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Leveraging the psychology of online behaviour to enhance Information Operations

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Abstract

The current research explores the issue of potential vulnerability in the online space and its relationship to selected personality measures. We conducted a large-scale online survey, using a civilian sample, that asked respondents to indicate the degree to which they (1) feel disinhibited online; (2) engage in risky online behaviours (e.g., meeting up with an online acquaintance in person); and (3) feel open to forming online relationships. They also completed various personality measures, including the Honesty-Humility, Emotionality, eXtraversion, Agreeableness, Conscientiousness, and Openness (HEXACO) six-factor model of personality. We also included a series of other individual differences measures, such as loneliness and social anxiety, which we predicted would be related to these behaviours. Results revealed that, in general, people who score lower on Honesty-Humility, Conscientiousness, and higher in sensation risk-taking and are more likely to actively control their presentation to others (i.e., high in self-monitoring), are more likely to report online disinhibition, risky online behaviours and an openness to forming online relationships. Implications of our results to the Canadian Armed Forces (CAF) are discussed.

Significance to Defence and Security

Our research has potential implications to inform influence operations carried out by the CAF in the online environment. For instance, our findings can be used to help identify individuals who may be more vulnerable to online influence. Moreover, extensions of this work might also be leveraged as an enabler for forming trusting relationships with key leaders on non-domestic operations.

Résumé

La présente recherche examine la question de la vulnérabilité potentielle dans l'espace en ligne et ses liens avec certaines mesures de la personnalité. Nous avons réalisé un sondage en ligne à grande échelle, à l'aide d'un échantillon de civils, dans lequel les répondants devaient indiquer dans quelle mesure ils (1) se sentaient désinhibés en ligne, (2) adoptaient des comportements à risque en ligne (p. ex. rencontrer en personne quelqu'un dont ils ont fait la connaissance en ligne) et (3) étaient ouverts à nouer des relations en ligne. Les répondants ont aussi effectué diverses mesures de la personnalité, notamment le modèle de personnalités à six facteurs Honnêteté-Humilité, Émotivité, eXtraversion, Agréabilité, caractère Consciencieux, et Ouverture (HEXACO). Nous avons aussi inclus une série d'autres mesures des différences individuelles, par exemple la solitude et l'anxiété sociale, qui, selon nos prévisions, seraient liées à ces comportements. Les résultats montrent que, en général, les personnes qui obtiennent un pointage plus faible pour l'honnêteté-humilité et le caractère consciencieux, un pointage plus élevé pour la recherche de sensations fortes et la prise de risques, et qui sont plus susceptibles de gérer activement l'image qu'elles présentent aux autres (c.-à-d. qui obtiennent un pointage élevé pour l'autosurveillance) sont plus susceptibles de se dire désinhibés en ligne, d'adopter des comportements risqués en ligne et d'être ouverts à nouer des relations en ligne. Les répercussions de nos résultats sur les Forces armées canadiennes (FAC) sont examinées.

Importance pour la défense et la sécurité

Notre recherche pourrait avoir des répercussions qui serviraient de base aux opérations d'influence exécutées par les FAC dans l'environnement virtuel. Par exemple, nos conclusions peuvent servir à identifier les personnes qui pourraient être plus vulnérables aux techniques d'influence en ligne. De plus, la poursuite de ces travaux pourrait aussi servir à faciliter l'établissement de relations de confiance avec des dirigeants clés lors d'opérations à l'étranger.

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1 Introduction

1.1 Overview

Nearly everyone carries out some aspects of their lives in the online space. For some, it may not extend beyond using email, booking vacations, and paying bills. For many others however, the online environment represents a social environment where friendships, businesses, and romances are built and maintained (e.g., Cacioppo, Cacioppo, Gonzaga, Ogburn, & VanderWeele, 2013; McKenna, Green, & Gleason, 2002). For most, we posit that interactions with others that are conducted online are probably met with a healthy level of caution in response to the fact that, what we *think* we know about other people we have only ever interacted with online, is built on information and a projected image that is under the almost complete control of the other person. Others may be less careful. For some Canadians, genuine trusting relationships are formed and maintained completely online (Sinha, 2014). The practise can come with real risk, as is evident in several incidents reported by the popular media in which a person, or victim, has had his or her safety, dignity, or financial security threatened by individual scammers, organized criminal enterprises or foreign actors who have been able to leverage the properties of the online environment to groom or dupe their victims into engaging in behaviours that cause them harm.

In this report, we explore how aspects of a person's psychological make-up—their personality and their behavioural tendencies—play a role in their willingness to form relationships in the online environment and enhance their willingness to engage in behaviour that in other contexts, might be understood to carry substantial and obvious risk. Finally, we explore the idea that a central construct, referred to as the online disinhibition effect (Suler, 2004), is associated with online "misbehaviour" or risky behaviour. Online disinhibition refers to the absence of feelings that govern normal behavioural constraint because of the perceived anonymity, invisibility, and impunity that exists when people interact with others online. For example, in a widely publicised case, we believe that online disinhibition may have played a role in enabling adversaries to gain blackmail-worthy content to use against a Canadian government official (Tasker & Kapelos, 2018).

Given the increasing ubiquity of the internet, online disinhibition represents both a challenge and opportunity for operators in the Canadian Armed Forces (CAF). On the one hand, the relative anonymity of the online environment seems to encourage disinhibited behaviour—behaviour possibly made more likely by a person's psychological constitution. Hence, understanding who in a population are vulnerable to influence operations against them represents a first step in inoculating people against adversarial attempts to shape online behaviour. On the other hand, online disinhibition represents a potentially valuable enabler for the CAF who may wish to reach, and influence the will and behaviour of, target audiences who are wary of, or hostile toward, the CAF in deployed operations.

This Scientific Report responds to a direct request from the Deputy Minister's office and draws upon two manuscripts intended for publication in the external literature; portions of which are combined here to provide the reader with a more integrated view of the relationships between personality and online behaviours.

1.2 Online Disinhibition

Over a decade ago, John Suler (2004) proposed that individuals perform disinhibited behaviour in the online environment because they are anonymous and provided with protection from being identified. He coined this construct the *online disinhibition effect* and posited that it includes six factors (see Table 1). The ideas proposed by Suler are not entirely new. There are several examples of research that support the basic notions of the online disinhibition effect; for example, aggressive tendencies are heightened under anonymity but attenuated when it is eliminated (e.g., Aboujaoude, Savage, Starcevic, & Salame, 2015; Rowe, 2015; Santana, 2014; Siegel, Dubrovsky, Kiesler, & McGuire, 1986; Srivastava, 2012; Zimmerman & Ybarra, 2014). Although all of the six factors may be relevant to the current research, we expect that the most relevant factors are dissociative anonymity, invisibility, dissociative imagination, and minimization of status and authority, as each of these are integrally associated with the mechanisms of heightened anonymity thought to account for online disinhibition.

Table 1: *Description of Suler's (2004) proposed six factors of the online disinhibition effect.*

Factor	Description
Dissociative Anonymity	Feelings of invulnerability when self-disclosing, due to the fact that one's behaviours or disclosures cannot be linked back to them, reducing feelings of accountability.
Invisibility	Individuals can be physically invisible in the online environment allowing them to navigate the space without others' knowledge.
Asynchronicity	Response delays exist in the online space (e.g., emails, message boards) that can reduce inhibitions as well as timely social norm feedback that is commonplace in face-to-face interactions.
Solipsistic Introjection	Individuals may internalize the presence and/or influence of others in the online space, leading them to feel as though others' voices are their own, unconsciously promoting feelings of disinhibition because it feels as though others are speaking directly to them.
Dissociative Imagination	Individuals have the ability and opportunity to create imaginary or different versions of themselves that they only present online, which can increase feelings of disinhibition because it allows them to feel even less responsibility for behaviour of that 'version' of themselves.
Minimization of Status and Authority	Feelings of anonymity and invisibility can provide protection from being identified, thus reducing or even eliminating the fear of disapproval or punishment from others for online behaviours.

In the current research, we developed a measure of online disinhibition (see Method for more details) that, broadly speaking, assesses the factors outlined above.

1.2.1 Risky Online Behaviours

To further explore online activities, we also created a measure of risky online behaviours. We define risky online behaviours in the current research as generally being somewhat innocuous behaviours (e.g., meeting up with someone that they met online) but that hold the potential for having negative outcomes. The measure assesses the frequency with which individuals have engaged in these types of behaviours. We created this measure in an effort to (i) assess the criterion validity of our online disinhibition measure, as well as (ii) test whether feelings of online disinhibition relate to engaging in risky or careless behaviours online. We predicted that:

> *H1:* Higher levels of online disinhibition will be related to more risky online behaviours.

It is worth noting that we expected the two constructs to be related. However, one may experience feelings of disinhibition in the online space but that does not necessarily translate into engaging in risky online behaviours.

1.2.2 Openness to Form Online Relationships

We also created a measure to assess openness to form online relationships. We included this measure in order to better understand the relationship between forming online relationships and online disinhibition. Specifically, we expected that:

> *H2a:* Higher levels of openness to form online relationships will be related to higher levels of online disinhibition.

Engaging with others may also be associated with risk. For instance, people can lie more easily about their true identity online compared to offline. Thus, we also expected that:

> *H2b:* Higher levels of openness to form online relationships will be related to more risky online behaviours.

1.3 Personality

As noted earlier, we also explored how behaviour in the online environment might be related to aspects of a person's personality. Research has examined a range of personality variables as predictors of online behaviours such as social network use, forming online relationships, pathological internet use and so on. For instance, research indicates that extraversion is the strongest predictor of using social network sites as well as a number of social network site activities such as gaming, interacting with others, updating one's status and so on (Liu & Campbell, 2017). Openness has also been found to be related to social network behaviours such as gaming and information seeking (Liu & Campbell, 2017). Similarly, other research has found a relationship between openness and the formation of strong online relationships and social networks (Huang, Cheng, Huang, & Teng, 2018). Moreover, Huang and colleagues (2018) also found that high agreeableness, and low conscientiousness and neuroticism were also related to online engagement with others. For those individuals who are motivated to engage in online relationships in order to socialize with others, again openness is related, and conscientiousness is negatively related (Hughes, Rowe, Batey, & Lee, 2012). Similarly, when examining attitudes towards Facebook, extraversion and openness are related to holding positive attitudes, while conscientiousness is associated with holding negative attitudes (Chua & Chua, 2017).

Although research on personality and online behaviours is frequently conducted, unfortunately the research tends to be limited in power with small sample sizes as well as in scope (Liu & Campbell, 2017). Additionally, oftentimes findings reported in the literature are contradictory or reported relationships are weak in magnitude (e.g., Chua & Chua, 2017; Hughes et al., 2012; Stanton, Ellickson-Larew, & Watson, 2016). Thus, we sought to address this methodological issue by conducting our study on a large sample of Canadian and American civilians to, hopefully, obtain more accurate results from which we can derive a better understanding of how personality drives online behaviour.

1.3.1 The HEXACO Six-Factor Model of Personality

Although much of the cited literature focuses on the five-factor model of personality, we used Lee & Ashton's (2004; 2006) six-factor model of personality (i.e., the HEXACO) in our research. The HEXACO was selected because it is a state-of-the-art scale of personality, widely-used in the literature, and is available for researchers to use at no charge (see Table 2 for summary of the six-factor model of personality).

Table 2: *Summary of Lee & Ashton's (2004) six-factor model of personality, the HEXACO.*

Factor	Description
Honesty-Humility	Honest; fair; sincere; modest; not greedy.
Emotionality	Anxious; fearful; sentimental; dependent; emotionally reactive; emotionally attached to others.
eXtraversion	Talkative; social; cheerful; passive; quiet.
Agreeableness	Good-natured; tolerant; agreeable; not irritable; not argumentative; not critical.
Conscientiousness	Organized; hard-working; careful; thorough.
Openness	Original; creative; aesthetic appreciation; inquisitiveness.

1.3.2 Honesty-Humility

Research has linked online disinhibition and dark personality traits (Kurek et al., 2019); given the overlap between dark personality traits and Honesty-Humility (Hodson et al., 2017), we expected that:

H3a: Lower Honesty-Humility will be related to higher levels of online disinhibition.

Additionally, people low in Honesty-Humility are more willing to cheat or steal (Lee & Ashton, 2004), thus we also expected that:

H3b: Lower Honesty-Humility will be related to higher levels of risky online behaviours.

Forming relationships online has the potential to allow for dishonesty or concealing of the self, thus, given their propensity toward deceiving or manipulating others, we also expected that:

H3c: Lower Honesty-Humility will be related to greater openness to form online relationships.

1.3.3 Emotionality

Research suggests individuals high in neuroticism (e.g., Emotionality) use the online environment to express their actual selves; in other words, they have self-presentational concerns that can be attenuated when operating online (Seidman, 2013), thus, we predicted that:

H4a: Higher Emotionality will be related to higher levels of online disinhibition.

Individuals high in Emotionality are risk-averse (Lee & Ashton, 2004), thus we expected that:

H4b: Lower Emotionality will be related to higher levels of risky online behaviours.

Research suggests engagement with others online is negatively related to neuroticism (Huang et al., 2018), thus, we expected that:

H4c: Lower Emotionality will be related to greater openness to form online relationships.

1.3.4 eXtraversion

Although, individuals higher in extraversion indicate a heightened level of social engagement in the online environment (e.g., Gosling, Augustine, Vazire, Holtzman & Gaddis, 2011), prior research shows a negative relationship between offline behavioural inhibition and extraversion (Shatz, 2005). Individuals lower in extraversion may feel more at ease and disinhibited when engaging with others online such that concerns surrounding potential feedback on social interactions, whether it is negative or positive, may be attenuated. Thus, we expected that:

H5a: Lower eXtraversion will be related to higher levels of online disinhibition.

H5b: Lower eXtraversion will be related to greater openness to form online relationships.

Our rationale for our predictions (*H5a* and *H5b*) are primarily related to engaging with others in the online environment, thus, we did not have a specific hypothesis regarding the relationship between eXtraversion and risky online behaviours.

1.3.5 Agreeableness

Individuals who are low on this trait experience difficulties engaging with others due to their argumentative and unforgiving nature (Lee & Ashton, 2004). It may be that because individuals lower on the trait may more often engage in social interactions that are marked by controversy they may feel more disinhibited while operating online. Thus, we expected that:

H6a: Lower Agreeableness will be related to higher online disinhibition.

Huang et al. (2018) found a link between high Agreeableness and engagement with others online, thus we expected that:

H6b: Higher Agreeableness will be related to greater openness to form online relationships.

Again, we did not have any specific predictions regarding the relationship between Agreeableness and risky online behaviours since our predictions focused on interactions with others.

1.3.6 Conscientiousness

As discussed prior, Conscientiousness is negatively associated with online engagement (Huang et al., 2018) and motivation to socialize with others online (Hughes et al., 2012). Moreover, individuals high on Conscientiousness are diligent and careful (Lee & Ashton, 2004), thus, we expected that:

H7a: Lower Conscientiousness will be related to higher levels of online disinhibition.

H7b: Lower Conscientiousness will be related to more risky online behaviours.

H7c: Lower Conscientiousness will be related to greater openness to form online relationships.

1.3.7 Openness

As discussed prior, Openness is associated with forming strong online and social network relationships (Huang et al., 2018), thus, we predicted that:

H8: Higher Openness will be related to greater openness to form online relationships.

Given the nature of the factor (i.e., appreciation for art and nature, being inquisitive), it was not readily apparent to us how Openness might relate to online disinhibition or risky online behaviours, thus, we did not have specific hypotheses for those relationships.

1.4 Individual Differences

Although much of our focus has been on the stable six-factor model of personality, we also considered other individual differences that we hypothesized would be related to or impactful with respect to online behaviours. Thus, we also pursued a number of other individual differences that prior research has linked to an increased susceptibility to fall prey to social engineering tactics (for a review, see D'Agata & Kwantes, 2019b).

1.4.1 Risk-taking

Research suggests a link between engaging in risk-taking behaviours in the online environment and susceptibility to being groomed online, particularly for young people (Whittle, Hamilton-Giachritsis, Beech, & Collings, 2013). Risk-taking propensity has also been linked to information security awareness, such as paying attention to contextual cues and reporting security incidents (e.g., Gratian, Bandi, Cukier, Dykstra, & Ginther, 2018; McCormac, Zwaans, Parsons, Calic, Butavicius, & Pattinson, 2017) as well as higher susceptibility to falling prey to phishing attempts (Moody, Galletta, & Dunn, 2017). We predicted that:

H9a: Higher risk-taking will be related to higher levels of online disinhibition.

H9b: Higher risk-taking will be related to more risky online behaviours.

H9c: Higher risk-taking will be related to greater openness to form online relationships.

1.4.2 Loneliness

Loneliness has been found to be related to a dependency on forming online as opposed to face-to-face relationships (e.g., Nowland, Necka, & Cacioppo, 2017). Feelings of loneliness can be reduced when online relationships allow for the strengthening or development of relationships, however, a reliance on online relationships in an effort to avoid face-to-face interactions and relationships can lead to increases in loneliness (Nowland et al., 2017). Similarly, researchers have found a link between increased reliance on social media use and real-life social isolation (Whaite, Shensa, Sidani, Colditz, & Primack, 2018). Thus, we predicted that:

> *H10a:* Greater loneliness will be related to higher levels of online disinhibition.
>
> *H10b:* Greater loneliness will be associated with greater openness to form online relationships.

Similarly to eXtraversion and Agreeableness, our hypotheses were based on interacting or engagement with others, thus, we did not have a specific hypothesis regarding the relationship between loneliness and risky online behaviours.

1.4.3 Social Anxiety

For individuals who experience social anxiety, communicating with others online, as opposed to face-to-face, can be more comfortable (Prizant-Passal, Shechner, & Aderka, 2016). Operating in the online environment can eliminate non-verbal cues which, among the socially anxious, could be anxiety provoking and lead to obvious, visible signs of social discomfort and physiological symptoms (Prizant-Passal et al., 2016). We expected that:

> *H11a:* Higher social anxiety will be associated with greater online disinhibition.
>
> *H11b:* Higher social anxiety will be associated with greater openness to online relationships.

Our predictions relating to social anxiety focus primarily on interacting with others online, thus, it was not readily apparent to us how the trait might relate to risky online behaviours.

1.4.4 Trust

Individuals who are more trustworthy are more likely to fall victim to online romance scams (Whitty, 2018). Moreover, focusing on earning a victim's trust is a commonly used tactic by scammers to achieve their goals (Whitty, 2013). Additionally, a greater willingness to disclose personal information online has also been associated with higher trust and lower dispositional privacy concerns (Joinson, Reips, Buchanan, Schofield, 2010). Thus, we predicted that:

> *H12a:* Greater levels of dispositional trust will be related to risky online behaviours.
>
> *H12b:* Greater levels of dispositional trust will be related to greater openness to form online relationships.

We did not have a specific prediction regarding the relationship between trust and online disinhibition given much of the construct may be unconnected to trust in others.

1.4.5 Self-Concealment

Self-concealment refers to a tendency towards hiding or concealing negative thoughts, feelings, and events from others (Larson & Chastain, 1990). Limited research exists on self-concealment and online behaviours, however, individuals who are more prone to withholding or concealing personal information in their day-to-day lives may actually be more open to disclosing in online as opposed to face-to-face contexts (Trub, 2017). This may occur because these individuals may feel as though they can more openly reveal the negative aspects of themselves online to others who they perceive will be more accepting of their flaws; in contrast, such individuals often do not experience that comfort in face-to-face interactions where concerns surrounding rejection from others may be intensified (Trub, 2017). We expected that:

H13a: Higher self-concealment will be related to greater online disinhibition.

H13b: Higher self-concealment will be related to more openness to form online relationships.

Our predictions were developed based on limited research in this area that has focused primarily on interactions with others online, thus we did not expect a relationship between self-concealment and risky online behaviours.

1.4.6 Self-Monitoring

Self-monitoring, a form of impression management, involves altering one's behaviour to align with a specific social situation (Snyder, 1974). Individuals higher on self-monitoring display an increased willingness to deceive others online; this pattern occurs in online dating profiles where high self-monitors are more likely to withhold information or misrepresent themselves (Hall, Park, Song, & Cody, 2010). We predicted that:

H14a: Higher levels of self-monitoring will be related to higher levels of online disinhibition.

H14b: Higher levels of self-monitoring will be related to more risky online behaviours.

H14c: Higher levels of self-monitoring will be related to greater openness to form online relationships.

1.4.7 Need for Cognition

Research has identified a link between need for cognition (NFC; Cacioppo, Petty, & Kao, 1984), or one's disposition to engage in and enjoy thinking, and a decreased susceptibility to misinformation or cognitive biases (e.g., Carnevale, Inbar, & Lerner, 2011; Hess, Popham, Emery, & Elliott, 2012). NFC is also related to greater levels of focused attention, feelings of greater control and curiosity in the online environment (Li & Browne, 2004). Together, the patterns suggest that those with high NFC think through the risks of the online environment, and may therefore be less susceptible to be influenced online. We predicted that:

H15a: Lower NFC will be related to greater online disinhibition.

H15b: Lower NFC will be related to more risky online behaviours.

We did not have specific hypotheses regarding NFC and openness to form online relationships.

1.5 Self-Disclosure

For individuals who have formed an online relationship in the past, we were interested in examining the extent to which they exert control and intention over their disclosures. We expected that:

H16a: Higher intended self-disclosure will be related to lower levels of online disinhibition.

H16b: Higher intended self-disclosure will be related to less risky online behaviours.

We did not expect a significant relationship between intended self-disclosure and openness to form online relationships because participants in this sub-sample have already indicated that they are open to forming online relationships.

1.6 Current Research

In the current research, we integrated the previous literatures to begin developing a better understanding of the relationships between selected measures of personality and individual differences and online behaviour. More specifically, we examined the extent to which particular personality traits and individual differences relate to (1) feeling disinhibited in the online space, (2) engaging in risky online behaviours, and (3) one's openness to forming online relationships.

2 Method[1]

2.1 Participants

Participants (N = 213) were a Canadian and American adult community sample. Participants were recruited through Qualtrics (Utah, USA) employing their Online Panels service that recruits and launches surveys for researchers. To be eligible to participate, participants needed to be 18 or older and fluent in English. The mean age of our sample was 49.71 (SD = 15.60). Based on responses to demographic questions at the beginning of our survey, 64.3% of our sample were female, and 35.7% were male. Over 70% of our sample had some post-secondary education, and nearly 50% of the sample was currently employed. On average, participants reported engaging in recreational activities online with others for 9.13 (SD = 11.93) and alone for 12.41 (SD = 12.20) hours a week.

2.2 Measures

2.2.1 HEXACO Personality Inventory-Revised

We used the HEXACO (HEXACO-PI-R; Ashton & Lee, 2008; Lee & Ashton, 2004, 2006), a 100-item measure to assess the six-factor model of personality (Honesty-Humility, Emotionality, eXtraversion, Agreeableness, Conscientiousness, Openness). As noted in the introduction of this report, Honesty-Humility refers to one's tendency to be honest, fair, sincere, modest, and not greedy. Emotionality refers to fearfulness, anxiety, dependency on others for emotional support, and emotional attachment to others. The eXtraversion factor refers to one's expressivity and enthusiasm, confidence associated with social gatherings, and enjoyment of social interactions. Agreeableness assesses one's tendency to forgive others' wrongdoings, to be lenient with others, and comprising and maintaining a calm composure. Conscientiousness refers to being organized, diligent, perfectionistic, and prudent. Finally, Openness assesses one's appreciation for beauty in art and nature, being inquisitive, creative, and unconventional. All of the subscales demonstrated good internal consistency (Cronbach's α = .80–.86).

2.2.2 Measures Related to Online Behaviour

2.2.2.1 Online Disinhibition

To assess Suler's (2004) online disinhibition effect, we created a 20-item measure. Sample items include: "I have disclosed personal information online that I never have disclosed offline" and "Some of my online behaviours would surprise people close to me." The scale employs a 5-point rating scale, ranging from 1 (*strongly disagree*) to 5 (*strongly agree*). The factor structure of the scale was unidimensional and demonstrated good internal consistency (Cronbach's α = .91).

2.2.2.2 Openness to Form Online Relationships (OFOR)

The Openness to Form Online Relationships (OFOR) is a short 12-item measure developed by the authors to assess individuals' willingness to develop relationships with strangers in the online space. The scale uses a 5-point scale, ranging from 1 (*strongly disagree*) to 5 (*strongly agree*). Unexpectedly, the results of

[1] Portions of this report have been published in previous reports (see D'Agata & Kwantes, 2019; Kwantes & D'Agata, 2019a).

an initial factor analyses suggested a two-factor model; the first factor representing *Engagement* (e.g., "I feel more comfortable making friends online than in person") and the second factor reflecting *Suspicion* (e.g., "I believe most people lie at least a little bit about who they truly are when they are online"). The Engagement and Suspicion factors (i.e., subscales) both indicated adequate internal consistency (Cronbach's α = .83 and.71, respectively). The two subscales were correlated at r = -.32, suggesting that, while related in expected ways (i.e., greater openness is related to less suspicion), the two factors are also at least somewhat distinct from each other.

2.2.2.3 Risky Online Behaviours (ROB)

We created a 22-item scale to measure individuals' frequency with engaging in risky online behaviours (e.g., disclosing personal information, falling victim to a romance scam). Items were assessed on a 4-point rating scale, ranging from 0 (*never*) to 4 (*more than 5 times*). The scale demonstrated good internal consistency (Cronbach's α = .89).

2.2.3 Behavioural and Psychological Measures

2.2.3.1 Stimulating Instrumental Risk Inventory

The Stimulating Instrumental Risk Inventory (Zaleskiewicz, 2001) is a 17-item measure that assesses dispositional risk-taking. The scale consists of two subscales: Stimulating Risk-Taking (e.g., impulsivity, sensation-seeking) and Instrumental Risk-Taking (e.g., analytical decision-making, analysis of expected outcomes). The scale is measured on a 4-point rating scale ranging from 1 (*does not describe me at all*) to 4 (*describes me very well*). In our sample, the subscales demonstrated low and adequate internal consistency, respectively (Cronbach's α = .67 and .79) and were moderately positively related to each other (r = .38, p < .01).

2.2.3.2 UCLA Loneliness Scale

The UCLA Loneliness Scale (Russell, 1996) is a 20-item scale that assesses the frequency with which individuals experience situations or feelings related to loneliness. The scale uses a 4-point rating scale, ranging from 1 (*never*) to 4 (*always*). The scale indicated good internal consistency (Cronbach's α = .93).

2.2.3.3 Liebowitz Social Anxiety Scale

The Liebowitz Social Anxiety Scale (Heimberg et al., 1999) assesses one's fear or anxiety associated with certain situations. Additionally, the measure can be completed a second time to assess the extent to which participants avoid the same situations; due to missing data we only present findings on the fear/anxiety component of the measure. Items are assessed on a 4-point scale, ranging from 0 (*none*) to 3 (*severe*). The scale consists of two subscales—performance and social interaction—however, in our sample the two subscales correlated at r = .92 suggesting a high level of redundancy, thus we report a total mean score for the full scale. The full scale demonstrated high internal consistency (Cronbach's α = .96).

2.2.3.4 Interpersonal Trust Scale

The Interpersonal Trust Scale (Rotter, 1967), a 25-item measure, assesses dispositional trust and one's expectation of others' (e.g., government, parents, etc.) integrity. The scale is measured on a 5-point rating scale, ranging from 1 (*strongly agree*) to 5 (*strongly disagree*) and demonstrated good internal consistency (Cronbach's α = .84).

2.2.3.5 Self-Concealment Scale

The 10-item Self-Concealment Scale (SCS; Larson & Chastain, 1990) measures one's disposition toward concealing or hiding personal information that is typically negative or upsetting in nature. Responses are rated on a 5-point rating scale, ranging from 1 (*strongly disagree*) to 5 (*strongly agree*). In our sample, the scale demonstrated good internal consistency (Cronbach's $\alpha = .90$).

2.2.3.6 Self-Monitoring Scale

The Self-Monitoring Scale (Snyder, 1974) is a 25-item measure that uses a *true-false* rating scale to assess the extent to which one alters or modifies one's behaviour depending on the social situation or cues. The scale indicated poor internal consistency (Cronbach's $\alpha = .60$).

2.2.3.7 Self-Disclosure Scale

The Self-Disclosure Scale (Wheeless & Grotz, 1976) is an 18-item measure that assesses willingness to self-disclose to others. Participants were first asked if they have ever formed a relationship with someone online; if they indicated yes, they completed this measure using the following instructions: Mark the following statements to reflect how you communicate with your online friend. Items are measured on a 7-point rating scale, ranging from 1 (*strongly disagree*) to 7 (*strongly agree*). The scale consists of six subscales or factors: intended disclosure, amount, positive-negative, honesty-accuracy, control of depth, and relevance-message nature. We also calculated a mean total score and report on that in our results section. The overall scale indicated good internal consistency (Cronbach's $\alpha = .79$).

2.2.3.8 Need for Cognition Scale

The Need for Cognition Scale (NFC; Cacioppo et al., 1984) assesses one's tendency to engage in and enjoying thinking. It is an 18-item measure and uses a 5-point rating scale, ranging from 1 (*extremely uncharacteristic of me*) to 5 (*extremely characteristic of me*). The scale indicated good internal consistency (Cronbach's $\alpha = .85$).

2.3 Procedure

The survey was completed online using the survey platform Qualtrics.[2] Participants either completed the HEXACO followed by our online measures (Risky Online Behaviours, Online Disinhibition, and Openness to Form Online Relationships) or vice versa (see Figure 1). All participants then completed all remaining measures, presented in a randomized order.

[2] Ethics approval was granted by DRDC Toronto's Human Research Ethics Committee Protocol No. 2018-071.

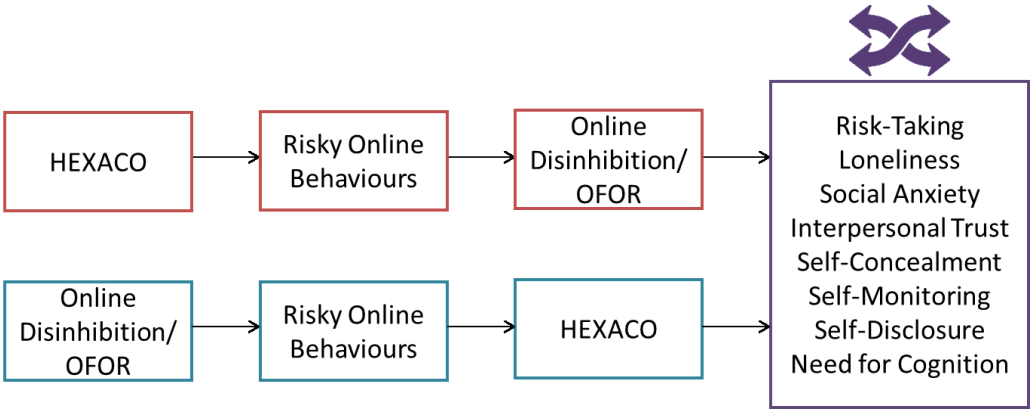

Figure 1: *Visual representation of the procedure for the ordering of the measures (Note: OFOR = Openness to Form Online Relationships).*

3 Results and Discussion

In the current section, we describe both our results and interpret each finding. For ease of interpretation, we present a series of research questions and then present those correlations that are relevant to each research question posed (please see Annex A for the full correlation matrix that includes all of the study variables). As an initial check, we first seek to ensure that self-reports of online disinhibition and the three online behaviours (willingness to engage in risky online behaviours; openness to engage in online relationships and (based on our factor analytic results) less suspicion about online relationships) are related in the expected way.

3.1 Do people who feel disinhibited online tend to be those with an increased willingness to form online relationships, less suspicious of online relationships, and engage in more risky online behaviours?

As expected, we found a significant and positive correlation between our online disinhibition and risky online behaviours measures (*H1*). Higher levels of disinhibition in the online environment are associated with engaging in more risky behaviours (see Table 3).

Although we expected online disinhibition to be associated with greater openness to form online relationships (OFOR), we did not anticipate that two factors for our OFOR measure would emerge: willingness to engage with others (Engagement) and feelings of suspicion toward others in the online environment (Suspicion). As a result, while our hypothesis pertains to OFOR as a single construct, our analysis of the relationship between online disinhibition and OFOR will consider Engagement and Suspicion separately in this analysis, and the subsequent ones in this report. Our hypotheses are generally aligned with the Engagement subscale, and marked as such throughout the results section. Online disinhibition is positively related to OFOR Engagement (*H2a*) and negatively related to OFOR Suspicion. That is, greater feelings of disinhibition are associated with an enhanced willingness or openness to meeting, and/or forming relationships, with others in the online environment. In addition, greater feelings of online disinhibition are accompanied by being less suspicious of others in the online environment.

Table 3: *Means, standard deviations, and intercorrelations between online disinhibition and our online measures [Note: $p < .01$ are bolded].*

	M (SD)	**1**	**2**	**3**
1. Online Disinhibition	2.24 (.66)			
2. ROB	0.52 (.55)	**.57**		
3. OFOR Engagement	2.19 (.83)	**.77**	**.50**	
4. OFOR Suspicion	3.96 (.62)	**-.38**	-.12	**-.32**

Also as expected, scores on our risky online behaviours measure are positively related to one's openness to form online relationships, (OFOR Engagement; *H2b*), however, they are not related to one's suspicion of others (OFOR Suspicion). This pattern is intuitive in that some risky online behaviours that we assessed included engagement with others in the online environment. However, participants' increased willingness to assume risk while engaging online likely meant that they had little concern about whether people they interact with online can be trusted. Having established, and largely confirmed the relationships among the behavioural indicators we now turn to understanding the pattern of personality and individual differences that are associated with these indicators of online activities that could result in vulnerability in the online environment.

3.2 What types of people report greater disinhibition online?

We examined the correlations between our measure of online disinhibition and the HEXACO personality traits and individual differences included in our study (see Table 4). Consistent with most of our hypotheses, online disinhibition is negatively and significantly correlated with all of the HEXACO subscales, except Emotionality which is unrelated. Specifically, those who tend to report being disinhibited to a greater extent on the internet than in other contexts (e.g., face-to-face interactions) also tended to report lower levels of eXtraversion (*H5a*), Conscientiousness (*H7a*), Honesty-Humility (*H3a*), Agreeableness (*H6a*), and Openness. Additional findings also indicate that greater online disinhibition scores are related to less NFC (*H15a*). In other words, people who tend to feel disinhibited online report being more introverted, less organized and diligent, report being less honest and modest, less cooperative when interacting with others, report lower enjoyment and engagement in thinking, and tend not be inquisitive. Additionally, greater online disinhibition is also associated with greater reported loneliness (*H10a*), social anxiety (*H11a*), self-monitoring (*H14a*) and a tendency to take risks (*H9a*), and to conceal negative information about one's self (*H13a*) in face-to-face interactions. Contrary to our prediction, Emotionality was not related to online disinhibition (*H4a*). Although we discussed research suggesting individuals high in neuroticism use the online space to express their 'true' selves, the lack of relationship in our data suggests the possibility that expressing one's 'true' self perhaps does not necessarily necessitate self-expression in a disinhibited way.

Table 4: *Correlations between online disinhibition and personality and individual differences variables [Note: $p < .05$ are italicized, $p < .01$ are bolded].*

		Online Disinhibition
HEXACO Subscales	Honesty-Humility	**-.59**
	Emotionality	.11
	eXtraversion	**-.34**
	Agreeableness	**-.23**
	Conscientiousness	**-.47**
	Openness	*-.18*
Other Individual Difference Measures	Loneliness	**.34**
	Social Anxiety	**.30**
	Risk-Taking (Stimulating)	**.36**
	Risk-Taking (Instrumental)	*.15*
	Interpersonal Trust	.05
	Self-Concealment	**.37**
	Self-Monitoring	**.26**
	Need for Cognition	**-.19**

3.3 What types of people engage in risky online behaviours?

We next examined the relationship between our measure of risky online behaviours and the personality variables. As presented in Table 5 below, people with higher tendencies to engage in risky online behaviours tend to be high in Emotionality, low in Conscientiousness (*H7b*), and low in Honesty-Humility (*H3b*). We expected Emotionality to be negatively related to risky online behaviours (*H4b*); it may be that other aspects of Emotionality contribute to higher levels of risky online behaviours, such as seeking others' approval. In terms of the individual differences, greater tendencies to engage in risky online behaviours are associated with heightened loneliness, social anxiety, self-concealment, stimulating and instrumental risk-taking (*H9b*), and self-monitoring (*H14b*). Although the pattern for online disinhibition and risky online behaviours is similar in these instances, there are a few differences. Emotionality is significantly related to risky online behaviours but not online disinhibition. Additionally, eXtraversion, Openness, and NFC are significantly related to online disinhibition but not risky online behaviours. Future work could examine the apparent inconsistency between how one's behaviour online and their level of disinhibition are driven differently by aspects of their psychological make-up. Contrary to expectations, and somewhat puzzling, trust (*H12a*) and NFC (*H15b*) were not significantly related to risky online behaviours. It may be that our trust measure does not necessarily adequately reflect trust feelings in the online domain, although, it remains unclear as to why NFC was not significant.

Table 5: *Correlations between risky online behaviours and personality and individual differences variables [Note: p < .05 are italicized, p < .01 are bolded].*

		ROB
HEXACO Subscales	Honesty-Humility	**-.40**
	Emotionality	*.16*
	eXtraversion	-.10
	Agreeableness	**-.21**
	Conscientiousness	**-.26**
	Openness	-.08
Other Individual Difference Measures	Loneliness	*.14*
	Social Anxiety	**.24**
	Risk-Taking (Stimulating)	**.34**
	Risk-Taking (Instrumental)	**.22**
	Interpersonal Trust	-.01
	Self-Concealment	**.20**
	Self-Monitoring	**.20**
	Need for Cognition	-.06

3.4 What types of people are open to forming online relationships?

Table 6 represents the relationship between one's openness to engage in online relationships and the personality variables. A heightened willingness to form online relationships is associated with lower eXtraversion (*H5b*), Conscientiousness (*H7c*), and Honesty-Humility (*H3c*). Such people are also more likely to report higher levels of loneliness (*H10b*), social anxiety (*H11b*), and self-concealment (*H13b*). They are also more likely to report higher levels of dispositional risk-taking (*H9c*), and self-monitoring (*H14c*). Similar patterns emerge among our OFOR Engagement measure, online disinhibition, and risky online behaviours. That is, certain traits appear to be strongly related to all three constructs. Contrary to our predictions, Emotionality (*H4c*), Agreeableness (*H6b*), Openness (*H8*), and trust (*H12b*) were not related to openness to form online relationships. Although it is unclear why Emotionality did not emerge as significant, we suspect Agreeableness may not be related as it may be that difficulties in getting along with others extend into the online realm. In terms of Openness, the construct is very much focused on appreciation for the beauty of nature and art, so perhaps although these individuals are open to other types of experiences, it may not apply to openness to forming online relationships. With regards to trust, again, it may be that that construct is not directly assessing the type of trust that would be most relevant to online behaviours.

Table 6: *Correlations between openness to form online relationships and personality and individual differences variables [Note: $p < .05$ are italicized, $p < .01$ are bolded].*

		OFOR Engagement
HEXACO Subscales	Honesty-Humility	**-.46**
	Emotionality	.00
	eXtraversion	**-.19**
	Agreeableness	-.12
	Conscientiousness	**-.29**
	Openness	-.09
Other Individual Difference Measures	Loneliness	**.28**
	Social Anxiety	*.16*
	Risk-Taking (Stimulating)	**.36**
	Risk-Taking (Instrumental)	**.25**
	Interpersonal Trust	.11
	Self-Concealment	**.22**
	Self-Monitoring	**.24**
	Need for Cognition	-.07

3.5 What types of people are suspicious of forming online relationships?

Our OFOR Suspicion subscale was positively related to Honesty-Humility, Conscientiousness, and negatively related to interpersonal trust (see Table 7). That is, people who are suspicious of others' motives or intentions in the online space tend to be more honest, careful and diligent, and are generally more distrusting of others in their day-to-day lives.

Table 7: *Correlations between suspicion about online relationships and personality and individual differences variables [Note: $p < .05$ are italicized, $p < .01$ are bolded].*

		OFOR Suspicion
HEXACO Subscales	Honesty-Humility	**.23**
	Emotionality	.08
	eXtraversion	.05
	Agreeableness	-.12
	Conscientiousness	**.19**
	Openness	.05
Other Individual Difference Measures	Loneliness	.02
	Social Anxiety	-.01
	Risk-Taking (Stimulating)	-.12
	Risk-Taking (Instrumental)	.09
	Interpersonal Trust	**-.37**
	Self-Concealment	.07
	Self-Monitoring	-.06
	Need for Cognition	.09

Although there were differences in the specific patterns of results across our three indicators of online behaviours, some consistent patterns emerged. Overall, lower levels of Honesty-Humility, eXtraversion, and Conscientiousness were all related to higher levels of online disinhibition, risky online behaviours, and openness to form online relationships (Engagement subscale). In terms of individual differences, higher levels of loneliness, social anxiety, and stimulating risk-taking were related to higher levels of online disinhibition, risky online behaviours, and openness to form online relationships (Engagement subscale). Having explored the overall relationship among personality, individual differences and online markers, we next sought to begin to understand some of the dynamics among those in our sample who reported having formed online relationships.

3.6 For people who have formed relationships online, what is the relationship between online disinhibition, one's tendency to engage in risky online behaviours, and the extent to which they intentionally share personal information about themselves?

In social interactions, people may be careful or calculating regarding what personal information they are willing to share about themselves, especially in the early stages of a relationship (Holmes, 1991; Levinger, 1983). Yet the increased anonymity afforded by and associated with the online space can provide an illusion of protection that seems to encourage some to behave in disinhibited and uncharacteristic ways (Suler, 2004). In this section, and the next, we look more specifically at those participants who have formed friendships and/or romances online (30% of our sample reported having done so) to understand what psychological factors are associated with their control and intentionality

associated with disclosing information about themselves to someone they have met online. To pursue this issue, we had participants, who had indicated that they had formed a relationship entirely online, complete the Self-Disclosure Scale where higher scores indicate disclosures are intentional and controlled. More specifically, we asked them to respond to the questions based on their experience in an online relationship. The data shown in Table 8 reveals that greater control or intentionality over self-disclosure in the online context was not associated with disinhibition or risky behaviours. This runs contrary to our predictions. The lack of relationship emerging may have been due to insufficient power—that is, if the effect is small, we may not have had a sufficient subsample to detect the relationship between intended self-disclosure and our online measures. As expected, there was no relationship between intended self-disclosure and our OFOR measure.

Table 8: *Correlation matrix of online activities and self-disclosure for participants who have formed an online relationship (n = 64).*

	Self-Disclosure
Online Disinhibition	-.06
ROB	.06
OFOR Engagement	-.07
OFOR Suspicion	-.07

3.7 For people who have formed relationships online, what psychological factors are associated with their willingness to intentionally share personal information about themselves?

This set of analyses were exploratory in nature, thus we did not have specific hypotheses. People who are controlled and intentional in their online disclosures tend to be higher in Honesty-Humility, eXtraversion, Conscientiousness, Openness, and NFC. Additionally, they also tend to report lower levels of loneliness or social anxiety, and self-concealment. The data are shown in Table 9.

Table 9: *Correlation matrix of personality and individual differences variables and self-disclosure for participants who have formed an online relationship (n = 64). [Note: p < .05 are italicized, p < .01 are bolded].*

		Self-Disclosure
HEXACO Subscales	Honesty-Humility	*.30*
	Emotionality	.15
	Extraversion	**.50**
	Agreeableness	.20
	Conscientiousness	**.42**
	Openness	**.38**
Other Individual Difference Measures	Loneliness	**-.61**
	Social Anxiety	**-.38**
	Risk-Taking (Stimulating)	-.02
	Risk-Taking (Instrumental)	.13
	Interpersonal Trust	.17
	Self-Concealment	**-.47**
	Self-Monitoring	-.05
	Need for Cognition	**.54**

4 Conclusion

The online environment has made connecting and interacting with other people in the world easier in very important ways. For instance, the many technical and social platforms that exist represent several different means by which users can find, contact, and connect to almost anyone. In addition, the online environment can also enable its inhabitants to overcome social anxiety that they may otherwise experience in face-to-face interactions. Yet, the anonymity afforded by the online environment also means that people can manage, or in some cases manipulate, the impression they project to others, and this may reduce behavioural inhibitions because of the invisibility and safety people feel while operating online.

In this report, we sought to begin to understand selected psychological dynamics of the online environment; specifically 1) the relationship among online behaviours, and 2) their relationships with a range of personality and individual difference measures. Our analyses supported 25 of our 35 hypotheses. As expected, we found that greater reported online disinhibition was related to greater online risky behaviours, as well as a greater willingness to, and less suspicion of, engaging in online relationships. Although our method does not allow us to speak to cause and effect here, we believe that online disinhibition is the central mechanism contributing to one's willingness to form online relationships and one's propensity to engage in risky online behaviours. Although our results do not allow us to speak to this hypothesis directly, this interesting line of inquiry could be pursued more specifically in future research, for instance, by experimentally inducing higher versus lower levels of anonymity within an online context. In any event, to the extent that this conjecture is true, online disinhibition represents both a challenge and an opportunity for those interested in understanding the success of influence operations in the online context.

With respect to the correlations between personality variables and these online activities, we see some consistent patterns emerge across the three positive markers of online activities (i.e., online disinhibition, ROB, and OFOR). In general, people who score lower on Honesty-Humility, Conscientiousness, and higher in sensation risk-taking, and are more likely to actively control their presentation to others (i.e., high in self-monitoring) are more likely to report online disinhibition, risky online behaviours and OFOR Engagement. On the other hand, unexpectedly dispositional interpersonal trust, Emotionality and Openness appeared to have no relationship to most of the measures of online activities. Although the pattern is less consistent for the OFOR Suspicion subscale, results similarly indicated that those who indicate less Honesty-Humility and/or greater Conscientiousness also score higher on the OFOR Suspicion subscale. In addition, those people who report higher levels of interpersonal trust are less likely to be suspicious of online relationships; interestingly, this is the only occurrence where dispositional interpersonal trust appears to be significantly related to these online activities. We still expect trust to play an important role in online behaviours; perhaps the measure we employed is not sufficiently applicable to the online context. Future work may examine other measures of dispositional trust that may be more directly relevant.

We also explored the dynamics of self-disclosure, specifically control over or the intentionality of self-disclosure, and personality for a sub-group of our sample that reported having formed an online romantic relationship or friendship. Our results also indicate that among this group, higher levels of intentional, honest, self-disclosure were associated with higher scores on eXtraversion, Honesty-Humility, Conscientiousness, Openness, and NFC, and to lower dispositional loneliness, social

anxiety and self-concealment. Interestingly, greater intentional self-disclosure is unrelated to online disinhibition and risky online behaviours among this group.

From a military perspective, online disinhibition may also represent a psychological mechanism that makes people vulnerable to online influence operations. As noted in the introduction, the popular media has reported several examples of where otherwise intelligent and wise people have been victimized by adversaries or criminals who have successfully exploited their vulnerabilities to convince or coax them to engage in behaviour that might otherwise be out of character. Thus, the results of the current research also begin to shed some light on the types of individuals who might be more vulnerable to such attempts. In this respect the findings are somewhat sobering; however, it is important to point out that this information could also be used to create effective counter-measures to such influence attempts, particularly those that might be tailored based on the relevant personality characteristics of the online user.

Although more speculative, it might also be interesting to assess the extent to which psychological traits that are implicated in online disinhibition might be manipulated successfully in a targeted influence operation. Psychological traits are presumed to remain unchanged across a wide variety of contexts and circumstances. However, we wonder whether it is possible that a person's status on a trait like Honesty-Humility can be manipulated in such a way that they can be made vulnerable to an influence operation. Indeed, being able to temporarily move people's levels on personality traits may be one reason why some social engineering tactics used by criminals are successful. If so, education and training programs designed to inoculate groups from online influence tactics should outline not just what criminals and adversaries do, but also why they are successful so that potential victims are better prepared.

Finally, we wonder whether our results and future work may also have other implications for influence operations carried out by the CAF. Specifically, can the overall dynamics of interacting in the online environment be explored as an enabler for forming genuine, trusting relationships with key leaders while on operations? While the idea may be counterintuitive, we are suggesting that it may be possible to extend our research as an enabler for creating productive, rapid, and genuine relationships with local leaders in the context of Civil-Military Cooperation operations.

Although our initial foray is an important contribution in assessing potential vulnerabilities to online influence, other opportunities for future basic research also exist. First, our work is correlation in nature, thus, as noted above, future work should examine these constructs using experimental paradigms to better assess underlying causality. Second, mean scores on the risky online behaviours measure were quite low. This is not necessarily a negative finding—some of the behaviours in the measure refer to low-base rate events (e.g., I've given away money online only to find out later it was a scam) and/or potentially unlikely to occur more than once (e.g., I've given away private information (e.g., password, credit card number) only to find out later it was a scam). However, future work might involve using samples (e.g., younger samples) who may more frequently engage in risky online behaviours, and who also represent future CAF members. Third, in the current research only a small subsample in our study reported having formed an online friendship or relationship in the past; future work examining samples that more frequently engage with others online is needed. Finally, future work should more directly compare the nature and the magnitude of differences in these relationships between online and offline contexts. Lab studies focused on, forming relationships online as opposed to offline will help us better understand levels of vulnerability to influence that are specific or unique to the online environment.

In conclusion, it seems clear that the online environment will be increasingly important in human interaction. As such, it presents both challenges and opportunities for the CAF. Our research has explored one perspective of the larger online realm: as a context where the creation of relationships is unfettered by the social barriers some experience in face-to-face interactions. The feelings of safety and control one can feel in the online space needs to be better understood, so that it can be properly treated in methods for inoculating people against adversary or criminal influence operations, but also so it can be better understood as an enabler to enhance a range of influence operations conducted online by the CAF.

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Annex A Correlation Matrix

Table A.1: *Correlation matrix of study variables (n = 211).*

Table A.	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.	13.	14.	15.	16.	17.
1. Online Disinhibition																	
2. ROB	**.57**																
3. OFOR Engagement	**.77**	**.50**															
4. OFOR Suspicion	**-.38**	-.12	**-.32**														
5. Honesty-Humility	**-.59**	**-.40**	**-.46**	**.23**													
6. Emotionality	.11	*.16*	.00	.08	.11												
7. Extraversion	**-.34**	-.10	**-.19**	.05	**.22**	**-.25**											
8. Agreeableness	**-.23**	**-.21**	-.12	-.12	**.26**	**-.27**	**.45**										
9. Conscientiousness	**-.47**	**-.26**	**-.29**	**.19**	**.44**	-.08	**.47**	**.36**									
10. Openness	*-.18*	-.08	-.09	.05	**.20**	.07	**.20**	*.15*	**.31**								
11. Loneliness	**.34**	*.14*	**.28**	.02	**-.39**	.07	**-.65**	**-.33**	**-.34**	-.09							
12. Social Anxiety	**.30**	**.24**	*.16*	-.01	**-.20**	**.38**	**-.50**	-.11	**-.29**	*-.15*	**.44**						
13. Risk-Taking (S)	**.36**	**.34**	**.36**	-.12	**-.39**	*-.16*	-.01	-.06	**-.30**	-.13	.06	.10					
14. Risk-Taking (I)	*.15*	**.22**	**.25**	.09	**-.21**	-.12	**.18**	-.04	.06	*-.15*	.04	-.00	**.38**				
15. Interpersonal Trust	.05	-.01	.11	**-.37**	.01	-.13	**.28**	**.28**	.11	-.03	**-.34**	*-.14*	.08	-.04			
16. Self-Concealment	**.37**	**.20**	**.22**	.07	**-.39**	.11	**-.45**	**-.32**	**-.33**	-.02	**.55**	**.39**	*.16*	.11	**-.24**		
17. Self-Monitoring	**.26**	**.20**	**.24**	-.06	**-.34**	.11	.08	-.11	**-.18**	.06	.03	.02	**.22**	.12	-.05	.13	
18. Need for Cognition	**-.19**	-.06	-.07	.09	**.25**	.00	**.27**	**.19**	**.47**	**.48**	*-.16*	-.12	*-.14*	.09	.11	-.11	.03

Note: ROB = Risky Online Behaviours; measures 3–8 are the HEXACO subscales; Risk-Taking (S) = Stimulating Risk-Taking subscale; Risk-Taking (I) = Instrumental Risk-Taking subscale. $p < .05$ are italicized; $p < .01$ are bolded.

List of acronyms

CAF	Canadian Armed Forces
DND	Department of National Defence
DRDC	Defence Research and Development Canada
HEXACO	Honesty-Humility, Emotionality, eXtraversion, Agreeableness, Conscientiousness, and Openness
NFC	Need For Cognition
OFOR	Openness to Form Online Relationships
ROB	Risky Online Behaviours
SCS	Self-Concealment Scale

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The current research explores the issue of potential vulnerability in the online space and its relationship to selected personality measures. We conducted a large-scale online survey, using a civilian sample, that asked respondents to indicate the degree to which they (1) feel disinhibited online; (2) engage in risky online behaviours (e.g., meeting up with an online acquaintance in person); and (3) feel open to forming online relationships. They also completed various personality measures, including the Honesty-Humility, Emotionality, eXtraversion, Agreeableness, Conscientiousness, and Openness (HEXACO) six-factor model of personality. We also included a series of other individual differences measures, such as loneliness and social anxiety, which we predicted would be related to these behaviours. Results revealed that, in general, people who score lower on Honesty-Humility, Conscientiousness, and higher in sensation risk-taking and are more likely to actively control their presentation to others (i.e., high in self-monitoring), are more likely to report online disinhibition, risky online behaviours and an openness to forming online relationships. Implications of our results to the Canadian Armed Forces (CAF) are discussed.

La présente recherche examine la question de la vulnérabilité potentielle dans l'espace en ligne et ses liens avec certaines mesures de la personnalité. Nous avons réalisé un sondage en ligne à grande échelle, à l'aide d'un échantillon de civils, dans lequel les répondants devaient indiquer dans quelle mesure ils (1) se sentaient désinhibés en ligne, (2) adoptaient des comportements à risque en ligne (p. ex. rencontrer en personne quelqu'un dont ils ont fait la connaissance en ligne) et (3) étaient ouverts à nouer des relations en ligne. Les répondants ont aussi effectué diverses mesures de la personnalité, notamment le modèle de personnalités à six facteurs Honnêteté-Humilité, Émotivité, eXtraversion, Agréabilité, caractère Consciencieux, et Ouverture (HEXACO). Nous avons aussi inclus une série d'autres mesures des différences individuelles, par exemple la solitude et l'anxiété sociale, qui, selon nos prévisions, seraient liées à ces comportements. Les résultats montrent que, en général, les personnes qui obtiennent un pointage plus faible pour l'honnêteté-humilité et le caractère consciencieux, un pointage plus élevé pour la recherche de sensations fortes et la prise de risques, et qui sont plus susceptibles de gérer activement l'image qu'elles présentent aux autres (c.-à-d. qui obtiennent un pointage élevé pour l'autosurveillance) sont plus susceptibles de se dire désinhibés en ligne, d'adopter des comportements risqués en ligne et d'être ouverts à nouer des relations en ligne. Les répercussions de nos résultats sur les Forces armées canadiennes (FAC) sont examinées.