Big5 PTs (arrow A in Fig. 1).

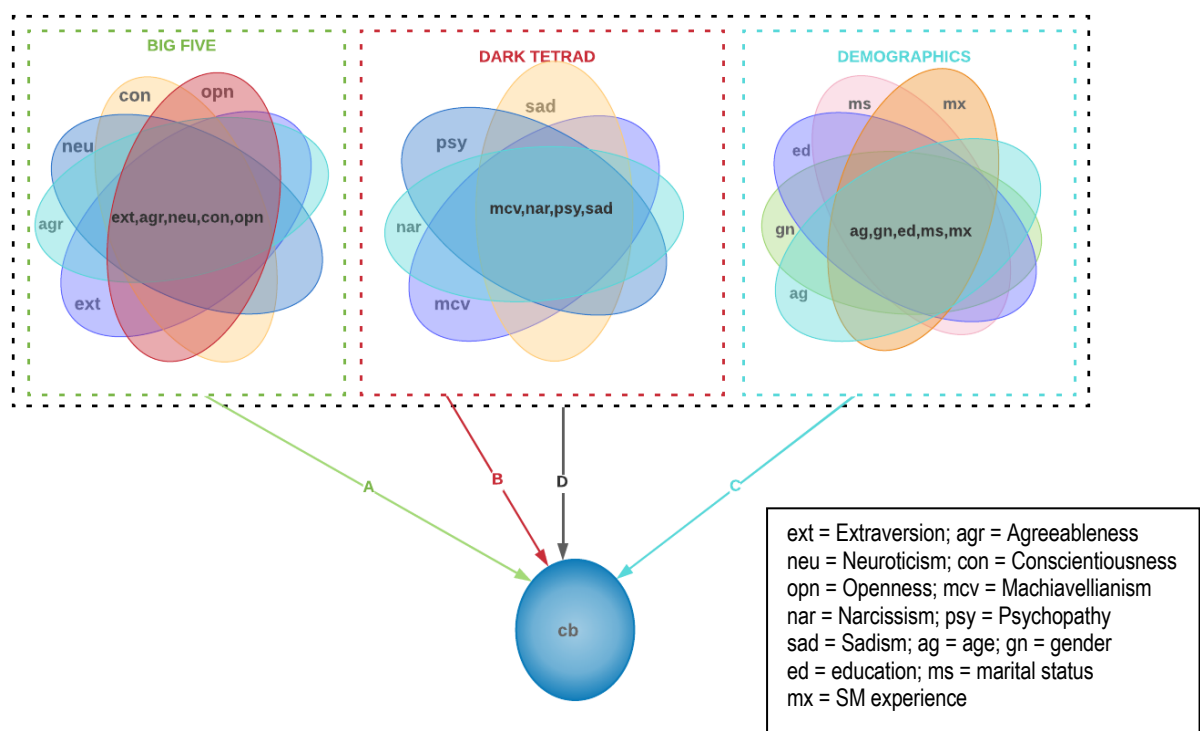


Figure 1. The research model

According to the third tenet (the equifinality principle), the same outcome can be obtained with more than one deterministic configuration of the conditions (Ragin, 2000, Woodside, 2014). This tenet broadens our view and explains the contrasting findings of two different studies. For example, through the arrow B (Fig. 1), we postulate that a psychopath with high Machiavellianism and narcissism can be a likely offender (Baughman et al., 2012); however, cyberbullying can also be performed by a sadist and psychopath with high narcissism (van Geel et al., 2017).

According to the fourth tenet (the causal asymmetry principle), the causes leading to the presence of an outcome of interest may be quite different from those leading to the absence of the outcome (Ragin, 2008, Woodside, 2014). In other words, the causal recipes for predicting low CB are unique and not mirror opposites of recipes of the high CB. However, as per the third tenet, multiple recipes may exist predicting high and low values of cyberbullying, which are obtained using set theoretic analysis of data using fsQCA. The fifth tenet suggests that “Relationships between variables can be non-linear with abrupt switches occurring, so the same ‘cause’ can, in specific circumstances, produce different effects” (Urry, 2005, p.4). In other words, the same condition may have different, even opposing, effects on the same outcome variable depending on how it is arranged with other conditions on the configuration (Woodside, 2014).

The sixth tenet suggests that for high outcome scores, “a given recipe is relevant for some but not all cases; coverage is less than 1.00 for any one recipe” (Woodside, 2014, p. 2500). This tenet also suggests the existence of contrarian cases in data (see appendix A). In cross-tabulation analysis between conscientiousness (CON) (one of the Big5 PTs) and CB, it is found that they are significantly positively associated (chi-square = 93.84, $p = 0.00$). Yet there are 59 positive contrarian cases, revealing a high level of CON producing a low level of CB, and 12 negative contrarian cases, revealing a low level of CON producing a high level of CB. Similarly, cross-tabulation between Machiavellianism (MCV) (one of the dark triads) and CB (chi-square = 127.24, $p = 0.00$) shows that there are 40 positive contrarian cases, revealing high MCV producing a low level of CB, and nine negative contrarian cases, revealing low MCV producing a high level of CB. Our modelling effort using fsQCA will address these contrarian cases in data.

Our research model further posits that CB is a complex and multidimensional phenomenon that should be explained as a triadic configuration of Big5 and Dark4 PTs with demographic attributes. Our configurational research model is presented in Fig. 1. In Fig. 1, the configuration of the Big5 PTs to influence CB is indicated by arrow A [$cb = f(ext, agr, neu, con, opn)$]. As indicated by arrow B [$cb = f(mcv, nar, psy, sad)$], four factors of Dark4 are configured. Then, arrow C [$cb = f(ag, gn, ed, ms, mx)$] represents a combination of demographic variables—age, gender, education level, marital status, and social media experience. Finally, Big5 and Dark4 PTs are combined with demographic attributes to produce the all-inclusive model (Big5 +Dark4 +demography), indicated by arrow D [$cb = f(ext, agr, neu, con, opn, mcv, nar, psy, sad, ag, gn, ed, ms, mx)$].

4. Method

4.1. Measures

For reliability, our measures (see appendix B) are based on previously developed and applied indicators. Specifically, the Big5 PTs have been measured with the items from Hossain and Rahman (2021). Dark triads, namely Machiavellianism, narcissism, and psychopathy, have been measured with the short Dark Triad scale of Jones and Paulhus (2014) and sadism from O'Meara, Davies, and Hammond (2011). To measure cyberbullying behavior, we have used four items from Chan, Cheung, and Wong (2019) and two items from Lowry et al. (2019)¹ All items for the measures (except CB) are rated on five-point Likert scales anchored from “strongly disagree” to “strongly agree.” Following Lowry et al., 2019, Lowry et al., 2016, the scale for CB have used five-points (i.e., 1 = “Never,” 2 = “Rarely,” 3 = “Occasionally,” 4 = “Frequently,” and 5 = “Very frequently.”). The five-point Likert scale is used because “literature suggests that five-point scale appears to be less confusing and to increase response rate” (Bouranta, Chitiris, & Paravantis, 2009, p. 280). For binary demographic variables, “0” has been used for “men” while “1” for “women;” similarly, “0” represents “single” and “1” for “married.”

4.2. Data Collection

For data collection, we have employed Amazon’s Mechanical Turk (MTurk) platform, which works on the principle of crowdsourcing (Sheehan, 2018). Recruiting participants via MTurk has been used in various research domains, including cyberbullying (e.g., Lowry et al., 2019). Sheehan (2018) suggest that collecting data using MTurk is better than other traditional methods for several reasons. MTurk’s respondent pool is more diverse than a typical sample. In addition, it is much cheaper, quicker, and ensures minimum social desirability bias (SDB) given that online survey reduce the chance of SDB (Larson, 2019).

By following Pyo and Maxfield (2021), we have used multiple attention checks to check if the respondents have paid sufficient attention. As an ex-ante method, by using MTurk’s feature, we have screened out the ‘workers’ (potential respondents) who do not meet our specific criteria e.g., location, social media platform use. In addition, we recruit only the workers who not only have completed high HITs (Human Intelligence Tasks) but also have high satisfaction scores from the researchers. As an ex-post measure, we used three reverse-coded items. In addition, we compare responses across two responses. To start the actual survey, each respondent had to select either “yes” or “no” to the question: “have you ever committed cyberbullying to any degree?” Irrespective of their response, they could proceed but they had to answer it. Later, on the survey, they had to respond to six questions for “Cyberbullying” construct, where the choices ranging from “Never” to “Very frequently”. To be consistent, for instance, a respondent has to select “no” and “never” to these questions, respectively.

To reduce SDB, we have applied the principles of Larson (2019). In the participant consent form (loaded before the actual survey), the respondents have been assured that their responses would be anonymous and kept completely confidential, and used in an aggregated manner. In the PCI page, all respondents had to check the “I understand” radio-button before proceeding to the questionnaire. In PCI, we also have included a statement that encouraged and appreciated respondents’ honesty (Larson, 2019). These two efforts are expected to

make the respondents less likely to respond in a socially desirable way (Chan et al., 2019). However, we have not used SDB measures as a control variable for the following reasons. The SDB measures “tend to be linked with personality traits” (Larson, 2019, p. 538) and may confound with the personality items our study applied. More specifically, the SDB “scales are strongly affected by substantive traits, particularly conscientiousness, emotional stability [i.e., neuroticism], and agreeableness” (Connelly & Chang, 2016, p. 329). Scholars, therefore, warn that multicollinearity may make it difficult to quantify SDB when both the bias scale and personality measures are used as independent variables (Connelly and Chang, 2016, Larson, 2019). Further, the use of self-reported SDB measures may “introduce random noise into personality measurement” (Connelly & Chang, 2016, p. 329).

The online survey has been developed in Qualtrics and linked with MTurk. Every worker has been paid a financial incentive to participate in this study. We specifically set the target respondents from India and the U.S., using Facebook and YouTube. It is noted that the U.S. (developed country) and India (developing country) are significantly different on different cultural (Hofstede, 1984). However, extant studies have also shown that personality trait scores across the U.S. and India are not significantly different (Schmitt, Allik, McCrae, & Benet-Martínez, 2007, among others). In terms of tackling cybercrime, both countries have extensive cyberlaws. However, there are gaps in the cyberlaws of both countries (Jain & Chaudhary, 2019). Facebook has been chosen because most cyberbullying cases occur in it (Suciu, 2021), while YouTube is the most vulnerable to cyberbullying (Security.org, 2022). The primary qualifying question was: “Have you ever committed cyberbullying to any degree?” To proceed and complete the questionnaire, each respondent had to select either “yes” or “no.” This response has later been checked with their responses for CB. In addition, all respondents had to be above 18 years of age. Altogether 313 responses (158 from the U.S and 155 from India) have been collected. It is noted that fsQCA handles both small and large sample sizes. Our sample sizes are adequate based on the guidelines of Mattke, Maier, Weitzel, Gerow, and Thatcher (2021) (p. 561–562). Among them, 6.1 % never commit, and more than half often commit cyberbullying. The distribution of committing cyberbullying is consistent between the U.S. and Indian sample, and between Facebook and YouTube users (Table 1). The profile of the respondents and their distribution with respect to committing cyberbullying are provided in Table 1.

Table 1.

Profile of the respondents

Criteria	%	Never	Rarely	Occasionally	Frequently	Very frequently
Across sample	313	6.1%	14.7%	24.0%	32.6%	22.7%
U.S. sample	158	8.2%	15.2%	29.7%	31.0%	15.8%
Indian sample	155	3.9%	14.2%	18.1%	34.2%	29.7%
Facebook users	166	6.6%	14.5%	25.9%	30.7%	22.3%
YouTube users	147	5.4%	15.0%	21.8%	34.7%	23.1%
Gender						

Male	68.7%	2.9%	9.6%	15.7%	22.4%	18.2%
Female	31.3%	3.2%	5.1%	8.3%	10.2%	4.5%
Age (year)						
18–22	1.3%	0.0%	0.6%	0.0%	0.0%	0.0%
23–30	54.6%	0.3%	7.0%	11.8%	20.4%	15.0%
31–40	27.2%	3.5%	3.5%	7.7%	8.3%	4.2%
41–50	11.5%	1.3%	1.9%	3.2%	2.9%	2.2%
51–60	3.5%	0.6%	0.6%	0.6%	0.6%	1.0%
61+	1.9%	0.3%	0.9%	0.0%	0.3%	0.3%
Education						
High School	3.5%	0.3%	0.3%	1.3%	1.6%	0.0%
College	3.5%	0.6%	0.6%	1.3%	0.6%	0.3%
Associate degree	7.3%	0.3%	1.6%	2.6%	1.9%	1.0%
Bachelor degree	59.7%	2.9%	9.6%	12.8%	21.1%	13.4%
Postgraduate	26%	1.9%	2.6%	6.1%	7.3%	8.0%
Marital status						
Unmarried	21.7%	1.0%	4.2%	5.8%	4.8%	6.1%
Married	72.2%	4.8%	9.9%	15.0%	26.2%	16.3%
Divorced	1.3%	0.3%	0.3%	0.3%	0.3%	0.0%
Others	4.8%	0.0%	0.3%	2.9%	1.3%	0.3%
Working status						
Student	1.9%	0.0%	0.6%	1.0%	0.3%	0.0%
Part-time employed	8.3%	0.3%	1.9%	3.8%	1.3%	1.0%
Full-time employed	78%	4.5%	11.2%	18.5%	27.8%	16.0%
Unemployed	2.6%	0.6%	0.3%	0.3%	0.3%	1.0%
Self-employed	9.3%	0.6%	0.6%	0.3%	2.9%	4.8%
Social media use						
1–4 year	18.5%	0.3%	3.5%	4.8%	4.5%	5.4%
5–9 year	41.5%	1.0%	5.4%	7.0%	16.9%	11.2%
10–15 year	27.5%	3.2%	4.2%	9.9%	6.4%	3.8%
15+ year	12.5%	1.6%	1.6%	2.2%	4.8%	2.2%
Device used						
Smartphone	46%	4.8%	8.9%	13.1%	13.4%	5.8%
Laptop computer	41.2%	1.0%	4.8%	8.3%	14.7%	12.5%
Tablet computer	2.2%	0.0%	0.0%	0.6%	0.0%	1.6%
Desktop computer	10.5%	0.3%	1.0%	1.9%	4.5%	2.9%

5. Data Analyses and Results

5.1. Psychometric Properties Test

Before proceeding to the fsQCA procedure, we check the measurement properties of the variables (see appendix B). All items' loadings are higher than 0.6 (Igbaria, Guimaraes, & Davis, 1995), and the internal consistency of all constructs (composite reliability and Cronbach's alpha) is higher than the acceptable level of 0.7 (Hair, Hult, Ringle, & Sarstedt, 2021). In addition, the average variance extracted (AVE) for every variable is greater than 0.5, indicative of acceptable convergent validity (see appendix B). To establish discriminant validity, we have used the Heterotrait–Monotrait ratio of correlations (HTMT) criterion. Based on the bootstrapping results and the percentile approach, we confirm that the HTMT values of all constructs are significantly ($p < 0.05$) lower than the conservative threshold of 0.85 (Hair et al., 2021).

5.2. fsQCA Method

We investigate our configurational research model using fsQCA – a qualitative-quantitative technique suitable for investigating complex configurations of construct (see Ragin, 2008 for more details). This method examines the relationships between the outcome variable (e.g., CB) and all possible combinations of binary states (i.e., presence or absence of its conditions such as PTs). For our analysis, we follow guidelines and recommendations from recent papers in IS (Mattke et al., 2021, Pappas and Woodside, 2021, Park et al., 2020). The fsQCA analysis has been carried out using the software fsQCA 3.0 (Ragin, 2018); the reason for the choice is that the software support all the required calculations for the analysis. Note that the data analysis is based on the total sample ($n = 313$).

5.2.1. Data Calibration

Using fsQCA software, we perform data calibration. As fsQCA relies on Boolean algebra (presence/absence of conditions), the Likert scale data need to be calibrated from a crisp value (1–5) into a fuzzy form (between 0 and 1). As we use a five-point Likert scale, 4, 3, and 2 are used for full membership, intermediate membership, and full non-membership (Pappas & Woodside, 2021).

5.2.2. Analyzing Necessary Conditions

In this stage, we identify the necessary conditions for high and low levels of CB. A condition is considered “necessary” if its associated consistency and coverage are ≥ 0.9 and ≥ 0.5 , respectively (Pappas et al., 2020, Schneider and Wagemann, 2010). Based on this, three traits each from the Big5 and Dark4, and “education” individually are found to be the necessary condition for a high score of CB2 (see Table 2). It can be interpreted that cyberbullying cannot occur without them. For example, low agreeableness is a necessary condition for high cyberbullying. Alternatively, no single variable comes out as a necessary condition for low CB.

Table 2.

The necessary conditions

	For high cyberbullying		For low cyberbullying	
	Consistency	Coverage	Consistency	Coverage
Extraversion	0.905	0.715	0.825	0.366
~Extraversion	0.197	0.667	0.357	0.678
Agreeableness	0.167	0.829	0.939	0.388
~Agreeableness	0.922	0.678	0.220	0.613
Neuroticism	0.829	0.768	0.668	0.347
~Neuroticism	0.295	0.613	0.553	0.645
Conscientiousness	0.938	0.678	0.937	0.380
~Conscientiousness	0.143	0.803	0.206	0.651
Openness	0.750	0.740	0.633	0.633
~Openness	0.342	0.624	0.350	0.350
Machiavellianism	0.898	0.726	0.804	0.364
~Machiavellianism	0.213	0.659	0.394	0.685
Narcissism	0.899	0.807	0.599	0.302
~Narcissism	0.222	0.497	0.616	0.774
Psychopathy	0.905	0.854	0.504	0.267
~Psychopathy	0.224	0.445	0.724	0.809
Sadism	0.854	0.921	0.319	0.193
~Sadism	0.252	0.398	0.870	0.769
Age	0.322	0.630	0.492	0.541
~Age	0.766	0.728	0.664	0.354
Education	0.959	0.650	0.948	0.360
~Education	0.056	0.656	0.079	0.520
Social media use	0.839	0.661	0.859	0.380
~Social media use	0.213	0.729	0.233	0.449

Note. The bold attributes satisfy the threshold values for necessary conditions

5.2.3. Analyzing Sufficient Conditions

This step considers whether the fsQCA yields sufficient conditions. To do so, using fsQCA software, the calibrated data have been incorporated into a fuzzy set truth table. The truth table lists all possible configurations of the conditions. In refining the truth tables, we delete rows with no cases (Ragin, 2008). In addition, for configurations with a consistency of <0.75 and PRI consistency of <0.5, the outcome in the truth table has been set to “0” to ensure that the sufficient configurations exhibit a satisfactory quality (Mattke et al., 2021, Ragin, 2008). Further, we remove the alternative solutions with less than two cases from the truth table (Pappas and Woodside, 2021, Ragin, 2008).

For a configuration to be considered as “sufficient,” its consistency and coverage values need to be ≥ 0.75 (Pappas et al., 2020) and ≥ 0.2 , respectively (Rasoolimanesh et al., 2021). The diagrammatic representation of the sufficient solutions for modelling high and low CB are outlined in Table 3. The results in Table 3 show “do not care” situation for extraversion in C1, which conflicts with the results of the necessary condition (Table 3). Following Mattke et al. (2021), we do not consider the presence of extraversion as a necessary condition for high CB. The same argument is applicable to Agreeableness, Machiavellianism, and narcissism, and social media experience (see Table 3).

Table 3.

The diagrammatic representation of the findings

Key: CB, cyberbullying ● High level of a condition ⊗ Low level of a condition

★ Necessary condition (high level) Δ Necessary condition (low level)

Conditions/Configuration	Big Five Personality Traits				Dark Tetrad Personality Traits					Demographics			Inclusive					
	High CB		Low CB		High CB		Low CB			High CB		Low CB	High CB			Low CB		
	C1	C2	C3	C4	C5	C6	C7	C8	C9	C10	C11	-	C12	C13	C14	C15	C16	
Extraversion		●	⊗											●	●	⊗	●	
Agreeableness	⊗		●	●									⊗	⊗		●		
Neuroticism	●	●	●	⊗										●	●	●	⊗	
Conscientiousness	★	★		●									●			⊗		
Openness	●	●	⊗	⊗										●			⊗	
Machiavellianism					●				●				●		●	●		
Narcissism								⊗	⊗					●	●	⊗		
Psychopathy					★	★	⊗		⊗				★	★	★	⊗	⊗	
Sadism						●	⊗	⊗					●		●		⊗	
Age										⊗		No sufficient configuration identified		⊗				
Gender													●				⊗	⊗
Education										★	★		★	★	★	★		●
Marita status										●	●		●	●			●	
Social media experience											●			●	●			
Raw coverage	0.632	0.622	0.227	0.408	0.768	0.821	0.671	0.557	0.469	0.549	0.202	-	0.466	0.463	0.534	0.221	0.245	
Unique coverage	0.007	0.001	0.074	0.265	0.022	0.076	0.038	0.101	0.034	0.422	0.024		0.003	0.005	0.015	0.015	0.030	
Consistency	0.857	0.861	0.811	0.782	0.936	0.950	0.857	0.882	0.871	0.764	0.781		0.922	0.914	0.981	0.713	0.923	
Solution coverage	0.763		0.506		0.843		0.868			0.573		-	0.674			0.519		
Solution consistency	0.811		0.762		0.932		0.777			0.757			0.912			0.793		

5.2.4. Validation of the Findings

As the fsQCA results are sensitive to method decisions, following Mattke et al. (2021), we perform sensitivity analysis to check if QCA's thresholds and calibration are robust. First, to check robustness to threshold, we replicate the analysis with a frequency threshold 1; however, the configurations do not change significantly. Next, to check robustness to calibration, we replicate the analysis with different calibration anchors (5, 3, and 1 are used for full membership, intermediate membership, and full non-membership). We have found that the configurations (except C9 and C14, which are not sufficient anymore) are robust to the new calibration anchor. Hence, we can conclude that the findings pass the sensitivity analyses. We also have tested for predictive validity following guidelines from Pappas and Woodside (2021). The findings show that the highly consistent models for the subsample have high predictive ability for the holdout sample and vice versa. See appendix C.

5.3 Tenets of Complexity Theory

Assessing the first tenet of complexity theory, a condition (e.g., conscientiousness) is necessary but is not alone sufficient for simulating high CB, which supports the first tenet. In support of the second tenet, the configurations shown in Table 3 combine more than one condition predicting high and low CB. Supporting the third tenet, there is more than one alternative model for simulating high CB and low CB. For example, C1 is a sufficient model for predicting high CB, but it is not necessary because there is another alternative model (i.e., C2) that sufficiently explains conditions leading to high CB, as far as the Big5 are concerned.

In support of the fourth tenet, the causal recipes for low CB (e.g., C7–C9) are not the mirror opposites of the causal models for high CB scores (e.g., C5, C6). For example, high Machiavellianism and psychopathy (C5) leading to high cyberbullying does not mean that the opposite of these traits would reduce it. Rather, people with low psychopathy combined with low narcissism are less likely to engage in cyberbullying even if they have high Machiavellianism (C9). According to the fifth tenet, the same condition may have different—even opposing—effects on the same outcome variable. For example, low extraversion in C15 but high extraversion in C16 contributes to low CB; hence, the role of extraversion is dependent on how it is combined with the other conditions. It denotes the heterogeneity of the variables, to which prior studies did not pay adequate attention.

6. Discussion and Implications

The purpose of this paper was to explore how the combination of PTs and users' demography affect cyberbullying on social media. Investigation of the most critical factors leading social media users to commit and restrain from cyberbullying is important for both academics and practitioners. Our study investigates the configurational linkage among PTs and demography by means of fsQCA method.

6.1 Toward a Configurational Theory of How PTs Influence Cyberbullying

Our results (see Table 3) reveal a number of configurations based on PTs and demographic attributes, which act as influencing mechanisms for high and low cyberbullying on social media. Configurations C1–C9 are based on PTs, configurations C10 and C11 are related to demographics, and configurations C12–C16 are based on combined influencing

mechanism of PTs and demographics.

For the Big5 PTs (arrow A in Fig. 1), to explain high CB, two configurations (C1, C2) are obtained. According to the configuration C1, a cyberbully must possess high conscientiousness (necessary condition) along with high neuroticism and openness, and low agreeableness, while it does not matter whether they are extravert or introvert. However, an extravert too can be a likely offender if they have high neuroticism, conscientiousness, and openness (C2), in which case it does not matter how agreeable they are. Alternatively, there are two solutions for a low score of CB. According to C3, cyberbullying is less expected from an introvert, agreeable, and less-creative user who possesses even higher anxiety and irritability (neurotic), while it does not matter whether s/he is conscientious or not. Moreover, a less neurotic and less open person with high agreeableness and conscientiousness is likely a non-perpetrator (C4). These four configurations within the Big5 explain sufficiently the high and low incidents of cyberbullying and thus address the net effect (Ragin, 2008) inconsistencies of the Big5 PTs.

Among the Dark4 (arrow B in Fig. 1), to commit cyberbullying, a social media user must be a psychopath (necessary condition) with high Machiavellianism (C5). High psychopathy and sadism are also sufficient to commit cyberbullying (C6). Alternatively, cyberbullying is less likely for a social media user who has low psychopathy and sadism (C7); or low narcissism and sadism (C8); or low narcissism and psychopathy even with high Machiavellianism. These five configurations within the Dark4 sufficiently explain the high and low scores of cyberbullying and thus explain the net effect inconsistencies of the Dark4.

Like the Big5 and Dark4, our literature review suggests that the net effects of demographic attributes in isolation on cyberbullying produce inconclusive results. For demographic attributes (arrow C in Fig. 1), our analyses reveal two solutions for high CB. A cyberbully must be an educated person (necessary condition) who is young and married, irrespective of their gender and social media experience (C10). In addition, a bully must be an educated person who is married and has high social media experience (C11). However, no valid solution for a low score of CB is obtained, which suggests that cyberbullying cannot be reduced by the net effect of demographic attributes alone. This is an interesting and valuable finding.

Configurations C12–C14 produce outcomes (i.e., CB) based on combined influencing mechanism of the Big5, Dark4 and demographic attributes (arrow D in Fig. 1). The results in Table 3 suggest that male, educated, and married social media users having less agreeableness but high conscientiousness, Machiavellianism, psychopathy, and sadism are susceptible to committing cyberbullying (C12). In addition, a young, educated person with low agreeableness and high extraversion, neuroticism, openness, narcissism, psychopathy, and social media experience may also participate in cyberbullying (C13). Finally, high extraversion, neuroticism, Machiavellianism, narcissism, psychopathy, sadism, education, and social media experience together can explain a cyberbully (C14). Alternatively, an agreeable married female who is introverted with low conscientiousness, narcissism, and psychopathy yet neurotic and Machiavellianist is less prone to committing cyberbullying (C15). Similarly, we expect less cyberbullying from the female educated social media users who possess less psychopathy, sadism, neuroticism, and openness yet with high extraversion (C16). Considering the consistency and coverage scores (see Table 3), we argue that cyberbullying

can be theorized well by the combined effects of the Big5, Dark4 and demographic attributes. The extant literature has considered them in isolation (i.e., using net effect modeling approach, Ragin, 2008), which has resulted in inconsistent outcomes.

We summarise that these configurations together form the basis of a configuration theory explaining cyberbullying as these configurations have high consistencies and coverage above the required thresholds (see Table 3). In other words, we claim that cyberbullying is a 'causally complex' phenomenon where the ideal combinations of demographic attributes with Big5 and Dark4 are required both for high and low CB (Byrne, 2005, Misangyi et al., 2017). These ideal combinations of influencing mechanisms result in a configurational theory of cyberbullying (Misangyi et al., 2017). As mentioned earlier, there are synergies between complexity theory and configurations (Byrne, 2005), which is further elaborated by Woodside (2014) and Misangyi et al. (2017) as number of "tenets" or "foundational elements." As shown previously, our analyses support the tenets (Woodside, 2014) of complexity theory. As we have used fsQCA to analyze our data, they also support the foundational elements of configuration theory (Misangyi et al., 2017).

6.2 Implications for Research

This article extends cyberbullying and personalities literature by addressing mixed and inconsistent findings. More specifically, it presents different configurations between PT and demography and provides a deeper explanation of the conditions under which the Big5, Dark4, and demography lead to cyberbullying on social media. It thus presents a configuration theory of high and low values of cyberbullying based on PTs and demographics. Regarding its methodology, this paper is arguably the only attempt to perform configurational analysis based on personality and demographic data from social media users. It offers five implications.

First, the majority of the extant studies on cyberbullying are based on the assumption that the relationship between CB and its antecedents (personality and demography) is symmetric. The present study recognizes that the antecedents of cyberbullying have complex and asymmetric relationships. The contrarian cases presented in the appendices demonstrate the presence of asymmetric relationships in our study. Each of the configurations explaining CB identified in this study may lead to developing new hypotheses and theories. For instance, an extravert, neurotic, conscientiousness, and open to experience person may commit cyberbullying. Similarly, complementing Buckels et al. (2014), who have found that psychopathy and sadism individually predict online deviant behavior, our study suggests that a person who is a psychopath and a sadist is likely to commit cyberbullying. Hence, our study suggests varied combinations of PTs of a social media bully. This is more plausible than understanding CB as a function of one independent personality attribute (e.g., sadism) (Kircaburun et al., 2018).

Second, the integration of the two PT perspectives (Big5 and Dark4) with demography offers a rich canvas and a comprehensive theoretical explanation explaining CB. Moreover, the application of complexity theory explaining the heterogeneity (i.e., both positive and negative effects) of the conditions as well as their asymmetric relationships in predicting CB is innovative. Our empirical study thus expands current knowledge by proposing complexity theory as a theoretical lens to combining relevant theories by appreciating the non-linear associations of the associated variables to examine CB. The fsQCA results are supported by the key tenets of complexity theory that suggest cyberbullying is a complex phenomenon

where its conditions have complex trade-off effects and that only a specific combination of these factors act as sufficient conditions for cyberbullying to occur (or to restrain). It will help researchers and practitioners cope better with rapidly changing non-linear competitive contexts, including cyberbullying (Jacucci et al., 2006).

Third, this study offers a configuration theory of CB and suggests that combinations of the conditions of cyberbullying, rather than an individual condition, explain the phenomenon better. The configurations thus help explain why knowledge to date about the role of PTs and demography on cyberbullying has been inconclusive. It offers deeper insight into how PT variables should combine within and with demographic attributes to predict CB, which aids researchers to revisit their models and check if a configurational model can better explain their research problem and the context (e.g., Balakrishnan et al., 2019; Baughman et al., 2012; van Geel et al., 2017). In addition, the equifinal recipes not only for the drivers but also for the inhibitors of cyberbullying are suggested, which offers a richer understanding than the existing research that relies on the traditional statistical analysis such as regression-based approaches.

Fourth, our results emphasize the central role of psychopathy in predicting high and low cyberbullying. Concisely, cyberbullying cannot occur without psychopathy; however, lack of psychopathy is insufficient to reduce cyberbullying because it must combine with low sadism. This is consistent with the literature. For example, the literature review of Moor and Anderson (2019) “revealed evidence that psychopathy is the trait most strongly associated with” antisocial online behaviors, including cyberbullying (p. 40). Psychopathy also has joint effects with the Big5 PTs and demography for high and low levels of cyberbullying. Yet, future research can investigate if psychopathy plays a similar role in other online deviant behaviors (e.g., trolling and cyberstalking) before calling antisocial online behavior a psychotic act.

Fifth, our findings can have implications for current psychological theories (e.g., theory of planned behavior (TPB) (Ajzen, 1991, Ajzen, 2020)). TPB is primarily based on three “salient beliefs”: behavioral belief, which influences attitude toward a “behavior” (e.g., taking part in cyberbullying); normative belief, which is based on social pressure (or lack of it) to act; and control belief, which is based on “requisite resources and opportunities” needed to act (Ajzen, 1991, Ajzen, 2020). It is noted that TPB does not include PTs and demographics explicitly. Nonetheless, some studies have extended the basic TPB model using both Big5 and Dark4 variables (e.g., McLarty, Skorodzyevskiy, & Muldoon, 2021; Wilson, Woolfson, Durkin, & Elliott, 2016). However, all of these studies are based on regression-based approaches and thus only investigate the net effects of the variables. In our study, we specifically consider PTs (both Big5 and Dark4) and demographics as the primary drivers of cyberbullying. Using configurational approach, our study has justified that PTs and demographics in combination are able to explain cyberbullying adequately.

6.3. Implications to Practice

Our research has important implications for practice. Our findings make it clear that a combination of personality and demographic factors should be considered in designing actionable and proactive policymaking to address CB.

First, we highlight that personality plays an important role on social media cyberbullying. More precisely, the personality of social media users explains if they are likely

or less likely to commit cyberbullying. Therefore, while designing programs to reduce cyberbullying, we need to give more attention to the users with combinations of certain personalities. In addition, social media administrators can use self-evaluation questions or gamification techniques to acquire information on personality from the users without making them feel invaded, and then predict cyberbullying acts beforehand. In addition, as our study has not found any significant difference between Facebook and YouTube users, in terms of committing cyberbullying, the profile of likely offenders could be similar; therefore, different social media platforms may develop a generic user profile and share. The practice of developing social media user profiles using demographics already exists (e.g., Belenioti, Andronikidis, & Vassiliadis, 2015) and needs to integrate personality. Educating social media practitioners about these findings can help to identify potential perpetrators. For example, social media platforms can promote educational videos alerting users about the possible risks of various personas that can contribute to “unfriending” or disclosing sensitive private information to strangers. Our findings can also contribute to the design of flexible IS in which social media users can control their information disclosure irrespective of any personality or demography.

Second, although previous studies have enumerated various demographic and personality characteristics responsible for cyberbullying, we still do not know the various combinations of these variables leading to cyberbullying. Our results suggest not considering all perpetrators on social media as equal but reveal that social media perpetrators have dissimilar PTs and demography. From our study, different guardianships, including social media platform guardians, law enforcement agencies, and social psychologists, can develop profiles of the likely social media perpetrators. By looking at the different configurations, social media administrators and legal guardians can predict, in the cyberbullying process, what combination of attributes may explain a potential or already offender. Our findings provide them with more than one profile of a potential offender. They can also provide different awareness and societal training programs targeted toward different demographic segments and potentially different personality profiles. To reduce CB, our findings directly contribute to introducing or reforming legislation that often targets “the usual suspects” to control deviant online behavior. Proper legislation can enable social media managers to investigate any material uploaded by any group and introduce zero tolerance policies toward deviant behaviors from any corner.

Third, the results of our study offer practical guidelines not only to understand the human factors responsible for cyberbullying but also to predict users who are less likely to be involved in cyberbullying, which may not be the mirror opposite of recipes for predicting a high score of CB. For example, high psychopathy and sadism sufficiently explain a bully; alternatively, a person with low psychopathy and sadism is less likely to commit cyberbullying. However, low narcissism and sadism also explain an unlikely offender. These strategies for predicting low scores of cyberbullying contribute to programs targeting to lessen cyberbullying. These findings can contribute toward designing a sophisticated social media platform with automated warning systems of “temporary suspension” or “permanent bans” if anyone violates the terms of use. Overall, our findings can contribute to adopting, adapting or customizing

pathways to develop policies to reduce the spread of CB and improve society significantly.

6.4. Limitations and Future Research Directions

Despite the contributions provided by this research, the study has a few limitations. The first limitation of this study is related to using self-reported personality and CB, although this approach is considered valid and reliable (e.g., Jones & Paulhus, 2014). Second, the data used in this research are collected from the U.S. and India to capture the perceptions from different cultures, societal values, and cybersecurity laws and their implementations. We have found that our findings based on U.S. data are well validated by the Indian data. Hence, the findings of this research can be generalized to other countries. However, use of U.S. and Indian data to develop a configuration theory of PTs on Cyberbullying remains a limitation of our study.

Future research can be conducted along multiple directions. First, further research can conduct several cross-cultural comparisons to find out if a robust configuration theory of PTs affecting cyberbullying can be developed across different cultures. In doing so the difference in PTs can be examined against cultural dimensions (e.g., power distance and collectivism) and thus modify the model accordingly. Second, the severity of cybersecurity laws and their implementations in the respective country can also be considered as a condition. This may modify the configuration model, adding another dimension to configurations. Third, future research is also recommended to apply complexity theory by integrating other conditions that could influence cyberbullying. For example, empathy (or lack of it) and perceived norms (both injunctive and descriptive) have been found to influence cyberbullying (Doane, Pearson, & Kelley, 2014). Future research can also deal with different types of cyberbullying, from unwanted contact to public humiliation (Doane et al., 2014). Fourth, cyberbullying on social media is a dynamic process and so are human traits. Our study collected data at a single point in time and thus used cross-sectional data. Future longitudinal research is thus necessary.

7. Conclusion

Cyberbullying, an intricate and evolving form of bullying closely linked to social media, can impact people's health and well-being in several ways. This study aims to identify the configurations of offenders' personalities and demographic attributes. Drawing on complexity and configurational theories, we develop and empirically test a model to explain cyberbullying on social media. Using complexity theory, the results suggest various equifinal configurations leading to cyberbullying, thus offering a configuration theory of cyberbullying. This research is important because cyberbullying has become a global issue and problem. Our findings have significant implications for research on users' online deviant behavior and provide practical guidance for formulating preventive measures and behavioral programs related to manage personality. Although we have a better understanding about the reasons behind cyberbullying on social media, further research is necessary in applying psychological theories to identify other related personalities and demographics.

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Appendix A. The evidence of contrarian cases
Conscientiousness (CON) vs. Cyberbullying (CB)

~CON → CB
 12 Negative contrarian cases

CON * CB Cross-tabulation

		CB						
		1.00	2.00	3.00	4.00	5.00	Total	
CON	2.00	Count	0	2	3	3	0	8
		% within CON	0.0%	25.0%	37.5%	37.5%	0.0%	100.0%
		% within CB	0.0%	4.3%	4.0%	2.9%	0.0%	2.6%
		% of Total	0.0%	0.6%	1.0%	1.0%	0.0%	2.6%
	3.00	Count	1	3	17	8	1	30
		% within CON	3.3%	10.0%	56.7%	26.7%	3.3%	100.0%
		% within CB	5.3%	6.5%	22.7%	7.8%	1.4%	9.6%
		% of Total	0.3%	1.0%	5.4%	2.6%	0.3%	9.6%
	4.00	Count	7	32	45	62	15	161
		% within CON	4.3%	19.9%	28.0%	38.5%	9.3%	100.0%
		% within CB	36.8%	69.6%	60.0%	60.8%	21.1%	51.4%
		% of Total	2.2%	10.2%	14.4%	19.8%	4.8%	51.4%
5.00	Count	11	9	10	29	55	114	
	% within CON	9.6%	7.9%	8.8%	25.4%	48.2%	100.0%	
	% within CB	57.9%	19.6%	13.3%	28.4%	77.5%	36.4%	
	% of Total	3.5%	2.9%	3.2%	9.3%	17.6%	36.4%	
Total	Count	19	46	75	102	71	313	
	% within CON	6.1%	14.7%	24.0%	32.6%	22.7%	100.0%	
	% within CB	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	
	% of Total	6.1%	14.7%	24.0%	32.6%	22.7%	100.0%	

CON → ~CB
 59 Positive contrarian cases

Chi-Square Tests

Value	df	Asymptotic Significance (2-sided)
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Pearson Chi-Square	93.842 ^a	12	.000
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Machiavellianism (MCV) vs. Cyberbullying (CB)

~MCV → CB
9 Negative contrarian cases

MCV * CB Cross-tabulation

		CB					Total	
		1.00	2.00	3.00	4.00	5.00		
MCV	1.00	Count	0	0	0	0	1	1
		% within MCV	0.0%	0.0%	0.0%	0.0%	100.0%	100.0%
		% within CB	0.0%	0.0%	0.0%	0.0%	1.4%	0.3%
		% of Total	0.0%	0.0%	0.0%	0.0%	0.3%	0.3%
	2.00	Count	3	4	3	7	1	18
		% within MCV	16.7%	22.2%	16.7%	38.9%	5.6%	100.0%
		% within CB	15.8%	8.7%	4.0%	6.9%	1.4%	5.8%
		% of Total	1.0%	1.3%	1.0%	2.2%	0.3%	5.8%
	3.00	Count	6	12	32	16	1	67
		% within MCV	9.0%	17.9%	47.8%	23.9%	1.5%	100.0%
		% within CB	31.6%	26.1%	42.7%	15.7%	1.4%	21.4%
		% of Total	1.9%	3.8%	10.2%	5.1%	0.3%	21.4%
	4.00	Count	7	26	37	55	17	142
		% within MCV	4.9%	18.3%	26.1%	38.7%	12.0%	100.0%
		% within CB	36.8%	56.5%	49.3%	53.9%	23.9%	45.4%
		% of Total	2.2%	8.3%	11.8%	17.6%	5.4%	45.4%
5.00	Count	3	4	3	24	51	85	
	% within MCV	3.5%	4.7%	3.5%	28.2%	60.0%	100.0%	
	% within CB	15.8%	8.7%	4.0%	23.5%	71.8%	27.2%	
	% of Total	1.0%	1.3%	1.0%	7.7%	16.3%	27.2%	
Total	Count	19	46	75	102	71	313	
	% within MCV	6.1%	14.7%	24.0%	32.6%	22.7%	100.0%	
	% within CB	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	
	% of Total	6.1%	14.7%	24.0%	32.6%	22.7%	100.0%	

MCV → ~CB
40 Positive contrarian cases

Chi-Square Tests

	Value	df	Asymptotic Significance (2- sided)
Pearson Chi-Square	127.243 ^a	16	.000

Appendix B. The measures and psychometric properties

Item	Reference	Mean	SD	Loading
Extraversion (mean = 3.926; alpha = 0.774; AVE = 0.579; CR = 0.844)				
I enjoy being the center of attention.	(Hossain & Rahman, 2021)	3.738	1.088	0.871
I like to start conversations.		3.955	0.985	0.807
I have a wide circle of friends and acquaintances.		3.911	0.952	0.743
I communicate with many different people.		4.099	0.911	0.603
Agreeableness (mean = 4.021; alpha = 0.819; AVE = 0.504; CR = 0.792)				
I have a great deal of interest in other people.	(Hossain & Rahman, 2021)	3.927	1.026	0.699
I care about other people.		3.962	0.962	0.607
I feel concern for other people.		4.029	0.909	0.610
I enjoy contributing to the happiness of other people.		4.137	0.870	0.604
I enjoy helping other people.		4.048	0.858	0.941
Neuroticism (mean = 3.566; alpha = 0.829; AVE = 0.660; CR = 0.886)				
I easily become stressed.	(Hossain & Rahman, 2021)	3.470	1.158	0.784
I worry about things.		3.725	1.131	0.796
I get upset easily.		3.495	1.223	0.841
My mood changes a lot.		3.574	1.177	0.826
Conscientiousness (mean = 3.984; alpha = 0.706; AVE = 0.572; CR = 0.797)				
I spend time preparing.	(Hossain & Rahman, 2021)	3.901	0.925	0.871
I finish important tasks right away.		4.032	0.864	0.609
I pay attention to detail. ^d		4.246	0.827	-
I follow a set schedule/structure.		4.019	0.896	0.766
Openness to experience (mean = 3.475; alpha = 0.897; AVE = 0.764; CR = 0.928)				
I am creative.	(Hossain & Rahman, 2021)	3.450	1.346	0.839
I am open to trying new things.		3.444	1.332	0.907
I focused on tackling new challenges.		3.514	1.202	0.863
I am happy to think about abstract concepts.		3.492	1.207	0.886
Machiavellianism (mean = 3.774; alpha = 0.835; AVE = 0.547; CR = 0.878)				
I like to use clever manipulation to get my way.	(Jones & Paulhus, 2014)	3.716	1.014	0.676
I understand that whatever it takes, you must get the important people on your side.		3.872	1.037	0.742
I understand that it is wise to keep track of information that you can use against people later.		3.760	1.022	0.739
I understand that you should wait for the right time to get back at people.		3.853	1.044	0.817

I understand that there are things you should hide from other people to preserve your reputation.		3.773	0.944	0.679
I make sure my plans benefit myself, not others.		3.668	1.152	0.777
I understand that most people can be manipulated. ^{deleted}				-
Narcissism (mean = 3.564; alpha = 0.888; AVE = 0.563; CR = 0.911)				
People see me as a natural leader.	(Jones & Paulhus, 2014)	3.677	1.139	0.762
Many group activities tend to be dull without me.		3.489	1.148	0.811
I know that I am special because everyone keeps telling me so.		3.594	1.163	0.795
I like to get acquainted with important people.		3.626	1.190	0.794
I feel embarrassed if someone compliments me. (Reverse-coded)		3.505	1.234	0.639
I have been compared to famous people.		3.495	1.228	0.784
I am an average person. (Reverse-coded)		3.604	1.157	0.627
I insist on getting the respect I deserve.		3.700	1.107	0.767
Psychopathy (mean = 3.514; alpha = 0.886; AVE = 0.596; CR = 0.911)				
I like to get revenge.	(Jones & Paulhus, 2014)	3.415	1.254	0.792
I avoid dangerous situations. (Reverse-coded)		3.470	1.261	0.809
I understand that payback needs to be quick and nasty.		3.658	1.120	0.601
People often say I am out of control.		3.387	1.350	0.785
It is true that I can be mean to others.		3.594	1.158	0.779
People who mess with me always regret it.		3.559	1.171	0.820
I say/do anything to get what I want.		3.450	1.177	0.804
Sadism (mean = 3.238; alpha = 0.921; AVE = 0.761; CR = 0.941)				
I would enjoy hurting someone.	(O'Meara et al., 2011)	3.147	1.427	0.908
I have hurt people for my own enjoyment.		3.201	1.387	0.869
I understand that people would enjoy hurting others if they gave it a go.		3.243	1.363	0.886
I have hurt people because I could.		3.313	1.253	0.858
I have humiliated others to keep them in line.		3.284	1.340	0.839
Cyberbullying (mean = 3.369; alpha = 0.912; AVE = 0.695; CR = 0.932)				
In the past three months, how often did you engage in the following behaviors on social media?				
Posted hurtful, rude, inappropriate, or mean content that targets someone.	(Chan et al., 2019)	3.374	1.260	0.845
Publicly embarrassed or pranked someone with information or photos that are potentially harmful.		3.438	1.298	0.849
Spread rumors or untrue information about someone.		3.332	1.339	0.867
Sent threatening or harassing messages to someone.		3.329	1.360	0.850
Made fun of someone.	(Lowry et al., 2019)	3.495	1.262	0.760
Changed data or photos to embarrass someone.		3.246	1.338	0.827

Appendix C. Predictive Validity Test

To assess the fsQCA solution’s predictive validity (Pappas & Woodside, 2021; Rasoolimanesh et al., 2021), we used the individual samples from the U.S. and India. We used U.S. subsamples to identify the sufficient configurations for CB. There are three sufficient configurations from the U.S. data (see Table 4 below). Thereafter, we used Indian subsample to draw an XY plot and calculated consistency and coverage; Figure 2 depicts the results. The consistency and coverage values of both subsamples are acceptable, confirming the model’s predictive power for CB.

Table 4.

Sufficient conditions of CB from the U.S. sample

	RC	UC	C
S1: ext*agr*neu*mcv*~psy*~sad	0.393	0.030	0.855
S2: agr*~neu*con*opn*~nar*~psy*~sad	0.304	0.010	0.917
S3: agr*neu*con*~opn*mcv*~nar*~psy*~sad	0.258	0.051	0.952
Solution coverage 0.668			
Solution consistency 0.769			

Note. “*” represents “and” and the symbol tilde “~” indicates negation i.e., low of condition.

S1: Cons. (0.921); Cov. (0.765) S2: Cons. (0.953); Cov. (0.732) S3: Cons. (0.931); Cov. (0.735)

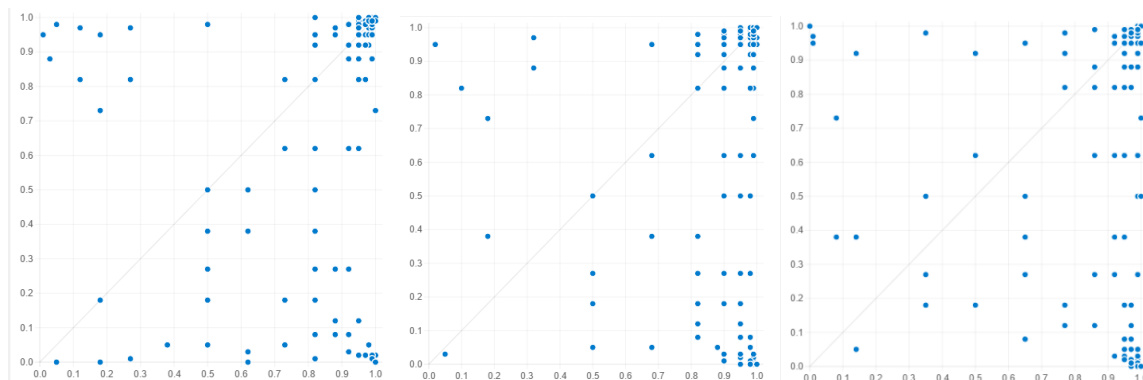


Figure 2. The XY plots for sufficient configurations to predict CB based on Indian sample