UNDERSTANDING ONLINE DISINHIBITION: AN INVESTIGATION OF THE
RELATIONSHIP BETWEEN INFORMATION AND COMMUNICATION TECHNOLOGY AND
ADOLESCENT PERSONALITY, IDENTITY, AND BEHAVIOUR.

BY

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Statement of Authorship

The three studies contained within this thesis have all been written for publication. I am the primary author of each paper, responsible for the developed ideas, collecting the data, and conducting and interpreting the analyses for the final articles. Study 1, (Kurek, Jose, & Stuart, 2017) has been published by *Cyberpsychology: Journal of Psychosocial Research on Cyberspace*. Study 2 (Kurek, Jose, & Stuart, 2018) has been accepted for publication in *Computers and Human Behaviour* and is currently in press. Study 3 is currently under review by the journal of *Personality and Individual Differences*. All studies have been included in the present manuscript with permission from the respective journal.

Study 1 is the accepted version of the following article:

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Abstract

A series of investigations were carried out to gain a better understanding of the influence of adolescent personality and identity in predicting online disinhibition. Taking a person-centred approach, the thesis tested whether distinct youth profiles of information and communication technology usage preferences, as well as unique motives of Internet use, would emerge among two adolescent samples; and second, whether these distinct profiles were significantly associated with maladaptive outcomes of personality, identity, and offline and online behaviour. In addition, this thesis also included a specific investigation of the predictive effects of the dark personality traits of narcissism, sadism, and psychopathy on self-perceptions, online disinhibition, and cyber aggression.

Study 1 involved two major objectives, first, by using a sample of 933 adolescents, it aimed to identify groups of adolescents who share similar communication technology use habits based on their time spent interacting with various digital communication devices and associated online platforms. Results indicated four distinct profiles of technology use preferences. The second objective of Study 1 was to investigate the degree to which these distinct usage preferences predicted indicators of maladaptive identity and offline behaviours. Most notably, immoral behaviours and compromised identity outcomes were found to be highest among those adolescents who displayed a preference for elevated communication technology use. Overall, the findings illustrate that important constructs of both identity and behaviour are associated with individual communication technology usage preferences.

Employing a large sample of 709 adolescents ($M_{\text{age}} = 15.56$ years), Study 2 was constructed to explore the direct effects of narcissism, sadism, psychopathy, and false self perceptions on online disinhibition and cyber aggression. Path model results indicated that all three dark personality traits, as well as false self, were positively associated with online disinhibition. Second, potential relationships among the dark personality traits, false self perceptions, online disinhibition, and cyber aggression were also examined, and psychopathy, sadistic traits, and online disinhibition were found to be significant predictors of aggressive online behaviour chiefly through indirect effects through false self and online disinhibition. The Study 2 findings

collectively provide a more nuanced understanding of how antisocial personality traits are associated with maladaptive identity formation as well as online disinhibition.

Finally, in Study 3, using latent profile analysis, distinct group differences behind adolescent *motivations* (as opposed to Internet *habits* studied in Study 1) for Internet and social media use were explored. In addition, we examined how personality, false self perceptions, and online disinhibition differed as a function of these motivation classes. Results revealed three discernable profiles of Internet and social media motives where adolescents either exhibited high, medium, or low levels of motives for engaging with the online world. Notably, self-report levels of sadism, perceptions of false self, and online disinhibition were highest among adolescents belonging to the group of youth who exhibited the highest overall motivations for Internet and social media use.

In combination, these studies illustrate the importance of considering adolescents as active and decisive consumers of various ICT outlets, as well as online content and platform selection. The thesis highlights how particularly high online engagement is associated with high levels of dysfunctional identity and behaviour, and how personality underlies unique motives to engage with particular online content. The thesis findings also highlight the important role identity construction may play in media selection and engagement, and how a breakdown in identity formation can result in an increase in poor behavioural control online. In conclusion, the study results illuminate that not all engagement with the online world is detrimental to youth, but rather individual characteristics of a developing teen (i.e., personality factors) can predispose adolescents to the online disinhibition effect.

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General Introduction

Since 1999, when the Internet first became relatively mainstream, (Bryant, 2011; Spiegel, 1999) advancements in technology have made Internet data accessible on a multitude of devices, such as tablets, laptops, computers, TVs, and even mobile phones. These innovations have made access to information and the ability to communicate with others easier than ever before. Moreover, the dawn of social media networks has introduced a new culture of Internet connectivity that has made distances shorter, and the world seemingly smaller, which has contributed to a global movement of open and unmonitored self-expression online that has become popular and commonplace. However, while information and communication technology (ICT) has created many conveniences on a global scale, it has also introduced new challenges in understanding the changing landscape of human behaviour, particularly in the digital world of cyberspace. Indeed, a number of studies have found that people are more likely to act differently online when compared to face-to-face interactions (Joinson, 2001; McKenna & Bargh, 1998; Suler, 2004; Tidwell & Walther, 2002).

The growing phenomenon of uninhibited online behaviour has had a particularly disproportionate impact on youth (Kowalski, Giumetti, Schroeder, & Lattanner, 2014). Some speculate that the psychological factors of the cyber environment associated with online disinhibition are responsible for the increasing rates of cyberbullying, cyber aggression, and online trolling behaviour (Garett, Lord, & Young, 2016; Pornari & Wood, 2010; Rawhide, 2017; Runions & Bak, 2015; Udris, 2014), making the online disinhibition effect particularly interesting and important throughout the developmental period of adolescence. The present thesis research was designed to explore and identify whether certain personality mechanisms and youth Internet usage motives and preferences play an influential role in predicting unrestrained and antisocial behaviour online. By taking a predominantly person-centred approach to investigating individual differences in adolescent digital media use, novel associations between both personality and identity, with regard to digital behaviours, were explored. Particular attention was given to the online disinhibition effect (Suler, 2004), the dark side of personality (Paulhus, 2014) (i.e., specifically narcissism, sadism, and psychopathy), and possible associations with perceptions of false self in relation to adolescent digital communication behaviour.

In the following sections, a brief overview of existing research on the associations between information and communication technology use and its influence on adolescent development will be considered. This introduction is meant to provide a general theoretical and empirical foundation for the three consequent investigations, which are presented in this dissertation as manuscripts that have either been submitted for publication or are already published. First, a brief outline of ICT is provided, and the importance of digital media and cyberspace in the lives of today's youth is explored. Then, contemporary theories and findings on the influence of ICT in adolescent development are discussed, and ICT's impact of digital media on adolescent identity and behaviour is also considered. Next, a concise introduction to the theory of online disinhibition is provided and the manifestation of dark personality traits in cyberspace is addressed. Finally, the importance of investigating the associations between personality and ICT use on adolescent digital behaviour is advanced, and a brief review of all three studies in the thesis is subsequently presented.

Information and Communication Technology and Digital Media

Information and communication technology (ICT) is an umbrella term used to describe communication transmissions or idea exchanges using a digital device (e.g., computers, tablets, or a cellular phone) (Burbach & Dundon, 2009). More broadly, ICT is a composite term that includes all technologies for the communication of information, and covers any product that will store, retrieve, manipulate, transmit or receive information electronically in a digital form, particularly via the Internet (Christensson, 2010). The advent and proliferation of digital media and ICT has revolutionized the way the world communicates, accesses information, and shares both personal and public information. The rise in Internet connected technologies has resulted in a wide range of sophisticated and engaging digital devices and attractive platforms. The use of ICT and access to cyberspace has also led to important changes in how people spend their time, how they choose to express themselves, and also how they behave online. These growing rates of public online engagement have given rise to ever increasing concerns about the issues and risks surrounding individuals' online presence and their digital lives (Morton, 2017).

Presently, both children and adolescents are the earliest adopters of technology, making the effects of new digital media on youth of particular interest and importance from a developmental perspective. Influence of media on youth development has

historically been considered an integral, albeit predominantly negative, component in the development of adolescents (Klein et al., 1993). In the earliest days of media, society expressed concern at the dissemination of fiction books to young people, and similar apprehensions were later expressed towards newspapers, magazines, film, comic books, radio, television, video games, and, eventually, to present day Internet content and social media. In fact, as each new popular media outlet emerged and evolved it was systematically met with concerns about its deleterious effects on youth (Arnett, 2004; Ferguson, 2015).

For example, early studies into the influence of media discovered that, within their own era, radio programs were a compelling and significant socializing agent in the lives of adolescents (Forer, 1955; Tyler, 1937). Later, the popularization of television was scrutinized for its negative impact on children and society, and studies emerged on the harmful associations between television viewing habits and young people's reading skills, vocabulary, and a number of other important health outcomes (Beentjess & van der Voort, 1988; Koolstra, van der Voort, & van der Kamp, 1997). Later research by psychologists, noticed how both film and television shows could influence viewer behaviour. Researchers became invested in understanding the impact of television violence on children's behaviour (Bar-On et al., 2001; Comstock & Strasburger, 1990; Friedrich-Cofer & Huston, 1986; Huesmann, 1986).

Almost simultaneously, the growing culture of video gaming in the late 1970s boomed and became a new form of popular entertainment, particularly among youth (Chikhani, 2015; The Strong, 2018). The rapid development of new games, new and improved consoles, and the enthusiastic acceptance of video gaming among young people brought with it new questions and concerns to the field of psychology. While the link between the exposure to aggressive media content and subsequent youth misbehaviour has been established, researchers were, and continue to be, faced with new and challenging questions about the influence, and addictive nature, of video games on youth development (Anderson, Gentile, & Buckley, 2007; Gentile & Stone, 2005; Kirsh, 2003; Tejeiro Salguero & Bersabé Morán, 2002).

Soon after the popularization of video games and gaming consoles, the personal computer became a common household device, and access to the ever-expanding landscape of the Internet introduced new and novel media experiences. It is at this point that the world saw, and continues to witness, a rapid advancement in technology and

the continuous introduction of new ICT devices and services. Among these advancements there has been a surge in new digital media, made readily available to be consumed with high frequency and regularity by the general public. This new digital media is a blend of technology and content (Centre for Digital Media, 2017) delivered via the very digital devices that have become ubiquitous in our daily lives. These can include smartphone applications, software platforms, Internet websites, social networking platforms, and other similar products. Numerous outlets of digital media can be accessed through a personal smartphone or a tablet which comes equipped with specialized operating systems meant to deliver various applications and services that have the proven ability to manipulate human behaviour (Eyal & Hoover, 2014; Fogg & Hreha, 2010). This ongoing proliferation of media influence in everyday life has given rise to several significant questions about how Internet media impacts human behaviour, which in turn has mobilized new approaches to studying the effect of media on the general public today.

The history of research examining how media influences adolescent development has clearly identified that drawing simple cause-and-effect relationships between youth media consumption and their subsequent behaviour can be problematic (Arnett, 2004). Tracing the nuanced effects of media on youth is exceedingly complex (Arnett), but important, and a growing awareness of the psychological impact of ICT and new digital media continues to garner public attention. This burgeoning awareness has resulted in a developing need to understand whether the particularly salient developmental chapter of adolescence may make youth more susceptible to the potentially damaging effects of Internet and social media addiction. Simultaneously, there has been a growing concern about aggressive and antisocial online behaviour among teens (Aboujouade, 2012; Garrett, Lord, & Young, 2016; Kardaras, 2016; Rawhide, 2017).

Understanding Adolescent Development in a Digital World

Adolescence is an important developmental period that occurs between the ages of 10 to 24 years of age (Sawyer, Azzopardi, Wickremarathne, & Patton, 2018), and is defined as the transitional period between childhood and adulthood (Jaworska & MacQueen, 2015). It is considered one of the most rapid phases of human development and is shaped by both individual and environmental influences (Arnett & Maynard, 2017). Blos (1967) refers to adolescence as the second phase of separation-

individuation, a critical period where the adolescent must disengage from, or eclipse, internalized representations of caregivers and establish a sense of self that is distinct and individuated. Indeed, research has long noted that during adolescence parental influence decreases, and peers, and peer relationships become more important (Blakemore & Mills, 2014). As a result, youth tend to have a strong desire to fit in with a particular peer group and place a significant amount of importance on social status and peer acceptance that can make them vulnerable to peer influence and pressures of conformity (Sebastian et al., 2011). Presently, the social lives of many youth exist, in large part, in the context of cyberspace and social media, where teens spend much of their time monitoring their social status and online relevance, checking in on peer feedback through ‘likes’ and comments, and seeking validation (Konijn, Veldhuis, Plaisier, Spekman, & den Hamer, 2015; Lifespan, 2013; Nesi & Prinstein, 2015; Valkenburg & Piotrowski, 2017; Yang, 2016).

This growing dependence on online connectivity points towards urgency in understanding the influence of cyberspace as an important socializing agent in adolescence. Moreover, it has been suggested that cyberspace may potentially influence specific processes of development, such as psychosocial and emotional changes, logical and moral reasoning, increasing cognitive capacities, and identity formation (Mills, 2016; Spies Shapiro & Margolin, 2014; Subrahmanyam, Greenfield, Kraut, & Gross, 2001). A vast majority of the changes that occur within the adolescent’s cyber environment may not only influence, but also be affected by, the biopsychosocial changes that transpire throughout the period of adolescence (Orr & Ingersoll, 1988; Sanders, 2013). Unmonitored, or unregulated, exposure to the external influences provided by cyberspace may adversely shape adolescent social value, norms, and expectations. Moreover, the unique vulnerability associated with adolescence suggests that unhealthy digital exposure has the potential to exert systematic changes in individual development.

In response to the growing influence of ICT, developmental psychologists have begun to advance certain traditional theoretical models to encompass and describe the changing, and influential, landscape of youth’s ever-present digital environments. One very useful approach is Bronfenbrenner’s ecological theory of human development (1994), characterized by five interlocking developmental systems based on a wide range of environmental influences (i.e., microsystem, mesosystem, exosystem,

macrosystem, and chronosystem), which suggest that the context in which an adolescent develops, from the most proximal to the most distal, interacts with, and impacts on, development. For example, the microsystem is relatively focused and includes the immediate environment in which the adolescent lives and the patterns of activities, social roles, and relationship building in which the youth engages (e.g., immediate family/guardian, peer groups) (Bronfenbrenner & Ceci, 1994). The mesosystem is described by how various parts of a child's microsystem work together to support and encourage the child (e.g., conflicting information or guidelines between home and school can hinder a child's growth and development in different ways) (Agabrian, 2007; Bronfenbrenner & Ceci, 1994). The exosystem is composed of more distant people and places such as community members or the neighbourhood in which the child and their family resides (e.g., elements of a child's environment cannot always be controlled by the family, yet often affects the family unit) (Bronfenbrenner, 1977; 1994). Bronfenbrenner's macrosystem encompasses the largest and most distant set of people and things that maintains an influence over the teen, which can include aspects of the outer world such as the economy, government, laws, wars, etc. And last, the chronosystem describes the effect of time on all of these levels, i.e., the change or consistency over time that is not solely limited to the person but also extends to the stability of the environment in which they reside.

Bronfenbrenner's model explicates a succinct multilayer overview of environmental influences on child development, and it was well articulated long before ICT became the influential communication medium it is today. A revised ecological model proposed by Johnson and Puplampu (2008) incorporates the potential influence of the Internet, and all devices that deliver this service, on child development within the broad reach of the Bronfenbrenner's system. In particular, explication of the model by Johnson (2010) has updated Bronfenbrenner's ecological model by validating the inclusion of a '*techno-subsystems*' level. The techno-subsystem sits within the microsystem, positioning technology as part of a child's immediate or direct environment. This further classification considers a child's interaction with both living (e.g., family and peers) and nonliving (e.g., Internet, mobile devices) elements of communication, information, and recreation technologies within their immediate environment (Johnson & Puplampu, 2008).

Since the inclusion of the techno-subsystem within the broader ecological model, several studies have advanced the understanding of how the digital world can be explained by this theoretical concept. For example, research has discussed the importance of recognizing that the Internet is not only a facilitator, but also an environment rich with various virtual communities (Boase, Horrigan, Wellman, & Rainie, 2006; Boyd, 2008). The interactions youth have within these virtual communities, and the devices they use, have also been attributed to playing a pivotal role in self-socialization, the period in which adolescents gain more independence and control over their own socialization and develop the autonomy to reflect on themselves and their growing sense of an individual identity (Anderson & Brown McCabe, 2012; Arnett, 1995; Gunner & Suss, 2016; Moschis & Moore, 1979; O'Guinn & Shrum, 1997). These self-socializing mechanisms impact greatly on identity development, gender role learning, and the progression of both value and belief systems that occur separately from those established in childhood by family/parental figures (Arnett, 1995). The constantly evolving landscape of the digital environment, and the growing dependence on digital connectivity has clearly established cyberspace as a key context in which young people develop. The present work aims to further explore the meaningful ways in which aspects of the online world not only inform, but are informed by, other contexts of adolescent development.

Moreover, while the predominant approach to understanding media in adolescence has focused on perceived effects (Bandura, 1994; Gerbner, Gross, Morgan, & Signorelli, 1994), digital technology usage is prevalently individually driven. Person-dependent motives and preferences of use have the potential to significantly shape specific usage behaviours and outcomes, and thus should be incorporated into furthering existing understanding of online behaviours. In response, the '*uses and gratifications theory*' developed by Blumler and Katz (1974) stresses the importance of taking a more person-centred approach to media research. According to the theory individuals typically take a deliberate and considered path in the decision-making process when selecting what sources of media they will use, and what effects they are seeking. In this context, the uses and gratifications theory states that individuals purposely choose which media outlets to use to satisfy specific goals and individual needs, while avoiding others that do not serve their motivational desires (Blumler & Katz).

The uses and gratifications theory highlights adolescents as active media consumers (Paik, 2001). The theory takes two distinct views of consumers, namely that individual differences will drive different choices about which ICT and digital media to consume, and secondly, that consuming the same ICT and media products will elicit unique reactions based on individual characteristics (Arnett, 2004). This media approach is uniquely captured by the adolescents' '*media practice model*' (Steele & Brown, 1995) that considers identity formation as a key component in youth's selection and interaction with media, and in turn, considers how those choices may influence the developing adolescent sense of self. To date, both theories have been considered in a variety of research topics related to adolescent media selection and outcomes (Jimenez, De Ayala Lopez, & Pisionero, 2012; Ko, Cho, & Roberts, 2005; Moreno & Whitehall, 2014; Shao, 2009; Stafford, Stafford, & Schkade, 2004; Whiting & Williams, 2013), however, a direct person-centred approach to understanding the growing online disinhibition effect has not been undertaken. By borrowing these theoretical concepts, the present thesis aims to advance a more in-depth understanding of the relationship between youth and cyberspace, and how personal preferences, usage patterns, personality constructs, and identity may be contributing to trends of disinhibited behaviour.

Youth, Cyberspace, and the Effects of Digital Media

Today's adolescents and young adults, those born between 1995 and 2006, are termed '*digital natives*', a phrase meant to describe those individuals who have never experienced the pre-digital era, i.e., they have literally grown up in the digital culture of the Internet, computers, and mobile devices (Prensky, 2001). In fact, global statistics of today's youth claim those individuals aged between 13 and 24 are the highest consumers of the Internet and social media (Pew Research, 2010; Cramer & Inkster, 2017; Statista, 2017), particularly through the use of smartphones (94%), when compared to other age demographics (e.g., 82% for 35-44 year olds, 48% for 55 to 64 years of age, and 6% for those 75 years of age or older (Ofcom, 2017).

Ofcom (2017) also reports that use of a mobile phone is much more prevalent among those aged 16 to 24 years of age (98%) when compared with adult populations aged 45-54 (95%), 65-74 (75%) and over-75 (60%). As many as 74% of youth claim the mobile phone as a favourite device over the computer, tablet, radio, and TV set, with 24% more adolescents reporting social media and messaging as the most important

applications on their phone when compared with every other demographic (Ofcom, 2017). Similarly, those in the 16 to 24 years of age demographic spend more hours online in a typical week than the adult demographic and are more likely to engage in video game activities on all possible gaming devices compared to any other demographic group (e.g., 67% of youth gaming on any device compared to 50% aged 25-34 years of age, 42% aged 35-44 years) (Ofcom, 2017).

Social media usage also remains highest among the youngest users (Greenwood, Perrin, & Duggan, 2016), with Facebook, Snapchat, and Instagram ranking highest in popularity (Statista, 2017). For those teens who engage with social media applications, 71% report accessing more than one social media account, while 24% claim they are 'almost constantly' online due to the ubiquitous popularity of smartphones (Lenhart et al., 2015). Many teens log on to their favourite social media site more than 10 times a day (O'Keefe, Clarke-Pearson, & Council on Communications and Media, 2011). In fact, social media use is currently ranked as one of the most popular leisure activities among adolescents (Ahn, 2011; Lenhart et al., 2015; Lenhart, Purcell, Smith, & Zickuhr, 2010). These statistics, while only scratching the surface, illuminate the profound relationship young people have with new, and old, media. When it comes to digital media, research and census data alike have continually concluded that media consumption among young people today is at an all-time high and that mobile devices provide almost constant connectivity to peers, social networks, and unmonitored media access (Dalope, 2018; Gerwin, Kaliebe, & Daigle, 2018; George & Odgers, 2015; Lenhart, 2015).

This increased connectivity has resulted in a growing concern that these, and other, ICT activities are inadvertently having a significant impact on adolescent identity formation, behaviour, and various mental health outcomes. For example, evidence suggests that use of a smartphone or a personal digital device has the ability to damage individual cognitive capacity by reducing memory capacity and attention span (Carson et al., 2016; Egan, 2016; Uncapher, Thieu, & Wagner, 2016; Ward, Duke, Gneezy, & Bos, 2017), and over-exposure to screen time can lead to attention deficit disorder and conduct disorders among the adolescent age group (George, Russell, Piontak, & Odgers, 2017). Moreover, the majority of digital media platforms used today, such as Instagram and Facebook, and even computer-mediated-communication (CMC) services like Snapchat and WhatsApp, among others, are designed to create an enhanced anticipation for reward, good feelings, and a craving for validation. This media use results in an

increase in compulsive and addictive user behaviours, engagement, and smartphone-dependent practices (i.e., frequent screen monitoring and notification checking) (Alter, 2017; Begley, 2017).

Despite the existing empirical evidence outlining the deleterious effects of cyberspace and social media platforms, the field of cyberpsychology remains dominated by a marked lack of consensus about the effects of cyberspace and new digital media on the youth of today. Polarizing opinions have been voiced on both the positive (Young, 2001; Passey, Rogers, Machell, McHugh, & Allaway, 2003; Subrahmanyam, Kraut, Greenfield, & Gross, 2000) and negative (Carson et al., 2016; George, Russell, Piontak, & Odgers, 2017; Ward et al., 2017) impacts connectivity has on adolescent health outcomes and behaviours. To illustrate, findings on adolescents' search for self-clarity have noted that youth with lower ego development spent more time online per week (Israelashvili, Kim, & Bukobza, 2012), suggesting that the Internet offers a perceived safe place for identity experimentation among adolescents. Other benefits of using online technologies have been associated with an increase in self-esteem, perceived social support, increased social capital, as well as an increased opportunity for self-disclosure (Ahn, 2012; Dolev-Cohen & Barak, 2013; Leung, 2004; Phua, Jin, & Kim, 2017; Quinn & Oldmeadow, 2013; Sarriera, Abs, Casas, & Bedin, 2012; Siriaraya et al., 2011; Williams & Merten, 2013). Moreover, some aspects of social media platforms such as the availability of emotional support, access to others' health experiences, and, in some instances, an open and non-judgmental forum for self-expression may constitute a few of the positive outcomes of social media for teens (RSPH, 2017).

On the other hand, studies have also found strong associations between social media use and increased anxiety, depression, low self-esteem, changes in behaviour, and even suicide-related activities in adolescence (Bavelier, Green, & Dye, 2010; Fredriksen et al., 2004; Twenge, Joiner, Rogers, & Martin, 2017; Woods & Scott, 2016). Negative associations between social wellbeing and interpersonal interactions online have also been reported (Pea et al., 2012), as well as an increased exposure to harm and cyberbullying (Machmutow, Perren, Sticca, & Alsaker, 2012). Lastly, engagement in violent video game play has been linked to antisocial behaviour, higher degrees of externalizing behaviours, aggression, and even elevated psychopathy among adolescent samples (Delisi et al., 2012; Milani et al., 2015). Taken together, these conflicting outcomes illustrate how, in the Internet context, youth gain an immense degree of

independence and self-agency within a largely unstructured, unmonitored, and relatively disinhibiting environment. An active online presence allows youth to create a separate social world that can either facilitate, or impede, key developmental tasks, such as identity development (Anderson & McCabe, 2012), moral behaviour (Morris, Eisenberg, & Houlberg, 2011; Smetana, Robinson, & Rote, 2014), and healthy self-regulation (Farley & Kim-Spoon, 2014; Zeman, Cassano, & Adrian, 2013).

Youth and Identity Expression Online

The core of youth identity is founded largely in the choices and commitments made regarding personal and social characteristics (Marcia, 1966), such as those concerning presentation of self in face-to-face and digital worlds. It is not uncharacteristic for an adolescent to endure a period of uncertainty and self-doubt, questioning a multitude of ideas, such as personal views and needs, and the expectations of others. Erikson (1968) argued that the fifth stage of lifetime personality development, which usually occurs between 12 to 18 years of age, is centered on resolving the dilemma of *identity versus role confusion*. An individual's self-concept, or true self, is achieved through a process of identity exploration (Marcia, 1966). For some youth, this is a difficult and arduous process that, if not carefully nurtured, can result in identity confusion. When adolescents become confused about their identity, they develop unhealthy coping mechanisms that can lead to the development of a false self, a protective mask meant to diffuse the disparity between who one really is, and how they want others to perceive them (Dayton, 2011; Goth et al., 2012; Kernberg, 1985; Schwartz et al., 2011; Schwartz, Zamboanga, Weisskirch, & Rodriguez, 2009). These self-conceptions (i.e., one's relatively enduring and stable sense of 'the real me') can greatly influence the way adolescents represent themselves online (Gil-Or, Levi-Belz, & Turel, 2015).

According to Steele and Brown (1995), an early adolescent already has a base identity from childhood that motivates the choice of media consumption based on pre-existing interests and preferences. Once the selection occurs, the teen's attention gets increasingly drawn towards those particular selections. Once the adolescent has identified the key messages they seek, they strive to apply them to their self, which affects how they behave with others. As a result, the core identity evolves, appropriating these new goals, choices, and messages as a part of their identity development process (Brown & Witherspoon, 2002). Originally, the five most dominant motivations

identified behind ICT use and selection were: entertainment, identity formation, high sensation seeking, coping, and youth culture identification (Arnett, 1995). When investigating whether these motivations are applicable for Internet use today, Soh, Charlton, and Chew (2014) identified psychological escape, social interaction, and erotic gratifications as additional incentives for content selection that could be added to Arnett's original findings.

Undeniably, the Internet has provided adolescents with a unique space for exploring various facets of their identity and allowing for unrestrained self-expression (Bauman, 2010; Runions & Bak, 2015; Suler, 2002; 2004). Indeed, the majority of teens confess to sharing a different self offline compared to the one they believe they share online (Kaplan & Haenlein, 2010). This potentially bifurcated identity development process may have serious implications on overall identity development and individual self-perceptions. In the thick of the resulting social pressures and the challenges of managing both online, as well as offline, self-representations, it is hypothesized that the ever-changing landscape of the digital world that exists today may reveal youth-specific motivations for digital selection.

The perceived freedom of expression, coupled with the extensive interaction youth have with cyberspace, has important implications for the healthy development of their identity, and consequently their behaviour. Some studies have suggested that an enmeshed relationship with digital communication technology is unfortunately changing young people into self-centred and entitled individuals (Twenge & Campbell, 2009). Social media also exerts strong negative effects on teen attitudes, self-esteem, and self-image (Boyar, Levine, & Zensius, 2011; Rideout, 2010; Valkenburg, Peter, & Schouten, 2006). However, investigations into how this sensitive period of identity development may be impacted by ICT use remains understudied, and limited empirical evidence exists regarding the possible effect self-conceptions may play on digital behaviour. Applying the identified theoretical principles that state the importance of viewing the adolescent as an active decision-maker and consumer of digital content, this thesis employs a predominantly person-centered approach. This study investigates how digital technology preferences may be associated with identity during the stage of adolescent development, and how adolescent self-conceptions may contribute to online behaviour.

Youth, Behavioural Expression Online, and the Dark Personality

Exploring adolescent preferences for particular digital platform and applications has the potential to illuminate why many adolescents feel it is acceptable to behave and express themselves differently online than they do in their offline interactions (Kaplan & Haenlein, 2010). Mainstream media has highlighted, not only the popularity, but also novelty, of Internet connectivity and social media in adolescence and the unmistakable teen trend of self-expression via online content such as photographs, videos, and textual communication on various digital platforms that has emerged as a result. Despite the popularity of these digital platforms, and the ubiquitous role of the Internet in adolescent life, teens today often do not fully understand the possible repercussions of their Internet activity, making them susceptible to partaking in risky, provocative, and disinhibited online behaviour (O'Keeffe & Clarke-Pearson, & Council on Communications and Media, 2011; Udris, 2014). As a matter of fact, the innate and powerful desire for positive self-presentation, acceptance, and popularity (Baumeister, 1982; Leary & Kowalski, 1990) during adolescence exposes teens to unique pressures to portray a particular type of public persona, or participate in behaviours, that are non-normative for face-to-face interactions, (e.g., showing another person a semi-nude photo of oneself). The constant and unregulated nature of the online world has been labeled as a breeding ground for toxic and negative social interactions (Lamblin, Murawski, Whittle, & Fornito, 2017). In fact, many of the existing online social networks youth inhabit come with their own set of unwritten '*rules and expectations*' (Choi, 2016), creating a ripe environment for impulsive or strategic behaviours that motivate youth towards employing novel techniques of ingratiation, a social strategy used by youth to convince others about the attractiveness of their qualities (Jones & Pitman, 1982). These strategies have the ability to increase adolescent's social status, reputation, and peer group relevance (Goodyear, Armour, & Wood, 2018).

Coincidentally, a growing phenomenon of an increasing number of young people behaving in an unrestrained manner on the Internet has been observed (Kowalski, Giumetti, Schroeder, & Lattanner, 2014). This unrestrained online behaviour has been associated with a drastic increase in the prevalence of cyber aggressive behaviour, particularly among youth (Garett, Lord, & Young, 2016; McGrath, 2009; NetSafe, 2015; Rawhide, 2017; Wooldridge & Shapka, 2012). In the interest of what may motivate particular expressions of disinhibited or hostile communications online, studies have

increasingly been exploring associations between negative technology usage and maladaptive personality characteristics of narcissism, psychopathy, sadism, and Machiavellianism (Baumeister, Smart, & Boden, 1996; Donnellan, Trzesniewski, Robins, Moffitt, & Caspi, 2005; Ehrenberg, Juckes, White, & Walsh, 2008; Muschert & Sumiala, 2012; Buckels, Trapnell, & Paulhus, 2014; Twenge & Campbell, 2009). These socially aversive traits, known as the dark tetrad (Paulhus, 2014), have been found to not only predict social media network preferences, but also be associated with specific online behaviours (Buckels et al., 2014; Cheng, Bernstein, Danescu-Niculescu-Mizil & Leskovec, 2017; Madan, 2014; van Geel, Goemans, Toprak, & Vedder, 2017).

In particular youth scoring higher on narcissistic traits (i.e., vanity, self-centredness, lack of empathy, high levels of egotism, and a sense of entitlement) have been found to display higher levels of activity on social media platforms and exhibit increased levels of self-promoting and self-enhancing behaviours, such as an increase of selfies (i.e., pictures of oneself) being posted online (Aboujaoude, 2017; Choi, Panek, Nardis, & Toma, 2015; Halpern, Valenzuela, & Katz, 2016; McCain et al., 2016). Characteristics of sadism (i.e., individuals who gain amusement or pleasure from inflicting pain or humiliation onto unsuspecting others) and psychopathy (i.e., lack of empathy or remorse, elevated selfishness, low inhibition, superficial charm, and manipulateness) have also been linked to hostile, aggressive, and intimidating behaviours (Buckels et al., 2014; Sest & March, 2017). Cyber-trolling activity (i.e., unprovoked hostile, destructive, or disruptive online behaviour), for example, has been linked to indices of sadism (Buckels et al., 2014). Moreover, it was found that other people's public pain or humiliation is perceived as both humorous and pleasurable for the sadistic perpetrator (Buckels et al., 2014). These preliminary investigations illustrate promising associations between the dark personality traits and online activity; however, possible mechanisms between personality and digital behaviour remain unexplored. One such mediating factor might be online disinhibition.

Exploring the Online Disinhibition Effect

The digital environment has been identified as an unregulated landscape that facilitates moral disengagement and the expression of anti-social behaviours and attitudes that run counter to the norms of everyday behaviour (Bauman, 2009; Runions & Bak, 2015). This behavioural juxtaposition, namely that people often behave differently online than in an offline context, has been described as the '*online*

disinhibition effect (Joinson, 1998; 2003; Suler, 2004). According to Suler (2004), this effect can be further categorized as either '*benign*' or '*toxic*' digital disinhibition. In the instance of benign disinhibition, the online environment motivates individuals to over-share personal details about themselves and their emotions. These individuals use the Internet as a means of exploring their inner self, and their over-sharing is marked by an intrinsic need to better understand existing or new emotions while working out interpersonal issues. In contrast, the toxic, dark, side of disinhibition results in displays of rude or crude language, harsh commentary, hatred, and even threats that would be extremely rare in a face-to-face setting.

Following from this distinction between benign and toxic disinhibition, Suler (2004) builds on existing theories of new media attributes (Soh et al., 2014), and suggests that there are several factors associated with the digital landscape which contribute to the online disinhibition effect, namely: dissociative anonymity (e.g., "They'll never know who I really am"), invisibility (e.g., "I can't see you, so you can't see me"), asynchronicity (e.g., "I'll post whatever I want now, and you'll see it later when I don't have to deal with your reaction"), solipsistic introjection (e.g., "The way I see you is the real you"), dissociative imagination (e.g., "Who I am online is different from who I am in real life"), and minimization of authority (e.g., "There are no consequences for what I say or do online"). These six elements of online disinhibition promote self-disclosure through digital media and technology. Limited research exists as to what individual characteristics or motivations may elicit an increase of online disinhibition among youth. Some researchers, however, have speculated that a reduction in nonverbal cues and a sense of control offered by computer-mediated communication is what encourages feelings of empowerment and disinhibition in adolescents (Schouten, Valkenburg, & Peter, 2007), while others have used various psychological perspectives in an attempt to explain the online disinhibition effect. For example, the theory of selective self-presentation argues that individuals communicating online wish to present themselves in as positive a light as possible for the person on the other end (Ellison, Heino, & Gibbs, 2006; Schau & Gilly, 2003; Walther, 1996, 2007). In contrast, the social identity model of deindividuation phenomena (SIDE) argues that being digitally connected allows individuals to dissociate from real life and temporarily assume the morals and culture of an online community (Henderson & Gilding, 2004; Postmes et al., 1998; Reicher, 1982).

While these theories have provided adequate support and explanations for the online disinhibition effect, several researchers, including Suler (2004), argue that key personality characteristics (i.e., neuroticism, extraversion, narcissism, etc.) are vital predictors of online disinhibition, and other digital behaviours (Amichai-Hamburger & Ben-Artzi, 2003; Bargh, McKenna, & Fitzsimons, 2002; Peter & Valkenburg, 2006; Schouten, 2007; Valkenburg & Peter, 2007). Despite Suler's (2004) speculation on the role of personality in uninhibited digital behaviour, research to date has yet to fully consider the influence of personality in predicting online disinhibition. Instead, studies continue to focus on specific factors, or particular clusters, of the six unique environmental factors of cyberspace described by Suler (2004) (Lapidot-Lefler & Barak, 2012; Wu, Lin, & Shih, 2017). In response, the present thesis aims to address the existing gap in the literature, and aspires to contribute further empirical understanding towards the correlates of disinhibited digital behaviour.

Thesis Overview and Studies

The present set of studies was designed to explore whether any significant associations between ICT use, personality, and identity exist in relation to online behaviour, particularly disinhibition. As such, Study 1 is a general overview of how ICT usage preferences are clustered together in adolescents at the person level and examines how these preference clusters may be associated with several identity and maladaptive behavioural outcomes. The findings illuminate a specific theme of overall moral disengagement (e.g., immoral offline behaviour) that subsequently informed the structure of Study 2. The second study took this theme further by examining how existing dark personality traits, namely narcissism, sadism, and psychopathy, may be associated with both online disinhibition and cyber aggression, and how these relationships may be mediated by maladaptive adolescent self-perceptions (i.e., false self perceptions). Finally, the third study capped this sequence of studies by investigating motivations (rather than behaviours) of Internet and social media use at the person level, which revealed distinct clusters of motivations for usage. Using these derived clusters, the study investigated whether mean differences between groups would exhibit different levels of three dark personality traits, or be predictive of false self perceptions and online disinhibition.

Preview of the Three Studies

Study 1.

Using data collected in 2014 by Jose, Ryan, and Pryor (2012) for the Youth Connectedness Project, a sample of 933 adolescents aged 17 to 22 years of age reported time spent engaging in a range of ICT behaviours. In order to identify groups of adolescents who share similar ICT use habits, a latent profile analysis (LPA), a statistical method used to identify latent class membership among participants using continuous observed variables, was used. Latent profile analysis is a person-centred technique that considers responses to a set of variables and then identifies groups of individuals who endorse these variables in similar ways. The person-based groups that are identified with the LPA technique are referred to as latent classes in that they are not directly observed but instead are inferred from the data. Upon identification of the ICT user profiles, a series of linear regressions were then used to assess whether class membership was associated with aspects of identity and maladaptive behaviour. A total of four distinct classes of ICT usage preferences emerged and illuminating differences among the classes were found.

Study 2.

As a follow up to Study 1, and to expand on the limited ICT research data available in the first data set, a second dataset was collected in an effort to assess both ICT use and personality in a more in-depth fashion. A total of 709 adolescents aged 13 to 17 years were recruited from 18 different high schools across both the North and South Islands of New Zealand and participants were asked to respond to a battery of self-report measures on ICT usage habits, trends, and attitudes, as well as a number of personality questionnaires. In order to examine whether the three dark personality traits of narcissism, psychopathy, and sadism would predict false self perceptions, and in sequence, online disinhibition and aggressive online behaviour, a path model was constructed using structural equation modeling. The results collectively provide a more nuanced understanding of how antisocial personality traits are associated with maladaptive identity formation (i.e., endorsement of false self beliefs) as well as maladaptive online behaviour (i.e., disinhibited online behaviour and cyber aggression).

Study 3.

Utilizing the same dataset as Study 2, with a total of 709 high school adolescents from New Zealand aged 13 to 17 years, Study 3 sought to explore what particular

adolescent motives of Internet and social media use may be associated with expressing disinhibited behaviour online. To this aim, a latent profile analysis was carried out, and it identified three unique groups of youth with low, medium, or high motives of use for Internet and social media. A series of multivariate analyses of variance (MANOVA) were conducted, and mean differences of dark personality traits (i.e., narcissism, sadism, and psychopathy), false self perceptions, and disinhibited behaviour online were explored. Results indicate that self-report levels of sadism, perceptions of false self, and online disinhibition were highest among adolescents belonging to the highest motivations for Internet and social media use group. These findings illustrate important factors involved in adolescent Internet dependence and outcomes associated with elevated usage.

STUDY 1: Discovering unique profiles of adolescent information and communication technology (ICT) use: Are ICT use preferences associated with identity and behaviour development?

Abstract

The present study was designed to better understand how young people utilize multiple types of information and communication technology (ICT) in their everyday lives and how these preferences may be associated with key aspects of their development. To this end, the present study was designed to explore whether specific profiles of technology usage would be associated with key characteristics of identity and behaviour. To identify groups of adolescents who share similar technology use habits, a sample of 933 adolescents reported on their time spent interacting with various digital communication devices and associated platforms. Utilizing a latent profile analysis, four distinct profiles of technology use preferences emerged. Then, a series of linear regressions were calculated to investigate the degree to which class membership predicted indicators of identity and problem behaviours. The findings suggest that important concepts of both identity and behaviour are associated with individual ICT usage preferences. Acknowledging the cross-sectional nature of the data, it is suggested that the impact of clusters of communication technology use on adolescent development should be investigated with longitudinal data.

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Introduction

It has long been reported that young people's lives are shaped by the interactions they maintain within their multiple social worlds (Ito et al., 2010; Larson et al., 2002). Today, as a result of the proliferation of communication technology, many of these social worlds exist online. Research indicates that the average weekly screen-time of youth has increased by 43 hours in the last few years, suggesting that adolescents now spend approximately 11 hours a day interacting with a digital media device (O'Loughlin, Lambert, Gauvin, Kestens, & Daniel, 2008; Rideout, Foehr, & Roberts, 2010; Rideout, Saphir, & Pai, 2015). Some research has showcased the social and educational benefits that come from teenager technology use (GLSEN, CiPHR, & CCRC, 2013; Hickerson & Mowen, 2013; Pew Research Center, 2015), however, more numerous studies have attributed negative and deteriorating mental health to the increasingly ubiquitous digital media consumption amongst adolescents (Martin, 2011; Messias, Castro, Saini, Usman, & Peeples, 2011; Rosen et al., 2013). Despite these initial and, in some cases, mixed findings, current understanding of how access to, and interaction with, technology impacts on our youth's development is impoverished. The present study was designed to help fill this gap in the literature, and investigate whether adolescents' involvement with digital media is harmful, helpful, or perhaps benign.

Young people's ability to access and interact with media content and person-to-person communication through Internet-enabled digital devices, applications, and services is vast and seems to be continually increasing. Indeed, the expansion of digital devices in the home, school, and wider community has enabled a variety of new entertainment and socialization options, all of which have led children and youth to be far more digitally connected than the generations before them. The steady proliferation of the use of the Internet in daily life has resulted in earlier childhood exposure to the use of digital devices such as tablets and smartphones, as well as a wide number of services and applications like digital online games, video messaging software such as Facetime and Skype, and social media outlets such as Facebook and Instagram. This exposure is often facilitated through parenting behaviours involving educational software or posting photos of the family or offspring on social media. One can thus speculate that this exposure, as well as parental media behaviours, may facilitate a primary interest or preference towards particular digital media usage, which may then be further shaped throughout adolescence by individual peer groups.

Impacts of Technology Use on Youth Mental Health

In recent years a niche area of research has begun to document digital communication and media use among youth in an attempt to identify how usage patterns impact on relevant outcomes. Information and communication technology (ICT) primarily focuses on different modes of Internet use, cell phones, and other mobile and communication mediums (Christensson, 2010). ICT preferences have recently been documented by Lenhart (2015) and show that while some adolescents spend more time accessing social networking sites, others show a predilection towards video games, streaming videos, or consuming large amounts of other digital media. Moreover, 91% of American teens aged between 12 and 15 years report using their mobile device to go online, and just as many send text messages (Lenhart). These data suggest that unique profiles of preferences might exist for specific patterns or styles of ICT use among adolescents. Associations of these preferences with behavioural outcomes, however, remains relatively understudied. Some existing research, however, suggests that social media activity can contribute to anxiety, depression, and low self esteem in adolescence (Fredriksen et al., 2004; Woods & Scott, 2016). Specific Facebook activities, such as status updates and frequency of likes and comments, have exhibited significant relationships with social anxiety and extraversion (Garcia & Sikstrom, 2014; Ong et al., 2011). Other social media activities like taking and posting pictures of oneself (i.e., *selfies*) have been linked to elevated rates of narcissism (McCain et al., 2016).

Social media use, however, is only one dimension of adolescent digital media consumption, and research into the effects of gaming suggests that there are psychological and behavioural impacts of video game usage during adolescence. For example, engagement in violent video game play has been linked to antisocial behaviour, higher degrees of externalizing behaviours, aggression, depression, reduced academic performance, as well as elevated psychopathy among adolescent samples (Delisi et al., 2012; Milani et al., 2015). Other research has linked cyber-trolling activity (i.e., unprovoked hostile, destructive, or disruptive online behaviour) to indices of sadism, deriving pleasure from other people's pain or humiliation, and Machiavellianism, where personal gain is put above normative societal principles of equality (Buckels, Trapnell, & Paulhus, 2014).

The research on social media, particularly hostile social cyber behaviour, and online gaming provides important preliminary findings that illustrate the significance of

understanding the interconnectedness between adolescent well-being and the digital world they inhabit. This research suggests that ICT use may be significantly associated with individual identity as well as a variety of behavioural outcomes of adolescents. The present study was motivated by the 'uses and gratifications' approach that emphasizes the importance of viewing the adolescent as an active consumer of ICT and media (Paik et al., 2001; Rubin, 1993) and the belief that what is presently missing in the field is a person-centred analysis to determine how specific ICT behaviours may or may not cluster together and predict important outcomes. The present study was designed to better understand how young people utilize multiple types of ICT in their everyday lives and how these preferences may be associated with important indices of development.

Information and Communication Technology and Identity Development

Identity is the process of defining oneself as an individual who knows and understands who they are, what they value, and their unique direction in life (Erikson, 1956). Securing a strong self-identity can be accomplished through the creation of personal relationships outside of the family unit, developing awareness of one's sexual orientation, and by exploring the impact of ethnic and cultural identity. Forming awareness and understanding of these various facets of self in adolescence are an integral component of identity commitment (Erikson, 1956; Marcia, 1966) and they ensure that teens avoid identity confusion, lack of direction, and an ill definition of self. Decreasing identity confusion during the developmental stage of adolescence prepares youth for emerging adult experiences and responsibilities by setting the necessary foundation for future stages of adulthood (Erikson, 1956).

The process of reaching self-understanding in adolescence requires a coming together of separate traits into larger, abstract ones, with an aim to gradually combine these characteristics into one holistic organized system (Bee, 1992; Erikson, 1963). The mechanism by which this system is achieved includes identity exploration, the process of trying out different roles, activities, or interests, while actively questioning and evaluating a multitude of identity options. These dynamics are seen to eventually lead to identity commitment, the point at which the adolescent commits to certain aspects of the self (Marcia, 1966).

While there are several benefits associated with identity commitment, such as higher self esteem, life satisfaction, and decreased symptoms of depression and anxiety (Crocetti, Rubini, Luyckx, & Meeus, 2008; Schwartz et al., 2011), studies have shown

that identity exploration is frequently associated with identity confusion and a lack of certainty about one's identity (Schwartz et al., 2011; Schwartz, Zamboanga, Weisskirch, & Rodriguez, 2009). This lack of certainty can result in the creation of a false self, a protective mask meant to diffuse the discrepancy between the adolescents' perceptions of who they are as opposed to how they believe they are perceived by other important people (Broughton, 1981; Dayton, 2009; Goth et al., 2012; Kernberg, 1985). The false self may initially be used to ward off anxiety or feelings of inferiority, but in some instances can become so well accepted that it is compulsive and unconscious as the adolescent loses sight of rectifying the discrepancies between the false and true selves (Sartain et al., 1973; Dayton, 2009).

Communication technology provides adolescents with a growing number of options for self-exploration, and studies have begun to suggest that the integrity of adolescent self-concept can greatly influence the way youth represent themselves online, specifically on the social networking platform Facebook (Gil-Or, Levi-Belz, & Turel, 2015). For example, identity state and psychosocial well-being in particular have been found to be negatively associated with presentations of the ideal and false selves through Facebook activity, whereas, for example, self esteem has been reported as being positively associated with representations of the authentic self on Facebook (Gil-Or et al.; Michikyan, Dennis, & Subrahmanyam, 2015). Today's youth spend a significant amount of time online, and recent research has suggested that this involvement may lend itself to living two different lives, with some youth confessing to sharing a different self offline (i.e., face-to-face) compared to the one they believe they share online (Kaplan & Haenlein, 2010). The developmental implications of living and managing these two separate identities remains relatively unexplored.

Alongside the impact on identity confusion, research has suggested that certain types of ICT use are positively correlated with relationship difficulties (Nyarko, 2012; Shyam & Bhorla, 2011). Evidence for this association is illustrated in a study of college students in which individuals who reported low identity coherence were shown to use texting as a means of peer avoidance (Berusch, 2016). Similarly Cyr (2012) showed that time spent using ICT was significantly correlated with identity distress and existential anxiety among a sample of high school students. Although these investigations have provided tantalizing suggestions that the use of ICT may adversely affect identity achievement, these conclusions are limited by often being correlational in nature and

failing to broadly survey a wide range of ICT behaviours. The personal identity of each adolescent should result in a coherent sense of self in emerging adulthood, and investigating how communication technology preferences may be associated with identity is a necessary next step in understanding the impact of ICT use on adolescent development. The present work took a person-centred approach in exploring how not only Facebook use but also other ICT use preferences may be associated with maladaptive adolescent identity.

Youth Problem Behaviours and ICT

The effects of ICT have also been found to extend beyond youth's development of identity, impacting on adolescent behaviour. For example, increases of overt aggression, aggressive feelings, and social isolation among youth have been attributed to lengthy screen time (Ray & Jat, 2010). Reports indicate that the number of youth who develop or display conduct problems during adolescence have more than doubled over the last 25 years (Collishaw et al., 2004). This fact should provide motivation to investigate whether increased ICT involvement is responsible for this increase in externalizing behaviour. Moreover, ICT activities such as heavy video game usage, irrespective of content, has consistently been shown to be associated with depression, externalizing and internalizing problems, social phobia, withdrawal, anxiety, delinquency and aggressive behaviours (Brown & Bobkowski, 2011; Gentile et al., 2011; Holtz & Appel, 2011; Lemmens, Valkenburg, & Peter, 2011; Romer, Bagdasaroc, & More, 2013; Scott & Porter-Armstrong, 2013). Web surfing and general Internet use has also been linked to negative outcomes in adolescence, i.e., conduct disorders, attention deficit disorder, impulsivity, obsessive-compulsive disorder, hostility, and antisocial behaviours (Carli et al., 2013; Ko, Yen, Yen, Chen, & Chen, 2012). Investigations into clusters of ICT usage preferences coupled with time spent accessing particular outlets of technology could shed more light on how different types of media consumption are associated with specific behavioural concerns.

Research Questions

Given the background evidence demonstrating the impact of ICT in adolescence, the present study was designed to explore whether specific profiles of technology usage would be associated with key characteristics of identity and problem behaviour. Our first research question sought to determine whether adolescents would fall into a small number of distinct ICT usage profiles (RQ1). The second research question was posed to

investigate whether significant differences would be documented between ICT usage profiles on a range of self-reported aspects of identity such as false self, authentic self, self-image satisfaction, and self esteem (RQ2). Lastly, it was anticipated that significant differences would be documented among ICT usage profiles on a range of self-reported problem behaviours such as bullying, victimization, trouble with friends, externalization, and immoral behaviour (RQ3).

Methods

Participants

In 2006, a large initial sample ($N = 2,174$) of adolescents was recruited from 78 schools across the North Island of New Zealand to start the Youth Connectedness Project (YCP), a longitudinal study examining adolescent behaviour and adjustment. The participants were drawn from schools with a range of socio-economic backgrounds, yielding a mean that approximated a middle-class status. The geographical distribution included 61% urban schools, 33% suburban schools, and 6% rural schools. A total of 933 young people took part in the fourth and last wave of data collection for the YCP study in 2015, and this sample served as the basis for the present study because the previous time points did not include questions assessing adolescent ICT, particularly the social media outlet Facebook.

At T4 the sample was composed of 336 males (36%) and 597 females (64%) ranging in age from between 17 and 22 years old. Participants also reported on their cultural background, and were permitted by the question to identify with more than one ethnicity. Most respondents (85%; $n = 588$) identified as New Zealand European, the majority cultural group in New Zealand. Other ethnicities were Maori (23%; $n = 156$), Pacific Islander (6.9%; $n = 48$), Asian (3%; $n = 23$), and 18% ($n = 123$) identified as Other. Ethical approval was obtained from the Victoria University of Wellington Human Ethics Committee, and all adolescents consented to the study's procedures prior to data collection at T4.

Procedure

As part of the longitudinal Youth Connectedness Project (see Jose, Ryan, and Pryor, 2012), adolescents were recruited from high schools across the North Island of New Zealand through a stratified random sampling method, yielding a nationally representative sample of school types. Over time the research team attempted to retain all of the previous adolescent participants from preceding time points, however, many

contact details ceased to be current or accurate. This lack of contact information resulted in an attrition rate of 57% between time point 1 (T1) in 2006 and time point 4 (T4) in 2013. All participants at T4 received an email notification with an online hyperlink inviting them to complete the survey online. Each participant was compensated with a \$10 voucher for his or her participation. All participants at T4 were 16 years of age or older and consent was obtained from each participating individual.

Measures

To assess the impact of technology use on identity, the study included measures of both authentic and false self, self-esteem, and self-image satisfaction. In order to measure problem behaviour, measures of bullying behaviours, victimization, trouble with friends, immoral behaviour, and externalization were obtained.

Perceptions of False Self. To assess adolescent false self-conceptions three items measuring false sense of self were taken from the Perceptions of False Self scale (POFS) (Weir & Jose, 2010). Participants were asked to rate how much each statement applied to them: 'I don't let people see the real me', 'What I say on the outside is different to what I think on the inside', and 'I hide the real me by looking like others'. Responses were marked on a 5-point Likert scale, ranging from 1 (strongly disagree) to 5 (strongly agree) where higher scores indicated increased levels of false sense of self. The total scale internal consistency for the present dataset was good ($\alpha = .78$).

Perceptions of Authentic Self. To measure participant's levels of authentic self, participants were asked to respond to three reverse-coded items of the POFS scale (Weir & Jose, 2010) dedicated to measuring levels of authenticity ('I say what I think even if it is different to the opinions of others', 'I act in ways that express who I really am', and 'I can talk openly to others about my feelings'). Responses were marked on a 5-point Likert scale, ranging from 1 (strongly disagree) to 5 (strongly agree) where higher scores indicated increased levels of authentic self. An additional 2 items, using a 5-point Likert scale ranging from 1 (very difficult) to 5 (very easy), assessed degrees of perceived authenticity by asking participants to indicate how easily they could be themselves around different individuals, (e.g., your best friend, other friends). The total scale internal consistency was good ($\alpha = .74$).

Self Esteem. In order to measure participant's self esteem, the Rosenberg Self Esteem Scale (Rosenberg, 1965) was employed. A total of six self-report items were used (e.g., 'I feel that I am a person of worth, at least on an equal plane with others' and

'On the whole, I am satisfied with myself'). Responses were measured using a 5-point Likert scale ranging between 1 (strongly disagree) and 5 (strongly agree) with higher scores indicating higher levels of self-reported self-esteem. The total scale internal consistency was high ($\alpha = .85$).

Immoral Behaviour. Utilizing 3 items from the Morality of Action scale adapted from the Washington Healthy Youth Survey (Washington State Healthy Youth Survey, 2002-2004) participant's level of immoral behaviour (e.g., 'I think it is ok to take something without asking as long as you get away with it' and 'I think sometimes it is ok to lie rather than tell the truth') was measured. The measure employed a 5-point Likert scale ranging from 1 (strong disagree) to 5 (strongly agree) with higher scores indicating higher levels of immoral behaviour. The total scale internal consistency was good ($\alpha = .74$).

Self-Image Satisfaction. A number of items were specifically created for the Youth Connectedness Project (YCP) to measure adolescent health. Among these were items aimed at measuring health and self-image satisfaction within the sample. A total of 4 items were used to assess participant's self-image satisfaction (e.g., 'Happy with how I look', 'Happy with my weight') using a 5-point Likert scale ranging from 1 (strongly disagree) to 5 (strongly agree). Higher scores indicated higher levels of self-image satisfaction. The total scale internal consistency was good ($\alpha = .77$).

Bullying. Rates of bullying behaviour within different contexts were measured for the previous four weeks. A total of 7 items were created for the YCP, and using a 5-point Likert scale ranging between 1 (Never/Does not apply) and 5 (Almost daily/daily) participants responded to a total of 7 items regarding their bullying behaviour (e.g., 'Have you bullied others in the last month?', 'How often in the last month have you bullied: Online?'). Higher scores indicated a higher frequency of bullying in the previous month. The total scale internal consistency was good ($\alpha = .73$).

Victimization. Rates of victimization from bullying were also measured for the previous four weeks. A total of 7 items created for the YCP were employed, and using a 5-point Likert scale ranging between 1 (Never/Does not apply) and 5 (Almost daily/daily) participants responded to the items regarding their experiences of victimization (e.g., 'Have you been bullied in the last month?', 'How often in the last month have you been bullied: Online?'). Higher scores indicated a higher frequency of

victimization in the previous month. The total scale internal consistency was high ($\alpha = 82$).

Trouble with Friends. Employing a total of 3 items generated specifically for the study, the tendency to get into trouble with friends (e.g., 'How many of your close friends get into trouble?; How often do your friends pressure you to do things that can get you into trouble?') was measured using a 5-point Likert scale ranging between 1 (Never) and 5 (All of the time). Higher scores indicate an elevated frequency of negative peer pressure from friends. The total scale internal consistency was good ($\alpha = 79$).

Externalizing. A total of 3 items created for the study were employed to assess externalizing behaviours (e.g., 'I get into fights or argue with people', 'I hurt somebody that does not have anything to do with the problem', 'I yell and scream') were measured using a 5-point Likert scale ranging between 1 ('Never/Almost Never') and 5 ('Always/Almost Always'). Higher scores indicate an elevated frequency of externalization. The total scale internal consistency was good ($\alpha = 73$).

ICT Use and Exposure

In addition, questions about technology were included to measure adolescent use, exposure, and involvement with different outlets of information and communication technology. At the time of data collection, the social media network Facebook was gaining in popularity amongst adolescents and thus, the research team believed it was an important cyber-social phenomenon to measure in the present study. A total of seven questions were constructed for the present study to measure participant use, preferences, and engagement with the popular social media platform. Responses were reported on a 5-point Likert scale ranging from 1 (strongly disagree) to 5 (strongly agree). In addition, alternative response options were used that ranged from 1 (never) to 5 (all the time) to questions such as 'How often do you visit Facebook (to update your status, read your friend's posts, etc.)?' or 'Your Facebook profile gives an accurate picture of your life'.

In addition to adolescent Facebook engagement and use details, we included measures that would assess how much time youth were spending using Facebook as well as other ICT activities. From the perspective that all youth are different, we assumed that measuring time spent using various technologies might illuminate different youth preferences. Loosely following the Pew Research Center Internet and Technology (Lenhart, 2015) report, we selected items that previous research had

identified as relevant for adolescents. As such, in order to assess our sample's time spent engaging with different outlets of ICT on a daily basis, participants' responses were reported on 6-point Likert scale ranging from 1 (*0 hours*) to 6 (*10+ hours*) to questions such as 'How many hours a day, on average, would you say you spend playing video games?' and 'How many hours a day, on average, would you say you spend surfing the Internet?' where higher self reports indicated more time spent using that particular digital medium. A complete list of items used in the ICT use and exposure section is outlined in Table 1. Taken together, these items were deemed representative of the existing technological trends and ICT preferences among youth.

Table 1

ICT Use and Exposure Items in the Adolescent Sample

ICT Outlet	Item Details	Scale Used
Facebook	How many of your Facebook friends do you consider your close friends? (FB1)	1 (None) to 5 (All of them)
	Other people's Facebook profiles give an accurate picture of their lives. (FB2)	1 (Strongly disagree) to 5 (Strongly agree)
	Your Facebook profile gives an accurate picture of your life. (FB3)	1 (Strongly disagree) to 5 (Strongly agree)
	When you compare yourself to others on Facebook, does it make you feel: (FB4)	1 (Much worse) to 5 (Much better)
	Do you have a physical response (increased heart rate, stomach pain, sweating, headache, etc.) in response to information you see/receive on Facebook? (FB5)	1 (Never) to 5 (All the time)
	How often do you visit Facebook to update your status, read your friends' posts, etc.?(FB6)	1 (Never) to 6 (I am on most of the time)
	Keeping up to date with Facebook (messages, posts, links, photos) interferes with my daily life (eating a meal, doing assignments/chores, going out) (FB7)	1 (Never) to 5 (All the time)
	Time spent using Facebook (TimeFB)	1 (0 hrs) to 6 (10+ hrs)

Internet	Time spent surfing the Internet (TimeNet)	1 (0 hrs) to 6 (10+ hrs)
Video Games	Time spent playing video games (TimeVG)	1 (0 hrs) to 6 (10+ hrs)
Mobile Phone	Time spent making phone calls or texting (TimePhon)	1 (0 hrs) to 6 (10+ hrs)

Data Analysis

As we were interested in identifying groups of adolescents who share similar ICT use habits, latent profile analysis (LPA), a statistical method used to identify latent class membership among participants using continuous observed variables, was used. Latent profile analysis is a person-centred technique that considers responses to a set of variables and then defines groups of individuals who endorse these variables in similar ways. LPA is distinguished from factor analysis, which is a variable-centered technique that assumes that latent clusters of variables exist (Muthén & Muthén, 2000). The person-based groups that are identified with the LPA technique are referred to as latent classes in that they are not directly observed but instead are inferred from the data. The optimal number of profiles is determined by estimating models with an increasing number of classes and comparing fit indices between these models (Muthén & Muthén).

Identification of communication technology classes. The variables used to construct the LPA were the 12 items assessing ICT use, such as Facebook use, time spent surfing the Internet, playing video games, making phone calls, and texting. Using these variables, it was expected that a small number of distinct user profiles would emerge within the sample population, illustrating the various ways in which youth interact with ICT. The classes were derived using Mplus version 7.2 (Muthén & Muthén, 2015). Classification quality was assessed using recommended indices, including the Akaike information criterion, the Bayesian information criterion, as well as the Lo-Mendell-Rubin likelihood ratio test and normalized entropy criterion. It was anticipated that at minimum, three latent profiles would emerge reflecting average, high, and low users of ICT, but fewer and more possibilities were examined as well.

Regression models predicting outcomes. Upon identification of the ICT user profiles, a series of linear regressions were then used to assess whether class membership was associated with aspects of identity and aggressive behaviour. It was expected that variations between outcomes based on class membership would be identified.

Results

Descriptive Analysis

Table 2 presents correlation coefficients, descriptive statistics, and Cronbach's α for all of the variables used in the study.

Table 2

Youth Reports of Identity and Behaviour Variables: Correlations and Descriptive Statistics

Variables	FS	AS	SE	IMM	SIS	BULLY	VICT	TRBF	EXTN
AS	-.58**	-							
SE	-.54**	.54**	-						
IMM	.36**	-.22**	-.26**	-					
SIS	-.31**	.35**	.50**	-.07*	-				
BULLY	.29	.14	-.07	.35	.29	-			
VICT	.50**	.19	-.21	.56**	-.15	.85**	-		
TRBF	.20**	-.11**	-.15	.36**	-.04	.24	.61**	-	
EXTN	.27**	-.19**	-.36**	-.21**	-.24**	.10	.43**	.22**	-
<i>M</i>	2.29	3.94	3.00	1.82	3.39	1.55	1.59	1.69	1.82
<i>SD</i>	.80	.56	.56	.75	.80	.68	.57	.68	.77
α	.78	.74	.85	.74	.77	.73	.82	.79	.73

Note. ** $p < .01$, * $p < .05$. FS = False Self, AS = Authentic Self, SE = Self Esteem, IMM = Immorality, SIS = Self Image Satisfaction, BUL = Bullying, VIC = Victimization, TRF = Trouble with Friends, EXN = Externalizing Behaviours. (N = 933)

Identifying ICT Profiles with Latent Profile Analyses

Four latent profile models, representing 2-, 3-, 4-, and 5-profile solutions were fitted to the data. The 2-profile model, while achieving statistical significance ($p < .001$), was not sufficiently representative of the data, and resulted in a relatively low entropy (.78), the chief measure of the distinguishability of the classes. When fitting the 3-profile model, the Akaike Information Criterion (AIC) and Bayesian Information Criterion (BIC) scores significantly decreased from the 2-profile model, while the entropy increased (to .89), indicating improved model fit. At the next step, the fit indices for the AIC and BIC showed a sufficient decrease between the 3- and 4-class models (> 100), and entropy increased to .90 and remained significant ($p = .03$). When attempting to fit the 5-profile

model, the Lo-Mendell Rubin likelihood ratio test rejected the model ($p = .17$). Taken together, these LPA results indicated support of a 4-class model.

The four profiles are depicted in Figure 1 with ICT profile membership descriptive statistics outlined in Table 3. Upon initial analysis of the ICT model, we saw limited variability between classes for the first five variables focused on Facebook perceptions (namely FB1 to FB5). As a result we focused our profile analysis on the remaining six ICT items. The first and largest ICT profile, distinguished by overall average levels of ICT use, was labeled the Average Use group, and it represented 46.3% ($n = 434$) of youth in the sample. The smallest group was constituted by 6.1% ($n = 57$) of the total sample size, and it was defined by a higher amount of time spent engaging with video games ($M = 3.43$) compared to other types of ICT use. This group also manifested lower average levels of social media use ($M = 1.11$) than the other profiles. Consequently this group was termed the High Video Game/Low Social Media class. The third class, dominated by individuals who reported high levels of ICT usage, namely reporting significantly high amounts of time using all forms of communication technology, was designated the Elevated ICT Use class, and it made up 40.8% ($n = 383$) of the sample across all of the categories. The final profile included 6.3% ($n = 59$) of youth in the sample, and they spent a higher than average amount of time using social media ($M = 5.29$) and surfing the net ($M = 4.75$), but little time engaged with video games, phone calls, or texting, and as such this group was consequently labeled the High Social Media and Net Use class. Thus, these results support the intent behind RQ1 by identifying a small number of discrete ICT use profiles.

Table 3

ICT Usage Profile Membership Descriptive Statistics

	Average		Elevated		HVG-LSM		HSM-Net	
	M	SD	M	SD	M	SD	M	SD
Surfing the Internet	2.65	.89	3.48	.83	3.2	1.38	4.75	.95
Using Facebook	1.96	.27	3.36	.49	1.11	.32	5.29	.46
Playing Video Games	2.67	1.07	2.95	1.08	3.43	1.18	3.88	1.56
Mobile Texting & Calls	2.27	.88	2.86	1.05	1.94	.83	3.89	1.56

Note. Average = Average ICT Use Group, Elevated = Elevated ICT Use Group, HVG-LSM = High Video Game-Low Social Media Group, HSM-Net = High Social Media and Net Use Group.

Figure 1. Technology Use Preferences by ICT Profile Membership.

Note. FB1 = Number of Facebook friends, FB2 = Other Facebook profiles accurate, FB3 = Own Facebook profile accurate, FB4 = Compare self to others on Facebook, FB5 = Physical response, FB6 = Facebook visit frequency, FB7 = Keep up with Facebook, TimeNet = Time on Internet, TimeFB = Time on Facebook, TimeVG= Time playing video games, TimePhon = Time on phone

Associations between ICT Profile Membership and Outcomes

Controlling for age and gender, a series of linear regressions were calculated to investigate the degree to which class membership predicted indicators of identity, namely, false self, authentic self, self image satisfaction, and self esteem, as well as problem behaviours, such as bullying, victimization, trouble with friends, immoral behaviour, and externalization. To this end, profile membership in the High Video Games-Low Social Media, Elevated ICT, and High Social Media-Net groups were dummy coded and as a result the regressions are interpreted in comparison to the reference category of the Average ICT Use profile.

Differences in identity. The second research question (RQ2) involved examination of differences in identity among the obtained classes. shows that membership in the elevated ICT group ($\beta = .15, p < .001$), as well as in the high video game profile ($\beta = .11, p$

< .001), were associated with higher levels of false self-perceptions in comparison to the average usage profile. Similar results were found for authentic self, but in the opposite direction, where participants in the high video game profile ($\beta = -.14, p < .001$) and elevated ICT use group ($\beta = -.09, p < .01$) reported significantly lower levels of authenticity in comparison to the average usage profile. No significant differences were noted between the high social media and net use profile and the average use profile for rates of false self ($p = .44$) or authenticity ($p = .58$).

In comparison to the average group, results indicated that belonging to the elevated ICT use profile ($\beta = -.13, p < .001$) and high video game group ($\beta = -.07, p < .05$) predicted significantly lower self-image satisfaction. Moreover, self-esteem was found to suffer if participants belonged to the elevated ICT use group ($\beta = -.10, p < .01$) and high video game profile ($\beta = -.16, p < .001$) in comparison to the average group. No significant effect, however, was noted between the high social media and net use profile and the average use groups for self-image satisfaction ($p = .25$) or self-esteem ($p = .11$).

These findings indicate that the models, including covariates and ICT class membership, explained a significant amount of the variance in these identity variables, in support of RQ2. These results suggest that ICT class membership in youth was significantly associated with key variables of identity development.

Table 4

Standardized Regression Weights of the Three Non-Reference ICT Classes Relative to the Reference Class of Average ICT Use in Predicting Identity Variables

Covariates	IDENTITY BLOCK			
	FS	AS	SIS	SE
Age	.00 [-.03, .03]	.05 [-.01, .04]	.03 [-.01, .05]	.10** [.01, .05]
Gender	-.05 [-.20, .01]	.04 [-.01, .15]	-.21*** [-.44, -.23]	-.11*** [-.18, -.04]
ICT Profiles				
Elevated	.15*** [.09, .31]	-.09** [-.16, -.01]	-.13*** [-.29, -.08]	-.10** [-.14, -.01]
HVG-LSM	.11*** [.05, .48]	-.14*** [-.45, -.13]	-.07* [-.34, -.01]	-.16*** [-.47, -.17]

HSM-Net	.03 [-.26, .16]	.02 [-.04, .27]	-.04 [-.24, .20]	-.05 [-.20, .10]
R ²	.03	.03	.06	.05

Note. * $p < .05$, ** $p < .01$, *** $p < .001$. Square brackets indicate 95% Confidence Intervals. FS = False Self, AS = Authentic Self, SIS = Self Image Satisfaction, SE = Self Esteem, HVG-LSM = High Video Game – Low Social Media, HSM-Net = High Social Media and Net Use.

Differences in negative behavioural outcomes. Similar analyses were performed exploring the associations between class memberships with self-reported negative behavioural outcomes. The findings, as indicated in Table 5, suggest that user profiles significantly predicted important indicators of problem behaviours, in support of RQ3. Specifically, it was found that belonging to the elevated ICT use class ($\beta = .15, p < .01$) and the high social media and net use group ($\beta = .09, p < .01$) significantly predicted greater externalizing behaviours than if participants were part of the average use profile. We also found that membership in the elevated ICT use profile ($\beta = .08, p < .01$) and the high social media and net use group ($\beta = .09, p < .01$) predicted higher levels of problematic behaviours with friends as compared with the average user group. Furthermore, belonging to the elevated ICT use profile predicted significantly higher levels of immoral behaviour (e.g., lying and stealing) when compared to the average use group ($\beta = .08, p < .05$). However, no significant predictive effect was found for self-reported immoral behaviour for the high video game ($p = .25$) or high social media and net user groups ($p = .32$) when compared against the average ICT use profile members. There were also no significant differences identified between the high video game/low social media group and the average use group on externalization ($p = .27$) or problematic behaviours with friends ($p = .42$).

Notably, in comparison to the average use group, membership in the high social media and net use ($\beta = .48, p < .001$) predicted increased overall victimization, while no significant differences were observed between the average group and the elevated ICT use group or the high video game play members. The rates of bullying behaviour were similar across the high social media and net use group ($p = .16$), the high video game profile ($p = .60$), and the average use group. On the other hand, belonging to the elevated ICT use group significantly predicted fewer bullying behaviours ($\beta = -.54, p < .05$) in comparison to the average class.

Table 5

Standardized Regression Weights of the Three Non-Reference ICT Classes Relative to the Reference Class of Average ICT Use in Predicting Behaviour Variables

Covariates	BEHAVIOUR BLOCK				
	BUL	VIC	TRF	EXN	IMB
Age	.17 [-.11, .21]	-.04 [-.12, .06]	-.26*** [-.10, -.05]	-.11*** [-.08, -.03]	.01 [-.02, .03]
Gender	-.30 [-.77, .34]	-.23 [-.75, .02]	-.18*** [-.44, -.26]	.15*** [.14, .34]	-.27*** [-.51, -.32]
ICT Profiles					
Elevated	-.54* [-1.08, -.16]	-.15 [-.60, .04]	.08** [.00, .17]	.15** [.10, .30]	.08* [.00, .20]
HVG-LSM	-.11 [-1.50, 1.55]	-.04 [-.61, .60]	-.02 [-.30, .07]	.04 [-.20, .21]	.04 [-.14, .26]
HSM-Net	-.36 [-.88, .57]	.48*** [.74, 2.15]	.09** [.04, .39]	.08* [.05, .35]	.03 [-.16, .23]
R ²	.21	.37	.12	.06	.08

Note. *p < .05, **p < .01, ***p < .001. Square brackets indicate 95% Confidence Intervals.

BUL = Bullying, VIC = Victimization, TRF = Trouble with Friends, EXN = Externalizing Behaviours, IMB = Immoral Behaviour, HVG-LSM = High Video Game – Low Social Media, HSM-Net = High Social Media and Net Use.

Overall, the covariates and ICT class membership explained a significant amount of the variance among these particular behavioural variables. These findings suggest that ICT preferences and usage habits were significantly associated with behavioural outcomes. The results indicate that important concepts of both identity and behaviour are affected, and that these identity characteristics are correlated with individual ICT usage preferences. The most interesting results were the significant associations between elevated ICT use with the variables of adolescent positive and negative self-perceptions, self-esteem, self-image satisfaction, immoral behaviour, externalizing behaviours, and trouble with friends.

Discussion

In this study we achieved two major goals: first, we identified four distinct classes of ICT use among a large sample of adolescents and early adults; and second, the analyses identified a number of reliable differences between classes associated with maladaptive identity and problem behaviour variables. Among the four unique ICT use profiles, the majority of the sample fell into the average ICT use class, while three other groups were also identified: elevated ICT use, high social media and net use, and high video game use. Using the average technology use profile as the reference category, the effects of class membership on both identity and behaviour among adolescents were explored.

Class Differences in Maladaptive Identity

In comparison to the average ICT use group, several classes displayed higher levels of compromised identity variables. For example, individuals in the elevated ICT use group were significantly more likely to exhibit increased levels of false self-perceptions and, in turn, lowered authenticity when compared to the average ICT user group. Similar results were identified for the high video game users, with participants showing significantly higher rates of false self-perceptions and decreased authenticity. Further to these findings, individuals belonging to either of these classes also reported significantly decreased self-image satisfaction as well as lowered self-esteem compared to peers belonging to the average technology user profile.

The high social media and net use profile, however, did not evidence any significantly worse identity outcomes when compared to the average use group. Rates of false self, authenticity, self-image satisfaction, and self-esteem did not significantly differ between those belonging to the high social media and net use profile when compared to the average user group. The noted differences between ICT use group membership on maladaptive identity supports the hypothesis that ICT use preferences are significantly associated with important indices of youth's identity formation.

Class Differences in Maladaptive Behaviour

When comparing all ICT profiles against the average user group, adolescents and early adults who exhibited elevated rates of ICT use, or who frequently interacted with social media and the web, were more likely to report rebellious, defiant, aggressive, and antisocial behaviours characteristic of externalizing behaviours. Moreover, these digital preferences were also significantly associated with a higher likelihood of problematic

behaviours with friends (e.g., getting pressured into doing things that could get one into trouble and an increased frequency of getting into risky situations with friends). Further, the rates of victimization by bullying were found to be significantly higher for individuals belonging to the high social media and net use profile. Bullying behaviours, however, were significantly less likely among youth who belonged to the elevated ICT use profile compared to the average use group. Results further indicated that participants belonging to the elevated ICT use profile demonstrated significantly higher levels of immoral thoughts and behaviours, suggesting that perhaps adolescents who display these immoral tendencies have graduated from bullying tactics and are using ICT for different means. Future studies should explore how immoral behaviour might present via ICT use and whether these immoral tendencies are manifested through trolling (i.e., starting arguments or posting inflammatory comments on profiles or forums), catfishing (i.e., the luring of someone into a relationship through a fake online persona), or even phishing (i.e., using social engineering to ascertain people's personal information such as passwords or credit card information with malicious intent). The current differences in ICT use group membership found in association with maladaptive behaviour supports the hypothesis that significant associations exist between ICT use preferences and maladaptive youth behaviour.

No significant differences were found for self-reported immoral behaviour for both the high video game and the high social media and net user groups when compared with the average ICT user group. Further, we also found no significant differences for the high video game/low social media group, or for the average ICT group for externalizing or trouble behaviours with friends. Participants belonging to the elevated ICT use, as well as the video game group, did not experience significantly higher rates of victimization. Similarly, we found no significant differences in rates of bullying across the high social media and net use members or those belonging to the high video game profile, when compared to the average user profile. These results suggest that unique ICT user profiles are associated with both positive and negative aspects of identity formation.

Comparing Our Findings with Existing Research

The findings on both identity and behaviour from the present study are generally consistent with results noted in previous research, however, the predominant approach taken by previous researchers has solely focused on one or two behaviours associated

with a specific ICT platform such as Facebook or the use of video games, in isolation. The current study, however, took a person-centred approach, focusing on the adolescent as an active user over a range of ICT use preferences. This person-centred approach allowed for the identification of typical adolescent profiles of ICT usage not previously identified by researchers. Illuminating these unique profiles allowed us to examine ICT usage as a holistic whole embodied within individual adolescents, an approach that has not been previously undertaken in this area of research. This novel approach resulted in several new findings, which highlights the importance of growing existing literature in the field.

We further speculated that profile membership would be associated with problematic behaviours. The present findings on the predictive relationships between externalizing and problematic behaviours with friends in relation to elevated ICT, social media, and net use expand on previous research that has documented significant relationships between prolonged screen time and increased aggression and conduct disorders (Kelishadi et al., 2015; Ray & Jat, 2010). The manifestations of these antisocial and aggressive tendencies are further showcased when exploring rates of online victimization. The current findings are consistent with reports that 88% of adolescents aged between 12 and 17 years have witnessed 'mean acts' online or experienced some degree of victimization in their own lives (Lenhart et al., 2011). Our findings underscore that adolescents who spend a significant amount of time online, as well as using social media, are more likely to experience being bullied. Adolescents, however, who exhibit elevated levels of all ICT use showed no significant association with committing acts of bullying, suggesting that a unique relationship may exist specifically between social media and bullying.

Our study did find that elevated ICT use was significantly associated with increased rates of immoral behaviour, a finding that has not been previously identified in the research. While limited empirical evidence exists investigating the relationship between immoral behaviour and ICT use, research has suggested that externalizing and aggressive behaviour are directly related to moral sensibility (Gini, 2006; Menesini et al., 2003). Exposure to highly immoral content via Internet access, for example, could result in 'routinization' (a form of adaptation), which has been shown to prevent individuals from enacting moral actions and behaviour (Tsang, 2002). Although literature on the influence of ICT use on adolescent morality is relatively scarce, a recent

public survey by the Pew Research Centre (2015) revealed that the vast majority of the public believes that active and frequent use of the Internet is likely to result in decreased morality. Future research should consider how morality may be affected by different modes of ICT use, and how ICT activity may be impacting on the development of moral thought and action among youth.

Implications

The findings of the present study suggest that diverse aspects of ICT use among teens may have unique implications for personal development. The findings also contribute to an emerging literature on the subject of communication technology and adolescent development by illustrating a need for a broader and more developmental approach to the study of youth information and communication technology use. The current cross-sectional study illustrates that ICT is significantly associated with identity and behavioural attributes in adolescence, and although we cannot infer causality with such data, the associations suggest that personal inclinations towards specific digital preferences in youth may have the ability to not only amplify and shape identity and behaviour but also may have a transformative effect on teen development. Moreover, identifying clusters of ICT use, rather than focusing research on individual media outlets one at a time, illustrates a more dynamic and diverse digital media consumption among youth. These findings suggest that the outlets that teens may choose to predominantly use could be satisfying specific and unique psychosocial needs by aiding youth to seek out particular social networks, establishing a sense of community outside of their immediate environment, and building support systems with similar-minded individuals. In the reverse direction, it may be that individuals who possess antisocial personality traits seek out particular ICT outlets and experiences that are congruent with their inner motivations. Future work will be needed to tease apart longitudinal and causal relations that the current cross-sectional study cannot illuminate fully.

The findings of the present study illustrate the need to focus on collective or holistic depictions of ICT usage preferences as a building block in research as a means to truly understanding the unique motivations behind adolescent ICT platform preferences. Moreover, the rapid acceleration of computer-mediated technology use as well as other communication technology advancements, such as virtual or augmented reality, illustrates a pressing need for researchers to take on innovative and holistic approaches to studying the impact of technology on youth development.

Future Directions and Limitations

By identifying unique adolescent profiles of communication technology use preferences, research can expand its scope to focus on clusters of ICT use and thereby improve our current understanding of the unique profiles of adolescent communication technology consumption. Future research should evaluate what motivates youth to gravitate towards specific clusters of ICT usage by expanding empirical work to include different themes and/or motivations that stimulate participation and involvement in new and existing digital media. The current findings showed that high social media use is significantly associated with increased rates of bullying and victimization. Future work could consider how high rates of malicious activity over several social networking platforms by youth may be associated with personality traits related to sadism, Machiavellianism, narcissism, or psychopathic tendencies. Research into these four 'dark' personalities in relation to online behaviour is relatively uncharted (but see Buckels, Trapnell, & Paulhus, 2014), and with the paradoxical mix of decreasing privacy and digital anonymity, it is critical to distinguish the different types of antisocial personalities that may be liberated in unmonitored online behaviour.

It is also important to note that the present work did not include all of the communication technology platforms available today, and as such future studies should investigate a wider breadth of ICT usage in latent profile analyses such as involvement with Instagram, Twitter, ask.fm, Snapchat, Tumblr, Skype, Facetime, and the like. While the use of a latent profile analysis in this context is novel, we recognize, as noted above, that doing so with a concurrent sample limits the ability to explain how ICT use *causes* differences in identity and problem behaviours over time, and vice versa. In the present case we cannot discern the temporal nature of these relationships, and must instead consider the findings as illustrating specific concurrent associations between the variables, which, we would argue, signpost the use of certain variables in future longitudinal investigations. Lastly, the current sample was taken from a single Western country in the Southern hemisphere, and while some of the results attained are consistent with previous work that has illustrated an impact of communication technology on identity and behaviour in other countries, future work should strive to replicate our findings in other cultures and countries.

Conclusions

Applying a latent profile analysis on various adolescent communication technology use preferences has yielded evidence that distinct youth ICT user profiles not only exist, but also exhibit significant associations with various identity and behavioural outcomes. We argue that the present findings illuminate the importance of studying clusters of ICT use preferences and we hope it motivates researchers to evaluate how certain types of communication technology use in adolescence may have impacts on development. Although significant associations were found between ICT profile membership and both identity and behaviour, the discrepancies between the current findings and those found in select previous literature indicate that there is still much to understand about the complex influence of communication technology on youth and development.

Moving from Study 1 towards Study 2

In Study 1, it was established that adolescent ICT usage preferences are significantly associated with both maladaptive identity and behavioural outcomes. Most notably, a relationship between offline immoral behaviours and ICT usage were discovered. As a result, I speculated that for some youth, this interest, or predisposition, towards immoral actions might also present in the digital world. In this vain, I hypothesized that particular personality traits in adolescence would make teens more susceptible towards exhibiting or engaging in unethical, antisocial, or unscrupulous activities online. In addition, maladaptive characteristics of identity (specifically false self perceptions) would also need to be a salient feature of the chosen personality features. My attention was then drawn to the dark personality traits of narcissism, sadism, and psychopathy, which have been shown to significantly predict not only immoral behaviours, but also fraudulent self-presentations (Harrison, Summers, & Mennecke, 2016; Međedović & Petrovic, 2016; Naaijken, 2014).

To further expand on the findings from Study 1, and to address the existing research questions, Study 2 was designed to investigate whether these dark traits would significantly predict adolescent false self perceptions, and whether these characteristics may also be predictive of notable immoral digital behaviours such as online disinhibition and cyber aggression.

STUDY 2: 'I did it for the LULZ': How the dark personality predicts online disinhibition and aggressive online behaviour in adolescence

Abstract

A large proportion of youth believe that the world of cyberspace provides them with a relatively safe and anonymous digital bubble ripe for uninhibited self-expression. At the same time, observers have noted an increase of individuals behaving in an unrestrained manner on the Internet, while researchers have reported elevated rates of cyber aggressive behaviour. What remains unclear, however, is whether, and how, disinhibition might be related to cyber aggression. In an aim to explore the possible associations, a large sample (total N = 709) of high school ($M_{age} = 15.56$ years) respondents from New Zealand were recruited, and completed a survey featuring scales assessing personality and technology behaviours, attitudes, habits, and trends. The present study was designed to investigate whether the three dark personality traits of narcissism, psychopathy, and sadism would predict false self perceptions, and in sequence, online disinhibition and aggressive online behaviour. All three dark personality traits, as well as false self, were positively associated with online disinhibition. Perceptions of false self were found to be a significant predictor of cyber aggression when mediated by online disinhibition. In the case of cyber aggression, however, psychopathy, sadistic traits, and online disinhibition were found to be significant predictors of this outcome. The results collectively provide a more nuanced understanding of how antisocial personality traits are associated with maladaptive identity formation (i.e., endorsement of false self beliefs) as well as maladaptive online behaviour (i.e., disinhibited online behaviour and cyber aggression).

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Introduction

Understanding the Roots of Cyber Aggression

As the online social world has expanded, some observers have noted an increase of individuals behaving in an unrestrained manner on the Internet. Identified as a considerable problem, particularly among adolescents (Kowalski, Giumetti, Schroeder, & Lattanner, 2014), this growing phenomenon seemingly coincides with the drastic increase in the prevalence of aggressive online behaviour (Garett, Lord, & Young, 2016; Rawhide, 2017). Eager to unearth the complex motivations behind the burgeoning culture of cyber aggression, researchers continue to investigate the origins of aggressive online adolescent behaviour. As such, it has been argued that the unique and continuously changeable digital landscape demands a broader understanding of aggressive online behaviour that goes beyond the narrow scope of 'online bullying' (Corcoran, McGuckin, & Prentice, 2015).

Much of the current speculation behind the increase of aggressive digital behaviour in youth coincides with the idea that the Internet is an important anonymous space that promotes honest self-expression free of immediate judgement or consequence (Suler, 2004). Indeed, in many ways, this digital landscape provides a context in which there is an absence of important social cues concerning appropriate behaviour (which are generally present in face-to-face interactions), that allow youth to engage in hostile or antisocial behaviour online (Hemphill & Heerde, 2014; Pornari & Wood, 2010). Because victims' responses may be absent, suppressed, or delayed on the Internet, it is very possible that aggressive individuals fail to accurately predict the severity of harm caused by their actions. Moreover, increased opportunities for aggression and the ability or willingness to override inhibition are other common features that have been used to explain why certain individuals are more likely to act aggressively online (Anderson & Bushman, 2002; Arsenio & Lemerise, 2004;). Research has also found significant correlations between aggressive behaviour and biases in morality, specifically distorted moral reasoning, that influences the individual to minimize feelings of guilt or remorse (Arsenio & Lemerise, 2004; Caravita, Gini, & Pozzoli, 2012; Hymel, & Bonanno, 2014; Malti, Gasser, & Gutzwiller-Helfenfinger, 2010; Menesini, Nocentini, & Camodeca, 2013; Pozzoli, Gini, & Thornberg, 2016). Additionally, fluctuations in self-image, self-concept, self-standards, and sense of self-worth can increase the likelihood of aggressive acts (Crocker & Wolfe, 2001; Ronningstam, 2017).

Despite these findings, why certain youth are susceptible, and some are not, to the disinhibiting effects of cyberspace and to engagement in aggressive online behaviour remains relatively understudied.

Moral Disengagement and the Online Disinhibition Effect

A systematic review of Bandura's (2002) research into selective moral disengagement (i.e. a cognitive process by which a person justifies their own harmful or aggressive behaviour towards others by loosening one's own inner self-regulatory mechanisms) (Bandura, 1986; 1999) posits that individuals experience greater ease towards engaging in harmful behaviour when the harm is invisible to the perpetrator as a result of either distance or time. In support of Bandura's theoretical position, moral disengagement has frequently been linked to hostile, aggressive, and disinhibited behaviour (Perren & Gutzwiller-Helfenfinger, 2012; Pornari & Wood, 2010; Runions & Bak, 2015). The digital environment, therefore, seems to provide a felicitous landscape for moral disengagement and the expression of anti-social behaviours and attitudes that run counter to the norms of everyday behaviour (Bauman, 2009; Runions & Bak, 2015).

The behavioural juxtaposition outlined above, namely that people often behave differently online than in an offline context, has been described as the '*online disinhibition effect*' (Joinson, 1998; Joinson, 2003; Suler, 2004). According to Suler (2004), this effect can be further categorized as either '*benign*' or '*toxic*' digital disinhibition. In the instance of benign disinhibition, the online environment motivates individuals to over-share personal details about themselves and their emotions. These individuals use the Internet as a means of exploring their inner self, and their over-sharing is marked by an intrinsic need to better understand existing or new emotions while working out interpersonal issues. In contrast, the toxic, dark, side of disinhibition is characteristic of the modern troll, and results in displays of rude or crude language, harsh commentary, 'hate speech', and even threats that would be extremely rare in a face-to-face setting. Following from this distinction between benign and toxic disinhibition, Suler (2004) suggested that there are several factors associated with the digital landscape which contribute to the online disinhibition effect, namely: dissociative anonymity (e.g., "They'll never know who I really am"), invisibility (e.g., "I can't see you, so you can't see me"), asynchronicity (e.g., "I'll post whatever I want now, and you'll see it later when I don't have to deal with your reaction"), solipsistic introjection (e.g., "The way I see you is the real you"), dissociative imagination (e.g.,

“Who I am online is different from who I am in real life”), and minimization of authority (e.g., “There are no consequences for what I say or do online”). These six elements of online disinhibition promote self-disclosure through computer-mediated communication and digital technology. Supporting this proposition, a number of studies have found that behaviours of self-disclosure are significantly increased in the digital environment when compared to face-to-face interactions (Joinson, 2001; McKenna & Bargh, 1998; Tidwell & Walther, 2002).

Exploring Adolescent Identity and the Online False Self

The Internet provides adolescents with a unique space for exploring various facets of their identity and the freedom for dissociative self-expression (Bauman, 2010; Runions & Bak, 2015; Suler, 2002; 2004). In fact, some studies have shown that a large proportion of youth believe that the world of cyberspace provides them with a relatively safe and anonymous digital bubble that is free of the direct criticism, judgement, or immediate consequence that they may experience offline (Bauman, 2010; Runions & Bak, 2015; Suler, 2002; 2004). Moreover, the majority of teens confess to sharing a different self offline compared to the one they believe they share online (Kaplan & Haenlein, 2010). This belief system, coupled with the extensive interaction youth have with cyberspace, has important implications for the healthy development of their identity, and consequently their behaviour. Adolescents’ engagement with the Internet, for example, can impact not only the coherence, but also the integrity, of youth’s developing sense of self.

An individual’s self-concept, or true self, is achieved through a process of identity exploration (Marcia, 1966). For some youth, this is a difficult and arduous process that, if not carefully nurtured, can result in identity confusion. When adolescents become confused about their identity, many develop a protective mask meant to diffuse the disparity between who one really is, and how they want others to perceive them (Dayton, 2011; Goth et al., 2012; Kernberg, 1985; Schwartz et al., 2011; Schwartz, Zamboanga, Weisskirch, & Rodriguez, 2009). These self-conceptions (i.e., one’s relatively enduring and stable sense of ‘the real me’) can greatly influence the way adolescents represent themselves online (Gil-Or, Levi-Belz, & Turel, 2015). To date, research has mainly focused on how perceptions of identity influence Facebook behaviour and attitudes. For example, after measuring levels of ‘true self’ expression, Seidman (2014) found that higher levels of true self (authenticity) were associated with

increased Facebook communication, self and emotional disclosure, as well as attention- and acceptance-seeking. A separate study found that adolescents who harboured higher false self perceptions, believed that information shared online is inaccurate, and not representative of real life (Kurek & Jose, 2016). Investigations into whether adolescent self-perceptions promote disinhibited behavior, however, have not been previously explored. The present study was designed to investigate whether underlying personality constructs may have a significant influence on the process of identity exploration and the formation of these personal self-perceptions. In particular, we sought to identify whether specific personality constructs prone to moral disengagement (i.e., aspects of aversive personality) may impact on identity and self-expression online.

The Dark Side of Personality and Cyberspace

Leading experts in the field of the 'dark personality' argue that there is a set of common, socially aversive traits known as the *dark tetrad* (Paulhus, 2014). Individuals who express these personality traits of narcissism, psychopathy, Machiavellianism, and/or sadism, are seen to be self-centered and socially offensive, while often maintaining the ability to get along with other people in everyday settings, i.e., be considered as effectively engaging with the broader community (Paulhus, 2014). In the present study, the influence of three out of the four dark tetrad traits were explored: *narcissists*, who are often grandiose self-promoters, carry a strong sense of entitlement, lack empathy, and display high levels of egotism (Campbell & Miller, 2012; Madan, 2014; Paulhus & Williams, 2002; Paulhus, 2014); *psychopaths*, who cause others serious harm in impulsive fits of callous thrill-seeking, exhibit elevated selfishness, low inhibition, superficial charm, callousness, and display a lack of empathy or remorsefulness (Madan, 2014; Paulhus, 2014); and *sadists*, who try to verbally or physically hurt others for pleasure or amusement (Buckels, Jones, & Paulhus, 2013).

Recent work in cyber psychology has revealed that these dark personality characteristics contribute to not only social media network preferences but also to online behaviours (Buckels, Trapnell, & Paulhus, 2014; Cheng, Bernstein, Danescu-Niculescu-Mizil & Leskovec, 2017; Madan, 2014; van Geel, Goemans, Toprak, & Vedder, 2017). Frequently, narcissists display higher levels of activity on social media platforms and exhibit increased levels of self-promoting and self-enhancing behaviours (Aboujaoude, 2017; Choi, Panek, Nardis, & Toma, 2015; Halpern, Valenzuela, & Katz,

2016). Narcissists are also found to use social media networks for self-enhancement and to develop and exploit shallow and short-term online friendships in an attempt to bolster their social status and self-esteem (Barry, Doucette, Loflin, Rivera-Hudson, & Herrington, 2017; Buffardi & Campbell, 2008; Campbell, Reeder, Sedikides, & Elliot, 2000; Fox & Rooney, 2015; McCain et al., 2016).

Narcissism, however, is not the only dark personality to be manifested online. Both sadism and psychopathy have been linked to hostile, aggressive, and intimidating behaviours, which are frequently, characterized as trolling behaviour (Buckels et al., 2014) in the online context. Sest and March (2017) found that while higher levels of trait psychopathy and sadism predicted trolling behaviour, individuals scoring highest on trait psychopathy tend to use trolling in an aim to manipulate others. Sadistic individuals, on the other hand, exhibit the highest levels of enjoyment of their own adversarial and provocative online behaviours (Buckels et al., 2014). This strong correlation between trolling behaviour and sadism illustrates how both trolls and sadists “feel sadistic glee at the distress of others” (Buckels et al., 2014, p. 101), suggesting that these individuals do it for the ‘LULZ’ (i.e., aggressive laughter derived from another person’s distress or discomfort). To date, some studies have demonstrated that traits associated with narcissism, sadism, and psychopathy manifest in unhealthy digital behaviours (e.g., Grothe, Staar, & Janneck, 2016), however, little to no attention has been given to how these dark personality traits inform the expression of inauthentic identities, online disinhibition, or cyber aggressive behaviour. The chief aim of the present study is to describe the associations that likely exist between and among these various constructs.

Aims of the Current Study

In particular, while existing associations between each of the dark personality traits and false self have been previously established (e.g., Campbell & Foster, 2011; Chabrol & Leichsenring, 2006; Gediman, 1985; Vaknin, 2015), we endeavoured in the present study to establish whether significant predictive associations between narcissism, sadism, and psychopathy exist in relation to online disinhibition, as well as cyber aggression. Moreover, the possible influence of adolescent false self perceptions on uninhibited digital behaviour or cyber aggression has not been established. Lastly, although links between increased online disinhibition and cyberbullying have been acknowledged (e.g., Udris, 2014), the present study aimed to investigate cyber

aggressive behaviour more broadly. Following these distinctive gaps in the existing literature, the present study sought to investigate whether personality traits of the dark triad would directly, or indirectly, predict false self perceptions, online disinhibition, and aggressive online behaviour.

It was first predicted that psychopathy, narcissism, and sadism would evidence significant and positive direct associations with perceptions of false self, online disinhibition, and cyber aggression (*H1*). Second, it was hypothesized that perceptions of false self would positively predict online disinhibition but not cyber aggression, while online disinhibition would be a significant positive predictor of cyber aggression (*H2*). Third, it was predicted that perceptions of false self would mediate the relationship between dark personality traits and online disinhibition, while online disinhibition would mediate the relationship between the dark traits and cyber aggression (*H3*). Finally, we expected a double mediation through false self perceptions and online disinhibition between the dark personality traits and cyber aggression (*H4*).

Methods

Participants

A total of 709 adolescents (50.5% female; 49.5% male) aged 13 to 17 years were recruited from 18 different high schools across both the North and South islands of New Zealand. Respondents reported on their cultural background, with the majority identifying as New Zealand European (67.1%; $n = 476$), the majority cultural group in New Zealand. Other ethnicities reported were Maori (16.9%; $n = 120$), Pacific Islander (2.2%; $n = 16$), Asian (10.3%; $n = 74$), and 3.3% ($n = 24$) identified as Other. The key questions regarding online behaviour and the dark personality triad are embedded in a larger battery of personality questionnaires and questions about information and communication technology (ICT) use. Participation was completely anonymous, voluntary, and parental consent and youth assent forms were collected for participants under the age of 16, while student consent forms were collected for those individuals 16 years of age and older prior to data collection. Ethical approval was obtained from the Victoria University of Wellington Human Ethics Committee, and all schools, principals, parents, and adolescents consented to the study's procedures prior to data collection.

Procedure

Named the New Zealand Youth and Technology Use Project, a large-scale cross-sectional, subject variable data collection was performed on youth across the entirety of

New Zealand. The project featured key items that assess technology behaviours, personality, attitudes, habits and trends. At the beginning of the recruitment phase, a New Zealand national school zones dictionary was acquired, and a project directory of all secondary schools was created to facilitate school recruitment. Approximately 30 school principals were called and emailed, and a brief outline of the project details and goals was communicated. At the conclusion of the recruitment phase, either the head of school or principal of 18 different schools expressed interest in participating in the project. Thus, approximately 60% of approached schools agreed to participate. Participating classes were selected at random by the school principals, and research information and consent forms were sent home for parental signature. The lead researcher and research assistant visited each participating school to carry out in-school assessments and oversee all project material dissemination over a period of five weeks in 2015. Participants at each school completed the online survey through the use of either a Samsung tablet provided by the research team, or a school computer via private web link, on the day of the assessment. All measures were randomly ordered at the individual level and administered using Qualtrics through a private webhost. Data were collected from both urban and rural schools, and represented equal numbers of mixed-gender and single-gender institutions. The survey was administered at the school, in small groups, and under the supervision of the research team and school staff. Each participant received a mini chocolate bar in compensation for his or her time.

Measures

Narcissism. A revised 32-item Pathological Narcissism Inventory (PNI; Pincus et al., 2009) was used to assess rates of overall narcissism (e.g., 'I find it easy to manipulate people', 'I am disappointed when people don't notice me') and responses were collected on a six-point scale ranging from 0 (*not at all like me*) to 5 (*very much like me*). Consistent with previous studies on adolescent narcissism which evidenced a Cronbach's α of .93 (Lee-Rowland, Barry, Gillen, & Hansen, 2016), the current study obtained a Cronbach's alpha of .93 as well.

Sadism. The Comprehensive Assessment of Sadistic Tendencies (CAST; Buckels & Paulhus, 2013) measure, containing a total of 13 items, was administered to participants. Responses were collected to assess the degree of overall sadistic tendencies among the youth sample by measuring vicarious sadism (e.g., 'I enjoy playing the villain in games and torturing other characters'; seven items) and direct

verbal sadism (e.g., 'When making fun of someone, it is especially amusing if they realize what I'm doing'; six items). The five items assessing direct physical sadism were omitted from the study for ethical reasons. Each question was rated on a five-point scale from 1 (*strongly disagree*) to 5 (*strongly agree*). Previous work by Buckells et al. (2014), evidenced a complete scale reliability of $\alpha = .89$, whereas the current study's total scale (with five omitted items) resulted in an acceptable Cronbach's alpha of .79.

Psychopathy. In order to measure the interpersonal and affective traits of psychopathy (Frick & Ellis, 1999; Viding, Blair, Moffitt, & Plomin, 2005) that have been found to be persistent across development (Frick & White, 2008; White & Frick, 2010), the Inventory of Callous-Unemotional Traits (ICU; Frick, 2004) was employed. A total of 12 items from the self-report questionnaire were used to assess the degree of callousness (e.g., 'I do not care who I hurt to get what I want'; seven items), and uncaring (e.g., 'I feel bad or guilty when I do something wrong'; five items all of which were reverse scored) in the sample. These items were scored on a three-point Likert scale from 1 (*not at all true*) to 3 (*definitely true*). The reliability and validity of the total ICU scores has been found to be consistently acceptable, ranging from .79 to .81 (Byrd, Kahn, & Pardini, 2014; Kimonis et al., 2008; Neal & Sellbom, 2012), however, the unemotional subscale has consistently demonstrated the poorest reliability (Byrd et al., 2014). As a result, and to decrease respondent fatigue, the unemotional ICU subscale was removed from the current study. With the removal of the unemotional subscale, the current study's total scale reliability resulted in an acceptable Cronbach's alpha of .71.

False Self. Perceptions of false self (POFS; Weir & Jose, 2010) were measured using 7 items (e.g., 'If people really knew what I was like on the inside, they wouldn't like me', 'I hide the real me by looking like others') scored on a five-point Likert scale from 1 (*strongly disagree*) to 5 (*strongly agree*). The scale's internal reliability has previously been reported at $\alpha = .88$, and 10-week test-retest reliability has been reported at $r = .84$ (Weir & Jose, 2010). The scale has also shown good convergent validity with other scale measures of false self (Say What I think Scale, Harter & Waters, 1991; and Silencing the Self Scale, Jack, 1991). The present scale resulted in a similarly high Cronbach's alpha of .86.

ICT attitudes and behaviours. And last, the research team developed a survey section dedicated to measuring technology use and attitudes. This portion of the

questionnaire asked participants to report on various ICT behaviours, preferences, motivations, and attitudes.

Online disinhibition. A total of 5 items assessing disinhibition online were developed for the purpose of the study (e.g., 'I say/write/post comments online that would not say in person', 'I am aware when I am being hurtful online, but do it anyway', 'I feel safer expressing negative thoughts and feelings online than in person'). These items were scored on a 5-point Likert scale ranging from 1 (*strongly disagree*) to 5 (*strongly agree*). At the time of research development, there was no validated online disinhibition measure, however, the items selected loaded onto a single factor (see the psychometric evaluation of items below), and were similar to the 11 items used by Udris (2014). The total scale internal consistency was good ($\alpha = .73$).

Aggressive online behaviour. A total of 7 items assessing a range of aggressive online behaviours were developed for the purpose of this study. Participants were asked to rate how often in the last month (30 days) they had engaged in any of the listed behaviours (e.g., 'Posted something online about someone else to make others laugh', 'Made mean or negative comments on someone's photos, updates, or tags to make that person feel bad'). Items were scored on a 5-point Likert scale ranging from 1 (*Never*) to 5 (*7 or more times*). Higher scores indicate a higher frequency of aggressive behaviour online and the total scale internal consistency was very strong ($\alpha = .92$).

Psychometric Evaluation of Items

A total of twelve questions (see Appendix A) relating to both online disinhibition and cyber aggression were factor analyzed on a randomly selected half of the total sample using principal component analysis with Varimax (orthogonal) rotation. The eigenvalues of the first two factors, i.e., 4.93 and 2.16, as well as the scree plot, identified two distinct factors explaining a total of 59.16% of the variance of the entire set of variables. Factor 1 was labeled cyber aggression and explained 41.11% of the variance. The second factor derived was labeled online disinhibition and explained 18.04% of the variance. All factor loadings were greater than .20 and there was a clear division between both factors.

The EFA-obtained factor structure was further examined with a CFA with the second randomly selected half of the sample. No cross-loadings were permitted in the CFA model, and it yielded good model fit indices ($\chi^2/\text{df} = 2.53$, CFI = .97, RMSEA = .066;

RMR = .048). These results provide support for the claim that we have identified two distinct factors of online behaviour.

Data Analysis Plan

In order to assess the relationships between variables a preliminary investigation of the variables was first conducted through descriptive analyses. Then, the mean group differences by age and gender were examined by performing a median-split of both variables into two groups to see if differences would be obtained for these two covariates. In order to examine potential relationships among the dark personality traits, false self perceptions, online disinhibition, and cyber aggression, a path model was constructed using structural equation modeling to address hypotheses 1 and 2. Finally, this path model allowed for the investigation of both hypothesis 3 and 4 through concurrent mediations.

Results

Descriptive Analysis

Table 6 presents the correlation coefficients, descriptive statistics, as well as Cronbach's α s for all of the variables in the study. A missing values analysis was run on the sample data and results indicated that very little, .81%, data was missing. Little's MCAR test indicated that data were missing completely at random, $\chi^2 = 31.37$, $df = 45$, $p = .94$. In order to retain optimal statistical power, an expectation maximization imputation in SPSS was performed (Lin, 2010) and correlations, regressions, and MANOVA analyses were performed on this imputed dataset. The EM-imputed dataset was also employed for the SEM analyses. Skewness and kurtosis estimates for all variables fell within the acceptable range, resulting in no data transformations.

Table 6

Correlations among Dark Triad Traits and False Self, Online Disinhibition, and Aggressive Online Behaviour

VARIABLES	NAR	SAD	PSY	POFS	ON-DIS	CYB-AGR
SAD	.25**	-				
PSY	.12**	.04	-			
POFS	.52**	.16**	.16**	-		
ON-DIS	.41**	.31**	.01	.34**	-	

CYB-AGR	.17**	.26**	.05	.08*	.26**	
<i>M</i>	3.43	2.64	1.91	2.68	2.35	1.33
<i>SD</i>	.79	.68	.19	.61	.83	.62
α	.93	.79	.71	.86	.73	.92

Note. * $p < .05$, ** $p < .01$. NAR = Narcissism, SAD = Sadism, PSY = Psychopathy, POFS = Perceptions of False Self, ON-DIS = Online Disinhibition, CYB-AGR= Cyber Aggression. (N = 718)

Gender and Age Differences

A MANOVA was computed to determine whether the main variables in question significantly varied by the two covariates gender and age. Age was split into two dichotomous groups of younger (13-14 years) and older (15-16 years) adolescents. Significant main effects were discovered for both age, Wilk's $\Lambda = .98$, $F(6, 700) = 2.18$, $p < .05$, partial $\eta^2 = .02$, and gender, Wilk's $\Lambda = .76$, $F(6, 700) = 37.09$, $p < .001$, partial $\eta^2 = .24$. An assessment of the univariate results revealed several significant group differences among the dependent variables (see Table 7). Females reported significantly higher levels of psychopathy, but lower levels of sadism, online disinhibition and cyber aggression than males $F_s(1, 705) = 4.57$ to 167.71 , $p_s = .030$ to $.001$, partial $\eta^2_s = .01$ to $.19$. Age differences showed that younger adolescents reported lower narcissism, relative to older youth, $F(1, 705) = 7.61$, $p = .006$, partial $\eta^2 = .01$.

Table 7

Means and Standard Errors for Mean Group Comparisons of Gender and Age

	Males	Females	Younger	Older
Narcissism	3.38 (.04)	3.49 (.04)	3.36** (.04)	3.52 (.04)
Sadism	2.95*** (.03)	2.54 (.03)	2.65 (.03)	2.60 (.03)
Psychopathy	1.89** (.01)	1.93 (.01)	1.90 (.01)	1.92 (.01)
POFS	2.85 (.03)	2.88 (.03)	2.84 (.03)	2.89 (.03)
ON-DIS	2.45** (.04)	2.26 (.04)	2.34 (.04)	2.37 (.05)
CYB-AGR	1.38* (.03)	1.28 (.03)	1.36 (.03)	1.3 (.03)

Note. Younger = 13-14 yrs; Older = 15-16 yrs. Standard errors are presented within parentheses. * $p < .05$; ** $p < .01$; *** $p < .001$. POFS = Perceptions of False Self, ON-DIS = Online Disinhibition, CYB-AGR= Cyber Aggression.

A Model of the Dark Personality Traits as Predictors of Online Behaviour

In the interest of testing how the dark triad personality variables might work together to predict both online disinhibition and cyber aggression, a path model was created to capture all of the relationships possible among these variables. By conceptualizing the three dark triad traits as exogenous variables, it was posited that these are relatively stable, unchanging characteristics of the person that were expected to predict more down-stream context-specific and changeable characteristics and behaviours, i.e., false self perceptions, online disinhibition, and aggressive online behaviour. The path model examined all possible contiguous and indirect effects between variables. Specifically, these included direct effects from the dark personality traits (i.e., narcissism, sadism, and psychopathy) to false self perceptions, and also to online behaviours (i.e., online disinhibition and cyber aggression), and these were specified in hypotheses 1 and 2. The possible indirect effects of dark personality traits on online behaviours through adolescent perceptions of false self and disinhibition (see Figure 2) were also tested, and these tested hypotheses 3 and 4. As created, the path model was a fully saturated model (degrees of freedom = 0) that allowed all possible paths to be freely estimated. All indirect effects were estimated with 5000 bootstrapped iterations, statistically evaluated with a bias corrected 95% confidence interval, and the p -values were calculated with a Monte Carlo estimate. Not shown in Figure 2 but estimated in the SEM model were covariances among the three dark personality traits.

Exploring the Direct Effects among Variables

In the first step of the analyses, an initial examination of direct relationships between variables noted in the path model was carried out in order to test hypotheses 1 and 2. The first prediction anticipated a significant relationship between the three dark personality traits (e.g., narcissism, sadism, and psychopathy) and false self perceptions ($H1$), however, only narcissism ($\beta = .38$, $SE = .026$, $p < .001$) and psychopathy ($\beta = .34$, $SE = .101$, $p < .001$) evidenced positive significant effects, while sadism showed no significant direct effect ($\beta = .02$, $SE = .029$, $p = .41$). In partial support of the hypothesis, the path model indicated that narcissistic traits ($\beta = .22$, $SE = .053$, $p < .001$) and sadism

($\beta = .27$, $SE = .041$, $p < .001$) were positive predictors of online disinhibition. Interestingly, and contrary to study predictions, the opposite effect was discovered for psychopathy ($\beta = -.31$, $SE = .143$, $p = .03$), which was found to be a marginal, but negative predictor of disinhibition online. It was also predicted that perceptions of false self would be a significant positive predictor of online disinhibition ($H2$), and this was supported empirically ($\beta = .23$, $SE = .053$, $p < .001$). These findings suggest that narcissistic and sadistic tendencies, as well as false self perceptions predicted increases in online disinhibition, however, psychopathy was an unexpected predictor of lower online disinhibition.

Next, the direct relationships between narcissism, sadism, and psychopathy on cyber aggression were observed. It was discovered that, contrary to study predictions, only sadistic tendencies ($\beta = .17$, $SE = .034$, $p < .001$) were found to be a significant positive predictor of aggressive online behaviour. Narcissism ($\beta = .05$, $SE = .035$, $p = .151$) and psychopathy ($\beta = -.004$, $SE = .117$, $p = .971$) showed no significant relationship. Instead, their impact on online aggression was indirect (see the mediation analyses below). It was also hypothesized that online disinhibition would be a significant predictor of aggressive online behaviour ($H2$), and this proposed relationship was verified ($\beta = .14$, $SE = .031$, $p < .001$). These findings suggest that sadism and online disinhibition significantly and positively predicted cyber aggression.

Mediation Analyses

In order to examine hypothesis 3, a fully saturated mediation analysis was conducted to assess if false self perceptions and online disinhibition individually (single) or sequentially (double) mediated the relationship between the dark personality traits and digital behaviours (e.g., online disinhibition or cyber aggression). The mediation analyses revealed that out of a total of 13 possible indirect effects, 8 indirect effects yielded statistical significance. The results of these mediation analyses are reported in the subsequent section. Table 7 reports the results of the single mediation analyses, while Table 8 reports the results for the double mediations that were performed.

Online Disinhibition as the outcome variable. Using online disinhibition (ON-DIS) as the outcome variable, a mediation analysis was performed with narcissism, sadism, and psychopathy as the independent variables, and perceptions of false self as the mediator. In an aim to test $H3$, namely whether perceptions of false self would

mediate the relationship between the dark personality and online disinhibition, this analysis revealed two statistically significant positive indirect effects (see Table 8), the first between narcissism ($\beta = .08, p < .001$) and online disinhibition, and the second, between psychopathy ($\beta = .08, p < .001$) and online disinhibition. Contrary to predictions, no statistically significant mediation was found between sadism and online disinhibition ($\beta = .01, p = .32$).

*Figure 2. Model of the Dark Personality Traits as Predictors of False Self and Online Behaviour. NAR = Narcissism; SAD = Sadism; PSY = Psychopathy; POFS = Perceptions of False Self; ON-DIS = Online disinhibition; CYB-AGR = Cyber Aggression. N = 709; * $p < .05$; ** $p < .01$; *** $p < .001$; Solid lines indicate statistical significance whereas dashed lines are non-significant.*

Cyber aggression as the outcome variable. Next, using cyber aggression (CYB-AGR) as the outcome variable, both perceptions of false self and online disinhibition were tested individually as mediating variables between the dark triad and CYB-AGR. Upon examining perceptions of false self as the mediating variable between the three independent variables and cyber aggression, no significant mediation was determined for narcissism ($\beta = -.02, p = .26$), sadism ($\beta = -.001, p = .26$), or psychopathy ($\beta = -.02, p =$

.19). This result suggests that the dark triad was not associated with increased rates of cyber aggression via greater false self perceptions. In the second instance, and in line with *H3*, statistically significant mediations for narcissism ($\beta = .04, p < .001$), sadism ($\beta = .04, p < .001$), and psychopathy ($\beta = -.04, p < .05$) through online disinhibition to cyber aggression were obtained. This mediation result suggests that individuals who scored higher on all three elements of the dark triad were more likely to report higher levels of online disinhibition, which, in turn, predicted higher levels of cyber aggression. It is notable that all three dark personality traits contributed significant amounts of unique variance in this respect.

Table 8

Indirect Effects for Perceptions of False Self as a Mediating Variable.

Independent Variable	Mediating Variable	Dependent Variable	Indirect Effects	Standard Error	Ratio %	95% CI	Sig.
Narcissism	False Self	On-Dis	.084	.021	21.88%	[.046, .126]	.001
	False Self	Cyb-Agr	-.018	.016	25.93%	[-.051, .013]	.26
	On-Dis	Cyb-Agr	.042	.011	46.81%	[.024, .067]	.001
Sadism	False Self	On-Dis	.006	.007	2.14%	[-.006, .021]	.32
	False Self	Cyb-Agr	-.001	.002	.78%	[-.009, .001]	.26
	On-Dis	Cyb-Agr	.038	.10	20.30%	[.021, .061]	.001
Psychopathy	False Self	On-Dis	.079	.029	20.09%	[.033, .152]	.001
	False Self	Cyb-Agr	-.017	.016	9.91%	[-.056, .010]	.19
	On-Dis	Cyb-Agr	-.044	.023	23.55%	[-.100, -.007]	.02
False Self	On-Dis	Cyb-Agr	.031	.010	41.31%	[.015, .055]	.001

Note. On-Dis = Online Disinhibition; Cyb-Agr = Cyber Aggression; Ratio = effect size determined by indirect/direct.

Last, in order to better understand the predictors of cyber aggression, both perceptions of false self and online disinhibition were tested as sequential mediating variables. By introducing the mediators sequentially, the study hoped to illuminate the possible mediating effects that may exist between elements of the dark personality and the outcome variable of cyber aggression (*H4*). Upon investigation, the results indicated that the double mediation (see Table 9) was statistically supported for both narcissism ($\beta = .01, p < .001$) and psychopathy ($\beta = .01, p < .001$), but not for sadism ($\beta = .001, p =$

.29). These double mediation results suggest that adolescents who scored higher on either narcissism or sadism were more likely to experience increased perceptions of false self and online disinhibition, and finally to engage in more cyber aggressive behaviour.

Table 9

Double Mediation of Inauthenticity and Online Disinhibition of the Relationship between Dark Personality Traits and Cyber Aggression

IndVar	MedV1	MedV2	DepVar	Indirect Effects	Standard Error	Ratio %	95% CI	Sig.
NAR	False Self	ON-DIS	CYB-AGR	.012	.004	5.80	[.006, .021]	.001
SAD	False Self	ON-DIS	CYB-AGR	.001	.001	.54	[-.001, .003]	.29
PSY	False Self	ON-DIS	CYB-AGR	.011	.005	5.73	[.004, .024]	.001

Note. IndVar = Independent Variable; DepVar = Dependent Variable; MedV1 = Mediating Variable 1; MedV2 = Mediating Variable 2; NAR = Narcissism; SAD = Sadism; PSY = Psychopathy; ON-DIS = Online Disinhibition; CYB-AGR = Cyber Aggression

Discussion

As societies become increasingly dependent on cyber technology, there is a pressing need for researchers to explore how facets of identity manifest in cyberspace behaviour, particularly during adolescence. The chief aims of this study were to examine the influence of narcissism, sadism, and psychopathy in predicting online disinhibition and cyber aggression. The study also endeavoured to investigate how perceptions of false self (i.e., identity inauthenticity) may mediate the relationship between the dark personality traits and online disinhibition. And last, the study sought to identify whether both perceptions of false self and online disinhibition might mediate the relationship between the dark personality traits and cyber aggression. Several significant results were found, namely that all three dark personality traits, as well as adolescent false self perceptions were significantly and positively associated with online disinhibition. In addition, while only sadistic traits and online disinhibition were found to be significant direct predictors of cyber aggression, several indirect effects were also discovered, namely that all three dark traits became predictive of cyber aggression through the indirect role of increased disinhibition. Additionally, both narcissistic and

psychopathic tendencies indirectly predicted cyber aggression through the mediation of both false self perceptions and online disinhibition.

Predictors of Online Disinhibition

In the development of the online disinhibition effect theory, Suler (2004) proposed that the concept of self as well as underlying feelings, needs, drives, and personality variables, have the potential to foster and promote the online disinhibition effect. The results of the present study are the first to provide empirical evidence that suggests that some of these latent mechanisms may indeed significantly predict an increase in the expression of online disinhibition. The findings revealed that both narcissism and sadism positively predicted online disinhibition. Higher scores on perceptions of false self (i.e., inauthenticity) also significantly predicted online disinhibition. The opposite effect was discovered for psychopathy, namely that adolescents who reported high levels of psychopathy exhibited *decreased* online disinhibition. A possible explanation for this direct effect could be found in the theory of context-dependent psychopathic behaviour that posits that psychopathic expression can differ in various circumstances, including possibly the online and offline worlds (Koenigs, Baskin-Sommers, Zeier, & Newman, 2011; Nevin, 2015; Vaknin, 2015). At the core of the psychopathic personality are traits of low conscientiousness, indifference to the opinion of others, proneness to boredom, and impulsivity (Freeman, 2014); it is possible that these traits may not be amplified by the disinhibiting nature of cyberspace. In short, some psychopathic individuals may not experience any disinhibiting effect of being online; their baseline of disinhibition may be chronically high.

Delving deeper into these associations, the construct of false self perceptions was tested as a mediating variable between each of the dark personality traits and online disinhibition. It was found that false self perceptions play a significant role in mediating the relationship between narcissism and online disinhibition, as well as psychopathy and online disinhibition, indicating that an increase in either of these personality traits results in an increase of false self perceptions and, in turn, predicts an increase in online disinhibition. These findings indicate that the long-established link in adults between narcissism and false self (Vaknin, 2015) might arise as early as adolescence. It was also found that youth manifesting psychopathic tendencies are likely to report higher levels of inauthentic self, which, in turn, was found to be predictive of higher disinhibition. This pattern suggests that psychopathic youth experiencing heightened false self

perceptions may be more inclined towards behaving in a more impulsive and disinhibited fashion online, potentially as a defense mechanism or in retaliation when their fragile or false belief systems or opinions are challenged. Alternatively, perhaps these youth are still in the process of identity exploration, and are struggling to reconcile their psychopathic inclinations in the offline world, so they turn to the Internet to exhibit suppressed psychopathic urges.

These results suggest, as Suler (2004) noted, that the underlying mechanisms of inhibited or disinhibited behaviour lie fundamentally within the processes of personality dynamics, and consistent with this view, the present findings provide empirical evidence that certain individuals may be at an increased risk of disinhibited behaviour online. The developmental trajectory from childhood to young adulthood is often affected by growing pains of risk behaviour, impulsivity, tendencies towards misconduct, and egocentrism, all of which are associated with traits of psychopathy and both adaptive and maladaptive narcissism (Bushman & Baumeister, 1998; Chinchilla & Kosson, 2016; Hill & Lapsley, 2011; Twenge & Campbell, 2003; van den Bos & Hertwig, 2017). Perhaps certain adolescents, due to a vulnerability created by the presence of dark personality traits, are more susceptible to the unique nature of cyberspace and certain digital platforms that stimulate and encourage online behaviour that is less inhibited compared to offline behaviour.

For example, Aboujade (2011) argues that the nature of the Internet facilitates easy self-promotion and instant gratification of individual needs. Some youth, whose basic needs are grounded in dark motives, when exposed to a vastly uncontrolled and unmonitored space like the Internet, may gravitate towards the unhealthy development of disinhibited actions and attitudes. Results of the present study provide validation for Suler's (2004) argument that certain personality traits predispose individuals to engage in more online disinhibition. This basic foundation can be easily aggravated by external factors such as environmental or societal influences. For example, Casale, Fiovaranti, and Caplan (2015) found that unique features of computer-mediated communication, such as a reduction in nonverbal cues and enhanced message control, brings on greater feelings of disinhibition and increased preference for online social interactions among adolescents. This suggests that the digital world does, to some degree, influence digital behaviour.

Predictors of Cyber Aggression

Cyberspace has become an instrument for both positive and negative social influence. Trolling behaviour, in particular, has garnered much attention in recent years. In an effort to understand the motives that trigger the distasteful and antisocial activities of those who engage in aggressive behaviours online, the present investigation yielded several novel and important results in predicting cyber aggression. The investigation of particular pathways through mediation revealed additional unique associations among the variables. Namely, it was found that all three dark traits, false self perceptions, and online disinhibition predicted, either directly or indirectly, greater cyber aggression. Sadism, for example, unlike narcissism and psychopathy, was the only personality construct found to be directly predictive of cyber aggression, indicating that sadism does not have an influence on cyber aggression through false self, while narcissism and psychopathy both do. Looking at these associations more closely, it could be said that sadistic individuals may hold a unique baseline motivation for engaging in trolling behaviour online that is independent of these false self perceptions. Specifically, while these false self perceptions have been found to play a significant role in predicting online disinhibition, they have evidenced no such role in directly predicting cyber aggression. This suggests that of the dark personality traits, it is the sadistic youth who engage in cyber aggression that may be more intrinsically motivated, and find particular pleasure or amusement, in trolling behaviour (Buckels et al., 2013; Levesque, 2011). This is broadly consistent with past research that has suggested that a common adolescent motive behind aggressive online behaviour is humour and doing it 'for fun' (Bartlett et al., 2014; Kyriacou, 2015), traits consistently associated with characteristics of sadism.

Lastly, it was identified that both narcissism and psychopathy significantly predicted greater perceptions of false self and higher levels of online disinhibition that resulted in predictive elevated engagement in cyber aggressive behaviour. In the case of elevated false self perceptions in conjunction with psychopathic traits, it is possible that the characteristic impulsivity frequently recognized as a common trait of psychopathy may be exacerbated in digital settings when the fragile self-concept of these individuals is tested, resulting in an increased response to perceived provoked attacks or through the disinhibition of social restraints (Fanti, Frick, & Georgiou, 2009; Madan, 2014). Psychopathy has also been positively associated with trolling behaviours, specifically of

social media profiles of popular or prominent users (Lopes & Yu, 2017), illustrating a somewhat retaliatory or exploitative motive behind the cyber aggressive activity. The double mediation outcomes found point to how several steps may be needed to explain the ways in which personality is predictive of cyber aggression. Taken together, these findings are consistent with, and further explicate, previous work by having identified mechanisms of how the dark personality predicts cyber aggression through various mediators.

Future Directions

Future research should examine in a more detailed fashion the linkages identified here and elsewhere. In the case of narcissistic individuals, who desire admiration and see themselves as superior to others (Lopes & Yu, 2017), research should examine whether cyber aggressive acts committed by this demographic are more deliberate, manipulative, and instrumental in nature (Madan, 2014; Wright, 2017) than in the case of psychopathic youth, who have a more impulsive nature (Lopes & Yu, 2017). In addition, research should aim to investigate how the disinhibiting characteristics of the cyberspace environment may exacerbate trolling activities and aggressive behaviour among these groups of adolescents. Additionally, research into possible disparities between offline and online self-views may shed light on why cyberspace may widen the gap between these two dichotomous selves and behaviour. Consideration should be given to how the perceptions of a safe space in the Internet may facilitate individuals harbouring dark personality traits to act in disinhibited and aggressive ways to help them bolster their fragile and evolving self-concepts and self-image vulnerabilities (Barry, Kerig, Stellwagen, & Barry, 2011).

Limitations

The main limitation of the study is that the data used were concurrent in nature, which prevented us from drawing firm conclusions about sequential and temporal influences. Second, having measured sub-clinical rather than clinical levels of the dark personality traits, the present findings may not generalize to clinical samples. Third, the sample, while relatively large in size, solely represents New Zealand high school students and thus may not be representative of other age populations or cultures. And last, the limitations of employing self-report questionnaires, which introduces the potential of coloring data with social desirability response biases, should also be considered.

Conclusions

In sum, this study revealed important associations between three dark personality traits, false self perceptions, online disinhibition, and cyber aggression. Specifically, all of these variables were found to be positively associated with each other in both direct and indirect ways. These findings demonstrate the importance of delving deeper into the reasons why individuals engage in disinhibited and cyber aggressive behaviour online. In an increasingly cyber-connected world that is progressively utilized by children and adolescents, there is a growing urgency to understand how the nature of the digital world disinhibits negative behaviour, and in particular, how certain maladaptive personality traits trigger dangerous and hurtful online behaviour. We hope that the present findings provide novel and informative implications so that interventions can be created to reduce the incidence of antisocial, disinhibited, and aggressive digital behaviour.

Moving from Study 2 towards Study 3

In the last chapter, significant associations between the three dark personality traits and false self perceptions were found. It was also identified that false self perceptions functioned as a significant positive mediator between the dark traits of narcissism and psychopathy and online disinhibition. Moreover, the empirically verified mediations suggest that several steps or phases may be needed to explain the ways in which a developing adolescent's personality and identity predicts online disinhibition. Having established the link between these various characteristics, I speculated that these personality traits may motivate specific interests in Internet and social media use that may satisfy needs inherent to an individual's personality. Being curious about whether and how motives of Internet and social media use may differ among adolescents, I designed the next study to explore whether distinct motivational profiles of Internet and social media use may be associated with individual differences in the dark personality.

In order to address this research question, the following study employed a latent profile analysis to discern how distinct groups of adolescents may differ in their unique motives for Internet and social media use. Additionally, the study explored whether differences in levels of dark personality traits (i.e., narcissism, sadism, and psychopathy), false self perceptions, and disinhibited behaviour varied by classes of these individual motives. The aim was to determine whether a small number of distinct classes of ICT use would exhibit illuminating profiles of digital engagement, and further, whether these groups would significantly differ with regard to dysfunctional personality characteristics.

STUDY 3: Do Dark Personality Traits Lurk Behind Adolescent Motivations of Internet and Social Media Usage? Exploring Online Disinhibition

Abstract

This study examines whether there are distinct group differences behind adolescent motivations for Internet and social media use, and how personality, false self perceptions, and disinhibited online behaviour differ as a function of these motivations. Employing a person-centred approach, through the application of a latent profile analysis, results from a cross-sectional survey of New Zealand high school adolescents ($N = 709$) aged between 13 and 17 years of age ($M_{\text{age}} = 15.56$ years) reveal three distinct profiles of motives for Internet and social media use, specifically; high, medium, and low levels of motivation. Mean differences in levels of dark personality traits (i.e., narcissism, sadism, and psychopathy), false self perceptions, and disinhibited behaviour online were found across the groups. Results indicate that self-report levels of sadism, perceptions of false self, and online disinhibition were highest among adolescents belonging to the group that exhibited high overall motivation for Internet and social media use in comparison to those with average and low motivations for use. This article contributes to ongoing work in the area of cyber psychology and how adolescent online usage patterns contribute to disinhibited behaviour in the world of cyberspace.

The following manuscript is the submission of the article in the journal of Personality and Individual Differences:

Kurek, A., Stuart, J., & Jose, P.E., (under review). Do dark personality traits lurk behind adolescent Internet and social media usage rates? Exploring online disinhibition. *Personality and Individual Differences*.

Introduction

Prevalence of New Media

For today's '*digital natives*', meaning young people who have never experienced the pre-digital era and have grown-up embedded in the culture of Internet, computer, and mobile devices, spending time in cyberspace makes up a significant portion of the average day (Prensky, 2001). Many use the digital landscape as their main means of communication and socialization, as well as an outlet for entertainment and connection to current events and trends. In fact, when compared to other age demographics, youth aged between 13 and 24 are the highest consumers of digital media, spending upwards of 9 hours a day interacting with various devices (such as mobile phones, laptops, tablets) that are connected to the Internet (O'Loughlin, Lambert, Gauvin, Kestens, & Daniel, 2008; Ramachandra & DeHart, 2017; Rideout, Saphir, & Pai, 2015; RSPH, 2017; Cramer & Inkster, 2017). Moreover, the use of more than one connected device at a time, for example simultaneously surfing the Internet on a laptop, checking Instagram on a mobile phone, while messaging friends, has become commonplace and effectively multiplies youth exposure to media content at any given time (Sparks, 2016).

Growing trends of increasing exposure to, and constant use of, digital technologies highlights the importance of recognizing new media forms as powerful socializing agents in the lives of adolescents (Arnett, 1995; Atkin, 1982; Genner, & Süss 2017; Moschis & Moore, 1979; O'Guinn & Shrum, 1997; Prot et al., 2015). Indeed, there is a growing awareness that the ubiquitous presence of the digital world plays an influential role in shaping adolescent mental health (Kim, 2016), social-connectedness (Allen, Ryan, Gray, McInerney, & Waters, 2014), self-identity formation (Long & Chen, 2007), and overall wellbeing (i.e., self-esteem, depression, body image, etc.) (Bahrainian, Alizadeh, Raeisoon, Hashemi Gorji, & Khazaee, 2014; Genner & Suss, 2016; Kircaburun, 2016; Kleemans, Daalmans, Carbaat, & Anschütz, 2016). Research has also speculated that unique user motives for engaging in cyberspace has the potential to determine types of online usage (e.g., social media, entertainment, etc.) (Chou & Hsiao, 2000; Choi, Panek, Nardis, & Toma, 2015; Huang, 2010). The particular motivations behind adolescent new media selection (i.e., the Internet and social media), however, remain relatively understudied, and investigations into whether these motives may be indicative of underlying personality traits and behavioural repertoires could yield

important insights into the associated outcomes of increased exposure to digital content.

The following sections outline existing theories behind adolescent media use, and explore how new forms of digital media have contributed increasing complexities to understanding the motives and influence of media usage on adolescents, and how this may relate to personality, self-perceptions, and online behaviour. Exploring what motivations drive Internet and social media use amidst today's digital landscape has the potential to illuminate why youth seek out specific content and interactions online, and whether these motives are fuelled by individual needs.

Motivations for New Media Use

According to the '*uses and gratifications*' theory developed by Blumler and Katz (1974), individuals typically take an active and conscious approach in the decision-making process when selecting what sources of media they will use in order to meet their motives and objectives of consumption. In explicating reasons behind traditional media selection (i.e., TV watching, radio, magazines, etc.), five cardinal motivations have been identified, these are: satisfaction of needs for entertainment, identity formation, engagement in sensation seeking, as a coping mechanism, and youth culture identification (Arnett, 1995).

Additionally, research has found that young people have individual needs for seeking out specific media sources and developing certain tastes, such as binge watching TV as a means of distraction (Jonassen, 2004), preferring rap or heavy metal instead of pop music in a relational context (Arnett, 1991), or engaging in violent video games over strategy driven games to satisfy particular personality needs (Markey & Markey, 2010; Przybylski, Ryan, & Rigby, 2009). Investigations into whether these motivations are applicable to cyberspace and Internet use indicate that three additional motives may be applicable to the digital environment, namely; psychological escape, social interaction, and erotic gratifications (Soh, Charlton, & Chew, 2014).

Furthermore, recent research suggests that motivations behind new digital media selection can be categorized into cognitive (e.g. to gain knowledge), affective (e.g., to stabilize mood), social (e.g. to interact with, and communicate with others), and habitual (e.g., to plan and stay organized) drivers, each of which has potential positive and negative outcomes for the user (Genner and Suss, 2016). Hastall (2017) stresses that the most pertinent user motivations behind media selection are driven by

psychological states that can arouse an individual's need for escapism, producing either adaptive (i.e., happiness, pleasure) or maladaptive (i.e., excessive media use, social disengagement) effects.

Implications of New Media Selection on Identity Expression

The adolescent media practice model (Steele & Brown, 1995) considers identity formation as a key component in youth's selection and interaction with media. It argues that not all adolescents have the same media preferences, but rather that existing elements of identity established in childhood inform (i.e., motivate) particular media selection. The model then assumes that an adolescent's emerging sense of self plays an integral role in the decisions an adolescent makes about which media will be selected, interacted with, and applied to their individuality and growing understanding of who they are and who they want to be (Brown, 2000).

For many adolescents the use of the Internet and social media is a way to seek identity validation from friends and strangers, while also gauging how others will react to their self exploration tactics (Baumeister, 1998; Leary & Kowalski 1990; McElhaney, Antonishak, & Allen, 2008; Sparks, 2013). This identity experimentation is a significant developmental milestone of adolescence (Calvert, 2002; Harter, 1999; Meshi et al., 2016; Meshi, Morawetz, & Heekeren, 2013; Runions & Bak, 2015; Valentine & Holloway, 2002) and a majority of teens confess that cyberspace is a ripe environment for trying out different personas and self-presentation strategies that they would not feel confident showcasing in their face-to-face interactions or offline lives (Kaplan & Haenlein, 2010).

Today, a majority of young people predominantly use popular social networking platforms such as Instagram, Snapchat, Facebook, and YouTube to explore their identity and express themselves (Douman et al., 2012; Nawaz, 2011; Pugh & Hart, 1999; Rassart et al., 2012). As a result, these same platforms have become an unmonitored and salient space for unfiltered social feedback (Burke, Marlow, & Lento, 2010; Emanuel et al., 2014) that has the potential to motivate youth towards novel techniques of ingratiation, a social strategy employed to convince others about the attractiveness of one's personal qualities in hopes of increasing one's social status, reputation, and peer group relevance (Goodyear, Armour, & Wood, 2018; Jones & Pitman, 1982). The social strategies of ingratiation found on various social networks have aroused an enthusiastic culture of validation seeking, showing off, and exaggerating the good (Eyal, 2013; Lifespan, 2013).

For an adolescent, the digital world has become a mixture of unique pressures and unwritten 'rules and expectations' unique to their age group (Choi, 2016; McLaughlin & Vitak, 2006), making what they post online either a source of peer acceptance (e.g., lots of likes, positive comments, or gaining followers) or shaming and ridicule (e.g., cyberbullying, negative comments, or unfollows) (Moncur, Orzech, & Neville, 2016; Waterloo, Baumgartner, Peter, & Valkenburg, 2017). Failing to appropriately manage the quality and quantity of the content a teen shares online by not following digital peer group norms has the potential to wreak havoc on self-image, self-esteem, and identity development (Boyar, Levine, & Zensius, 2011; Rideout, 2010; Lifespan, 2013).

A well-established online presence, however, is a vital component in the life of today's young digital natives. Both the Internet and social media play a pivotal role in adolescence as socializing agents. The social endorsements received online in the form of likes and comments for online content and behaviour contribute towards priming cognitions, increasing arousal, influencing beliefs and perceptions, as well as shaping enduring personality changes (Allen & Anderson, 2017; Anderson et al., 2003; DeWall, Anderson, & Bushman, 2011; Eyal, 2013; Huesmann & Kirwil, 2007; Paik & Comstock, 1994). For some, the pressures of maintaining a socially desirable online presence can lead to high degrees of self-monitoring behaviour that make it more difficult for a teen to establish a secure sense of self. Digital natives who are particularly dependent on their online personas are at risk of becoming confused about their identity, and may find themselves stuck in a prolonged period of uncertainty, self-doubt, and identity confusion (Allen, 2015; Gardner & Davis, 2013; Kumru & Thompson, 2003; Rubin, Bukowski, & Parker, 2006; Steiner-Adair & Barker, 2013). This internal confusion can have significant implications for behavioural expression, namely by increasing self-promotional behaviours, aggression, antisocial behaviour, poor impulse control, and disinhibition (Dayton, 2011; Goth et al., 2012; Seidman, 2014).

Personality Expression and Online Disinhibition in the Digital Environment

Unsurprisingly, the immediacy of these behavioural changes are most visible in the digital landscape (Joinson, 2001; McKenna & Bargh, 1998; Tidwell & Walther, 2002), and researchers, and public alike, have long observed a growing disparity between online and offline behaviour (Garett, Lord, & Young, 2016; Joinson, 1998; 2003; Rawhide, 2017; Udris, 2014). While some researchers have suggested unilateral

explanations, such as a reduction in nonverbal cues in computer-mediated-communication, for this online phenomenon (Schouten, Valkenburg, & Peter, 2009), others, like Suler (2004), argue that key personality characteristics (i.e., neuroticism, extraversion, narcissism, etc.) are vital predictors of either '*benign*' or '*toxic*' online disinhibition (Amichai-Hamburger & Ben-Artzi, 2003; Amichai-Hamburger & Vinitzky, 2010; Bargh, McKenna, & Fitzsimons, 2002; Blumer & Döring, 2012; Stritzke, Nguyen, & Durken, 2004; Valkenburg & Peter, 2007).

Suler (2004) suggests that, for some, the Internet is a safe space for benign disinhibition that allows for exploring their inner self and interpersonal issues, as well as sharing emotions and personal details about the self with supportive users that motivate individuals to seek out digital platforms that facilitate these needs. For example, individuals who harbour narcissistic traits (i.e., vanity, self-centredness, lack of empathy, high levels of egotism, and a sense of entitlement) tend to display higher levels of activity on social media platforms, engage in more frequent self-promotional behaviours, status updates, and post more boastful online content (Campbell & Miller, 2012; Choi, Panek, Nardis, & Toma, 2015; Fox & Rooney, 2015; Halpern, Valenzuela, & Katz, 2016; Paulhus & Williams, 2002). Gaining validation for inflated self-views through specific digital behaviours offers narcissistic individuals the gratification of being in constant contact with individuals who make them feel important and inflate their sense of self and their social status (Barry, Doucette, Loflin, Rivera-Hudson, & Herrington, 2017; Buffardi & Campbell, 2008; Campbell, Reeder, Sedikides, & Elliot, 2000; Fox & Rooney, 2015; McCain et al., 2016).

For others, the various disinhibitory elements of cyberspace (i.e., minimization of authority, dissociative anonymity, invisibility, asynchronicity, solipsistic introjection, and dissociative imagination) bring out the '*toxic*' and dark side of online users that can manifest in harsh commentary, crude language, and other antagonistic and antisocial online behaviours (Suler, 2004). Research has begun to demonstrate how this context-dependent expression is particularly relevant for aversive personality traits, specifically, sadism (i.e., those who gain amusement or pleasure from inflicting pain or humiliation onto unsuspecting others) and psychopathy (i.e., lack of empathy or remorse, elevated selfishness, low inhibition, superficial charm, and manipulateness), which often times manifest in hostile digital behaviours (e.g., Aboujouade, 2012; Blumer & Döring, 2012; Fox & Rooney, 2015; Grothe, Staar, & Janneck, 2016; Nevin, 2015;

Paulhus & Williams, 2002). For these individuals in particular, cyberspace reduces accountability and decreases the desire to showcase their true self, lowering genuine self-disclosure, but in turn, increasing antisocial online behaviours (Bernstein et al., 2011; Buckels, Trapnell, & Paulhus, 2014; Lapidot-Lefler & Barack, 2012; Lopes & Yu, 2017). What has been left relatively unexplored however, is how these particular personality traits, and occurrences of online disinhibition, may be associated with unique patterns of Internet and social media usage motives among adolescents.

Advancing the Research

Given the distinctive factors and important role of media influence on young people the present work took a person-centred approach in establishing whether overall adolescent motivations for Internet and social media may yield distinct profiles of usage motives (RQ1). Person-centred studies in this area, while scarce, are a much-needed approach towards forming a more holistic understanding of adolescent technology use and possible psychological outcomes (e.g., Kurek, Jose, & Stuart, 2017). Gaining insights into whether unique usage motives are borne from the developing adolescent personality have the potential to illuminate how these intrinsic differences may be associated with the onset of online behaviors. In an attempt to address these possible associations, the research aims to establish the importance between unique adolescent usage motives and the onset of online disinhibition. In this vain, the present study was designed to better understand whether personality, namely narcissism, sadism, and psychopathy, might play an influential role in youth Internet and social media usage motives (RQ2). Lastly, we sought to determine whether motivation profiles influence online disinhibition and adolescent false self perceptions (RQ3).

Method

Participants

A total of 709 adolescents (50.5% female; 49.5% male) aged 13 to 17 years were recruited from 18 different high schools across both the North and South islands of New Zealand. Respondents reported on their cultural background, with the majority identifying as New Zealand European (67.1%; $n = 476$), the majority cultural group in New Zealand. Other ethnicities reported were Maori (16.9%; $n = 120$), Pacific Islander (2.2%; $n = 16$), Asian New Zealand (10.3%; $n = 74$), and 3.3% ($n = 24$) identified as Other. The key questions regarding motivations for online behaviour, dark personality, online disinhibition and false sense of self were embedded in a larger battery of

personality questionnaires and questions about information and communication technology (ICT) use. Ethical approval was obtained from the Victoria University of Wellington Human Ethics Committee, and all schools, principals, parents, and adolescents consented to the study's procedures prior to data collection.

Procedure

Named the Youth and Technology Use Project, a large-scale cross-sectional, subject variable data collection was conducted with New Zealand youth. Featuring key items that assessed communication technology behaviours, personality, attitudes, habits and trends, in-school assessments were carried out over a period of five weeks in 2016. Data were collected from both urban and rural schools, and represented equal numbers of mixed-gender and single-gender institutions. Participants at each school completed an online survey through the use of either a Samsung tablet provided by the research team, or a school computer via web link, on the day of the assessment. The survey was administered at the school, in small groups, and under the supervision of the research team and school staff. Each participant received a mini chocolate bar in compensation for his or her time.

Measures

Narcissism. A revised 32-item Pathological Narcissism Inventory (PNI; Pincus et al., 2009) was used to assess rates of overall narcissism (e.g., 'I find it easy to manipulate people', 'I am disappointed when people don't notice me') and responses were collected on a six-point scale ranging from 0 (*not at all like me*) to 5 (*very much like me*). The total scale resulted in a high Cronbach's alpha of .93.

Sadism. The Comprehensive Assessment of Sadistic Tendencies (CAST; Buckels & Paulhus, 2013) measure, containing a total of 13 items, was administered to participants. Rated on a five-point scale from 1 (*strongly disagree*) to 5 (*strongly agree*), responses were collected to assess the degree of sadistic tendencies among the youth sample (e.g., 'I enjoy playing the villain in games and torturing other characters', 'When making fun of someone, it is especially amusing if they realize what I'm doing'). The total scale resulted in a Cronbach's alpha of .79.

Psychopathy. In order to measure the affective traits of psychopathy, the Inventory of Callous-Unemotional Traits (ICU; Frick, 2004) was employed. The 24-item self-report questionnaire was used to assess the degree of callousness (e.g., 'I do not care who I hurt to get what I want'), uncaring (e.g., 'I feel bad or guilty when I do

something wrong' which was reverse scored), and unemotional traits (e.g., 'I do not let my feelings control me') in the sample. These items were scored on a three-point Likert scale from 1 (*not at all true*) to 3 (*definitely true*). Internal consistency of the ICU in the present study was adequate ($\alpha = .71$).

False Self. Perceptions of false self (POFS; Weir & Jose, 2010) were measured using seven items (e.g., 'If people really knew what I was like on the inside, they wouldn't like me', 'I hide the real me by looking like others') scored on a five-point Likert scale from 1 (*strongly disagree*) to 5 (*strongly agree*). The total scale resulted in a Cronbach's alpha of .86.

Online Disinhibition. For the purpose of this study, the research team developed a survey section dedicated to measuring technology use and attitudes. This portion of the questionnaire asked participants to report on various ICT behaviours, preferences, motivations, and attitudes. Particular interest was given to questions that measure *online disinhibition*. A total of six items (e.g., 'There are no consequences for negative online behaviour', 'I am aware when I am being hurtful online, but do it anyway', 'I feel safer expressing negative thoughts and feelings online than in person') were used. These items were scored on a 5-point Likert scale ranging from 1 (*strongly disagree*) to 5 (*strongly agree*). The total scale internal consistency was adequate ($\alpha = .73$).

Internet and Social Media Use Motivations. Lastly, a collection of questions assessing youth Internet and social media use motivations were designed as part of the communication technology questionnaire section of the study (see Table 10). Responses were collected on a 5-point Likert scale ranging from 1 (*never*) to 5 (*always*) to measure frequency of Internet and/or social media use for specific actions and activities (e.g., 'How often do you use the Internet to pass the time', 'How often do you use the Internet to know what is going on in your peer group', 'How often do you go online or check your social media accounts as a way to escape reality'). Taken together, these items were deemed representative of the major activities and motivations for youth to go online or use social media.

Results

Data Analytic Strategy

Data were analysed in three stages in order to answer the three research questions. To address RQ1, whether distinct profiles of motivation behind Internet and

social media use exist among adolescents, a latent profile analysis was undertaken. Latent profile analysis is a person-centred analytic technique that considers responses to a set of variables and then identifies clusters of individuals who endorse these variables in similar ways (Muthén & Muthén, 2000). The latent classes are not directly observed but instead are inferred from the data, and the optimal number of classes is determined by estimating models with an increasing number of classes and comparing fit indices between these models (Tein, Coxe, & Cham, 2013). This method was used to identify groups of youth who have similar motivations for Internet and social media use (MISMU). Classification quality was assessed using recommended indices, including the Akaike Information Criterion, the Bayesian Information Criterion, as well as the Lo-Mendell-Rubin likelihood ratio test, and the normalized entropy criterion.

In order to address RQ2, namely that levels of the dark personality traits (narcissism, sadism, and psychopathy) might differ between the motivational profiles, the second stage of analysis involved testing the mean level differences in dark personality across MISMU clusters using MANOVA to control for the effects of age and gender. Finally, in the last stage of analysis, an additional MANOVA was conducted to address RQ3, namely whether class membership would predict perceptions of false self and online disinhibition.

Identifying Groupings of Individuals with Similar Motivations of Internet and Social Media Use with Latent Profile Analyses

In order to identify the optimal number of possible clusters of motivations of Internet and social media use, a total of 22 items assessing the frequency and purpose behind Internet and social media use were included in the latent profile analysis utilizing Mplus version 7.2 (Muthén & Muthén, 2015). Using these variables, it was expected that a small number of distinct motivational profiles would emerge from the sample population.

A total of four latent class models, representing 2-, 3-, and 4-class solutions were fitted to the data. The 2-class model achieved statistical significance on the Lo-Mendell-Rubin indicator ($p < .001$) and sufficient entropy (.83), the chief measure of the distinguishability of the classes. Additional classes, however, were also tested to determine whether a greater number of classes would increase the representation of the data and improve model fit. When fitting the 3-class model, the Akaike Information Criterion (AIC) and Bayesian Information Criterion (BIC) scores significantly decreased

from the 2-class model, while the entropy increased (to .86), and the Lo-Mendell Rubin likelihood ratio remained significant ($p = .03$), indicating improved model fit for 3 classes compared to 2 classes. When attempting to fit the 4-class model, however, the Lo-Mendell Rubin likelihood ratio test rejected the model ($p = .30$). Taken together, these LCA results indicated support for a 3-class model, which provided a substantive answer for the first research question, which queried whether a small number of classes would be derived from the sample.

Upon examination of the three different classes, it was noted that they were distinguished by high, medium, and low motivations for overall Internet and social media use. While different types of motives were differentially endorsed across all three classes, distinct motivational features did not readily emerge. It was discovered, however, that respondents in the high motivation for use class endorsed nearly all Internet and social media motives at higher rates than the other classes. MISMU profiles of the three classes are depicted in Figure 3, with class membership descriptive statistics outlined in Table 11.

The motivations for Internet and social media use (MISMU) profile with the largest number of individuals was labeled the '*medium*' motivations for use group. The class represented 57% ($n = 404$) of youth in the sample and evidenced medium levels of motivation for both Internet and social media use. Keeping in touch with friends was the highest rated motive for this class ($M = 4.07$, $SD = .79$), followed by staying entertained ($M = 3.99$, $SD = .66$), and watching online videos ($M = 3.86$, $SD = 1.03$). This class also rated using Internet and social media as a replacement to hanging out with friends ($M = 1.92$, $SD = .82$), participating in online forums ($M = 2.17$, $SD = 1.0$), and social media feedback ($M = 2.24$, $SD = .98$) as the lowest motives. Findings suggest that for the majority of our sample, the social aspects of cyberspace are the most influential in motivating use of Internet and social media, and suggest that these online interactions may be an extension of offline friendships.

The second largest group constituted 29.8% ($n = 211$) of the sample and was labeled the '*high*' motivations for use group. Members in this class evidenced the highest motivations for engaging with Internet and social media overall, however, there was evidence of slightly different patterns of motivations in comparison to the average class. Specifically, for the high usage group, watching online videos on platforms such as YouTube, Vine, Vimeo, and the like, was rated the highest motivational factor ($M = 4.61$,

$SD = .70$), followed by keeping in touch with others ($M = 4.60, SD = .71$), and general entertainment ($M = 4.59, SD = .63$). Participating in online forums ($M = 2.56, SD = 1.21$) was rated as the lowest motivating factor. Additionally, using Internet and social media as a replacement to hanging out with friends ($M = 2.77, SD = 1.10$), and social media feedback ($M = 2.95, SD = .82$), was also ranked very low for this group. These results suggest that youth in the high motivations of use group appear to be most motivated by entertainment purposes, perhaps exhibiting a unique drive for seeking out novel sources of amusement and recreation, not characteristic of individuals to the other two groups (e.g., low and medium). Patterns also suggest that spending time online plays an important role in social engagement for these youth.

The class with the fewest members constituted 13.3% ($n = 94$) of respondents and was labeled the 'low' motivations for use group. Individuals belonging to this class rated being entertained ($M = 3.18, SD = .95$), keeping in touching with others ($M = 3.08, SD = .98$), and watching online videos ($M = 3.05, SD = 1.23$) as the highest motivational factors. Using the Internet and social media as a means of avoiding hanging out with friends ($M = 1.26, SD = .46$), spending time with family ($M = 1.29, SD = .62$), and as a means of escaping reality ($M = 1.29, SD = .54$) were rated as the lowest motivational factors for this group. While usage rates of both Internet and social media were characteristically low compared to the other two classes, overall motives for usage appeared instrumental and well balanced, with members' offline lives and relationships bearing more importance for members in the low motivations of use group when compared with their average and high MISMU member peers.

Table 10

Descriptive Statistics by Usage Rates of Internet and Social Media Group Membership

	Low		Medium		High	
	M	SD	M	SD	M	SD
FNU: to pass the time (PTT)	2.63	.97	3.62	.86	4.27	.84
FNU: to be entertained (ENT)	3.18	.95	3.99	.66	4.59	.63
FNU: to keep in touch with people (KTP)	3.08	.98	4.07	.79	4.60	.71
FNU: to know what is going on in your peer group (GPG)	2.33	1.01	3.30	1.05	4.14	.89
FNU: to let other people know what is happening in my life (SHL)	1.64	.67	2.61	.99	3.35	1.16

FNU: to know what is happening in the world (KHW)	2.78	.95	3.41	.90	4.02	.94
FNU: to debate and discuss issues that are important to me (DIIM)	1.90	.86	2.55	1.01	3.10	1.10
FNU: to participate in online forums (POF)	1.63	.78	2.17	1.00	2.56	1.21
FNU: to keep up to date with entertainment news or gossip (ENG)	1.83	.90	2.60	1.09	3.68	1.16
FNU: to download or stream media (music, films, T.V. shows) (DTM)	2.51	1.10	3.55	1.06	4.36	.85
FNU: to play online games (POG)	2.54	1.28	3.08	1.30	3.56	1.39
FNU: to watch online videos (e.g., YouTube, Vine etc.) (WOV)	3.05	1.23	3.86	1.03	4.61	.70
FNU: to shop online (SHO)	1.80	.87	2.55	1.11	3.34	1.25
FNU: to check and respond to email (CRE)	2.56	1.04	3.03	1.09	3.62	1.22
APS-On: how often do you sit in anticipation of likes and comments? (ALC)	1.48	.76	2.24	.98	2.95	1.21
FNSM: instead of spending time with family (IHFA)	1.29	.62	2.36	.93	3.52	1.04
FNSM: instead of hanging out with friends (IHFR)	1.26	.46	1.92	.82	2.77	1.10
FNSM: as a way to procrastinate (PROC)	1.43	.63	2.80	1.15	3.90	1.02
FNSM: as a way to escape reality (ESCR)	1.29	.54	2.38	1.08	3.54	1.18
FNSM: as a way to feel connected with others (FCWO)	1.61	.70	2.95	.97	4.08	.81
FNSM: as a way of making new friends (MNFR)	1.34	.58	2.32	.94	3.43	1.21

Note. FNU = Frequency of Net Use, FNSM = Frequency of Net or Social Media Checking. Ns of Low, ($n = 94$); Medium, ($n = 404$); High, ($n = 211$) classes.

Figure 3. Class Membership by Adolescent Usage Rates of Internet and Social Media Descriptive Analysis.

Descriptive statistics, reliability coefficients, and bivariate correlations for the key study variables are shown in 11. As expected, narcissism, psychopathy, and sadism were all positively related. Moreover, perceptions of false self and online disinhibition were also positively related. While false self was positively correlated with all three dark personality traits, online disinhibition was not correlated with psychopathy. Lastly, it was found that age was positively correlated with narcissism, while gender (1 = females; 0 = males) indicated negative correlations between sadism and online disinhibition and a single positive correlation with psychopathy. Cronbach's alphas for the measures exceeded .70, indicating adequate internal consistency for all of the measures.

Table 11

The Inter-Correlations, Reliability Coefficients and Descriptive Statistics of Dark Personality Traits, False Self, and Online Disinhibition with Age and Gender

		1	2	3	4	5	6	No. of items	α	Mean (SD)
1	NAR							32	.93	3.43 (.79)
2	SAD	.26**						13	.79	2.65 (.68)

3	PSY	.12**	.04					24	.71	1.91 (.19)
4	POFS	.51**	.16**	.17**				7	.86	2.87 (.60)
5	ON-DIS	.42**	.31**	-.04	.33**			6	.73	2.35 (.83)
6	AGE YRS.	.11**	.06	.04	.04	.07		1	-	15.56 (1.24)
7	GENDER	.06	-.44**	.10**	.02	-.12**	-.18**	1	-	

Note. * $p < .05$, ** $p < .01$. NAR = Narcissism; SAD = Sadism; PSY = Psychopathy; POFS = Perceptions of False Self; ON-DIS = Online Disinhibition; Age Yrs. = Age in years.

Exploring Mean Differences in Dark Personality Traits among the MISMU Classes

In the next step of the data analysis, and in order to answer the second research question, namely, whether distinct differences between self-reported levels of narcissism, sadism, and psychopathy would exist between each of the MISMU profiles, a multivariate analysis of variance (MANOVA) was conducted with the medium MISMU class treated as the reference group in this analysis.

Results indicated a single significant multivariate main effect for gender on all three dark personality traits, $F(3, 698) = 49.84, p < .001$; Wilk's $\Lambda = .82$, partial $\eta^2 = .17$, yielding a large effect size. No other significant multivariate effects were found for either class or age differences, although univariate associations were explored in order to assess for specific differences in traits across classes.

Upon exploring the univariate results, significant differences among the classes were found for self-reported levels of sadism, $F(2, 700) = 3.49, p < .05$, partial $\eta^2 = .01$, but not for either narcissism ($p = .65$) or psychopathy ($p = .19$). Specifically, youth belonging to the high motives for use class evidenced the highest sadistic traits ($M = 2.89, SD = .68$), when compared to the reference group (medium motives; $M = 2.60, SD = .66$). This difference suggest that youth who are motivated to spend a higher than average time engaging with the Internet and social media also exhibited more sadistic traits and behaviours. Additionally, post-hoc, pairwise comparisons were conducted in order to examine whether the high and low classes differed significantly on the dark personality traits. In the case of sadism, a significantly higher mean was determined for the high motives of use class ($M = 2.89$) when compared to the low ($M_{dif} = .60, p < .001$) motives for use group. No significant mean differences were found between the MISMU classes for narcissism, or psychopathy. Overall, these results suggest that as motivations for Internet and social media usage increases among youth, so do traits of sadism.

Univariate results for the covariates, gender and age, revealed that male participants ($M = 2.32, SD = .61$) exhibited higher levels of sadism than females ($M = 2.35, SD = .63$), $F(1, 700) = 127.13, p < .001$, partial $\eta^2 = .15$., suggesting that adolescent males are more likely to gain amusement, or pleasure, from committing troll-like behaviours online. In the case of psychopathy, however, it was found that females ($M = 1.93, SD = .17$), rather than males ($M = 1.89, SD = .21$), reported higher levels of psychopathic traits ($M = 1.89, SD = .21$), $F(1, 700) = 8.30, p < .01$, partial $\eta^2 = .01$. Furthermore, it was the older adolescents in the sample who reported higher levels of psychopathic tendencies, $F(1, 700) = 3.74, p = .05$, partial $\eta^2 = .01$. No significant age or gender effects were found for narcissism, and no significant effects were identified between age and sadism.

Exploring Associations between MISMU Class Membership and Self-Reported Online Disinhibition and Perceptions of False Self

We were also interested in identifying whether usage rates of Internet and social media may be associated with either perceptions of false self or online disinhibition (RQ3). To this end, while controlling for age and gender, a second MANOVA was conducted to investigate whether class membership would yield significant mean group differences in false self and online disinhibition. After covarying out the effects of age and gender, results indicated significant multivariate main effects for class membership, $F(4, 1406) = 26.41, p < .001$; Wilk's $\Lambda = .86$, partial $\eta^2 = .07$, and gender, $F(2, 703) = 7.86, p < .001$; Wilk's $\Lambda = .98$, partial $\eta^2 = .02$, on measures of both online disinhibition and perceptions of false self. No significant multivariate effects were found for age.

Examination of univariate results for the three classes revealed that those belonging to the high motivations for usage class reported higher levels of perceptions of false self ($M = 3.05, SD = .64$), $F(2, 704) = 17.97, p < .001$, partial $\eta^2 = .05$ in comparison to the medium class. Similarly, youth belonging to the high Internet and social media motivations for usage class also reported significantly higher levels of online disinhibition ($M = 2.74, SD = .88$), $F(2, 704) = 49.40, p < .001$, partial $\eta^2 = .12$, when compared with the medium class. Youth in the low class reported lower mean levels of false-self perceptions ($M = 2.63, SD = .58$) when compared to the medium ($M = 2.82, SD = .56$) and this trend remained true for mean levels of online disinhibition, with the low motives of use group reporting lower levels ($M = 1.85, SD = .70$) than the medium motives of use class ($M = 2.27, SD = .73$). These results suggest that youth

highly engaged in social media and the Internet evidenced higher levels of false-self conceptions and were more likely to behave in disinhibited ways in cyberspace. In the case of online disinhibition, it was also found that males ($M = 2.45$, $SD = .85$), rather than females ($M = 2.26$, $SD = .80$), exhibited higher levels of disinhibited behaviour online, $F(1, 704) = 14.03$, $p < .001$, partial $\eta^2 = .02$. No significant gender effects were discovered for perceptions of false self, and no significant age effects were found for either outcome variable.

Post-hoc, pairwise comparisons were also conducted, in order to investigate significant mean differences between the high and low classes for both perceptions of false self and online disinhibition. In the case of false self, a significantly higher mean was determined for the high usage class ($M = 3.05$) when compared against the low ($M_{dif} = .36$, $p < .001$) usage groups. Similarly, the high usage group also exhibited a significantly higher mean on online disinhibition ($M = 2.74$) when compared to the low ($M_{dif} = .86$, $p < .001$) Internet and social media usage groups. These results suggest that membership in the high usage group is associated with increased online disinhibition and adolescent perceptions of false self.

Lastly, a third and final MANOVA was conducted controlling for the dark personality traits of narcissism, sadism, and psychopathy, as well as gender and age to test whether class membership would continue to show significant mean differences for self-reported levels of false-self perceptions and online disinhibition. Results indicated significant multivariate main effects for class membership, $F(4, 1396) = 3.28$, $p = .01$; Wilk's $\Lambda = .98$, partial $\eta^2 = .01$, for perceptions of false self and online disinhibition. No significant effects were found for either gender or age.

Univariate results indicated, after controlling for dark personality traits in addition to age and gender, that class membership continued to be predictive of perceptions of false self, $F(2, 699) = 3.19$, $p = .04$, partial $\eta^2 = .01$ and of online disinhibition, $F(2, 699) = 5.18$, $p < .01$, partial $\eta^2 = .02$. Gender also remained a significant predictor of rates of online disinhibition, with males reporting higher levels of disinhibited behaviour online, $F(1, 699) = 5.00$, $p = .03$, partial $\eta^2 = .01$. Taken together, these results suggest that class membership captured significant mean group differences in Internet and social media motives for use with both false self and online disinhibition, regardless of existing background levels of dark personality traits.

Discussion

Taking a person-centred approach to understanding adolescent motivations for engagement in online behaviour means placing the teenager at the center of their media selection choices and considering them as active decision makers in their cyberspace activities. To this end, the present study was designed to identify unique levels of motivations for use of Internet and social media among an adolescent sample. By establishing whether youth exhibit particular Internet and social media usage motives and patterns, we endeavoured to explicate whether rates of dark personality traits may significantly differ between groups defined by levels of adolescent motives for Internet and social media usage. We also sought to determine how these profiles of use might differ with regard to both perceptions of false self and online disinhibition.

Three distinct class profiles were identified, and these were categorized as low, medium, and high motives of use. These clusters suggest that overall levels of motivations for engagement are the most important characteristics in distinguishing groups among a large heterogeneous sample of adolescents. Testing for differences on self-reported traits of narcissism, sadism, and psychopathy among the three profiles revealed significant differences on sadism between the usage groups, with those in the high Internet and social media use class indicating elevated levels of sadistic traits when compared to the other two groups (i.e., medium and low motives). It was also found that males were more likely than females to exhibit sadistic tendencies. Class membership was also found to differentially predict false self and online disinhibition, indicating both perceptions of false self and rates of online disinhibition as highest among youth belonging to the high motives of use group.

Relationships of Findings with Extant Literature

The present study, by identifying significant mean differences in dark personality expression between usage profiles, illustrates support for the 'uses and gratifications' theory (Blumler & Katz, 1974), which argues that individuals take an active and conscious approach in selecting sources of media that satisfy, or achieve, particular social, cognitive, or emotional needs. The present study illustrates a strong association between the presence of dark personality traits with a broad range of motivations for adolescent Internet and social media usage, and provides evidence that, while Internet and social media use has a ubiquitous presence in the daily lives of young digital natives, personality factors may exacerbate different levels of usage patterns (Tan &

Yang, 2014). In the present case, significant mean differences between classes were identified for both sadism and narcissism, but not psychopathy, while significant main effects highlighted sadism as the most salient of the dark traits associated with Internet and social media usage profile membership. While no studies to date have measured possible associations between sadism and high Internet usage, or potentially Internet addiction, the present findings suggest that high usage of Internet and social media may be providing salient gratification of sadistic characteristics that, in turn, motivate a subsequent increase of activity on cyberspace.

Consistent with previous studies that have depicted elevated Internet and social media usage as strongly associated with unhealthy psychological consequences (Caplan, 2003), the present findings showed that all three outcomes of sadism, false self, and online disinhibition were highest in the high MISMU class. Research has suggested that maladaptive patterns of cruel, aggressive, manipulative, and demeaning behaviours are characteristic of individuals possessing sadistic personality traits (PsychNet-UK, n.d.) and are particularly evident among those individuals labeled as '*computer deviants*' (i.e., those who enjoy engaging in online misconduct and antisocial or deviant behaviour) (Rogers, Smoak, & Liu, 2005). Arguably, those individuals who behave in a disinhibited manner online may feel safer to express themselves in cyberspace than they do in their face-to-face interactions or offline relationships, because of a lack of accountability and reliable consequences. Disinhibited behaviour online, thus, seems to be a mechanism by which individuals freely express sadistic behaviours or attitudes.

Research has suggested that an individual's preference for online interaction is a positive predictor in the development of problematic Internet usage (Caplan, 2003). Moreover, it has been shown that too much time online can have a negative impact on an adolescent's ability to connect with others and can interfere with face-to-face relationships (Pontes, Szabo, & Griffiths, 2015), potentially creating a negative feedback loop that continually increases the time an adolescent spends online. The existence of elevated false-self perceptions in this cohort suggests further underlying concerns and potential motives towards elevated use of the Internet and social media.

In many ways, the Internet provides youth a free and unmonitored environment for dissociative self-expression (Bauman, 2010; Runions & Bak, 2015; Suler, 2002; 2004), however, for those who struggle with elevated false-self perceptions, cyberspace may offer a facilitative space that enables these rather fragile individuals to cling to

human interaction and connection without immediate judgement, consequence, or direct criticism (Bauman, 2010; Runions & Bak, 2015; Suler, 2002; 2004). Nevertheless, these adolescents may be at risk for carrying a stunted social understanding from the real world into cyberspace that manifests in aggressive, manipulative, or demeaning online behaviour characteristic of trolling, as they desperately try to connect with others (Brown, 2013). Perhaps this is why teens who troll or cyberbully claim they do it because it's 'funny' (Buckels et al., 2014); their attempt to tease and ridicule is their awkward attempt to bond with other users, particularly if it is encouraged by other Internet users who laugh or collaborate with that behaviour. Another potential consideration is that for youth with elevated false self conceptions, trolling behaviour may actually be a by-product of a negative social reward motivation (Craker & March, 2016), in that these youth, who feel badly or unsure of themselves, may seek out ways to make others feel bad as a means of improving their overall self-concept (Foulkes, McCrory, Neumann, & Viding, 2014). In sum, the present study illustrates that it may very well be a combination of personality, identity, and the disinhibitory nature of cyberspace that results in more bold, uninhibited, and antisocial behaviours online.

Limitations and Future Directions

The main limitation of the study is that the data used were concurrent in nature, which prevented us from drawing firm conclusions about sequential and temporal influences. Also, the sample, while relatively large in size, may only be representative of New Zealand high school students and thus may not reflect the Internet and social media usage habits of other demographic or cultural groups. While the use of a latent profile analysis in this context is novel, doing so with a concurrent sample limits the study's ability to discern how personality traits influence Internet and social media usage levels over time, and how these usage levels may exist in bi-directional relationships with false-self perceptions and online disinhibition.

Future studies might include a longitudinal component, which has the potential to illuminate whether adolescents who express strong endorsement of the importance of online social engagement and relationships feel so as an extension of social relationships, rather than being a replacement of face-to-face interactions. In other words, does pursuing intensive social connections online add to, or detract from, face-to-face interactions? Additionally, employing methods that do not rely on self-report data could provide a more veridical depiction of possible disparities between offline and

online social relationships and behaviours. Future research could also investigate whether youth perceptions of a lack of accountability in the world of cyberspace are strongly associated with online disinhibition. Moreover, delving deeper into Suler's (2004) descriptions of various disinhibitory elements of cyberspace could illuminate which specific factors have the strongest associations between adolescent online disinhibition and dark personality traits. Consideration should also be given to whether varying adolescent perceptions of self may predispose young individuals to perceive more freedom on the Internet.

Conclusions

The present study illustrates that personality is a key associate with the levels of engagement that youth invest in the Internet and social media. The study's findings also highlight the important role identity construction may play in media selection and engagement. The study findings contribute to a growing body of knowledge that has associated high levels of Internet and social media use with problematic online behaviours and unhealthy psychological outcomes. The study identified new associations between media selection and engagement, as well as important behaviours and identity outcomes that we hope will stimulate future work in understanding sadistic and disinhibited online behaviour in greater depth. Continued efforts to better understand why many seemingly normal adolescents engage in hurtful online behaviours are crucial to advancing the field.

General Discussion

A precipitous rise in the use of information and communication technology has resulted in a pressing need to understand the various influences of ICT in adolescent lives. The research in the present dissertation was designed to further current understanding of adolescent engagement in online disinhibition. A general overview of the theoretical foundation of media selection in adolescence informed the person-centred approach of the studies conducted in hope of advancing existing research on the online disinhibition effect. A total of three studies were carried out on the associations between personality and identity in relation to disinhibited online behaviour. It was discovered that high rates of ICT use are most significantly associated with maladaptive outcomes of both identity and behaviour. It was also found that narcissism, sadism, and psychopathy were all significantly predictive of adolescent online disinhibition. Furthermore, factors such as frequency of ICT use and exposure, perceptions of false self, and motives for Internet and social media use, all played a crucial role in explaining the various relationships among these variables.

Personality as a Predictor of Online Disinhibition

Taken together, these findings indicate that particular ICT usage patterns are unique to the individual using, and choosing them, which suggests that the type and frequency of digital media consumed is integral to both identity and behaviour. Thus, a key component to digital preferences and behaviour found across the three studies, was that of personality, which has previously been speculated as having the potential to directly impact online behaviours (Stritzke, Nguyen, & Durkin, 2004; Suler, 2004). Consistent with these suggestions, the studies were structured to highlight how socially aversive traits and a tendency towards immoral conduct may be directly predictive of online disinhibition in youth. Findings revealed that each of the dark personality traits were directly predictive of adolescent online disinhibition, illuminating the significance of cyberspace in motivating the negative impulses associated with narcissistic, sadistic, and psychopathic personality.

Indeed, while ICT alone probably cannot alter the normative bounds of human interaction (Yzer & Southwell, 2008), it is evident that individualized interactions with ICT and its digital media are in part, motivated by certain personality characteristics. This set of relationships suggests that the phenomenon of online disinhibition is more complex than just the disinhibitory opportunities available in the cyber world (Suler,

2004; Wu, Lin, & Shih, 2017). In support, the thesis findings showcase that adolescent ICT use and selection, while being significantly associated with online behaviour, is borne of unique motivations inherent to the evolving personality characteristics of each adolescent. These findings are consistent with the adolescent media practice model (Steele & Brown, 1995). This model highlights the impact of individual motives and personal selection of digital media throughout adolescent maturation, separate from family influence, as an integral component in shaping personality development and identity formation. This suggests that covert feelings and impulses associated with individual personality characteristics (Millon, Lerner, & Weiner, 2003), may inform and motivate media selection that predisposes certain youth towards increased online disinhibition.

Research has shown that the most important goals, needs, and motives of individuals are those that are central to personality development (Millon, Lerner, & Weiner, 2003). For adolescents who harbour dark personality traits, the unique psychological factors of cyberspace (e.g., dissociative anonymity, invisibility, asynchronicity, solipsistic introjection, dissociative imagination, and minimization of authority) may offer attractive digital outlets that allow these traits to be expressed through disinhibited online behaviour. Indeed, researchers have suggested that certain environments, including that of the online world, can inhibit self-awareness and self-regulation that results in a deindividuation process (Diener, Lusk, DeFour, & Flax, 1980; Festinger et al., 1952; Wu, Lin, & Shih, 2017; Zimbardo, 1970). When deindividuation occurs, a person fails to regulate their behaviour, and characteristic of the online disinhibition effect, may react impulsively based on their current emotional state or mood, unconcerned about immediate or long-term consequences (Koivu, 2015). For those individuals harbouring narcissistic, sadistic, or psychopathic tendencies, susceptibility to impulsivity is a particular salient trait that can motivate non-normative digital behaviours (Chester & DeWall, 2017; Justice, 2016; Morgan, Gray, & Snowden, 2011; Vazire & Funder, 2006). Moreover, given the limited capacity teens already have for self-regulation, and their susceptibility to social influence (O’Keeffe Clarke-Pearson, & Council on Communications and Media, 2011), the manifestation of online disinhibition as a result of dark personality traits highlights the importance of personality in behavioural expression online. The significant direct relationships

identified in Study 2 between all three of the dark personality traits to disinhibition, and subsequently to cyber aggression is evidence for this view.

Online Disinhibition and Identity – Understanding the Role of False Self

In line with examining the significance of personality in association with online disinhibition, the present sequence of studies considered the possible associative role of identity in online disinhibition. The expression of personality traits in adolescence is dependent not only on environmental constructs but also on the internal constructs of self (i.e., identity formation) (Abbott, 2005). Simply put, components of the 'self' in identity formation are the inner strength of personality and should be characterized by a coherent, internally consistent self-concept (Wu, Lin, & Shigh, 2017). The present thesis findings, however, suggest that ICT usage patterns and motives in adolescence can be associated with dysregulated identity formation. Most notably, across two studies performed here, it was found that increased false self perceptions were highest among those adolescents who evidenced high usage patterns for all forms of ICT as well as high motives for the use of Internet and social media. In addition, false self was found to be a significant positive mediator between several dark personality traits and online disinhibition. In particular, false self perceptions mediated the relationship between both narcissistic and psychopathic tendencies and online disinhibition. This finding illustrates that an increase in either of these personality traits results in an increase of false self perceptions, which, in turn, predicts an increase in online disinhibition. Narcissism and psychopathy are indicative of a weakened sense of self, compromised ego, an underdeveloped capacity to regulate self-esteem, and a propensity for anger and aggression (Ayton, 2011; DiGiuseppe & Tafrate, 2007; McLean, 2007; Ronningstam & Baskin-Sommers, 2013). These same characteristics were positively associated with false self perceptions, a feeling that one is behaving in ways that are not authentic and true to the self, and both were related to online disinhibition. Taken together, this pattern of results suggests that dysfunctional personality traits are associated with dysfunctional self perceptions, and both are related to dysfunctional online behaviour.

Moreover, the direct positive relationship between false self perceptions and online disinhibition that was discovered indicates a novel association between online behavioural expressions in response to a weakened self-concept. This association suggests that youth who have a compromised self-concept, or perhaps, are struggling with the process of identity formation, are susceptible to the influential psychological

and environmental factors of cyberspace. Individuals reporting high levels of psychological, emotional, and ego-centered weaknesses associated with narcissism and psychopathy, as well as problems in identity formation and self-discovery (i.e., false self perceptions) may be more vulnerable towards disinhibited expression when shrouded in the perceived safety of the online world. For some, choosing to engage in disinhibited ways online may act as a therapeutic outlet that allows these particular youth to experience a sense of perceived control, or heightened self-efficacy unavailable to them elsewhere (Koivu, 2015; Nevin, 2015). Indeed, in some instances, engaging in disinhibited online behaviour has the ability to create empowering experiences for some individuals, either through venting online, or by finding and affiliating with like-minded individuals within various digital communities (Koivu, 2015). The ability to find a potentially 'nurturing' digital outlet for a narcissist's, or psychopath's, internal struggle, however, provides these individuals with a new found capacity to discover unfamiliar feelings of empowerment, or social capabilities, when dealing with, or overcoming, familiar personal obstacles. This sense of newly perceived empowerment may foster unexpected feelings of dominance and control that are particularly attractive to those who harbour dark personality traits. Moreover, what some people deem as socially aversive behaviour online may actually be perceived as completely normal and accepted among other online users. This has the potential to perpetuate a tribe like mentality among similar user styles; further cultivating disinhibited behaviour in cyberspace.

In the case of narcissistic youth, for example, who experience significant deficits in authentic self development, an increase in disinhibited behaviour may be a misdirected attempt at obtaining positive feedback, approval, affirmation, or admiration by posting content on the web that is widely accepted by online communities and cyberspace culture (i.e., provocative photos, suggestive messages, etc.), but perhaps not as socially desirable or socially accepted in the offline context of home or immediate social community (i.e., offline relationships, school, etc.). It is possible that the characteristic impulsivity and lack of remorsefulness frequently recognized as common traits of psychopathy may be encouraged in cyberspace where secrecy and deniability (Dadds et al., 2009) are heightened, creating a more lenient environment to act out and behave antisocially (Fanti, Frick, & Georgiou, 2009; Lopes & Yu, 2017; Madan, 2014; Nevin, 2015). It has also been suggested that the Internet is an accommodative venue

for revealing the more stigmatized aspects of one's identity (Koivu, 2015; McKenna & Bargh, 1998; Turkle, 1995), suggesting that particular online platforms may create facilitative effects for dark personality expression (Fanti, Frick, & Georgiou, 2009; Madan, 2014).

Interestingly, of the dark personality traits examined, sadism did not evidence any predictive associations with false self perceptions, nor did false self perceptions evidence any significant mediating effects between sadism and engagement in online disinhibition. Sadism was, however, found to be directly predictive of both online disinhibition and cyber aggression. These findings suggest that there are independent mechanisms motivating online behaviour for sadistic youth, separate and unique to those that have been attributed to psychopathic and narcissistic disinhibition online. This indicates that important subclinical levels of sadism in youth samples are potentially associated with online behaviours. Focusing on the inner workings of identity and self-perceptions, research has argued that all humans have an innate readiness to find cruelty pleasurable (Nell, 2006). Perhaps unsurprisingly, Study 2 found that online disinhibition to be a significant positive mediator between sadism and cyber aggression. This finding suggests that certain psychological factors associated with the online disinhibition effect may amplify the direct associations between sadism and online trolling behaviours. Indeed, research has previously highlighted that diminished inhibitory control, a lack of immediate social punishment, and increased sensational interests often co-occur with sadistic traits and impulses (Buckels, 2012; Hagger-Johnson & Egan, 2010). Moreover, not only are these elements common features of cyberspace, they are also characteristic of the underdeveloped and poor self-regulatory mechanisms associated with adolescence (de Ridder et al., 2011; O'Keeffe Clarke-Pearson, & Council on Communications and Media, 2011). Indeed, it has been found that even healthy adolescents commonly express traits of subclinical sadism with little to no provocation (Chabrol, Van Leeuwen, Rodgers, & Séjourné, 2009). In response, perhaps some teens have an innate need or desire to explore this darker side of themselves. The minimization of authority, delayed response, and freedom of self-expression commonly attributed to cyberspace may further stimulate the disinhibition of sadistic impulses within the youth demographic, that may otherwise be better controlled in an offline context.

Frequencies of ICT, Internet, and Social Media Use

The unique motivations that stem from both personality and identity development in adolescence may explain, in part, why ICT usage preferences and motives differ from one teen to another. The present findings illustrate how innate personality and subsequent identity constructs are significantly associated with ICT usage preferences as well the degree to which individual motives drive Internet and social media engagement. In particular, it was discovered that when youth are highly engaged with, and highly motivated towards, ICT usage, sadistic traits are expressed, and false self perceptions, immoral conduct, externalizing behaviours, and online disinhibition are significantly elevated in comparison to youth who spend less time with ICT overall. Some youth, particularly those who are struggling to find their footing in the transitional period of adolescence, may use cyberspace as a place to satisfy unmet goals and needs inherent to their developing identities and personalities (Papacharissi & Rubin, 2000; Swickert, Hittner, Harris, & Herring, 2002; Hetzel-Riggin & Pritchard, 2011). When the world of cyberspace and connectivity, however, becomes the dominant, or even exclusive medium, for satisfying personal needs, some adolescents risk committing antisocial acts such as harmful online behaviour, and potentially even becoming ensnared in Internet dependency (Douglas et al., 2008; Mehroof & Griffiths, 2010; Tzavela et al., 2015).

The consistency of results suggest that dark personality traits in adolescence may not only mark these digital natives as high risk users, but encourage them to spend more time online. Narcissistic, sadistic, and psychopathic youth with unique unrestricted access to a space that provides immediate gratification of their dark needs, with limited to no repercussions, is a recipe for uncontrolled disinhibited behaviour and acts of cyber aggression. Moreover, youth struggling with a fragile identity and a weakened sense of self may also turn towards excessive Internet use as a means of coping with negative emotions and disquieting ambiguity about self identity (Ballarotto, Volpi, Marzilli, & Tambelli, 2018). The maladaptive states of both identity and personality have the potential to make these youth more susceptible to the seductive allure of the cyber environment, either by fulfilling socially aversive motives or needs, or acting as a temporary Band-Aid for deeper underlying issues (i.e., poor identity formation). Taken together, elevated usage of ICT can be both a symptom of dysfunction, as well as acting as an exacerbator of angry and depressed mood states for

these youth, putting them at an increased vulnerability to the disinhibiting psychological effects of the online world, as outlined by Suler (2004). Despite the important developmental considerations that need to be given to these factors, the results also arguably illustrate that, if access to, and usage of, ICT is done in moderation, not all forms of Internet and social media usage are detrimental for youth. The key concern that arises is distinguishing the background influences and factors of those youth who spend a higher than average amount of time online, and using these to identify youth at risk for Internet misbehaviour and/or addiction.

Future Directions

By recognizing the adolescent as an active user and consumer of the online world and digital media, future research should consider how personality development in adolescence may trigger changes in individualized personal motives as youth navigate separation from family and prioritize personal relationships, self-esteem, and the complex processes of identity formation (Millon, Lerner, & Weiner, 2003). It is important to understand how motives based in personality may be triggered by the various environmental factors associated with the disinhibitory nature of cyberspace. We need to know which adolescents are most susceptible to the deleterious effects of online engagement, as well as help identify youth who may be at risk for developing Internet addiction.

From a personality perspective, the fact that some people crave cruelty, while others abhor it, indicates that they differ in dispositional sadism, or a tendency to enjoy the suffering of others (Buckels, 2012). The recent classifications of five subtypes of sadists (e.g., 1) the explosive, known for being unpredictably violent in response to perceived humiliation, disappointment, or hopelessness; 2) tyrannical, they relish in the act of menacing behaviour to achieve power through submission; 3) enforcing, often hold positions of power in society that provide them with a false sense of empowerment where they can enforce punishment over broken rules, regulations, or laws; 4) spineless, often deeply insecure and they use aggressive hostility to promote a public façade of strength and intimidation; and 5) everyday sadist, they gain emotional benefits from causing or observing other's suffering) signal that sadistic impulses are complex and variable (Brockway, 2013; Buckells, 2012; Chabrol et al., 2009; Smith, Powell, Combs, & Schurtz, 2009). Future research should delve deeper into the possible

moderating and mediating effects between each of the unique subtypes of sadism and their influence on adolescent behaviour in the digital world.

Additionally, the findings provide important insights into the evolving relationship between adolescent personality and digital behaviour. Accordingly, deeper consideration should be given to the ubiquitous presence youth maintain online and the ever-growing influence ICT will continue to have on young users' mental health and development. Future work should strive to re-evaluate existing clinical assessments and methodologies used when treating and working with young people to incorporate questions on ICT usage and exposure as an influential factor in the onset of mental health and behavioural concerns within the youth demographic. Currently, while scales assessing Internet use are in circulation, questions regarding general ICT habits and their potential impact on young people are greatly missing in existing health questionnaires (Goldberg, 1978; Niemz, Griffiths, & Banyard, 2005). Moreover, future educational researchers should aim to develop age appropriate coursework about digital technology use in an effort to update existing educational curricula and build awareness about the role of ICT in everyday life. In this vain, young people at the primary and secondary level would be given the opportunity to learn about critical media literacy (Garcia, Seglem & Share, 2013; Higgins & Begoray, 2012) and the intricacies of the digital world. Specifically, these materials could focus on the psychological and emotional impacts of digital consumption, appropriate online etiquette, the importance of understanding privacy and the impact of media sharing, as well as various techniques used by tech giants to manipulate user behaviour. This early education could potentially serve as a healthy preventative measure from negative mental health and behavioural outcomes associated with ICT use.

Lastly, employing a longitudinal study would allow future research to evaluate how pre-adolescent personality and identity mechanisms evolve over time and how these changes inform media selection and cyber behaviours. This investigation would allow future researchers to investigate bi-directional associations between identity formation, personality, and cyber expression at different stages of childhood and adolescent development. Focusing on each of the dark personality traits (particularly sadism) separately in their manifestation could illuminate unique principles that govern online behaviour, and determine precisely how the disinhibiting nature of

cyberspace plays a crucial role in unleashing dark trait impulses that are otherwise unexpressed, or under-observed, in offline settings.

Limitations

The main limitation of the three thesis studies is that the data used were concurrent in nature, which prevented the opportunity to draw firm conclusions about sequential, causal, and temporal influences. Moreover, while the use of a latent profile analysis in this context is novel, doing so with a concurrent sample limits the study's ability to discern how personality traits influence Internet and social media usage levels over time, and how these usage levels may, in turn, affect the expression of personality traits over time.

Another limitation is the sole reliance on employing self-report questionnaires with youth samples, where the thesis studies may have benefitted from employing experimental, other-report, or qualitative research methods as added layers on the present person-centred focus. Lastly, the samples used were taken from a single Western country in the Southern Hemisphere, and while some of the results attained here are consistent with previous work from North America that has illustrated various impacts of communication technology on identity and behaviour, future work should strive to replicate our findings in other cultures and countries.

Conclusions

Despite the described limitations, the current findings illustrate the importance of considering adolescents as active and decisive consumers of various ICT outlets as well as online content and platform selection. Applying a series of latent profile analyses on various adolescent information and communication technology preferences revealed not only distinct ICT user profiles, but also unique and varying levels of Internet and social media usage motives. The thesis highlights how high online engagement is associated with maladaptive identity and behaviour indices, and how personality contributes unique motives to engage with particular online content. By drawing attention to the importance of studying the dark personality in the digital age, the thesis illuminates several important drivers behind online engagement and behaviour. The thesis findings also illuminate the important role identity construction may play in media selection and engagement, and how a compromised identity status can be associated with poor behavioural control online, and a heightened susceptibility to the psychological factors ascribed to the online disinhibition effect that exists in cyberspace.

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Appendix A: Scale Items and Instructions

Online Disinhibition Scale Items

Items were administered with the following instructions: 'How much do you agree with the following statements.' All responses were collected on a 5-point Likert scale with anchors: 1 = *Strongly Disagree* to 5 = *Strongly Agree*

Online Disinhibition

- I feel safer expressing negative thoughts and feelings online than in person.
 - The anonymity of the online environment influences the way I express myself online.
 - I say/write/post comments online that I would not say in person.
 - I am aware when I am being hurtful online, but do it anyway.
 - I often feel guilty after posting something negative online.
-

Cyber Aggression Scale Items

Items were administered with the following instructions: 'In the last month (4 weeks/30 days) how often have you engaged in the following cyber behaviours:' All responses were collected on a 5-point Likert scale with anchors: 1 = *Never* to 5 = *7 or more times*

Cyber Aggression

- Posted something on social media to anger or make fun of someone.
 - Made mean or negative comments on someone's photos, updates, or tags to make that person feel bad or for others to join in and/or laugh.
 - Spread rumours about someone online.
 - Edited a photo or created a meme making fun of something and then posted it online for others to see.
 - Sent someone an instant message to make him or her angry or to make fun of them.
 - Taken an embarrassing picture of someone and posted it online without their permission.
 - Posted something online about someone else to make others laugh.
-