Tampere University

IINA SAVOLAINEN

Addiction by Identification

A social psychological perspective on youth addictive behaviors

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ACADEMIC DISSERTATION
To be presented, with the permission of
the Faculty of Social Sciences
of Tampere University,
on 27 November 2020, at 12 o'clock.

ACADEMIC DISSERTATION
Tampere University, Faculty of Social Sciences
Finland

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The originality of this thesis has been checked using the Turnitin OriginalityCheck service.

Cover design: Roihu Inc.

ISBN 978-952-03-1717-1 (print)
ISBN 978-952-03-1718-8 (pdf)
ISSN 2489-9860 (print)
ISSN 2490-0028 (pdf)
http://urn.fi/URN:ISBN:978-952-03-1718-8

PunaMusta Oy – Yliopistopaino
Vantaa 2020

Dedication

I dedicate my dissertation work to my father who is no longer with us, but whose silent wisdom, exceptional sense of humor, and passion for books and reading will stay with me forever.

ACKNOWLEDGEMENTS

Ten years ago, I entered a Psych 101 class while in college in New Orleans. Little did I know back then how much that one class would impact my life. It sparked my interest toward studying psychological science, its discipline social psychology, and pursuing a career in academia. This was not an easy goal to attain, as it shouldn't have been. After all, in order to achieve, we need obstacles to overcome. During my years at Delgado Community College and Tulane University, I struggled, failed, learnt, endured, succeeded, and grew. Ultimately, those years prepared me to take on a great challenge: doctoral studies at Tampere University.

The doctoral studies have been a remarkable experience and I believe this dissertation is a demonstration of what can be accomplished in an enriching scholastic environment. Thus, I would like to express my deepest gratitude to my supervisor, professor Atte Oksanen, who first read my research plan and saw the potential in me. Through the past three years, Atte has given me guidance on practical issues, from writing high quality research articles, being published, and analyzing data to applying for research funding. Moreover, he has shared wisdom of the world of academia, the dos and don'ts that come with it, pushed me to reach higher, and given constructive criticism when I needed it the most. I consider myself lucky to have had Atte as a mentor on this path to a research career.

I am also grateful for having had the opportunity to be a part of the *Problem Gambling and Social Media: Social Psychological Study on Youth Behavior in Online Gaming Communities* – research project funded by the Finnish Foundation for Alcohol Studies and led by professor Oksanen. The wonderful and talented research team made this dissertation possible. Thank you, Dr. Markus Kaakinen and Anu Sirola for your immense contribution, and all the inspiration and help you have given me. I would also like to extend my appreciation to all my co-authors and collaborators of the project whose valuable insight helped me to amend my research articles and advance my writing skills. I would like to extend my sincere gratitude to the pre-examiners, Senior Research Fellow Michael Livingston from La Trobe University and Docent Susanna Raisamo from the Finnish Institute for Health and Welfare, whose feedback and valuable comments

improved my dissertation considerably. I also wish to commend Associate Professor Eilin Erevik from the University of Bergen who has agreed to act as my public opponent. A humble thank you goes to the Finnish Foundation for Alcohol Studies and the Finnish Cultural Foundation whose funding allowed me to focus on this dissertation research.

I want to thank my fellow PhD students and cohort, Rita Latikka, Eerik Mantere, Marko Mikkola, Reetta Oksa, and Nina Savela, with whom I have had the privilege to work and study, share experiences and thoughts, and from whom I have received peer support. I would also like to extend a warm thank you for the welcoming, friendly, and motivating work environment afforded by the Faculty of Social Sciences at Tampere University. Additionally, I wish to acknowledge the multidisciplinary Addiction Seminar organized by Professor Oksanen and Docent Katja Kuusisto. The seminar has allowed professional researchers and esteemed colleagues to read different versions of my work and offer valuable feedback, having a meaningful impact on my work. Thank you, Atte, Docent Katja Kuusisto, Research Director Tomi Lintonen, Senior Researcher Karoliina Karjalainen, Eeva Ekqvist, and Dr. Johanna Ranta. A special thank you goes to Dr. Jaana Minkkinen, Dr. Satu Ojala, and Dr. Tuuli Turja whose engaging conversations and knowledge related to methodology and research work offered me perspective and inspiration.

It is difficult to put into words the amount of appreciation I have toward my family and friends who have been there for me during this journey. I am beyond grateful to my two exceptional families. A heartfelt thank you to my family in Finland; Mom, Grandma, Inka, Reeta, Miro, Maiju, Soile, Viola, and my family in the U.S.; Karla, Raquel, Tatiana, and all the amazing people. The love and support I have received from you have been priceless. An immeasurable thank you goes to my friends, Tuija, Heli, Jaana, and Erja, who always found the time to talk, listened, offered me words of wisdom, and kept it real. Finally, I wish to express my deepest gratitude to my husband, Alejandro. The love and immense support I receive from you inspire me every day. You have been there for me through thick and thin, challenged me, and believed in me like no other. I value how you always show interest toward my research and take the time to have meaningful discussions about it. I look forward to continuing to explore new places with you, to seek out new adventures, to boldly go where we have not been before. Make it so, Number One.

Lakewood, WA, September 2020

ABSTRACT

Addictive behaviors are a global phenomenon and pose serious and widespread public health threats. Adolescents and young adults are particularly vulnerable to the harms of addiction. When initiated during these developmentally sensitive time periods, addictive behaviors can disrupt all areas of healthy functioning. Addiction is typically understood as an alcohol or substance use disorder. However, addiction is a complex condition that can also manifest in an inability to stop partaking in certain behaviors. Problem gambling and compulsive Internet use are prominent examples of these types of behavioral addictions.

This dissertation examines how different social psychological factors are related to addictive behaviors among youth. The key social psychological factors assessed were social identification with both offline and online peer groups, social support, perceived norms, and loneliness. The addictive behaviors investigated in relation to these social processes were excessive alcohol use, excessive drug use, problem gambling, and compulsive Internet use. The dissertation consists of four distinct survey studies analyzing 15- to 25-year-old adolescents and young adults from Finland (N = 1,200), the United States (N = 1,212), South Korea (N = 1,192), and Spain (N = 1,212). Study 1 examined the role of offline peer group identification in addictive behaviors and psychological distress among Finnish youth. Study 2 compared social identification preferences and problem gambling among youth in Finland and the United States. Study 3 further expanded the cross-national context and included data from youth in South Korea. The study examined the relationship between loneliness and addictive behaviors. Study 4 added a dataset from Spain and investigated if following gambling-related norms online is related to problem gambling in four countries.

According to the results, excessive alcohol use was associated with stronger peer-group identification. Youths who participated in excessive drug use, problem gambling, or compulsive Internet use seemed to have weaker social connections with their peers. All of the addictive behaviors were associated with higher psychological distress, but excessive drinkers experienced less psychological distress, likely due to their stronger social relations. Study 2 showed that social identification with an offline primary peer group was associated with less problem gambling among Finnish youths when they also reported receiving social support. Identifying with an online primary peer group was

related to higher problem gambling among youth in the United States. According to Study 3, loneliness was a significant risk factor for youth compulsive Internet use in Finland, the United States, and South Korea. Study 4 found that following perceived gambling norms online was associated with higher problem gambling across the four countries. The results of this dissertation highlight that while social relationships are essential and serve multiple purposes for young individuals, they are also an important element in youth addictive behaviors. Different social psychological factors such as social identity and norms can either protect youth from or predispose them to different addictive behavior patterns.

Keywords: Addictive behaviors, excessive alcohol use, excessive drug use, problem gambling, compulsive Internet use, social identity theory, social norms, social support, loneliness, youth

TIIVISTELMÄ

Riippuvuusongelmat eli addiktiot ovat yleisiä ja maailmanlaajuinen ilmiö. Addiktiot ja niistä koituvat haitat kuorimittavat yksilöitä, heidän läheisiään ja yhteisöjään sekä yhteiskuntaa. Nuoret ovat erityisen alttiita erilaisille addiktioille ja nuoruudessa alkaneen addiktiokäyttäytymisen haittavaikutukset ovat kauaskantoisia. Addiktio ymmärretään usein päihderiippuvuutena, mutta addiktio voi kehittyä myös toimintaan. Rahapeliongelmat ja pakonomainen internetin käyttö ovat esimerkkejä toiminnallisista addiktioista. Tässä väitöskirjassa tutkitaan nuorten addiktiokäyttäytymistä sosiaalipsykologisesta näkökulmasta. Väitöskirja koostuu neljästä osajulkaisusta, joiden tavoitteena on selvittää, mitkä sosiaalipsykologiset tekijät ovat yhteydessä nuorten addiktiokäyttäytymiseen. Keskityn tarkastelemaan sosiaalisen identifioitumisen, sosiaalisen tuen, normien ja yksinäisyyden merkitystä liiallisen alkoholin ja huumeiden käytön, rahapeliongelmien ja pakonomaisen internetin käytön yhteydessä. Lisäksi selvitän kuinka näiden sosiaalisten tekijöiden yhteydet addiktiokäyttäytymiseen mahdollisesti muuttuvat silloin, kun nuorten sosiaalinen vuorovaikutus tapahtuu perinteisesti internetin ulkopuolella ja toisaalta internetin verkkoyhteisöissä.

Väitöstutkimus on tehty osana *Rahapeliongelmat ja verkkoyhteisöt: Sosiaalipsykologinen tutkimus nuorten toiminnasta sosiaalisen median peliyhteisöissä* -tutkimushanketta. Hankkeessa tutkittiin 15–25 vuotiaiden nuorten sosiaalisia suhteita, hyvinvointia, sosiaalisen median käyttöä, rahapelaamista ja muita addiktiokäyttäytymisen muotoja. Tutkimusaineistona käytetään hankkeen keräämää kansainvälistä kyselyaineistoa Suomesta (N = 1200), Yhdysvalloista (N = 1212), Etelä-Koreasta (N = 1192) ja Espanjasta (N = 1212). Tutkimustulosten mukaan vahva kuuluminen internetin ulkopuoliseen kaveriporukkaan on yhteydessä nuorten liialliseen alkoholinkäyttöön. Liiallinen huumeiden käyttö, rahapeliongelmat ja pakonomainen internetin käyttö ovat yhteydessä heikentyneeseen kaveriporukkaan kuulumiseen. Kaikki tarkastellut addiktiot ovat yhteydessä voimakkaampaan henkiseen pahoinvointiin, mutta liiallisesti alkoholia käyttävillä nuorilla vahvat sosiaaliset suhteet voivat suojata henkiseltä pahoinvoinnilta. Vahva identifioituminen verkkoyhteisöön sekä rahapeliaiheisten normien seuraaminen internetissä ovat mahdollisia riskitekijöitä nuorten rahapeliongelmille. Lisäksi tutkimustulokset osoittavat, että ne nuoret, jotka kokevat itsensä yksinäisiksi ovat todennäköisimpiä pakonomaisia internetin käyttäjiä. Tutkimus huomioi monipuolisesti,

kuinka nuorten addiktiokäyttäytymisen eri muodot ovat kytköksissä sosiaalisiin suhteisiin internetissä ja sosiaalisessa mediassa ja näiden ulkopuolella. Tunnistamalla sosiaalipsykologisten tekijöiden yhteyksiä nuorten addiktioihin voidaan edistää addiktioita ennaltaehkäisevää ja kuntouttavaa työtä.

Avainsanat: Addiktio, liiallinen alkoholinkäyttö, liiallinen huumeiden käyttö, rahapeliongelmat, pakonomainen internetin käyttö, sosiaaliset suhteet, sosiaalinen tuki, yksinäisyys, nuoret

CONTENTS

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ABBREVIATIONS

APA	American Psychiatric Association
AUDIT-C	Alcohol Use Disorders Identification Test -Consumption
CIUS	Compulsive Internet Use Scale
EIS	Eysenck Impulsivity Scale
GHQ-12	General Health Questionnaire
IA	Internet Addiction
PIU	Problematic Internet Use
RQ	Research question
SISE	Single-Item Self-Esteem Scale
SIT	Social Identity Theory
SOGS	South Oaks Gambling Screen

ORIGINAL PUBLICATIONS

Publication I Savolainen, I., Kaakinen, M., Sirola, S., & Oksanen, A. (2018). Addictive behaviors and psychological distress among adolescents and emerging adults: A mediating role of peer group identification. *Addictive Behaviors Reports*, *7*, 75–81. https://doi.org/10.1016/j.abrep.2018.03.002

Publication II Savolainen, I., Sirola, S., Kaakinen, M., & Oksanen, A. (2019). Peer group identification as determinant of youth behavior and the role of perceived social support in problem gambling. *Journal of Gambling Studies*, *35*(1), 15–30. https://doi.org/10.1007/s10899-018-9813-8

Publication III Savolainen, I., Oksanen, A., Kaakinen, M., Sirola, S., & Paek, H.-J. (2020). The role of perceived loneliness in youth addictive behaviors: Cross-national survey study. *JMIR Mental Health*, *7*(1), e14035. https://doi.org/10.2196/14035

Publication IV Savolainen, I., Oksanen, A., Kaakinen, M., Sirola, S., Zych, I., & Paek, H.-J. The role of online group norms and social identity in youth problem gambling. Manuscript submitted for publication.

1 INTRODUCTION

Addiction has been part of the human experience throughout history. Today, *addiction* is a commonplace term that is abundantly and even lightheartedly used in everyday life discussions. However, addiction is an abstract concept and can actualize in many ways, making addiction challenging to define. Generally, addiction is described as a brain disease manifested in compulsive behavior such as substance use, despite its harmful consequences (American Psychiatric Association [APA], 2017). An addict is someone who needs to consume their drug of choice in order to maintain normal physiological functioning (West, 2006). Addiction is largely understood as substance use and abuse, but in reality, a person can become addicted to a variety of activities and behaviors (Orford, 2001a, 2001b). Regardless of its form, addiction is a complex disorder. It makes changes to the brain and can impact all areas of normal human functioning, which is why quitting or changing the addictive behavior can become very difficult to the affected individual (National Institute on Drug Abuse [NIDA], 2018). While the brain is a crucial part of explaining addiction, it cannot be viewed only as a disease of the brain (Volkow et al., 2016). Indeed, the shortcoming of brain-based theories of addiction is that they disregard individual and human factors, which are essential aspects of human behavior (Reinarman & Granfield, 2014). Humans are, first and foremost, social organisms that operate in larger social structures. Thus, they are inevitably influenced by these social structures and the interactions therein.

Social scientific theories have been utilized to some extent to study addiction over the past decades. However, they have not been applied to their fullest potential in efforts to investigate and explain addictive behaviors. This is largely because addiction is traditionally viewed as a problem of the individual, whether biological, cognitive, or behavioral (Saunders & Robinson, 2013; Swendsen & Le Moal, 2011). Yet, at its heart, addiction is a social problem, which highlights the necessity of applying social psychological theory to the study of addiction. Social psychology, in its essence, is the scientific study of people influencing other people. Through its theories, social psychology is aimed at explaining how individuals' thoughts, feelings, and behaviors are influenced by the implied, imagined, or actual presence of other

individuals (Fiske, 2018). It is thus reasonable that addictive behaviors do not develop solely in the individual but are interrelated with the individual's social contexts and processes. Emergent research from the past decade has utilized this social scientific approach and provided promising results, suggesting that when individuals seek health behavioral models or change their behavior, they often do so by joining with similar others. In other words, social psychological operations occur when people make decisions about their behaviors (Buckingham & Best, 2016).

Addictive behaviors among adolescents and young adults are a persistent societal and global challenge (Arnett, 2005). The years pertaining to adolescence (approximately 13–17 years of age) and young adulthood (approximately 18–25 years of age) are important and sensitive time periods in human development. During these years, youth go through many biological and physical changes as well as psychosocial developments (Albert et al., 2013; Van Petegem et al., 2012). Simultaneously, young people begin to separate and gain independence from their family, become increasingly autonomous, and explore different identities and ways to express themselves (Beyers & Goossens, 1999; Dasen, 2000; Soenens et al., 2005). As independence from the family setting increases, the importance of peer groups and relations also becomes heightened (Steinberg & Morris, 2001). Given all of these simultaneous changes and developments that young individuals go through, the years of adolescence and young adulthood have become known as times of uncertainty and distress (Arnett, 1999; Ayman-Nolley & Taira, 2000). This is also manifested in how youth behave and interact with others. Importantly, youth are highly influenced by their peers. They seek peers' approval and value peers' opinions when making judgments and decisions concerning themselves and their activities (Steinberg & Morris, 2001). Youth routinely participate in behaviors they find daring and exciting, many of which can be dangerous and have detrimental consequences. Youth are also more vulnerable to engaging in behavior patterns that can develop into addictions, such as alcohol use or gambling. While most youth behaviors can be credited to experimenting and are only present during the younger years, research has found that many lifelong addictive behaviors are initiated during adolescence and young adulthood (Arnett, 2005; Merikangas & McClair, 2012). Together, these findings highlight the importance of further studying the social factors behind addictions originating during youth.

The patterns of human development are inherently and strikingly diverse throughout different cultures worldwide. Each culture has its own values and norms through which youth learn to think about life. How youth are brought up and socialized in different cultural contexts inevitably influences their beliefs, behaviors,

and social interactions (Arnett & Jensen Arnett, 2010). This is also reflected in how youth engage in normative and addictive behaviors in different countries. Nevertheless, the fact that youth addictive behaviors are recognized as a global phenomenon suggests that at least some underlying factors behind youth developing and subsequently engaging in harmful behaviors are universal.

The aim of this dissertation is to investigate what key social psychological factors are related to different addictive behaviors of youth. An additional aim is to examine these relationships in a broader cross-national context. This was achieved by conducting four empirical studies examining a range of addictive behaviors. The studies focus on young individuals between 15 and 25 years of age in Finland, the United States, South Korea, and Spain. Together, the studies examine the social psychological concepts of social identity, support, loneliness, and social norms in relation to excessive alcohol use, excessive drug use, problem gambling, and compulsive Internet use. The Internet and modern technology have rapidly changed the world and how youth form and maintain peer relationships (Kaakinen et al., 2020; Keipi et al., 2016; Kushlev et al., 2017). Consequently, the overall structure of youths' social life has transformed significantly in a relatively short amount of time. That is why this research involves investigating the influences of both traditional peer relationships of youth and peer relationships formed online on addictive behaviors. As a result, this dissertation offers a comprehensive social psychological and cross-national investigation of the persistent issue of youth addiction.

2 YOUTH AND ADDICTIVE BEHAVIORS

2.1 Youth, the importance of peer relationships, and addiction

Over the past century, adolescence and young adulthood have been the time periods of interest for many researchers investigating human development (e.g., Arnett, 2006; Dasen, 2000; Erikson, 1968; Hall, 1904). Variations between nations and contexts exist concerning how age groups are defined, but the years generally referred to as *youth* (United Nations, 1981) typically include late adolescence (14- to 17-year-olds) and young, or emerging, adulthood (18- to 25-year-olds; Modecki, 2008; Steinberg, 2008; Stroud et al., 2015). The time period of youth has been also classically described as a time of storm, stress, and turmoil (Arnett, 1999; Ayman-Nolley & Taira, 2000; Erikson, 1968; Marcia, 1980). Youth is a developmentally sensitive time period because young individuals go through many biological, physical, and psychosocial changes during these years (Arnett, 2006; Côté, 2009; Furlong, 2012; Kroger et al., 2010; Viner et al., 2012). These changes often manifest themselves in fluctuations in mood, conflicts with family relationships, and new sets of behaviors. Notably, adolescence and young adulthood are not inherently times of difficulty, but puberty, brain development, and hormonal changes can trigger behaviors that are often considered problematic, which might, in part, explain dysfunction and maladaptation in youth (Jessor et al., 1991; Steinberg & Morris, 2001). Research on youth behavior and its risk and protective factors has been extensive and has greatly focused on reducing risk and problem behavior (Viner et al., 2012). However, adolescence and young adulthood still persist as time periods when many problematic and addictive behaviors initiate, posing serious and long-lasting public health threats and causing continuous economic burden to society.

During the adolescent and young adulthood years, young individuals begin to gain independence, have more autonomy in the family context, and place increased importance on their peer relationships (Steinberg & Morris, 2001; Tarrant, 2002). Youth is also a time of heightened identity exploration (Arnett, 2000). Through different peer groups, youth can try out various life possibilities and solve identity conflicts and confusion related to their maturation and increased independence (Arnett, 2000; Buckingham, 2008; Helve & Bynner, 2007). The increased importance

of peer groups is a significant part of healthy social development, but it also creates new vulnerabilities. This is especially evident in youth behavior because young individuals are motivated to alter their own behavior in accordance with that of their peers (Steinberg & Monahan, 2009). Youth learn and copy both positive and negative skills and behaviors from their peers. For instance, youth learn prosocial skills from peer interactions (van Hoorn et al., 2016), and peer influence can have a positive impact on academic achievement (Altermatt & Pomerantz, 2005). Similarly, youths can adapt harmful or delinquent behavior models and addictive behaviors such as substance use from their peers (Simons-Morton & Chen, 2006; Trucco et al., 2011). Indeed, research indicates that peer influence is among the most powerful and consistent predictors of youth alcohol drinking (Leung et al., 2014; McCabe et al., 2018), cigarette smoking (Mercken et al., 2010), and drug use (Tucker et al., 2014). There is a strong notion that addictive behaviors are transmitted through peer influence, and young individuals are especially susceptible to experimenting with and adapting harmful behaviors. Because their need to fit in with the crowd is strong, youth seek new experiences and may perceive these new activities as "cool" or exciting. At the same time, today's modern and technologically advanced world has brought forth new types of challenges such as increased virtual interaction, which are highly noticeable in youth relationships and behavior.

With the emergence and penetration of the Internet, social media, and advanced technology, youth have come to spend significantly large amounts of time online. This has greatly affected the traditional structure of youths' social life. Consequently, an ever-increasing amount of customary face-to-face (i.e., offline) interactions are now accomplished online (Kushlev et al., 2017; Smahel et al., 2012; Valkenburg & Peter, 2011). Online groups and communities offer youths new ways of building friendships and seeking like-minded others. Research shows that just like traditional offline relationships, those constructed online can have many benefits for a young individual such as providing support, information, and knowledge (Brandtzæg, 2012; Grieve et al., 2013; O'Keeffe & Clarke-Pearson, 2011; Reinecke & Trepte, 2014). The Internet and its social features also offer young individuals new means through which to construct their individual and social identities because online groups and communities provide similar experiences of belonging and connectivity as those offline (Buckingham, 2008; Jans et al., 2015; Keipi et al., 2016; Lehdonvirta & Räsänen, 2011; Mikal et al., 2016). However, just like the influences of traditional offline peer groups, which can be either positive or negative, the outcomes of online networking and socializing are not only positive. Peer groups formed online might be qualitatively different from those formed offline, influencing youth behavior and

states of mind in unforeseen ways. Research on online networking and communities thus far has associated their use with depression, lower self-esteem, decreased academic achievement, poor sleep quality, and cyber-bullying (e.g., Kuss & Griffiths, 2011; Lin et al., 2016; Tsimtsiou et al., 2017; Woods & Scott, 2016). Moreover, Internet use itself can pose challenges to young users and become compulsive due to constant access, the unlimited amount of content and features like social media, and other engaging activities such as gaming and gambling (Canale et al., 2016; Meerkerk et al., 2009; Sirola et al., 2020; Van Den Eijnden et al., 2016; Van Rooij et al., 2010). Notwithstanding the huge achievements and success that the Internet and technology have brought to people, they have also created new types of problems and addictive behaviors, of which many are manifesting among youth.

It is necessary to continue investigating the complex lives of adolescents and young adults in order to further advance our knowledge about what aspects of social relationships might be key factors in addiction and how the modern context influences the associations between youths' peer relationships and addictive behaviors. This research thus investigates addictive behaviors among youth within a social context by considering both traditional offline peer relationships and those constructed online. In the subsections that follow, I will describe in more detail the four addictive behaviors included in this research: alcohol use, illicit drug use, gambling, and Internet use.

There is a wide range of and inconsistencies in terminology when discussing and researching addiction and addictive behaviors. This dissertation considers alcohol and drug addiction in terms of excessive behaviors (i.e., *excessive* alcohol use and *excessive* drug use), as suggested by Orford (2001a, 2001b). This terminology is used because it is broader than the traditional definition of addiction and not restricted to certain measurements. However, addiction as excessive behavior still involves the core elements associated with addiction such as skewed consumption, loss of self-control, rapid reward, and conflict (Orford, 2001a). Gambling addiction is considered and discussed in this research as excessive gambling (Study I) and *problem gambling* (Neal et al., 2005). Problem gambling assumes varying degrees of severity (e.g., at-risk, mild, or severe) and captures all of the central elements present in nearly all other definitions, including difficulties in limiting the amount of time and money spent on gambling and negative consequences to the gamblers themselves, people around them, and the community (Neal et al., 2005; Williams et al., 2012). The term *compulsive Internet use* is applied when investigating Internet use as an addictive behavior. This term is more universal than other competing terms such as problematic Internet use (PIU) and acknowledges that an individual does not

become addicted to the Internet per se but to the various activities within (Meerkerk et al., 2009).

2.2 Excessive alcohol use

Recent research findings show that youth alcohol use has declined over the past decade worldwide (e.g., Oldham et al., 2018; Raitasalo et al., 2016; Raninen et al., 2014). While these findings suggest a positive trend in youth drinking culture, alcohol is still the most common psychoactive substance used and abused during adolescence (The European Monitoring Centre for Drugs and Drug Addiction [EMCDDA] & The European School Survey Project on Alcohol and Other Drugs [ESPAD], 2016; Inchley et al., 2018; Patrick & Schulenberg, 2014). Alcohol use is typically initiated between the ages 12 and 16 and then escalates through the adolescent and young adulthood years (Inchley et al., 2018). Young individuals perceive alcohol to be easily available, which might be one of the reasons for its continued consumption and popularity among youth (EMCDDA & ESPAD, 2016; Fairman et al., 2020; Foster et al., 2017; Livingston et al., 2007). Nearly 80% of the students surveyed in the most recent ESPAD study reported that they would be able to obtain alcohol if they wanted to (EMCDDA & ESPAD, 2016). The study also found that almost half (47%) of European 15- to 16-year-old students had used alcohol at least once during their life, and 13% reported having been drunk during the last month. Youth alcohol consumption is also widespread in the United States. According to the National Institute on Alcohol Abuse and Alcoholism (NIAAA, 2020), young individuals between the ages 12 through 20 years drink 11% of all alcohol consumed in the country. Overall, youth consume alcohol less often than adults do, but they drink greater volumes at once during their drinking sessions. This type of heavy episodic drinking is a very common drinking habit among youth. Drinking alcohol in general and heavy episodic drinking become more prevalent as young people get older, and the heaviest drinking takes place among youths between 15 and 19 years of age (Jernigan et al., 2017; NIAAA, 2020).

While age is a significant factor in youth drinking behavior, additional correlates of youth drinking and excessive drinking have been identified, including gender, culture, personality traits, and genes (Erevik et al., 2017; Patrick & Schulenberg, 2014). Moreover, many reasons for drinking alcohol are innately social. As discussed in section titled Youth, the importance of peer relationships, and addiction, youth are highly influenced by their peers. This is also evident in their drinking behavior.

Youth mainly have positive perceived expectancies about alcohol use, and they use alcohol to accomplish social relationships and fulfill personal needs (Sancho et al., 2011; Sieving et al., 2000). Alcohol use is expected to initiate new peer relationships and enhance existing contacts with peers (Inchley et al., 2018). Past research findings support this notion. For example, Boman and colleagues (2013) found that engaging in heavy drinking behavior together with peers strengthened friendships among drinking youths. Similarly, Stogner et al. (2015) concluded that adolescents with similar drinking patterns perceived the quality of their friendships to be higher.

Despite its perceived social benefits, excessive alcohol use has serious consequences that affect physical health, mental well-being, and social functioning alike. The consequences can be short-term and occur while the young person is still under the influence of alcohol, or they can be long-term and become evident only after months or years of excessive alcohol use (Brown & Tapert, 2004; Mitchell et al., 2013). The short-term consequences of excessive drinking are typically related to intoxication and lowered inhibition, which can lead to other risky behaviors such as drunk driving and result in accidents and injury (Luk et al., 2016; NIAAA, 2020). Excessive drinking can also lead to memory blackouts and alcohol poisoning (White & Hingson, 2013). The serious long-term consequences of excessive drinking include alcohol's impacts on youth brain development. Research has systematically shown that repeated and excessive alcohol use during youth leads to alterations to brain structures and function (Brown & Tapert, 2004; Feldstein, et al., 2014; Welch et al., 2013). Relatedly, adolescent alcohol involvement has been associated with learning disabilities, mental health issues such as depression and suicide, and heavy drinking episodes and alcohol dependence later in life (Aiken et al., 2018; Patrick et al., 2020; Swahn et al., 2010). Excessive drinking during one's high school years specifically is correlated with alcohol disorders in adulthood (Patrick & Schulenberg, 2014).

In addition, excessive alcohol use can damage youths' social life. Alcohol intoxication leads to impaired judgment, which can result in fights with peers, delinquency, or unwanted sexual behaviors and infections (Staton et al., 1999; Tapert et al., 2001). Prolonged alcohol use may further lead to lowered school performance or dropping out, conflicts with family members, running away from home, and homelessness (O'Malley et al., 1998; Schulenberg & Patrick, 2012). To reiterate, excessive alcohol use initiated at an early age has dire consequences to the individual, ranging from damaged health to injuries and from psychological harms to dependence and even death (McCambridge et al., 2011). However, alcohol-related

consequences are not only felt at the individual level but impact societies at large, emphasizing the need for additional research on excessive alcohol use among youth.

2.3 Excessive drug use

This dissertation also investigates illicit drug use as a youth addictive behavior. Like alcohol use, experimentation with illicit drugs and habitual drug use typically begin in adolescence and young adulthood (Arnett, 2005; Mitchell et al., 2013; Moss et al., 2014). According to a review study by LeNoue and Riggs (2016), about 80% of illicit drug users begin using drugs during adolescence. While alcohol is the most popular psychoactive substance used by adolescents and young adults, illicit drug use is also common among youth (EMCDDA & ESPAD, 2016). About 2% of teenagers included in the ESPAD (2016) study had used an illicit drug other than marijuana at least once in their life, and 4% reported having lifetime experience with psychoactive substances. Data from the National Survey on Drug Use and Health report that nearly 5,000,000 young people (6.3%) between the ages 12 and 17 in the United States had used some illicit drug in the past year (Substance Abuse and Mental Health Services Administration [SAMHSA], 2013).

There are numerous reasons why adolescents and young adults first choose to try illicit drugs and continue taking them. Often, youth illicit drug use is attributable to adolescence and young adulthood because these are times when impulsivity and sensation seeking are heightened (Romer, 2010). Thus, youth are motivated to experiment with and find new experiences they consider exciting or daring (Romer, 2010). For many teenagers, the decision to use illicit drugs is social, and their drug use begins as a way to fit in. In fact, youths rarely use illicit drugs without peer influence, and friends usually introduce these drugs to one another (Bahr et al., 2005). Congruently, adolescents often misperceive the frequency of peers' illicit drug use (NIDA, 2014), which might lead to increased drug use among adolescents and further extend the problem. Other significant social influences on youth illicit drug use include parental attitudes toward drugs and having a sibling who is a user (Bahr et al., 2005). Additional reasons for young individuals to use illicit drugs include attempts to feel good (i.e., to chemically induce the feeling of euphoria), to feel better (e.g., alleviate stress or anxiety), and to do better (e.g., enhance one's academic or sports performance through stimulants; NIDA, 2014).

The most widely used illicit drug among adolescents is marijuana, although adolescents also markedly experiment with other illicit drugs (EMCDDA & ESPAD,

2016; Johnston et al., 2018; SAMHSA, 2014). Approximately 16% of European students had used cannabis at least once in their life, with the equivalent figure being 23% among 12th-graders in the United States (EMCDDA & ESPAD, 2016; Johnston et al., 2018). A significant factor in the popularity of marijuana is its availability. About 30% of respondents to the ESPAD (2016) reported that cannabis is easily attainable. Likewise, nearly half (48.6%) of 12- to 17-year-olds in the United States reported that it would be "fairly easy" or "very easy" for them to obtain marijuana if they wanted to (SAMHSA, 2014). Beliefs and attitudes also have been identified as important factors in explaining current trends in both licit and illicit drug use, and youths' attitudes toward cannabis use in particular have experienced a notable shift. Accordingly, youths express attitudes toward experimenting with cannabis that are more liberal, perceive marijuana to be less risky than other substances, and underestimate the harms involved in cannabis use (Debnam et al., 2018; Guttmannova et al., 2019; Johnston et al., 2018; Miech et al., 2017; Nock et al., 2017; Raitasalo et al., 2016).

Experimenting with illicit drugs and excessive drug use have detrimental consequences that can affect the user's life comprehensively. Even though illicit drugs vary in the level of harm they bring (Nutt et al., 2010), excessive drug use is generally associated with numerous harms. These include physical health problems (Centers for Disease Control and Prevention, 2018b), damaged social relationships (Mallett et al., 2005), increased likelihood of accidents and criminal activities (Bennett et al., 2008; Pierce et al., 2017), and decreased socioeconomic achievement in young adulthood (Broman, 2009). Young illicit drug users tend to show lower cognitive skills and are more likely to develop further addictions or psychiatric disorders later in life (Indlekofer et al., 2009; Lisdahl et al., 2013). Ultimately, illicit drug use disrupts the brain's neurodevelopmental processes and particularly affect the brain's motivational circuitry, influencing decision-making and making it harder to stop taking the drug (Lisdahl et al., 2013; NIDA, 2018). Subsequently, the potential to develop a lasting addiction to illicit drugs is high. Considering the significant costs of substance use and abuse to societies and the comprehensive impacts that illicit drugs have on individuals, it is imperative to intervene in excessive substance use issues as early as possible.

2.4 Problem gambling

Gambling is commonly defined as an activity such as playing games in which something of value (usually money) is placed at risk, with the expectation that something of a greater value will be gained (Potenza et al., 2002). Playing games of chance in casinos, placing bets at sporting events, or playing the lottery are among typical forms of gambling. The availability of gambling opportunities has increased considerably over the last decades (Canale et al., 2016; Orford, 2010). A major culprit in this growth of gambling practices is technology (Gainsbury et al., 2015; Griffiths, 1999; Shaffer, 1996). The development of computers and other forms of advanced technology as well as the expansion of the Internet have allowed gambling industries to maximize their markets and offer betting opportunities through various online services on a range of devices (Gainsbury, 2015; Griffiths & Parke, 2002). Indeed, modern technology allows people to participate in gambling activities through not only computers but also smartphones, tablets, and digital televisions (Gainsbury, 2015). Concurrently, young individuals are the most active Internet users, and a majority of youths have access to these devices, especially smartphones (Anderson & Jiang, 2018). These developments in technology and gambling practices have made gambling widely accessible to young populations (Blinn-Pike et al., 2010). Even underage individuals are able to access gambling sites and platforms, even though gambling is illegal for minors in most countries (Canale et al., 2016; Cantell et al., 2018; European Casino Association, 2017). Bypassing age restrictions is easy on many international gambling sites, with little or no regulations. Notably, research has found that young problem gamblers are more susceptible to online gambling (Calado et al., 2016).

Not only is online gambling accessible, but young individuals also tend to have naïve perceptions about gambling online. Mainly, they find it entertaining and find placing bets to be easy, exciting, pleasurable, and stimulating, with a chance to make money. At the same time, youth fail to recognize the high risks involved in gambling (Derevensky & Gilbeau, 2015; Hume & Mort, 2011). Recent research and prevalence statistics (e.g., ESPAD, 2016; Molinaro et al., 2014; Orford, 2010; Spångberg & Svensson, 2020; Volberg et al., 2010; Welte et al., 2015) have noted that both at-risk gambling and problem gambling by youth is a growing international public health concern. According to the ESPAD (2016) report, 14% of students aged 15 to 16 years old reported having gambled during the last year, and 7% of them identified as being frequent gamblers. A systematic review of past problem-gambling prevalence

studies found that 0.2–12% of adolescents and young adults between 11 and 24 years of age qualified as problem gamblers worldwide (Calado et al., 2016).

The availability of gambling, while central, is not the only determinant and risk factor for youth gambling. Rather, gambling behavior is a result of complex interplaying factors, and problem gambling should be considered from multiple perspectives (Messerlian et al., 2005). Research on problem gambling so far has identified that intrapersonal factors such as individual characteristics (e.g., self-esteem, risk-taking tendency), personality traits (e.g., impulsivity), attitudes, and beliefs influence youths' intention to gamble (Dickson-Gillespie et al., 2008; Gupta & Derevensky, 2008; Lussier et al., 2014). Additional interpersonal determinants include social networks and support systems, mainly family and peers (Lussier et al., 2014; McComb & Sabiston, 2010). These systems provide youths with means for social identity and support, which accentuates the role of family and peers in providing examples of and attitudes toward gambling. In addition, family or peer conflict influences youth gambling behavior (Hardoon et al., 2002; Hardoon et al., 2004; Messerlian et al., 2005).

Like other behaviors that entail risk, gambling can be also practiced as a recreational activity in a safe and healthy manner. This entails making well-informed choices and weighing the probabilities of winning and losing in a way that minimizes one's personal financial risk (Dickson-Gillespie et al., 2008). However, due to gambling's addictive nature, it can become difficult to control the amount of time and money spent on gambling (Orford, 2001a). This can result in increased distress and feelings of shame and guilt (Raisamo et al., 2020). Young at-risk or problem gamblers can experience a variety of gambling-related harms, including conflicts in social relationships, disruptions in their daily rhythm, disruptions at school or work, and financial losses and troubles (Oksanen et al., 2018; Raisamo et al., 2013; Raisamo et al., 2020; Splevins et al., 2010). Furthermore, problem gambling is commonly comorbid with increased substance use (Brunelle et al., 2012), depression (Potenza et al., 2011), and psychotic and internalizing disorders (Desai & Potenza, 2009). Adolescents and young adults are particularly vulnerable to the risks and harms of gambling. Due to the extensive harms and long-term consequences associated with problem gambling, I am interested in investigating various social mechanisms that may be involved in transmitting and normalizing gambling behavior among youth.

2.5 Compulsive Internet use

In recent decades, the Internet has become a central part of people's lives and has dramatically shaped the way people connect, interact, and share information with others. In 2019, there were over 4 billion Internet users worldwide (Statista Research Department, 2020c). Internet use rates are predominantly high among adolescents and young adults (Eurostat, 2020; Gómez et al., 2017; Statista Research Department, 2019e). Although it is used for numerous purposes, many youths browse the Internet, particularly with their smartphones, to pass time and connect with other people through various social media platforms (Schaeffer, 2019). The Internet is essential in many ways and offers immense benefits to individuals and societies at large, but its use can become uncontrolled and compulsive, leading to unwanted and detrimental consequences for users. However, compulsive Internet use detection and intervention present challenges because smartphones and other modern devices make the Internet always accessible. Indeed, students in the ESPAD (2016) study reported that they used the Internet on approximately 6 of the past 7 days, and according to Anderson and Jiang (2018), 45% of American youths ages 13–17 reported that they are online almost constantly. However, these figures might be higher, as people might not always recognize that many regular activities in which they engage on their mobile devices count as Internet use. Yao and Zhong (2014) estimated that average Internet users might spend as much time online as offline.

Assessing prevalence rates and studying compulsive Internet use is challenging because there is no clear consensus in terminology or measurement for heavy Internet use. Rather, it has been investigated in previous research under such terms as Internet addiction (IA), PIU, compulsive Internet use, excessive Internet use, and uncontrolled Internet use (Ciarrochi et al., 2016; Cheng & Li, 2014; Dhir et al., 2015; Durkee et al., 2016; Kuss et al., 2014; Ryding et al., 2018; Sinkkonen et al., 2014; Thorsteinsson & Davey, 2014). Regardless of the terms and measures used, studies on heavy Internet use have been systematic in their findings and have shown that young individuals, particularly adolescents, are likely to use the Internet compulsively and are vulnerable to becoming addicted to such use (Dhir et al., 2015; Kuss et al., 2014). They are also more susceptible to the negative consequences of compulsive Internet use, which is associated with many psychological issues, such as increased distress (van den Eijnden et al., 2008) and the pressure of having to continue using the Internet (e.g., to get likes and comments on posts), feelings of inadequacy (Jiang, 2018), poor mental health (Ciarrochi et al., 2016), and depression (Durkee et al., 2016; Ha et al., 2007). Additional harmful consequences include effects on physical

health, such as disrupted sleep and poor diet, and effects on social functioning, such as lessened face-to-face interaction and poor academic performance (Anderson et al., 2017). It was of great interest to include an investigation of compulsive Internet use in this dissertation. Internet use can be highly addictive to young users, and even though people typically engage in Internet use alone, it can be considered a social activity. Therefore, it is fruitful to investigate compulsive Internet use as an addictive behavior from a social psychological viewpoint.

3 SOCIAL PSYCHOLOGICAL APPROACH TO ADDICTION

This dissertation investigates the addictive behaviors of youth from a social psychological perspective. This is established by using the social identity, social support, and norms theories, as well as a social psychological model of loneliness, as a framework. In this section, I introduce these major social psychological theories in more detail.

3.1 Social identity theory

Studying groups and group formation has been a key interest of social psychological research tradition for decades. Sherif et al.'s (1961) original experimental studies on group behavior in boys' summer camps established that people form groups naturally, quickly, and even on a minimal basis. Following in Sherif's footsteps, Tajfel et al. (1971) performed a series of experiments on intergroup behavior and found that individuals quickly begin to favor and identify with their own group and aim to achieve a difference between the in-group and the out-group. These findings led to the formation of social identity theory (SIT) by Tajfel and Turner (1979). SIT describes the psychological nature of group formation and proposes that an individual's identity is partly determined by his or her connectedness to desired social groups (Tajfel & Turner, 1979). An important part of SIT is self-categorization theory (Turner, 1985), which posits that individuals define their own memberships in social groups cognitively and describe themselves through group identity (Trepte & Loy, 2017; Turner et al., 1994). Overall, SIT offers a social psychological perspective on how people categorize themselves into various groups (Ashfort & Mael, 1989). These groups can be defined by their members' common characteristics, such as age, gender, organizational membership, or religious affiliation (Ashfort & Mael, 1989; Trepte & Loy, 2017; Turner, 1985). Social categorization of the self is advantageous for individuals because it allows them to cognitively separate and rationally order their surrounding social environment. When individuals categorize themselves as members of a specific group, this group is

henceforth perceived as the *in-group*, and its other members are recognized as affiliates. At the same time, comparison groups are identified. These are known as *out-groups*, and the in-group's value is typically measured and assessed against such perceived out-groups (Haslam et al., 2000; Tajfel & Turner, 1986). Identifying oneself as part of a group comprising similar others and being a member of an in-group offer many benefits to individuals, including positive identity development, social support, and a sense of belonging and fitting in (Tajfel & Turner, 1979).

As discussed in Section Youth, the importance of peer relationships, and addiction, peer groups have heightened importance to adolescents and young adults, and young individuals spend a substantial amount of time with their peers (Tarrant, 2002). During these developmental times, youth construct identities through their peer groups, and this becomes increasingly important because peer group identification provides a means of coping with the uncertainty inherent in adolescence and resolving possible identity conflicts (Helve & Bynner, 2007; Marcia, 1980; Ragelienė, 2016; Rubin et al., 2006). The sense of identity that youth derive from peers is also an important motivating factor in intergroup behavior (Tajfel & Turner, 1986). Collective identity can encourage many behaviors, including various positive and prosocial behaviors. However, social identity can have a negative influence on behavior, as it can promote and justify harmful, destructive, or even delinquent behaviors (Merrilees et al., 2013). Consequently, SIT has been utilized successfully in previous studies to investigate the role SIT has in health and addictive behaviors among various populations (e.g., Best et al., 2018; Buckingham et al., 2013; Dingle et al., 2019; Frings & Albery, 2015; Mawson et al., 2015; Rinker & Neighbors, 2014).

Overall, previous studies found support for the notion that a shift in one's social identity can facilitate addiction or other harmful behavior, as well as maintain addiction (Bathish et al., 2017; Beckwith et al., 2015; Best et al., 2016; Dingle et al., 2015; Dongle, Stark et al., 2015). At the same time, the opposite can be true: a shift in one's social identity can facilitate a way out of addiction. Buckingham et al. (2013) investigated whether social identity and self-categorization have a positive impact on health when recovering from addiction. By recruiting participants from the Alcoholics Anonymous and Narcotics Anonymous groups, they evaluated participants' journey to recovery in terms of social identity shift. In the study's premise, participants reported preferring either an "addict" or a "recovering addict" identity. Those participants who shifted in their identity and categorized themselves as "recovering addicts" through other Alcoholics Anonymous or Narcotics Anonymous members had higher self-efficacy levels and lower relapse levels

(Buckingham et al., 2013). Similarly, Mawson et al. (2015) concluded that, among a group of in-treatment substance use patients, strong identification with non-using groups was associated with lower substance use and higher recovery resources. Such results have implications in terms of building recovery resources, as well as maintaining treatment motivation and post-treatment results (Mawson et al., 2015). These results were further supported by Frings and Albery (2015), who developed the social identity model of cessation maintenance, which denotes that group therapy can be particularly helpful to addicted individuals because it offers them a context for social identity and related group processes through which recovery and maintenance of cessation can be achieved.

3.2 Social norms

Another mechanism closely tied to social identity is that of social norms. Social norms are a broad concept, but they can be essentially defined as the rules and standards implicit to group members (Cialdini & Trost, 1998; Reno et al., 1993; Sherif, 1936). The basic function of social norms is to regulate group members' actions in terms of expected and even ideal behavior (Asch, 1956; Sherif, 1961). Sherif (1936) tested the existence of social norms experimentally in terms of autokinetic effect and the convergence of judgments, and Schachter and Hall (1952) tested it in the context of reactions to deviations. Once individuals establish social identity with a desired group, they are more motivated to follow the group's observed normative behaviors, or social norms (Turner, 1991). Because people are social beings, human behavior is highly influenced by perceptions of how others think and act (Perkins & Berkowitz, 1986). Social psychological researchers have studied the role and meaning of social norms for people since Sherif's original experiments (Asch, 1956; Campbell, 1976; Cialdini & Trost, 1998; Festinger, 1954; Sherif, 1936; Opp, 1982). The extensive body of research on social norms suggests that following in-group norms provides social validation to individuals, reinforces societal values, rewards individuals, and is essential from the practical and survival perspectives.

Social norms result from individuals' interactions and are tied to socialization and cultural contexts (Bicchieri et al., 2011). Consequently, cultural variations illustrate variations in frames of reference to different groups. Countries differ not only in their cultural norms, but also in the extent to which norms are reinforced. Some countries are more stringent about what constitutes socially expected and appropriate behavior, whereas others have more relaxed social norms, and breaking

them does not incur considerable cost (Triandis, 1995). Following group norms is usually discussed in connection with *conformity*, which refers to the psychological process of shifting one's stance to match that of others. This can be afflicting to individuals, but they are still motivated to do so to gain approval or make judgments that are appropriate in the eyes of other group members (Cialdini & Trost, 1998; Deutsch & Gerard, 1955). Norms influence individuals' thoughts and behaviors, and researchers have established several linkages between norm conformity and health behavior. Youths are particularly susceptible to their peers' social norms, and this can lead to many unwanted and harmful behavior patterns—especially because people's perceptions of others' behavior are often inaccurate (Opp, 1982). For example, young individuals tend to overestimate their peers' substance use, which is associated with increased substance use among those youths (e.g., Bertholet et al., 2013; Pape, 2012; Sanders et al., 2013).

Social norms and conformity have been utilized in recent research relating to youths' problematic and addictive behaviors. Neighbors et al. (2007) found that conforming to both descriptive (i.e., perceived) and injunctive (i.e., expected) norms predicted drinking behavior among college students. Rinker and Neighbors (2014) confirmed these findings by employing social norms theory and SIT to examine college students' drinking behavior. They found that students who identified more strongly with their university's student body were more likely to follow the perceived social norms and engage in excessive drinking. These results provided additional validation for the authors' notion that young individuals make (detrimental) behavioral decisions on the basis of perceived social norms (Rinker & Neighbors, 2014). In a similar study, Foster et al. (2014) evaluated perceived norms and social influences on gambling behavior among college students. They found that students who reported identifying highly with other gamblers perceived that they spent normal amounts of time gambling and believed they spent less money on gambling than they actually did (Foster et al., 2014). In addition, perceived norms have been associated with the initiation and maintenance of substance use (Best et al., 2016; Peters et al., 2007). This dissertation builds on these past findings and includes an investigation of norm conformity in one of its studies. More specifically, it provides a novel investigation of whether young individuals are likely to conform to perceived gambling norms when the perceived norms are observed in online interactions.

3.3 Social support

One important function of social relationships and outcome of social identity processes is the *social support* derived from the group, or groups, upon which identity is built (Cohen & Willis, 1985). Social support is understood in various ways, and it is often discussed in a broad sense. However, it is best conceptualized through its core components: 1) social integration (i.e., social identity) and 2) interactional elements (e.g., availability of social resources, such as emotional support; Cohen et al., 2004; Reblin & Uchino, 2008). One important factor distinguishes social support from other functions of social relationships: it is always intended to be helpful and advantageous to the person receiving it (Heaney & Israel, 2008). Support is an important social capital resource for individuals, and its role has been widely studied and acknowledged in recent decades, particularly in the context of health maintenance and recovery. The majority of the social support literature has focused on investigating the stress-buffering effect of social support (Cohen & Willis, 1985; Cohen et al., 2004), which has important implications for overcoming and enduring life's adversities. For example, research on the impact of social support has indicated that the mere presence of a friend or supportive ally is associated with lower stress-related cardiovascular reactivity among patients (Gerin et al., 1995; Kamarck et al., 1998). More recent research has associated social support with better immune function, hormone production, increased disease recovery, higher psychological well-being, and higher quality of life (Cohen et al., 2004; Gomes et al., 2020; Reblin & Uchino, 2008; Uchino, 2006; Thoits, 2011; Wright, 2016). Furthermore, Feeney and Collins (2014) introduced interpersonal process model that suggests that people thrive through the mechanisms provided by social support.

Social support also has important implications for addictive behaviors. Researchers examining the impact of social support in addiction recovery found that higher social support predicted better treatment outcomes in substance abuse (Dobkin et al., 2002). In contrast, a perceived lack of social support has been linked to IA among adolescents (Gunuc et al., 2013; Wu et al., 2016). Similarly, Hardoon et al. (2004) found that at-risk and probable pathological gamblers reported feeling a lack of social support. In addition, although people strive to receive social support from meaningful others, a well-intended effort to attain social support may, in itself, lead to negative consequences. For example, Tang et al. (2016) found that increased social support received from online networks was associated with Facebook addiction among college students. In particular, young individuals are inclined to evaluate their total social capital as lower than that of older adults (Mawson et al.,

2015). This could indicate that social capital grows and strengthens over time in conjunction with stronger social identities. The social support literature demonstrates that social support has a highly important, though complex, role for individuals' overall health and behavior. This is why I included an investigation of social support in one of the studies.

3.4 Loneliness

People have an innate need to belong and to be included socially (Baumeister & Leary, 1995; Mund et al., 2020). However, most people experience feelings of loneliness at some point during their lives. Given the latest technological developments, the traditional forms of human contact and social interaction have diminished, and people spend more time online (Best, 2014; Davis, 2012; Kushlev et al., 2017). In the rapidly advancing and constantly connected modern world, loneliness is becoming an unprecedented, even paradoxical, societal issue that affects people across cultures and age groups. Loneliness is not merely the absence of actual social connections or close relationships. Rather, the social psychological model of loneliness (Perlman & Peplau, 1981) explains that it is a subjective feeling that occurs when individuals perceive their social relationships to be deficient, whether qualitatively or quantitatively (Mund et al., 2020). Consequently, people may experience loneliness even when surrounded by other individuals. In a way, loneliness is a discrepancy between individuals and their expectations of other people. When other people do not meet such expectations qualitatively or quantitatively during meaningful social interaction, individuals may feel socially isolated and experience loneliness. This in itself is a subjective, unpleasant feeling and an emotionally distressing experience that people want to avoid (Perlman & Peplau, 1981). Loneliness is often accompanied by anxiety and feelings of social isolation and emptiness (Stein & Tuval-Mashiach, 2015; Weiss, 1973).

Loneliness harms the individual experiencing it in many ways, but it also places a large indirect burden on society through its impact on people's well-being and health. An impressive body of research has associated loneliness with physical and psychological health problems, including decreased immunity, elevated blood pressure, increased inflammation, impaired sleep, eating disorders, depression, psychotic disorders, and even higher mortality (e.g., Cacioppo, Hawkley, Berntson, et al., 2002; Cacioppo, Hawkley, Crawford, et al., 2002; Cacioppo et al., 2010; Cacioppo et al., 2014; Holt-Lunstad et al., 2015; Houghton et al., 2016; Kiecolt-

Glaser et al., 1984; Levine, 2012; Lim & Gleeson, 2014). Indeed, socially content people tend to live longer and have happier lives than those who experience lasting loneliness (Greenaway et al., 2015).

Loneliness is salient across the life span, but research has indicated that adolescents and young adults are at particularly high risk for loneliness due to the developmental transitions they experience (Lee & Goldstein, 2016; Qualter et al., 2015). These, of course, involve trying out new identities, breaking away from the family, and gaining more independence (Hall-Lande et al., 2007; Houghton et al., 2016). In addition, many young individuals in late adolescence and young adulthood transition to college, which often entails physically leaving behind familiar surroundings and long-standing social relationships (Qualter et al., 2015). Considering today's youth, it is possible that, on top of the traditional developmental transitions they experience, lessened offline social interactions and increased online interactions affect the level at which they experience loneliness. In addition, loneliness could influence or be a risk factor for various addictive behaviors. Therefore, in this dissertation, I investigate the significance of perceived loneliness in youth addictive behaviors.

3.5 Synthesizing the social psychological approach to addiction

Considering the above overview of social psychological theory and social scientific literature in addiction research, it is evident that social processes and relationships can have a profound effect on people's addictive behaviors. However, gaps remain in the literature, specifically in further examining whether identification with peers offline and online, social support, perceived norms, and loneliness influence various addictive behaviors in today's youth. Furthermore, additional research is needed to examine whether these possible relationships between social factors and addiction are observable among youth in diverse cross-national contexts.

According to West (2006), the problem with multiple theories of addiction, including those offered by social science, is that they are often developed with a particular approach through which addiction could be understood and generalized. Therefore, in this dissertation, the aim is to apply well-established and interrelated social psychological theories developed to explain not addiction per se, but human behavior and social processes in general. Thus, they are not limited by a single approach to a specific behavior, but provide a broader framework for examining youth addiction. By applying multiple social psychological theories, this research

does not tie addiction to one specific social process, but aims to recognize addiction as a product of human interaction. Consequently, these theories offer a more comprehensive social psychological perspective on youth addictive behavior.

SIT, the foundation of this research, suggests that various youth addictions are related to grouping behavior and social identities offered by peer groups. Social support is an important resource provided by social groups, but groups differ in how much meaning and effort individuals place on them. Thus, it is possible that it is not the social identity itself, but the support received from the meaningful groups that influences addiction outcomes in social situations. Social norms provide people guidelines for normative and desired behavior, and the more meaningful the group, the more important its social norms. Thus, social norms guide young individuals' addictive behaviors. Loneliness, on the other hand, is a negative feeling people avoid. When people are not satisfied with their social relationships, they experience loneliness, which is heightened during youth and might manifest in addiction. Alternatively, addiction might isolate young people from their social groups.

By employing these theories, this dissertation builds on past research that paved the way for social scientific research on addiction. Furthermore, it extends the examination of how these social psychological theories work in cross-cultural and modern contexts. Focusing on social aspects can be an effective complementary approach to studying addictive behaviors.

4 STUDY OBJECTIVES, RESEARCH QUESTIONS, AND HYPOTHESES

This dissertation's main objective is to determine which key social psychological factors could explain various addictive behaviors among young individuals. Four research studies were conducted, each assessing different social psychological factors in relation to different addictive behaviors. The aims of the dissertation were to investigate how different addictive behaviors are associated with youth peer group identification and, given the modern context of today's youth, explore whether these associations vary depending on youths' identification with their peers offline or online. Previous studies have investigated social identity in relation to addiction and recovery from addiction (e.g., Best et al., 2018; Buckingham et al., 2013; Dingle et al., 2019; Frings & Albery, 2015), but such studies mainly focused on clinical settings and adult or college samples. This research contributes to existing research by investigating how social identity relates to various addictions experienced by young individuals in the general population of various countries. In addition, it investigates the significance of social support and perceived loneliness in youth addiction. Finally, this research examines whether perceived social norms coming from an online source might guide the addictive behavior of youth. Next, I discuss in more detail the four studies (Articles 1 through 4) that investigated these topics. I describe the exact research questions (RQs) and their related hypotheses, as well as provide a more in-depth contextualization of this cross-national research.

4.1 Research questions and hypotheses

4.1.1 How are addictive behaviors related to offline peer group identification?

The first study (Article 1) laid the groundwork for this dissertation investigation and examined the relationship between four forms of addiction (i.e., excessive alcohol use, excessive drug use, problem gambling, and compulsive Internet use) and

psychological distress among Finnish adolescents and young adults. It also assessed the role of offline peer group identification in this relationship. Consequently, we posed the following RQs.

RQ1: How are various addictive behaviors related to psychological distress and peer group identification among Finnish youth?

RQ2: Does identification with an offline peer group mediate the relationship between different addictive behaviors and psychological distress?

As past research has shown, youth is a time of heightened distress, and engaging in harmful or addictive behaviors can further influence young individuals' well-being. Thus, it was expected that all addictive behaviors are directly associated with higher psychological distress. In terms of offline peer group identification, we did not formulate hypotheses about the direction or strength of the relationship between addiction and peer group identification, as this part of the study was explorative in nature. Furthermore, identifying with others who engage in an addictive behavior, such as substance use, can lead to addiction or the maintenance of addiction, whereas identifying with a recovery group or non-users can function as a way out of addiction (e.g., Buckingham et al., 2013; Mawson et al., 2015).

4.1.2 Is problem gambling associated with offline and online peer group identification in various ways?

The second study (Article 2) expanded the first article's research interest and, by focusing on youth problem gambling, investigated how peer group identification with a primary online or offline peer group is related to youth problem gambling. The study also analyzed the role of perceived social support in this relationship. The study compared data from two samples: Finland and the United States. In this article, we sought to answer the following RQs:

RQ3: How is social identification with offline and online peer groups associated with youth problem gambling behavior?

RQ4: Does perceived social support moderate the relationship between online and offline peer group identification and youth problem gambling?

Based on previous research on the differences between online and offline peers (e.g., Kaakinen et al., 2018; Keipi et al., 2016; Minkkinen et al., 2015), as well as literature on social support (e.g., Gomes et al., 2020; Thoits, 2011), we formulated the following hypotheses:

H1: Strong identification with a primary peer group offline is associated with decreased engagement in problem gambling in Finland and the United States.

H2: Strong identification with a primary peer group online is associated with increased problem gambling in Finland and the United States.

H3: Perceived social support is associated with decreased problem gambling in Finland and the United States.

H4: Perceived social support moderates the association between social identification and problem gambling in both countries.

4.1.3 How is loneliness related to youth addictive behaviors?

Study 3 (Article 3) evaluated how perceived loneliness is related to excessive alcohol use, problem gambling and compulsive Internet use in Finland, the United States, and South Korea. The article focused on investigating the direct relationship between loneliness and various forms of addiction and therefore posed the following primary RQ:

RQ5: How is perceived loneliness related to various addictive behaviors among adolescents and young adults in Finland, the United States, and South Korea?

As in Article 1, we did not postulate possible outcomes: this study was explorative in nature and aimed at determining whether a relationship exists between perceived loneliness and addiction and, if so, identifying the relationship's direction.

4.1.4 What are the associations between perceived social norms online, in-group information, and problem gambling?

The fourth study (Article 4) utilized data from four countries to determine whether the traditional social psychological mechanisms of social identification (occurring on a minimal basis) and norm conformity can be observed in online interactions. To better recognize the role of online social groups and online norms in youth problem gambling, we posed the following RQs:

RQ6: Is conforming to perceived (gambling-related) social norms in online interactions related to youth problem gambling?

RQ7: Are youth more likely to conform to perceived gambling-related norms in online interactions if the norms come from an in-group source?

Individuals tend to conform to perceived social norms, or the majority opinion, to receive social validation from others or because the behavior feels rewarding (e.g., Cialdini & Trost, 1998; Festinger, 1954). Thus, we hypothesized as follows:

H5: Greater conformity with perceived gambling norms online is associated with increased problem gambling among youths in Finland, the United States, South Korea, and Spain.

SIT indicates that individuals value opinions more when they come from other in-group members. Due to their young age, youth are particularly motivated to alter their opinions to match those of similar others. Thus, we also hypothesized as follows:

H6: The association between norm conformity and problem gambling is moderated by in-group information in all four countries when norms come from a perceived online in-group.

4.2 Contextualizing the research

This research focuses on examining addictive behaviors of 15- to 25-year-old adolescents and young adults in Finland, the United States, South Korea, and Spain. This section contextualizes the research in more detail and provides a rationale for why these four countries were chosen for comparison.

4.2.1 The cross-national context of the research

Finland, the United States, South Korea, and Spain were chosen for comparison in this research for several reasons. First, this set of countries includes Nordic and Southern European societies, as well as Western and Eastern cultures (Hofstede & Bond, 1984; Inglehart & Welzel, 2005). This type of fundamental variety in the selected countries makes them ideal when examining topics of addiction and social processes. Investigating youths who have grown up in different cultural settings and societies provides additional insight into how addictive behaviors relate to social factors and whether these associations are similar in different settings. Second, although they are culturally and geographically distinct, these countries are comparable in terms of national affluence and technological advancements. The prevalence rates of youths' access to the Internet and social media use through a variety of modern devices are analogous in all four countries. This facilitates successful comparisons. For instance, Finland's current Internet usage rate is 90% and growing (Statista Research Department, 2020b). All Finnish youths (100%) in the 16–24 age group use the Internet, and nearly all (98%) of them have access to a smartphone. Finnish youths are also active social media users; 93% of individuals ages 16–24 use some social media platforms, among which WhatsApp, Facebook, and Facebook Messenger are the most frequently used social media services (Official Statistics of Finland, 2019; Statista Research Department, 2019c). In the United States, 93% of teenagers and young adults are active Internet users (Smith & Anderson, 2018). Ninety-five percent of U.S. teenagers have access to smartphones, and almost half of them report being online nearly constantly (Anderson & Jiang, 2018). The majority of U.S. teens use social media platforms, such as Snapchat, Instagram, and YouTube (Anderson & Jiang, 2018), and approximately 90% of 18- to 29-year-old Americans report using at least some form of social media (Statista Research Department, 2019a).

South Korea is among the world's leading nations in terms of Internet penetration rate and online connectivity. According to Statista Research Department (2020a), 98% of Koreans ages 20–29 are connected to the Internet. In addition, 90% of Koreans own a smartphone, and over 82% of individuals ages 18–24 use social media platforms (Statista Research Department, 2019b). Although it has not advanced as rapidly as South Korea, Spain has seen a steady increase in its Internet penetration rate over the last decade (Statista Research Department, 2019f). In 2019, 91% of Spanish households had access to the Internet—a statistic also reflected in the country's young Internet users. According to the Spanish National Institute of

Statistics (*Instituto Nacional de Estadística*, 2019), the most skilled Spanish Internet users belong to the 16–24 age group: 93% of them use the Internet daily, and 90% use social media.

4.2.2 Prevalence of problem gambling and compulsive Internet use

Youth problem gambling is an issue worldwide, and all four countries included in this dissertation have recognized gambling's effects on individual, societal, and public health levels and expressed concerns over youth problem gambling. Even though participating in gambling activities is illegal for underage individuals –those under 18 or 21 years of age in the United States (National Research Council, 1999) and those under 18 years of age in Finland, South Korea, and Spain (Calado & Griffiths, 2016; European Casino Association, 2019; Nordmyr & Österman, 2016), different forms of gambling, particularly Internet gambling, are prevalent among youth. The similarities and perceived differences among gambling and problem gambling prevalence rates and attitudes make these four countries attractive for research comparison.

Playing games of chance is a popular activity in Finland. According to the most recent report by the National Institutes of Health and Welfare (2019), 78% of the Finnish population had played some form of a game of chance during the last year, and 11% of them qualified as at-risk gamblers (Salonen et al., 2019). Gambling is most popular in the 35–44 age group, and prevalence of problem gambling is highest among individuals in the 18–24 age group. A Nordic comparison study found that the gambling rate is higher among Finnish youths than among their counterparts in Sweden, Norway, Denmark, and Iceland (Spångberg & Svensson, 2020). A national-level study found that almost 14% of Finnish males aged 15 to 28 years old and close to 5% of females in the same age group are at-risk gamblers (Edgren et al., 2016). According to the North American Foundation for Gambling Addiction Help, the United States is among the leading countries where a large portion of the population experience gambling-related harms or gamble problematically. Nearly 70% of 14- to 19-year-old youths in the United States had gambled during the past year (International Center for Responsible Gaming, 2019). Prevalence of problem gambling varies depending on age and gender, but research has shown that individuals in the 16–24 age group are most susceptible to problem gambling (North American Foundation for Gambling Addiction Help, 2016). Problem gambling prevalence, however, has been found to be highest among young adults between 18

and 30 years old (Welte et al., 2015). Furthermore, past research has identified that up to 15% of American youths experience gambling-related problems, and 2% to 7% have a gambling addiction (National Center for Responsible Gaming, 2015).

In comparison, South Koreans have very negative attitudes toward gambling, with a majority (77%) of Koreans believing that it is morally wrong (Williams et al., 2013). This attitude is likely to reflect on the current gambling and problem gambling prevalence rates estimated in South Korea. A relatively small proportion—up to 7% of the general population—gamble, and approximately 0.8% qualify as problem gamblers (Williams et al., 2013). As in many countries, in South Korea, a small percentage of problem gamblers account for a disproportionate and large percentage of gambling revenue. However, given the rise of online gambling, South Korea has seen a notable increase in the number of adolescent gamblers and in gambling addiction. According to the most recent statistics from the Korea Center on Gambling Problems (KCGP, 2016), close to 30% of 19- to 29-year-old individuals are problem gamblers, with the corresponding rate for individuals under 19 years of age being 2.5% (KCGP, 2016). A common feature among South Korean problem gamblers is that a majority (70%) of them report having started gambling during their adolescent years (Kang et al., 2019).

Spain has a large gambling industry and a particularly high gambling prevalence rate. According to the Directorate General for the Regulation of Gambling (2015), approximately 76% of the general population in Spain has gambled at some point during their life, nearly 90% of them having gambled during the last year. The average age of gambling initiation in Spain is around 23, but showing a trend similar to South Korea's, Spain also has seen a dramatic increase in gamblers aged 14 to 21 during the past few years (Spanish Federation of Gambling Players Rehabilitated, 2018). A recent study on Spanish adolescents aged 12 to 17 concluded that the number of adolescent online gamblers more than tripled over the 7 preceding years, the current prevalence rate being 6.5% (Gómez et al., 2019). Of the 18–24 age group, close to 6% are problem gamblers, and 4.5% are pathological gamblers (Directorate General for the Regulation of Gambling, 2015).

As described in Subsection The cross-national context of the research, the technological advancements and Internet penetration rates are similar in Finland, the United States, South Korea, and Spain. With the increased ability to attain and use modern technology and devices, the likelihood of Internet use becoming compulsive also increases. Indeed, relatively high numbers of compulsive Internet use among youths have been reported in all of these four countries. Research has shown that only about 14% of Finnish adolescents are normal Internet users, whereas nearly

62% are mild overusers and 24% moderate or serious overusers (Sinkkonen et al., 2014). Similarly, numerous studies have investigated the prevalence rates of adolescents' and young adults' PIU or IA in the United States and indicated that PIU or IA affects approximately 1.2% to 26.3% of American young individuals (Christakis et al., 2011; Derbyshire et al., 2013; Moreno et al., 2011). The large variety in these estimates for PIU and IA owes to different study contexts, conceptual approaches, and ways of measuring (Moreno et al., 2011). Although the current measures of compulsive Internet use, PIU, or IA cannot determine specifically what activity or feature of the Internet is particularly addicting to youth, a recent report by Statista Research Department (2019d) found that 40% of U.S. Internet users aged 18 to 22 years old felt they were addicted to social media. South Korea is a leading country in smart phone ownership and Internet penetration rate. This is likely reflected in the country's IA statistics. It has been estimated that 85% of South Korean adolescents are general Internet users, whereas 15% are addicted to Internet use and as many as 25% are addicted to online gaming (Ministry of Gender Equality and Family, 2019; Park et al., 2008; Seok & DaCosta, 2012; So & Chin, 2016). Simultaneously, Korea is highly progressive in its efforts to prevent and treat youth IA and gaming addiction, and the government has created a variety of programs with the goal of curing Internet-related behavioral addictions (Cho, 2015; Koo et al., 2011). Last, corresponding figures of Spanish Internet users have shown that approximately 23% of Spanish 14- to 17-year-olds exhibit dysfunctional Internet behavior and that the prevalence of PIU among Spanish adolescents is about 16% (Gómez et al., 2017).

4.2.3 Prevalence of excessive alcohol use

Recreational alcohol consumption and excessive alcohol use are prevalent among youths in the four countries analyzed in this research. However, slight differences can be observed between youth drinking habits in the diverse cultures, making them more interesting for cross-national comparison. In Finland, underage drinking has constantly declined since the 1990s (Raitasalo et al., 2016; Raitasalo & Härkönen, 2019), thus echoing the positive universal trend observed in youth alcohol consumption. However, drinking alcohol is still very evident among Finnish youth, especially among older adolescents and young adults. According to the ESPAD survey data, 22% of Finnish adolescents aged 15–16 reported they had been drunk during the last 30 days, and 7% of boys and 5% of girls in this age group reported

having been drunk on a weekly basis (Raitasalo & Härkönen, 2019). Excessive alcohol use is highest among the 20–29 age group in Finland. Twenty-six percent of men and 18% of women in this age group reported drinking excessively at least once during the past year (Härkönen et al., 2016). In Study 1, we also examine excessive drug use in relation to social identification and psychological distress among Finnish youth. Problematic drug use among 15- to 24-year-old Finnish young people has increased over the past decade. This increase has been detected particularly in opioid and amphetamine use. Up to 1.4% of youths in the 15–24 age group use opioids and amphetamines, representing the highest opioid and amphetamine use prevalence statistics ever observed in Finland (Rönkä et al., 2020). In addition, according to the results of the latest School Health Promotion (2019) study, 8% of eighth and ninth graders (i.e., 14- to 15-year-olds), 12% of 1st- and 2nd-year high schoolers, and 21% of 1st- and 2nd-year vocational school students (i.e., 16- to 17-year-olds) had experimented with illegal drugs at least once in their life (Ikonen & Helakorpi, 2019).

In the United States, nationwide surveys have indicated that 19% of young individuals between ages 12 and 20 use alcohol, and this age group alone drinks 11% of all alcohol consumed in the country (Centers for Disease Control and Prevention, 2018a; NIAAA, 2020). Even though alcohol use is illegal for individuals under 21 years old in most states of the United States, the 12–20 age group consumes a large volume of alcohol and is also most likely to engage in heavy episodic drinking (NIAAA, 2020). In comparison, alcohol use and abuse rates were once slightly lower among South Korean youth but are becoming more similar to the consumption rates seen in other countries (Asante et al., 2014; Hong et al., 2011; Park & Kim, 2016). A representative survey study on South Koreans aged 12 to 18 estimated that 43% of young people in this age group had experimented with alcohol at some point during their lives (Park & Kim, 2016). The legal drinking age in South Korea is 19 years, but the first drinking experience typically takes place at age 13 in the country. According to the Ministry of Health and Welfare, the prevalence rate of underage drinking in South Korea is nearly 25% (Asante et al., 2014).

In Spain, adolescents have traditionally and regularly consumed alcohol at family dinners (Goldberg-Looney et al., 2016). However, this tradition is becoming less frequent, and nowadays adolescents are more likely to drink alcohol socially among friends. Subsequently, the most common pattern of alcohol use among Spanish adolescents is heavy episodic drinking (Míguez & Becoña, 2015). A national study on Spanish high school students found that roughly 33% of students had engaged in heavy episodic drinking during the past month (Ministerio de Sanidad, Servicios Sociales e Igualdad, 2016). Alcohol use typically begins at the age of 16, but according

to the most recent HBSC data, about 9% of Spanish 15–year-old adolescents consume alcohol weekly (Inchley, 2018).

5 DATA AND METHODS

In this section, I provide a detailed description of the data and methodology used in the dissertation. As this dissertation consists of an aggregate of four studies, an additional comprehensive review of the RQs tested, data used, and methods applied is provided in Table 1.

5.1 Data

5.1.1 YouGamble cross-national surveys

This dissertation utilizes data from four different data sets. All data sets were collected as part of the *Problem Gambling and Social Media: Social Psychological Study on Youth Behavior in Online Gaming Communities* research project led by Professor Atte Oksanen and funded by the Finnish Foundation for Alcohol Studies from 2017 to 2019. The project designed a comprehensive YouGamble online survey targeted to measure young participants' well-being, peer group belonging, loneliness, social media use, problem gambling, and other addictive behaviors. Data collection was achieved through online panels administered by a data provider company formerly known as Survey Sampling International (SSI) and since 2019 called Dynata. Participants were reached through emails that contained a link to the online survey. The first data set (N = 1,200; M = 21.29; SD = 2.85; 50% female) was collected during March and April 2017 from Finnish adolescents and young adults between 15 and 25 years of age.

To examine and analyze the research questions cross-nationally and compare the observed outcomes in different cultural contexts, we expanded the data collection into three additional countries. First, we translated the YouGamble 2017 survey into English. The survey went through a back-translation process to assure consistency and accurate matching of the survey items. After a successful translation process, we launched the second data collection. The data were collected from 15- to 25-year-old adolescents and young adults in the United States. Consistently with the

procedure used in the first data collection, we employed SSI to attain U.S. participants. The second data set (N = 1,212; M = 20.05; SD = 3.19; 50.17% female) was collected during January 2018. Following the U.S. data collection, we collaborated with colleagues from South Korea in an effort to translate the YouGamble 2018 English survey into Korean. After successful translation and back-translation of the survey, we commenced data collection from South Korea, utilizing the same methods and SSI's respondent panels. The data collection was completed in March 2018, resulting in a comparable sample (N = 1,192; M = 20.60; SD = 3.24; 50.42% female) of 15- to 25-year-old South Korean adolescents and young adults. The last round of data collection, from Spain, took place in January 2019. As per the previous procedures, the YouGamble 2018 English survey was translated into Spanish as a combined effort between us and academic collaborators from Spain. Following an effective translation and back-translation process, we utilized Dynata's online panels for data collection. Consistently, the sample (N = 1,212; M = 20.07; SD = 3.16; 48.76% female) was comprised of 15- to 25-year-old adolescents and young adults. Each sample obtained from the YouGamble 2017–2019 surveys was demographically balanced in age, gender, and living area and mirrored the current population estimates of individuals in the 15–25 age group in each country (Oksanen et al., 2018). As a visual guide through the data collection and data used in each article, a flow chart is provided in Figure 1.

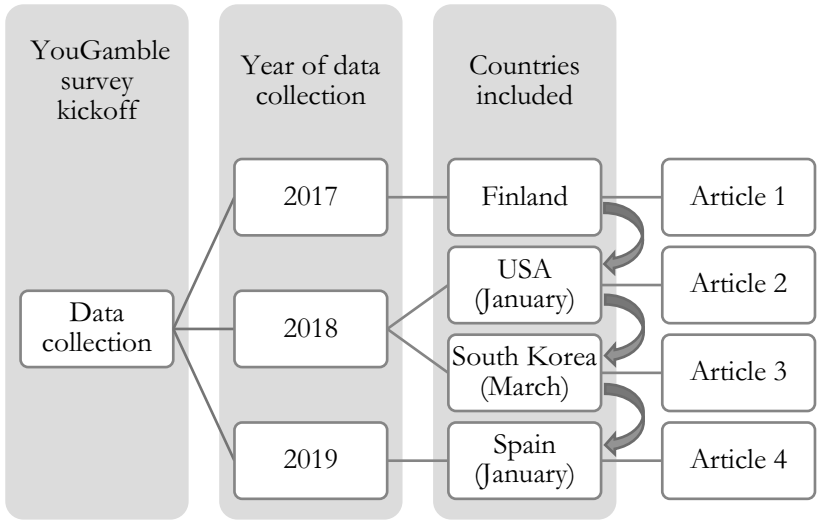

Figure 1. Data collection flow chart and the subsequent studies that used the data.

All four YouGamble surveys contained an embedded experimental section designed to explore behavior and self-stereotyping in online interaction. This was accomplished in the form of vignettes and was placed in the middle of the survey. At the starting point, the participants were instructed, "In the next section of the survey, we will ask you to evaluate different gambling-related situations taking place on social media." During this phase, the participants were randomly assigned to one of two conditions: an experimental in-group or a control condition. In the experimental in-group condition, the participants were told that on the basis of answers they had provided on the survey so far, they had been assigned to a Group C, which was composed of respondents who had provided similar answers to the survey items (as per Sherif et al.'s [1961] finding that people form groups quickly and even on a minimal basis). Respondents in the control condition were not provided any group information. The gambling-related situations that were taking place on social media were portrayed as simulated social media messages (i.e., vignettes). These were short messages with gambling-themed content. The content of the messages was manipulated in terms of narration style and stance toward gambling. We used two types of narration in the messages: fact-based narration written in the third person and experience-based narration written in the first person. Stance toward gambling was manipulated so that half of the messages discussed gambling in a positive light (i.e., considered the possible benefits of gambling, such as enjoyment) and the other half discussed gambling in a negative light (i.e., expressed harms related to gambling, such as damage to well-being). For the exact messages seen in the experimental vignettes, turn to Appendix A.

Evaluating these gambling-related situations or messages was accomplished by allowing the participants to "like" (click *I like this*), "dislike" (click *I don't like this*), or not to react at all (click *no reaction*) to the content. This type of reactive behavior was chosen for the experiment because it imitates the reactions one can provide in real social media environments. With each gambling message, we also showed the participant a manipulated distribution of reactions the message had already received, either from "other in-group members" or from "other survey respondents." Accordingly, those participants assigned to Group C saw the reactions as if they were coming from other in-group members, and those without any in-group information saw them as if they were coming from other survey respondents. The distribution of likes was manipulated so that a majority (e.g., 65%) in half the vignettes disliked the content and in the other half liked the content. In addition, the vignettes were divided into two sets so that each type of message was "liked" by the majority once. Consequently, each participant saw one message each wherein the majority had liked

pro-gambling, anti-gambling, experience-driven, and fact-driven content. We did this so that no particular form of narration or gambling content was favored by the group. This experimental strategy resulted in a two-level between-subject design (in-group and control condition) and a 2 x 2 x 2 within-subject factorial design (narration style, stance toward gambling, and majority reactions). We produced eight vignette scenarios, of which each participant saw four different ones in a randomized order. The experimental portion of the survey is utilized and analyzed in Article 4.

Table 1. Overview of the research questions (RQs), data, and methods.

	Article 1	Article 2	Article 3	Article 4
RQs examined	RQ1, RQ2	RQ3, RQ4	RQ5	RQ6, RQ7
Data	YouGamble 2017 Finland	YouGamble 2017 Finland & 2018 U.S.	YouGamble 2017 Finland & 2018 U.S. & South Korea	YouGamble 2017 Finland, 2018 U.S. & South Korea, & 2019 Spain
Respondents	15- to 25-year-old youth (N=1,200)	15- to 25-year-old youth (N=2,412)	15- to 25-year-old youth (N=3,604)	15- to 25-year-old youth (N=4,816)
Statistical techniques	Descriptive statistics, multistep regression and mediation analysis with Sobel tests	Descriptive statistics, linear regression analysis, slope difference analysis	Descriptive statistics, correlation, Kruskal-Wallis tests of mean differences, linear regression, zero-inflated Poisson regression, logistic regression	Descriptive statistics, ordinary least squares regression analysis (OLS)
Dependent variable/s (measure)	Psychological distress (GHQ-12)	Problem gambling (SOGS)	Excessive alcohol use (AUDIT-C), problem gambling (SOGS), compulsive Internet use (CIUS)	Problem gambling (SOGS)
Independent variables	Excessive alcohol use (AUDIT-C), excessive drug use, problem gambling (SOGS), compulsive Internet use (CIUS), peer group identification	Peer group identification offline & online, perceived social support	Perceived loneliness	Norm conformity and in-group membership
Control variables	Age, gender	Age, gender	GHQ-12, peer group identification offline & online, age, gender	Age, gender, self-esteem, impulsivity

5.2 Measures and statistical methods

5.2.1 Article 1: Youth well-being, peer group identification, and addiction

Study 1 analyzed the relationships between four different forms of addictive behaviors (excessive alcohol use, excessive drug use, problem gambling, compulsive Internet use) and psychological distress among adolescents and young adults in Finland. Further, we assessed if peer group identification offline mediates these relationships. Excessive alcohol use was measured with the three-item Alcohol Use Disorders Identification Test-Consumption (AUDIT-C). The test consists of three items that target alcohol consumption habits. The items are 1) "How often do you have a drink containing alcohol?", 2) "How many drinks containing alcohol do you have on a typical day when you are drinking?", and 3) "How often do you have six or more drinks on one occasion?" Each question is answered with a set of answers that range from 0 to 4. Each answer choice brings risk points, and higher points indicate higher risk for excessive alcohol use. The AUDIT-C is a validated and reliable (Cronbach's $\alpha = .82$) way to screen risky alcohol use and is suitable for survey studies (Bush et al., 1998; Rubinsky et al., 2013). Excessive alcohol use was treated as a continuous variable in the analyses.

We assessed excessive drug use with two questions. The first question asked, "Have you ever used or experimented with substances other than alcohol or tobacco to get high?" If participants responded with *yes*, a follow-up question would appear that asked them to indicate which drug(s) from the following list they had used or experimented with: *cannabis*, *stimulants*, *hallucinogens*, *opioids*, and *other pharmaceuticals*. A dummy variable was created to identify those youths who had used and were still regularly using (some or all of) these drugs, those who had tried (some or all of) the drugs but were not using them anymore, and those who had never tried any of the drugs (1, *drug use*; 0, *no drug use*).

We measured problem gambling by employing the South Oaks Gambling Screen (SOGS; Lesieur & Blume, 1987). The SOGS is a 20-item multiple choice questionnaire that is widely used for identifying problem or pathological gambling in a range of populations. The scale was modified slightly to accommodate for the Finnish cultural setting and had good internal consistency (Cronbach's $\alpha = .89$). We evaluated compulsive Internet use with the Compulsive Internet Use Scale (CIUS; Meerkerk et al., 2009). The scale contains 14 items that target the mindset and consequences of Internet use. The items are rated on a 5-point scale that ranges from

0 (*never*) to 4 (*very often*). Higher points indicate higher compulsive Internet use. This variable was treated as continuous in our analyses. The CIUS scale is easy to administer and psychometrically sound (α = .93).

We determined the subjective level of participants' identification with an offline peer group with the question "How strongly do you feel you belong to a peer group?" Answers were provided on a 10-point scale that ranged from 1 (*no belonging at all*) to 10 (*very strong belonging*). We measured psychological distress with the General Health Questionnaire (GHQ-12; Goldberg & Blackwell, 1970), a widely used screening device for identifying the level of distress in general populations (Pevalin, 2000). Consisting of 12 items, the screen assesses respondents' present state of well-being in relation to how they normally feel. Answers are provided on a 4-point scale that ranges from 0 (*less than usual*) to 3 (*much more than usual*), with higher scores indicating higher psychological distress. The scale had good internal consistency (α = .88) and was used as a continuous variable in the analyses. Age and gender were used as control variables (Table 1).

We used quantitative methods to analyze the relationships between the variables. We utilized Stata 15.1 software for running the analyses. The statistical analyses included descriptive statistics and linear regression modeling with mediation. We calculated descriptive statistics to acquire an overview of the sample characteristics. For these, we provide means (*M*) and standard deviations (*SD*) for the continuous variables and frequencies (*n*) and relational proportions (%) for the categorical variables. The linear regression analysis with mediation included all addictive behaviors as predictors, psychological distress as the outcome variable, and peer group identification as the mediator. We conducted the analysis with a multistep regression approach, as suggested by Baron and Kenny (1986). This approach resulted in four regression models in which unstandardized regression coefficients (*b*), standard errors (*SE*), Z-scores, and statistical significances (*p*) were estimated. Based on the above models, we used Sobel tests to test the statistical significance of the indirect associations (Sobel, 1982).

5.2.2 Article 2: Peer group identification, social support, and problem gambling

Study 2 examined how identification with a peer group offline and online is associated with problem gambling among youths in Finland and the United States. Additionally, we analyzed if perceived social support moderates this relationship.

Consistently with Study 1, we measured problem gambling with the SOGS questionnaire. The scale had good to excellent internal consistency in the two samples (α = .89 in Finland and α = .90 in the United States). Also consistently with Study 1, identification with a peer group offline was measured with the question "How strongly do you feel you belong to a peer group?" Answers were provided on a scale that ranged from 1 (*no belonging at all*) to 10 (*very strong belonging*). Identification with a peer group online was measured with the question "How strongly do you feel you belong to an online community?" Answers were given on a 10-point scale that ranged from 1 (*no belonging at all*) to 10 (*very strong belonging*). Perceived social support was assessed using the question "Do you feel you receive support from your close ones when you need it?" The answer choices were 1 (*rarely*), 2 (*sometimes*), and 3 (*often*). The variable was dummy-coded (0, *rarely*; 1, *sometimes* or *often*) for the analyses. Age and gender were included in the models as control variables.

Analyses were quantitative and run with Stata 15.1 software. First, we calculated descriptive statistics for all variables. Next, we used linear regression analyses as a multivariate method. Two linear regression models were estimated for both country samples. Model 1 tested the statistical significance of the linear relationship between our predictor variables (identification with peers offline and online), the moderator (perceived social support), and the outcome variable (SOGS). Model 2 tested the interaction effect between identification with a peer group offline and online and perceived social support on problem gambling. In the interaction analyses, we mean-centered the peer group identification variables for both the Finnish and the U.S. samples to avoid multicollinearity. In addition, we used a slope difference analysis in accordance with Robinson et al. (2013). This allowed us to test the moderation effect and analyze a difference in the regression coefficients of the independent variables relative to the values of the dichotomous moderator variable. The slope difference test was applied because it is less prone to Type II errors (failing to reject a false null hypothesis) and thus less conservative than interaction term testing. We report the unstandardized regression coefficients (*b*), standard errors (*SE*), standardized beta coefficients (*β*), and statistical significances (*p*) at the .05 significance level.

5.2.3 Article 3: Loneliness and addiction

In Study 3, the objective was to investigate how loneliness is associated with three different forms of addiction in three diverse countries: Finland, the United States, and South Korea. The three addictive behaviors included in the study were excessive

alcohol use, problem gambling, and compulsive Internet use. We measured excessive alcohol use with the AUDIT-C scale, as in Study 1. The scale had good internal consistency across the countries (α = .82 in Finland; α = .87 in the United States; α = .86 in South Korea). Consistently, we assessed problem gambling by using the SOGS measure. Some of the items in the SOGS questionnaire were modified for these countries to adjust for cultural differences in gambling practices. However, the scale showed good to excellent internal consistency in all samples (α = .89 in Finland; α = .90 in the United States; α = .82 in South Korea).

We employed the CIUS scale to measure compulsive Internet use. The scale showed excellent consistency, with alphas of .93 in Finland, .95 in the United States, and .95 in South Korea. We used the three-item loneliness scale to evaluate the respondents' levels of perceived loneliness (Russell et al., 1980). The three items inquire about different aspects of loneliness (e.g., "How often do you feel that you lack companionship?"). Answers were given on a 3-point scale (1, *hardly ever*; 2, *some of the time*; 3, *often*), and higher score indicates higher perceived loneliness. We treated the loneliness measure as a continuous variable in the analyses. The three-item loneliness scale was adapted from the standard measure of loneliness: the Revised UCLA Loneliness Scale. The short scale was designed for measuring loneliness in an efficient and quick way in large-scale social surveys (Hughes et al., 2004), so it was appropriate for our study purposes.

We also considered the possible variables that might be confounded with loneliness; these were psychological distress (Jackson & Cochran, 1991), belonging to a peer group offline, and belonging to a peer group online (Cole et al., 2017). We measured psychological distress using the GHQ-12, and the scale had good internal consistency (α = .88 in all three countries). We evaluated belonging to a peer group offline and online with the abovementioned items ("How strongly do you feel you belong to a peer group?"; "How strongly do you feel you belong to a peer group an online community?"). Answers were provided on a 10-point scale (1, *no belonging at all*; 10, *very strong belonging*). We also accounted for the respondents' living situation by giving the prompt, "Are you currently" with answer choices including 1, *living alone*; 2, *married or living with a partner, no children*; 3, *single parent*; 4, *married or living with a partner, children* 5, *living with parents*; and 6, *other household type (e.g., living with roommates)*. This variable was dummy-coded for the analyses to assess and account for the effect of living alone (0, *no*; 1, *yes*). Age and gender were included in the analyses as further controls.

To statistically test the relationship between perceived loneliness and three addictive behaviors in three countries, we applied multivariate methods. First, we

calculated the descriptive statistics for all the examined variables in the three samples. We then conducted Kruskal-Wallis tests to compare if the mean differences between the three countries were statistically significant in terms of perceived loneliness, excessive alcohol use, problem gambling, and compulsive Internet use. To statistically test the associations between our variables, we estimated two separate multiple linear regression models for each addictive behavior in each country. This resulted in nine regression analyses, each containing two models. The models were carried out by producing robust standard errors due to heteroscedasticity of the residuals (Huber, 1966; White, 1982). Otherwise, all the assumptions of ordinary least squares regression (OLS) were met. In Model 1, addictive behaviors were the outcome variables, perceived loneliness the independent variable, and demographic factors (age, gender, and living alone) control variables. Model 2 included the three potentially confounding psychological factors (peer group identification offline and online and psychological distress) in the analyses. Potentially confounding interactions (e.g., between age and gender) were also tested. For all models, we estimated the unstandardized regression coefficients (*b*), robust standard errors (*SE*), standardized beta coefficients (β), and statistical significances (*p*) at the .05 significance level.

After each model, we assessed the variance inflation rate to test for collinearity in the models, observing no multicollinearity. In addition, we investigated correlations between the three outcome variables (excessive alcohol use, problem gambling, and compulsive Internet use), as comorbidities are common in addictive behaviors among youths (Colishaw et al., 2014; De Leo & Wulfert, 2013). Due to the complexities involved in investigating addictive behaviors, we conducted additional analyses to ensure consistency of our findings. First, we removed potential outliers from the data and repeated the analyses. Second, we used zero-inflated Poisson regression as a multivariate method, because it has been noted as the most reliable regression model and is particularly suitable for addiction research, in which excess zeros in data are common (Baggio et al., 2018). Lastly, we ran logistic regression analyses with suggested cutoff scores for each addictive behavior (≥ 3 for excessive alcohol use in AUDIT-C use [Bush et al., 1998; Dawson et al., 2005], ≥ 21 for compulsive Internet use in CIUS applications [Guertler et al., 2014; Li et al., 2016], and ≥ 8 for problem gambling measured with the SOGS [Goodie et al., 2013; Tang et al., 2010]).

5.2.4 Article 4: Perceived social norms online and problem gambling

Study 4 investigated if conforming to perceived gambling norms in online interaction is associated with problem gambling among youths. We further explored whether youths are more likely to follow norms online when the norms come from a perceived online in-group. This four-country study contained data from Finland, the United States, South Korea, and Spain. Problem gambling was the dependent variable and was measured with the SOGS questionnaire. Consistently with the previous studies, this measure showed good internal consistency in all samples (α = .89 in Finland; α = .90 in the United States; α = .82 in South Korea; α = .79 in Spain).

Study 4 utilized the experimental section of the YouGamble survey and assessed norm conformity by calculating the number of times a participant agreed with the perceived majority opinion in a vignette message. Each participant saw four gambling-related messages, and every time a participant agreed with the majority reaction (liked the content that had a majority of *likes* or disliked the content that had a majority of *dislikes*), a point was earned. Thus, this variable had a range from 0 (*no conformity*) to 4 (*high conformity*). *In-group membership* was also determined by utilizing the surveys' experimental section. In this section, the participants were randomly assigned to one of two separate conditions: a control group or an experimental in-group. Consequently, those participants in the experimental in-group were informed (prior to seeing the vignettes) that they belonged to a Group C because their answers in the survey so far were similar to those of others in the group. Participants in the control group were given no group information.

We also accounted for two personal characteristics that have been associated with conformity and problem gambling in previous studies. These were self-esteem and impulsivity, both of which are also typically heightened during teenage and young adulthood years. We evaluated self-esteem with the Single-Item Self-Esteem Scale (SISE; Robins et al., 2001). This item states "I have high self-esteem," to which the respondent provides an answer on a scale from 1 (*not very true of me*) to 10 (*very true of me*). The SISE measure has high test–retest reliability and criterion validity (Atroszko et al., 2017). We used the Eysenck Impulsivity Scale (Eysenck & Eysenck, 1977) to measure impulsivity. The scale consists of five items that ask about the individual's impulsive personality traits. Answer choices are dichotomous (0, *no*; 1, *yes*). The scale had satisfactory internal consistency, with Cronbach's alphas of .74 in Finland, .69 in the United States, .63 in South Korea, and .66 in Spain. Age and gender were included in the models as additional controls.

As in the previous studies, the statistical methods included descriptive statistics and OLS regression with robust standard errors. The analyses were conducted in two steps. First, we ran a model observing all main effects and included SOGS scores as the dependent variable; norm conformity and group membership as independent variables; and self-esteem, impulsivity, age, and gender as controls. Next, we ran the second model by including an interaction term between norm conformity and group membership in the model. Doing this allowed us to examine the effect of group membership on the relationship between norm conformity and problem gambling. The models were run separately for each country to estimate the unstandardized regression coefficients (*b*), robust *SE*s, standardized beta coefficients (*β*), and *p*-values at the .05 significance level.

5.3 Ethical considerations

Addictive or otherwise problematic behaviors are a sensitive topic to research (Miller et al., 2010). Therefore, several possible ethical issues were considered before, during, and after conducting this study. First, given that our surveys included an experimental section including manipulations of content and topics about gambling, the Ethics Committee of Tampere Region reviewed the research proposal for the YouGamble survey study prior to implementing the research work. The committee stated in December 2016 that the research did not involve any ethical issues (decision 62/2016). Second, our sample contained underage and young individuals who can be considered vulnerable research subjects. Consequently, we minimized all possible risks to subjects by applying widely used and validated measures that were age appropriate, and by protecting the privacy of all participants. As a result, the risks of being involved in this research were considered minimal, although it is possible that answering personal questions about substance use or potentially illegal behavior such as gambling was embarrassing or afflicting to some participants (Griffiths, 2010; Miller et al., 2010).

This research adhered to the Finnish and international research ethics guidelines provided by the Finnish Advisory Board on Research Ethics and the American Psychological Association's Ethical Principles and Code of Conduct. The research data consist of samples of Finnish, American, South Korean, and Spanish adolescents and young adults who were informed that by completing the YouGamble survey, they provided their consent for research participation and data collection. Participation in the study was entirely voluntary. The participants were

aware of the goals of the study and were informed that they could withdraw from the study at any point during the data collection. Withdrawing at any time during the survey had no consequences for the participants. The YouGamble surveys were computer-administered, and the research group was not in direct contact with the participants at any point. However, the participants were provided contact information in case they wished to receive more information about the research. They could also leave comments and questions in a reserved space at the end of the survey. All research data received were unidentifiable, ensuring that participants' anonymity and privacy remained intact. All data were held and stored in accordance with the official research data protection guidelines. To guarantee its complete protection, all data are encrypted in secured electronic locations.

6 OVERVIEW OF THE MAIN FINDINGS

This section summarizes the main findings of each article included in this dissertation. The results are presented in the light of the research questions and the related hypotheses. Deeper discussion, reflection, and implications of the findings are provided in the Discussion section.

6.1 Article 1: Addictive behaviors and psychological distress among adolescents and emerging adults: The mediating role of peer group identification

The aim of Article 1 was to investigate the relationship between addiction and youth well-being, as well as the rather complex role of peer group identification in addictive behaviors. According to our analyses, all addictive behaviors—excessive alcohol use (measured using AUDIT-C), excessive drug use, problem gambling (measured using SOGS), and compulsive Internet use (measured using CIUS)—were related to higher psychological distress ($p < .05$). We also found statistically significant relationships between peer group identification and all four forms of addiction. These relationships were negative for excessive drug use, problem gambling, and compulsive Internet use. Excessive alcohol use, on the other hand, was positively associated with peer group identification ($b = .11$). From mediation analyses, we found that the indirect effects between addictive behaviors and psychological distress via social identification were significant for all the addictive behaviors examined. Notably, we observed that excessive alcohol use was the only form of addictive behavior indirectly associated with lower psychological distress ($b = -.07$), while the opposite was true in the cases of excessive drug use, problem gambling, and compulsive Internet use. However, the total effects, including both the direct and indirect effects, were positive in all forms of addictive behavior.

6.2 Article 2: Peer group identification as a determinant of youth behavior and the role of perceived social support in problem gambling

Article 2 extended the findings of Article 1 and investigated how identification with peer groups offline and online is associated with problem gambling. In addition, we examined if perceived social support moderates these associations. The analyses compared samples from Finland and the United States. According to our results, identification with a peer group offline had a significant association with lower problem gambling behavior in Finland ($p = .001$) and the United States ($p = .034$). This finding confirmed our first hypothesis (H1). Identification with a primary peer group online was associated with higher problem gambling behavior, but this association was only observed among U.S. youths ($p < .001$). Thus, this finding provides partial support for our second hypothesis (H2). The direct effect of perceived social support on problem gambling was negative, but also only among youths in the United States ($p < .001$). This finding likewise gives partial support to our third hypothesis (H3).

The moderation analyses showed that perceived social support significantly buffered the relationship between offline peer group identification and problem gambling ($p = .034$), as well as online peer group identification and problem gambling in Finland ($p = .009$). Among American youths, the interaction terms between perceived social support and social identification with either offline or online peer groups were not significant in relation to problem gambling. This finding provided partial support to our fourth hypothesis (H4). A slope difference test revealed that the slope for identification with a peer group offline differed significantly between youths who reported receiving social support and those who reported not receiving social support ($p < .001$). This difference did not exist in the slope calculated for identification with an online peer group. Importantly, identification with an offline peer group was associated with lower problem gambling behavior only if respondents also reported receiving at least some degree of social support.

6.3 Article 3: The role of perceived loneliness in youth addictive behaviors: A cross-national survey study

Article 3 examined the role of perceived loneliness in addictive behaviors. The study included data from Finland, the United States, and South Korea. Our results showed

that perceived loneliness was highest among youths in Finland and the United States (M = 5.52 in both countries), followed by youths in South Korea (M = 5.23). These mean differences were statistically significant when comparing Finland and the United States to South Korea ($p < .001$). Excessive alcohol use and problem gambling scores were highest among youths in Finland (M = 4.14 and M = 1.60, respectively), while compulsive Internet use scores were highest among youths in South Korea (M = 23.13). Mean differences were significant among all countries in terms of excessive alcohol use and problem gambling ($p < .001$). Mean differences in compulsive Internet use were significant between the United States and South Korea ($p < .001$) and between South Korea and Finland ($p < .001$).

Multivariate analyses revealed some differences between countries, but parallels as well regarding perceived loneliness and addictive behaviors. Model 1's results showed that perceived loneliness was significantly associated with excessive alcohol use in the United States ($p < .001$) and South Korea ($p = .006$), but this was not the case in Finland ($p = .820$). Living alone predicted excessive alcohol use among young individuals in South Korea ($p = .001$). Male gender was a significant predictor of excessive alcohol use in the United States ($p < .001$) and Finland ($p = .034$). Perceived loneliness was found to be significantly associated with compulsive Internet use in all three countries ($p < .001$). Regarding the control variables, younger age predicted compulsive Internet use in South Korea ($p < .001$) and Finland ($p < .001$), while male gender ($p = .040$) and living alone ($p = .030$) were predictors of compulsive Internet use in the United States. Model 1 also revealed that perceived loneliness was significantly associated with problem gambling in all three countries ($p = .001$ in Finland and the United States; $p < .001$ in South Korea). Living alone and older age were related to problem gambling in the United States ($p = .001$ and $p < .001$, respectively), while problem gambling was associated with younger age in South Korea ($p = .010$). Consistent with previous research, male gender was associated with higher problem gambling in all three countries ($p < .001$).

Using Model 2, which included possible confounding variables, we found that perceived loneliness remained significantly associated with excessive alcohol use only in South Korea ($p = .001$). Older age was a significant predictor of excessive alcohol use in all three countries ($p < .001$), while male gender predicted excessive alcohol use in Finland ($p < .001$) and the United States ($p < .001$). In addition, living alone endured as a statistically significant predictor of excessive alcohol use in South Korea ($p = .003$). Perceived loneliness was highly significantly associated with compulsive Internet use in all countries, even after including the possible confounding variables in the model ($p < .001$, consistently). Younger age predicted compulsive Internet use

in Finland (p = .002) and South Korea (p = .001), while living alone remained a significant predictor of compulsive Internet use in the United States (p = .020). Perceived loneliness continued to be associated with problem gambling only in South Korea (p = .001). Regarding the control variables, male gender was systematically associated with problem gambling in all countries (p < .001). Additional significant predictors of problem gambling in the United States were older age (p < .001) and living alone (p = .001). The results of our supplementary analyses showed that these findings were consistent and robust regardless of the multivariate method used. After removing potential outliers from the data, only excessive alcohol use remained significant in Model 2 for the United States (p = .020).

6.4 Article 4: The role of online social norms and social identity in youth problem gambling

Article 4 examined the association between perceived gambling-related norms online and problem gambling. Further, we assessed whether youths were more likely to conform to a perceived norm if it came from a perceived in-group. According to the descriptive statistics, problem gambling was not particularly high in our four samples, with the highest SOGS scores coming from Spain (M = 1.80) and Finland (M = 1.60), followed by the United States (M = 1.27) and South Korea (M = .73). Norm conformity was comparable in all four countries' samples, with the highest mean coming from Spain (M = 1.79 in Spain, M = 1.67 in South Korea, M = 1.66 in the United States, M = 1.27 in Finland). OLS analyses determined that conforming to perceived gambling norms online was directly and significantly associated with higher youth problem gambling in all four countries (p < .001 in Finland, the United States, and South Korea; p = .016 in Spain). This finding confirmed our fifth hypothesis (H5). In terms of interaction analyses, we observed that the association between online norm conformity and problem gambling was moderated by in-group information only among the South Korean sample. Subsequently, the moderation was significant among those South Korean participants who had received in-group information (p = .024). In-group information resulted in no significant moderation effects among the Finnish, U.S., or Spanish samples. Thus, our sixth hypothesis (H6) was only partially supported.

We also accounted for two personal characteristics, impulsivity and self-esteem, as these are typically heightened during adolescence and young adulthood, and may

impact risk-taking (i.e., gambling) behavior among young individuals. Our results showed that higher impulsivity was associated with higher problem gambling consistently across the countries ($p < .001$ in every country sample). Self-esteem was inversely related to problem gambling in Finland and the United States. In Finland, problem gambling was related to lower self-esteem ($p = .001$), while in the United States, problem gambling was associated with slightly higher self-esteem ($p = .030$). Male gender was a strong predictor of problem gambling ($p < .001$) as well as older age in all countries but South Korea.

7 DISCUSSION

The aim of this dissertation was to provide a social psychological perspective on youth addictive behaviors. This aim was achieved by conducting four empirical research studies. Prevalence statistics as well as annual costs reported by states from around the world indicate that addiction is a public health issue deeply rooted in the human condition (NIDA, 2014, 2018; Orford, 2001b; SAMHSA, 2014; West, 2006). Addiction is a complex disorder that impacts all areas of life. While an extensive body of research has explained and increased our knowledge about addiction and how to prevent it, addictive behaviors prevail. How is this? Why do some individuals become addicted while others do not? These questions, asked by many, also served as the starting point for this dissertation research. It is known that many life-long addictive behaviors initiate during the sensitive time periods of adolescence and young adulthood (Arnett, 2005; Inchley et al., 2018; Merikangas & McClair, 2012), which is why investigating the 15 to 25 age group was important in this research. These years are critical in human development as a time when young individuals break ties with families, gain independence, explore their identities, and place emphasis on peer relationships (Steinberg & Morris, 2001; Tarrant, 2002). These years of youth are also characterized as times of increased stress and turmoil (Arnett, 1999; Ayman-Nolley & Taira, 2000; Erikson, 1968; Marcia, 1980). Considering all these concurrent psychosocial developments, studying the social psychological factors behind youth addiction seemed imperative.

The addictive behaviors included in this research were excessive alcohol use, excessive drug use, problem gambling, and compulsive Internet use. These four types of addictive behaviors were chosen for investigation based on their current global prevalence rates as well as their overall acceptance among adolescents and young adults (e.g., Anderson & Jiang, 2018; Calado & Griffiths, 2019; Gómez et al., 2017; Sinkkonen et al., 2014; So & Chin, 2016; Volberg et al., 2010). All addictive behaviors were investigated in relation to different social psychological factors. While addiction is often considered a problem of the individual, addictive behaviors can be rarely considered without a social environment or without their impact on the individual and his or her social relationships. Although it is the individual who executes the behavior and thus manifests addiction, addiction is often tied to an

individual's social relationships (Bahr et al., 2005; Boman et al., 2013; Foster et al., 2014; Inchley et al., 2018). Furthermore, it is very likely that many addictive or otherwise destructive behavior patterns are learned or adopted from others.

In the first article, we investigated the relationships between four forms of addictive behaviors and psychological distress among Finnish youths. We further examined whether offline peer group identification mediates the association between addiction and psychological distress. We found that excessive alcohol use, excessive drug use, problem gambling, and compulsive Internet use were all directly associated with higher psychological distress. This finding is consistent with previous research. The key finding of this study, however, is that youths who used alcohol excessively also reported stronger identification with a peer group. These youths also experienced less psychological distress. This finding implies that, unlike other addictive behaviors included in the analyses, drinking alcohol continues to be a social activity among youth (Boman et al., 2013; Inchley et al., 2018). Young people who engage in excessive alcohol use are likely to do so together with peers, which enhances their feelings of togetherness. Analogous drinking patterns have been shown to enhance belonging to a peer group (Stogner et al., 2015). Alternatively, young people might engage in drinking to create new friendships (Inchley et al., 2018). Per our results, stronger identification with a peer group offline seems to safeguard youths from psychological distress to a certain extent, but it should be highlighted that the direct effect of excessive drinking on youth psychological well-being is still negative.

An additional noteworthy finding of this study was that engaging in other forms of addictive behaviors (i.e., excessive drug use, problem gambling, and compulsive Internet use) seems to detach youths from their peers. Based on our data alone, we cannot determine whether these youths become socially detached from peers because they engaged in these addictive behaviors or engaged in addictive behaviors because they felt detached. Regardless, these addictive behaviors seem to be more isolating in nature. They might also function as a replacement for social relationships. It is also possible that some youths engage in addictive behaviors such as excessive drug use or compulsive Internet use to alleviate distress. However, this is likely unsuccessful; as our results showed, addictive behaviors were consistently associated with distress.

These findings have possible implications in terms of further improving addiction prevention and intervention work. First, the results suggest that a strong sense of belonging to a peer group could be a risk factor of youth excessive drinking, highlighting a continuous need to educate youth about alcohol-related harm.

Further, youths should be taught that while having strong social ties is beneficial, engaging in excessive drinking is not a lasting or healthy way of building or maintaining social connections. Second, the results indicate that social identity resources should be better recognized as a way of facilitating psychological well-being for youths who battle with addictive behavior. However, rather than merely adding peer contacts, social relationships should be perceived as meaningful and provide youths a sense of belonging. Practitioners and counselors working with young individuals could guide them toward building healthy social relationships that steer them away from addictive behavior. Educating youths about the benefits of meaningful peer relationships and creating social groups consisting of peers with similar experiences could hold promise in improving young people's well-being and reduce addictive behavior patterns among them.

Study 2 built on the findings of the first article by focusing on youth problem gambling. The study explored the relationship between problem gambling and belonging to offline and online peer groups. We examined whether perceived social support moderates this relationship. The study compared samples from Finland and the United States. Our direct linear analyses revealed that identifying with an offline peer group was associated with lower amounts of problem gambling among both Finnish and American youths. Among American youth, identifying with an online peer group was associated with higher problem gambling. These results are in line with past research indicating that offline and online social relationships can have different effects regarding youth health behavior and well-being (e.g., Kaakinen et al., 2018; Minkkinen et al., 2015). Additionally, these results support the notion that offline relationships in particular can protect youth from the negative and harmful experiences they might encounter in both offline and online environments (Lee & Goldstein, 2016; Minkkinen et al., 2015; Turja et al., 2017). Perceived social support was directly associated with lower problem gambling among American youth, but not among Finnish youth. The direct association observed in the American sample is consistent with past literature and in line with the buffering hypotheses of social support (Cohen & Willis, 1985; Cohen et al., 2004).

The moderating effect of perceived social support was only observed among the Finnish sample. This result was somewhat surprising, and might indicate that the outcomes of peer group identification vary depending on the degree of social support received from meaningful others. As illustrated by our slope-difference test, the association between offline peer group identification and lower problem gambling was true only when participants reported receiving at least some level of social support. Thus, it seems that among American youths in our sample, perceived

social support has less influence (smaller statistical weight in the variable), or less emphasis is given to social support in gambling context. Perhaps for the American youths in our sample, peer groups are not the primary source of social support, as reflected in our nonsignificant interaction terms. Alternatively, American youths who engage in gambling might acquire social connections specifically around gambling, providing them a sense of belonging to a peer group, but at the same time normalizing gambling behavior. Then, social support fails to function as a buffering factor.

Previous literature on social support has shown that the processes of social support can be complex, but its impact on health and well-being can be highly beneficial (Cohen et al., 2004; Gomes et al., 2020; Thoits, 2011). Overall, the results of our analyses are in line with the prior literature. Our results also offer further viewpoints in terms of culturally sensitive youth problem gambling prevention work. Importantly, young individuals who gamble problematically should be considered as part of their larger social context: Online peers might be a risk factor for problem gambling among youth, while meaningful peer relationships offline may safeguard people from the activity. This falls back to the notion that addictive behaviors in general should not be considered merely on the level of the individual, but viewed as functions of a larger social picture. Emphasis should be placed on youths' offline peer relationships and helping youths evaluate and identify sources of social support. To efficiently reduce youth problem gambling, future cross-national research is needed to evaluate the potential of online peer groups to provide healthy relationships and support for youths.

In the third study, we examined how perceived loneliness among youth in Finland, the United States, and South Korea is associated with three different addictive behaviors. We included excessive alcohol use, problem gambling, and compulsive Internet use in our investigation. According to our findings, loneliness was highly associated with compulsive Internet use in all three countries. In addition, loneliness predicted excessive alcohol use and problem gambling among South Korean youths. These results support previous research on the negative consequences of loneliness (e.g., Cacioppo et al., 2010; Cacioppo et al., 2014; Holt-Lunstad et al., 2015; Houghton et al., 2016). Importantly, the results revealed that loneliness is a risk factor for compulsive Internet use systematically across diverse cultures. To that effect, these findings are aligned with those from Articles 1 and 2, which showed that youths who are more engaged in their social relationships are more likely to participate in other types of addictive behaviors, such as excessive alcohol use—or problem gambling, should the peer relationships be online.

The results of the third study further revealed some cultural differences in youth addictive behaviors. Loneliness was found to be associated with excessive alcohol use and problem gambling among South Korean youths. Meanwhile, these associations were not observed in Finland or the United States whose results were more analogous. These differences might be credited to variations in the countries' social structures (collectivistic vs. individualistic) or social environments. In Finland and the United States, youth alcohol use is often encouraged by the social environment, and youths typically engage in heavy forms of drinking in social gatherings (Ahlström & Österberg, 2004). In contrast, feeling lonely may be a direr issue in a collectivistic culture, and Korean youths who experience loneliness may experience it much more seriously than their counterparts in less collectivistic countries. This can result in unhealthy coping mechanisms, such as alcohol use. The results of this study highlight the need for offering youth help and support where they are most likely to find it: on the Internet. Online-based and culturally informed behavioral intervention technologies providing real-time support and personalized feedback could become effective in preventing compulsive Internet use. Additionally, we acknowledge the need to develop prevention programs to lessen youth loneliness, which in itself, is an emerging issue of the modern and technologically driven world (Best, 2014; Davis, 2012; Kushlev et al., 2017). Youths are at a high risk for loneliness (Lee & Goldstein, 2016; Qualter et al., 2015) and, as indicated by our results, loneliness could influence or be a risk factor for various addictive behaviors among youth. Consequently, intervening with loneliness could help reduce youth addictive behaviors as well.

The fourth study returned to investigating problem gambling. Utilizing data from four countries (Finland, the United States, South Korea, and Spain), we investigated whether conforming to perceived gambling norms (i.e., following the majority opinion about gambling) in online interaction is related to problem gambling. We further examined whether the norm source (the in-group) moderates this behavior. According to our results, higher conformity to perceived gambling norms online was associated with higher problem gambling. This result was found to be true in all four countries. Given that this finding was true in such diverse cultural settings, it is feasible that young problem gamblers, to whom gambling is already a salient topic, are more sensitive toward gambling content online, perhaps increasing their curiosity or motivation to gamble. The result might also indicate that these youths conform to perceived gambling norms because conformity is an easy way of achieving uniformity with the majority opinion about a sensitive topic (Cialdini & Goldstein, 2004; Cialdini & Trost, 1998; Deutsch & Gerard, 1955; Sherif, 1961).

In this study, we were interested in assessing direct norm conformity. In other words, regardless of the stance of the norm toward gambling (negative or positive), are young problem gamblers more likely to follow a gambling norm? The study was designed this way because gambling can still be considered a marginalized activity despite its increased popularity. Engaging in gambling might thus be shameful or evoke conflicting feelings in young individuals (Raisamo et al., 2020; Williams et al., 2013). Consequently, whether or not the majority opinion promotes or disapproves of gambling, or represents the young gambler's own viewpoint, conforming to a majority opinion about gambling might relieve anxiety and enhance positive self-concept (Cialdini & Goldstein, 2004). Indeed, we found a positive association between higher gambling norm conformity and problem gambling. It is further possible that youths who engage in problem gambling share some underlining characteristics, such as insufficient confidence (see Asch, 1956). This may make them more impressionable and likely to conform to the perceived majority opinion online. Following perceived gambling norms online might also explain the increased popularity of gambling among youth. Previous research suggests that young individuals have substantial misperceptions when it comes to peer gambling and norms surrounding peer gambling (Raisamo & Lintonen, 2012;). More specifically, youths overestimate the frequency of peers' gambling. This was reflected in our results as well, signposting that youths who perceive gambling as a more normative activity are more vulnerable to engage in gambling activities themselves. Research on the impact of social norms on youth health behavior has found so far that young individuals often misperceive the frequency of different risk behaviors (e.g., alcohol use, drug use, smoking) among their peers, which is associated with increased personal involvement in these behaviors (Best et al., 2016; Foster et al., 2014; Peters et al., 2007; Raisamo & Lintonen, 2012; Rinker & Neighbors, 2014). The results of this study indicate that social norms about gambling might influence youth behavior through the online context as well.

Regarding moderation analysis, we found that in-group information was not a significant factor in norm conformity among youth in Finland, the United States, or Spain. In South Korea, however, an in-group norm source moderated the association between norm conformity and problem gambling. Consequently, South Korean youths were more likely to follow the gambling norm if it was endorsed by a perceived in-group. This result could indicate that online in-group formation occurs even on minimal cues in South Korea. On the other hand, this result may reflect deeper cultural differences between the countries and denote that South Korean youths value group harmony more, even in online interactions, and place higher

importance on interaction when communication comes from an in-group (Kim & Markus, 1999). Our results suggest that conformity to perceived social norms is another social psychological process that extends to the virtual world. Perceived norms appear to guide the thought processes of young individuals, at least when making quick decisions and navigating the online realm. The results of this study could imply that youth who gamble problematically have a predisposition to imitate the most common perceived behavior set by others once they observe it online. This could at least partly explain why gambling, especially online gambling, has become such a popular activity among young individuals and why the behavior is becoming normalized among youth across the world. However, more research and experimental approaches are needed to further examine norm conformity online.

As mentioned above, the Internet offers many opportunities for intervention work in terms of youth problem behavior. In the case of problem gambling, educators and healthcare professionals working on prevention and intervention methods could aim to provide healthy support groups and group norms through online programs. This way, youths could be guided away from gambling activities. Limiting online content that endorses gambling could also be effective, as well as providing accurate information about gambling prevalence rates to correct misperceptions, and educating youths to think critically about gambling as a form of entertainment and the content they encounter online in general.

The four studies described in this dissertation offer a comprehensive cross-national investigation of addictive behaviors among youth from a social psychological framework. The results that emerged give valuable insight in the existing associations between various addictive behaviors and youths' social relationships. However, future research is needed to more deeply analyze and understand the current findings. Future cross-national work that delves into the topics of youth addiction from a social perspective are needed to ensure that the associations identified in this research are meaningful and consistent. These studies should be replicated with data-sets from the four countries compared here, but from different countries as well. More comprehensive cross-national comparisons are necessary to understand how universal the observed associations are and to better grasp why the observed differences exist.

7.1 Limitations

The four-country YouGamble survey data are cross-sectional and consequently do not allow for causal interpretations of the results. Additionally, our samples are non-probability-based convenience quota samples which somewhat reduces the generalizability of the studies. However, the large cross-national data sets from a wide range of countries offer valuable information, allowing for meaningful comparisons and evaluations to be made using the results. Another limitation regarding the data is that our surveys relied on self-reported information. Self-reported data are sensitive to social desirability bias, especially when surveying about personal, even illicit behaviors, such as substance use and gambling. However, our data collection procedure aimed to reduce this bias by keeping the surveys self-administered and anonymous. Article 4 utilized the experimental portion of the YouGamble surveys (i.e., vignette messages and in-group effect manipulation), but the results of the analyses were nonsignificant for all countries except South Korea, where the effects were statistically significant but small. It is possible that our manipulation for creating a salient in-group environment was not strong enough and, subsequently, did not produce a sufficient in-group experience for the participants, which then reflected on the results. It is conceivable that Group C membership remained superficial and meaningless to the participants, given that it was externally assigned and too unspecified (similarity between group members was only based on the perceivably analogous answers provided in the survey). Building social groups that are meaningful for individuals, especially in the online context, undoubtedly requires more effort and personal investment from young individuals. Future experimental research should use different techniques for in-group manipulation or focus on longitudinal methods to investigate whether more robust effects between online in-group membership and norm conformity can be found.

Some of the measures designed to assess addictive behaviors and employed in the surveys have received criticism. Earlier research has questioned the suitability of the brief screening tool AUDIT-C to detect excessive alcohol use among young people (McCambridge & Thomas, 2009). The measure is based on questions of consumption and common alcohol use behavior patterns of youth such as heavy episodic drinking, which may skew the predictive value of the tool (Kelly et al., 2009; Barry et al., 2015). The AUDIT-C was chosen, however, because it is a valid, reliable, and quick measure, particularly suitable for screening risky alcohol use in survey studies (Bush et al., 1998; Rubinsky et al., 2013). Similarly, the SOGS has been criticized for its cutoff scores, which increase sensitivity to false positives when

measuring problem gambling outside of clinical samples (Battersby et al., 2002; Stinchfield, 2002). However, the SOGS has good psychometric properties. In our analyses, we used SOGS scores as continuous variables rather than diagnostically, and discussed the scores in terms of high and low problem gambling in association with other variables. Lastly, across the four studies, our results showed some national differences among Finland, the United States, South Korea, and Spain. However, based on our measures and analyses, we cannot pinpoint what causes these differences. As mentioned, future cross-national research on youth addictive behaviors is needed to explore various psychological and sociocultural factors that may contribute to these differences.

7.2 Conclusions

The addictive behaviors of adolescents and young adults are a continuous global challenge, impacting individuals, their social relationships, and societies at large. Excessive alcohol and drug use are traditional forms of addictive youth behaviors that, despite changing trends, have maintained their popularity among young individuals. The modern world with its technological advances has brought forth new opportunities, but challenges as well. Such social challenges are visible in new forms of youth addictive behaviors, of which problem gambling and compulsive Internet use are prominent examples. Along with the digitalization of the world, the social lives of youths have also changed rapidly, and traditional real-life interactions have become increasingly virtual. Young people's addictive behaviors, social lives, and the modern advances of the world are all interconnected.

According to the results of this dissertation, different social psychological processes can protect youths from or predispose them to different addictive behavior patterns. Excessive alcohol use is more likely to occur among youths with strong social ties to primary peer groups offline. In contrast, excessive drug use, problem gambling, and compulsive Internet use seem to socially isolate youths from their peers. Identifying with supportive peer groups offline can safeguard youths from problem gambling. Identifying with peer groups online and following perceived gambling norms online seem to contribute to higher youth problem gambling across the world. Loneliness is a significant risk factor in youths' compulsive Internet use across geographically and culturally diverse countries. These results emphasize a need for recognizing and reducing youths' perceived loneliness globally. Social support, healthy social norms, and meaningful peer

relationships, particularly those in the real world (offline), should be considered as key social psychological factors and social resources in prevention and intervention work to help youths out of addictive behaviors. Together, the four research studies of this dissertation demonstrate the intricate connections between addiction and social factors. Our findings build on previous social psychological research on addiction and fill some of the existing gaps in our knowledge on what social psychological processes relate to different addictive behaviors among today's youth, and how.

REFERENCES

Ahlström, S. K., & Österberg, E. L. (2004). International perspectives on adolescent and young adult drinking. *Alcohol Research & Health*, *28*(4), 258–268.

Aiken, A., Clare, P. J., Wadolowski, M., Hutchinson, D., Najman, J. M., Slade, T., Bruno, R., McBride, N., Kypri, K., & Mattick, R. P. (2018). Age of alcohol initiation and progression to binge drinking in adolescence: A prospective cohort study. *Alcoholism, Clinical and Experimental Research*, *42*(1), 100–110. https://doi.org/10.1111/acer.13525

Albert, D., Chein, J., & Steinberg, L. (2013). The teenage brain. *Current Directions in Psychological Science*, *22*(2), 114–120. https://doi: 10.1177/0963721412471347

Altermatt, E. R., & Pomerantz, E. M. (2005). The implications of having high-achieving versus low-achieving friends: A longitudinal analysis. *Social Development*, *14*(1), 61–81. https://doi.org/10.1111/j.1467-9507.2005.00291.x

Anderson, M. & Jiang, J. (2018). Teens, social media habits & technology 2018. Pew Research Center. Retrieved March 1t, 2020, from https://www.pewresearch.org/internet/2018/05/31/teens-social-media-technology-2018/

Anderson, E. L., Steen, E., & Stavropoulos, V. (2017). Internet use and problematic Internet use: A systematic review of longitudinal research trends in adolescence and emergent adulthood. *International Journal of Adolescence and Youth*, *22*(4), 430–454. https://doi.org/10.1080/02673843.2016.1227716

American Psychiatric Association. What Is Addiction? (2017, January). Retrieved April 21, 2020, from https://www.psychiatry.org/patients-families/addiction/what-is-addiction

Arnett J. J. (1999). Adolescent storm and stress, reconsidered. *The American Psychologist*, *54*(5), 317–326. https://doi.org/10.1037//0003-066x.54.5.317

Arnett, J. J. (2000). Emerging adulthood: A theory of development from the late teens through the twenties. *American Psychologist, 55*(5), 469–480. https://doi.org/10.1037/0003-066X.55.5.469

Arnett, J. J. (2005). The developmental context of substance use in emerging adulthood. *Journal of Drug Issues*, *35*(2), 235–254. https://doi.org/10.1177/002204260503500202

Arnett, J. J. (2006). G. Stanley Hall's Adolescence: Brilliance and nonsense. *History of Psychology*, *9*(3), 186–197. https://doi.org/10.1037/1093-4510.9.3.186

Arnett, J. & Jensen Arnett, L. (2010). *Human development: A Cultural Approach*. Third Edition. Pearson: New York.

Asante, L. S., Chun, S., Yun, M., & Newell, M. (2014). Social supply of alcohol to Korean high school students: a cross-sectional international alcohol control study. *BMJ Open*, *4*(1), e003462. https://doi.org/10.1136/bmjopen-2013-003462

Asch, S. E. (1956). Studies of independence and conformity: I. A minority of one against a unanimous majority. *Psychological Monographs: General and Applied*, *70*(9), 1–70. https://doi: 10.1037/h0093718

Ashforth, B. E., & Mael, F. (1989). Social identity theory and the organization. *Academy of Management Review*, *14*(1), 20–39. doi.10.5465/AMR.1989.4278999

Atroszko, P. A., Sawicki, A., Sendal, L., & Atroszko, B. (2017). Validity and reliability of single-item self-report measure of global self-esteem. In M. McGreevy & R. Rita. (Eds.), *CER Comparative European Research 2017* (pp. 120–123). London, UK.

Ayman-Nolley, S., & Taira, L. L. (2000). Obsession with the dark side of adolescence: A decade of psychological studies. *Journal of Youth Studies*, *3*(1), 35–48. https://doi.org/10.1080/136762600113022

Baggio, S., Iglesias, K., & Rousson, V. (2018). Modeling count data in the addiction field: Some simple recommendations. *International Journal of Methods in Psychiatric Research*, *27*(1), e1585. https://doi.org/10.1002/mpr.1585

Bahr, S. J., Hoffmann, J. P., & Yang, X. (2005). Parental and peer influences on the risk of adolescent drug use. *Journal of Primary Prevention*, *26*(6), 529–551. https://doi.org/10.1007/s10935-005-0014-8

Baron, R. M., & Kenny, D. A. (1986). The moderator-mediator variable distinction in social psychological research: Conceptual, strategic, and statistical considerations. *Journal of Personality and Social Psychology*, *51*, 1173–1182. https://doi.org/10.1037/0022-3514.51.6.1173.

Barry, A. E., Chaney, B. H., Stellefson, M. L., & Dodd, V. (2015). Evaluating the psychometric properties of the AUDIT-C among college students. *Journal of Substance Use*, *20*(1), 1–5. https://doi.org/10.3109/14659891.2013.856479

Bathish, R., Best, D., Savic, M., Beckwith, M., Mackenzie, J., & Lubman, D. I. (2017). "Is it me or should my friends take the credit?" The role of social networks and social identity in recovery from addiction. *Journal of Applied Social Psychology*, *47*(1), 35–46.

Battersby, M. W., Thomas, L. J., Tolchard, B., & Esterman, A. (2002). The South Oaks Gambling Screen:A review with reference to Australian use. *Journal of Gambling Studies*, *18*(3), 257–271. https ://doi.org/10.1023/A:10168 9522.

Baumeister, R. F., & Leary, M. R. (1995). The need to belong: desire for interpersonal attachments as a fundamental human motivation. *Psychological Bulletin*, *117*(3), 497–529.

Beckwith, M., Best, D., Dingle, G., Perryman, C., & Lubman, D. (2015). Predictors of flexibility in social identity among people entering a therapeutic community for substance abuse. *Alcoholism Treatment Quarterly*, *33*(1), 93–104, https://doi.10.1080/07347324.2015.982465

Bennett, T., Holloway, K., & Farrington, D. (2008). The statistical association between drug misuse and crime: A meta-analysis. *Aggression and Violent Behavior*, *13*(2), 107–118. https://doi.org/10.1016/j.avb.2008.02.001

Best, D., Beckwith, M., Haslam, C., Alexander Haslam, S., Jetten, J., Mawson, E., & Lubman, D. I. (2016). Overcoming alcohol and other drug addiction as a process of social identity transition: The social identity model of recovery (SIMOR). *Addiction Research & Theory*, *24*(2), 111–123. https://doi.org/10.3109/16066359.2015.1075980

Best, D., Bliuc, A. M., Iqbal, M., Upton, K., & Hodgkins, S. (2018). Mapping social identity change in online networks of addiction recovery. *Addiction Research & Theory*, *26*(3), 163–173. https://doi.org/10.1080/16066359.2017.1347258

Best, P., Manktelow, R., & Taylor, B. (2014). Online communication, social media and adolescent wellbeing: A systematic narrative review. *Children and Youth Services Review*, *41*, 27–36. https://doi:10.1016/j.childyouth.2014.03.001

Bertholet, N., Faouzi, M., Studer, J., Daeppen, J. B., & Gmel, G. (2013). Perception of tobacco, cannabis, and alcohol use of others is associated with one's own use. *Addiction Science & Clinical Practice*, *8*(1), 15. https://doi.org/10.1186/1940-0640-8-15

Beyers, W., & Goossens, L. (1999). Emotional autonomy, psychosocial adjustment and parenting: interactions, moderating and mediating effects. *Journal of Adolescence*, *22*(6), 753–769. https://doi: 10.1006/jado.1999.0268

Bicchieri, C., Muldoon, R, & Sontuoso, A. (2011). Social norms. In E. N. Zalta (Ed.), *The Stanford Encyclopedia of Philosophy* (Winter 2018 Edition). Retrieved May 19, 2020, from https://stanford.library.sydney.edu.au/archives/sum2016/entries/social-norms/#Aca

Blinn-Pike, L., Worthy, S. L., & Jonkman, J. N. (2010). Adolescent gambling: A review of an emerging field of research. *Journal of Adolescent Health*, *47*(3), 223–236. https://doi.org/10.1016/j.jadohealth.2010.05.003

Boman, J. H., IV, Stogner, J., & Lee Miller, B. (2013). Binge drinking, marijuana use, and friendships: The relationship between similar and dissimilar usage and friendship quality. *Journal of Psychoactive Drugs*, *45*, 218–226. https://doi.org/10.1080/ 02791072.2013.803646.

Brandtzæg, P. B. (2012). Social networking sites: Their users and social implications—A longitudinal study. *Journal of Computer-Mediated Communication*, *17*(4), 467–488. https://doi.org/10.1111/j.1083-6101.2012.01580.x

Broman, C. L. (2009). The longitudinal impact of adolescent drug use on socioeconomic outcomes in young adulthood. *Journal of Child & Adolescent Substance Abuse*, *18*(2), 131–143. https://doi.org/10.1080/10678280902724002

Brown, S.A. & Tapert, S.F. (2004). Health consequences of adolescent alcohol involvement. In R.J. Bonnie & M.E. O'Connell (Eds.) *Reducing underage drinking: A collective responsibility* (pp. 383–401). National Academies Press.

Brunelle, N., Leclerc, D., Cousineau, M.-M., Dufour, M., Gendron, A., & Martin, I. (2012). Internet gambling, substance use, and delinquent behavior: An adolescent deviant behavior involvement pattern. *Psychology of Addictive Behaviors*, *26*(2), 364–370. https://doi.10.1037/a0027079

Buckingham, D. (2008). Introducing Identity. In D. Buckingham (Ed.) *Youth, Identity, and Digital Media* (pp. 1–24). Cambridge, MA: The MIT Press. https://doi:10.1162/dmal.9780262524834.001

Buckingham, S., & Best, D. (Eds.). (2016). *Addiction, behavioral change and social identity: The path to resilience and recovery*. Taylor & Francis.

Buckingham, S., Frings, D., & Albery, I.P. (2013). Group membership and social identity in addiction recovery. *Psychology of addictive behaviors: Journal of the Society of Psychologists in Addictive Behaviors*, *27* 4, 1132-40. https://doi.10.1037/a0032480

Bush, K., Kivlahan, D. R., McDonell, M. B., Fihn, S. D., & Bradley, K. A. (1998). The AUDIT alcohol consumption questions (AUDIT-C): an effective brief screening test for problem drinking. *Archives of Internal Medicine*, *158*(16), 1789–1795. https://doi:10.1001/archinte.158.16.1789

Cacioppo, S., Capitanio, J.P., & Cacioppo, J.T. (2014). Toward a neurology of loneliness. *Psychological Bulletin*, *140*, 1–40. https://doi.org/10.1037/a0037618

Cacioppo, J. T., Hawkley, L. C., Berntson, G. G., Ernst, J. M., Gibbs, A. C., Stickgold, R., & Hobson, J. A. (2002). Do lonely days invade the nights? Potential social modulation of sleep efficiency. *Psychological Science*, *13*(4), 384–387. https://doi.org/10.1111/1467-9280.00469

Cacioppo, J. T., Hawkley, L. C., Crawford, L. E., Ernst, J. M., Burleson, M. H., Kowalewski, R. B., Malarkey, W.B., Van Cauter, E., & Berntson, G. G. (2002). Loneliness and health: Potential mechanisms. *Psychosomatic Medicine*, *64*(3), 407–417.

Cacioppo, J. T., Hawkley, L. C., & Thisted, R. A. (2010). Perceived social isolation makes me sad: 5-year cross-lagged analyses of loneliness and depressive symptomatology in the Chicago Health, Aging, and Social Relations Study. *Psychology and Aging*, *25*(2), 453–463. https://doi.org/10.1037/a0017216

Calado, F., Alexandre, J., & Griffiths, M. D. (2016). Prevalence of adolescent problem gambling: A systematic review of recent research. *Journal of Gambling Studies*, *33*(2), 397–424. https://doi. 10.1007/s10899-016-9627-5

Calado, F. & Griffiths, M. D. (2016). Problem gambling worldwide: An update and systematic review of empirical research (2000–2015). *Journal of Behavioral Addictions*, *5*(4), 592–613. https://doi.org/10.1556/2006.5.2016.073

Campbell, D. T. (1976). "On the conflicts between biological and social evolution and between psychology and moral tradition": Reprise. *American Psychologist*, *31(*5), 381–384. https://doi: 10.1037/0003-066x.31.5.381

Canale, N., Griffiths, M. D., Vieno, A., Siciliano, V., & Molinaro, S. (2016). Impact of Internet gambling on problem gambling among adolescents in Italy: Findings from a large-scale nationally representative survey. *Computers in Human Behavior*, *57*, 99–106. https://doi.org/10.1016/j.chb.2015.12.020

Cantell, M., Castrén, S., Fabritius, J., Järvinen-Tassopoulos, J., Keinänen, J., Kesänen, M., Koskela, T., Laitakari, S., Leinonen, S., Mikkola, J., Murto, A., Mustalampi, S., Mykkänen, A., Rydman, E., Salonen, A., Selin, J., Suominen, S., Tukia, J., & Tulirinta, T. (2018). State of play 2017: A review of gambling in Finland. NationalInstitute for Health and Welfare (THL Review Report 12/2017). Helsinki, Finland 2017

Centers for Disease Control and Prevention. (2018a). Underage drinking. Retrieved April 10, 2020, from https://www.cdc.gov/alcohol/fact-sheets/underage-drinking.htm

Centers for Disease Control and Prevention. (2018b). Marijuana and public health: Adolescents and young adults. Retrieved April 25, 2020, from https://www.cdc.gov/marijuana/nas/adolescents.html

Cerniglia, L., Zoratto, F., Cimino, S., Laviola, G., Ammaniti, M., & Adriani, W. (2017). Internet Addiction in adolescence: Neurobiological, psychosocial and clinical issues. *Neuroscience & Biobehavioral Reviews*, *76*, 174–184. https://doi.org/10.1016/j.neubiorev.2016.12.024

Cheng, C., & Li, A. Y. L. (2014). Internet addiction prevalence and quality of (real) life: A meta-analysis of 31 nations across seven world regions. *Cyberpsychology, Behavior and Social Networking*, *17*, 755–760. doi.org/10.1089/cyber.2014.0317

Cho, E. (2015). Therapeutic Interventions for Treatment of Adolescent Internet Addiction—Experiences from South Korea. In C. Montag & M. Reuter (Eds.) *Internet Addiction. Studies in Neuroscience, Psychology and Behavioral Economics*. Springer: Cham.

Christakis, D. A., Moreno, M. M., Jelenchick, L., Myaing, M. T., & Zhou, C. (2011). Problematic internet usage in US college students: a pilot study. *BMC Medicine*, *9*(1), 77. https://doi.org/10.1186/1741-7015-9-77

Cialdini, R. B., & Goldstein, N. J. (2004). Social influence: Compliance and conformity. *Annual Review of Psychology*, *55*(1), 591–621. https://doi.org/10.1146/annurev.psych.55.090902.142015

Cialdini, R. B. & Trost, M. R. (1998). Social influence: Social norms, conformity, and compliance. In D. T. Gilbert & S. T. Fiske (Eds.), *The handbook of social psychology*: Vol. 1 (pp. 151–192). McGraw-Hill.

Ciarrochi, J., Parker, P., Sahdra, B., Marshall, S., Jackson, C., Gloster, A., Heaven, P. (2016). The development of compulsive internet use and mental health: A four year study of adolescence. *Developmental Psychology*, *52*, 272–283.

Cohen, S. (2004). Social relationships and health. *American Psychologist*, *59*(8), 676.

Cohen, S., & Wills, T. A. (1985). Stress, social support, and the buffering hypothesis. *Psychological Bulletin*, *98*(2), 310–357. https://doi.org/10.1037/0033-2909.98.2.310

Cole, D. A., Nick, E. A., Zelkowitz, R. L., Roeder, K. M., & Spinelli, T. (2017). Online social support for young people: Does it recapitulate in-person social support; can it help? *Computers in Human Behavior*, *68*, 456–464. https://doi.org/10.1016/j.chb.2016.11.058

Colishaw, S., Merkouris, S., Chapman, A., & Radermacher, H. (2014). Pathological and problem gambling in substance use treatment: a systematic review and meta-analysis. *Journal of Substance Abuse Treatment*, *46*(2), 98–105. https://doi.org/10.1016/j.jsat.2013.08.019

Côté, J. E. (2009). Identity formation and self-development in adolescence. In R.M. Lerner & L. Steinberg (Eds.), *Handbook of adolescent psychology*, (pp. 266–304). Wiley.

Das, J. K., Salam, R. A., Arshad, A., Finkelstein, Y., & Bhutta, Z. A. (2016). Interventions for adolescent substance abuse: An overview of systematic reviews. *Journal of Adolescent Health*, *59*(4), S61–S75. https://doi.org/10.1016/j.jadohealth.2016.06.021

Dasen, P. R. (2000). Rapid social change and the turmoil of adolescence: A cross-cultural perspective. *International Journal of Group Tensions*, *29*(1–2), 17–49. https://doi.org/10.1023/A:1005126629553

Davis, K. (2012). Friendship 2.0: Adolescents' experiences of belonging and self-disclosure online. *Journal of Adolescence*, *35*, 1527–1536. https://doi:10.1016/j.adolescence.2012.02.013

Dawson, D. A., Grant, B. F., Stinson, F. S., & Zhou, Y. (2005). Effectiveness of the derived Alcohol Use Disorders Identification Test (AUDIT-C) in screening for alcohol use disorders and risk drinking in the US general population. *Alcoholism: Clinical and Experimental Research*, *29*(5), 844–854. https://doi.org/10.1097/01.ALC.0000164374.32229.A2

Debnam, K. J., Saha, S., & Bradshaw, C. P. (2018). Synthetic and other drug use among high school students: The role of perceived prevalence, access, and harms. *Substance Use & Misuse*, *53*(12), 2069–2076. https://doi: 10.1080/10826084.2018.1455699

De Leo, J. A., & Wulfert, E. (2013). Problematic Internet use and other risky behaviors in college students: An application of problem-behavior theory. *Psychology of Addictive Behaviors*, *27*(1), 133–141. https://doi.10.1037/a0030823

Derbyshire, K. L., Lust, K. A., Schreiber, L. R., Odlaug, B. L., Christenson, G. A., Golden, D. J., & Grant, J. E. (2013). Problematic Internet use and associated risks in a college sample. *Comprehensive Psychiatry*, *54*(5), 415–422. https://doi.org/10.1016/j.comppsych.2012.11.003

Derevensky, J. L., & Gilbeau, L. (2015). Adolescent gambling: twenty-five years of research. *Canadian Journal of Addiction*, *6*(2), 4–12.

Desai, R. A., & Potenza, M. N. (2009). A cross-sectional study of problem and pathological gambling in patients with schizophrenia/schizoaffective disorder. *The Journal of Clinical Psychiatry*, *70*(9), 1250–1257. https://doi: 10.4088/jcp.08m04359

Deutsch, M., & Gerard, H. B. (1955). A study of normative and informational social influences upon individual judgment. *The Journal of Abnormal and Social Psychology*, *51*(3), 629–636. https://doi.org/10.1037/h0046408

Dhir, A., Chen, S., & Nieminen, M. (2015). Predicting adolescent internet addiction: The roles of demographics, technology accessibility, unwillingness to communicate andsought internet gratifications. *Computers in Human Behavior*, *51*, 24–33. http://dx.doi.org/10.1016/j.chb.2015.04.056.

Dickson-Gillespie, L., Rugle, L., Rosenthal, R., & Fong, T. (2008). Preventing the incidence and harm of gambling problems. *The Journal of Primary Prevention*, *29*(1), 37–55. https://doi.10.1007/s10935-008-0126-z

Dingle, G. A., Cruwys, T., & Frings, D. (2015). Social identities as pathways into and out of addiction. *Frontiers in Psychology*, *6*, 1795. https://doi.org/10.3389/fpsyg.2015.01795

Dingle, G. A., Haslam, C., Best, D., Chan, G., Staiger, P. K., Savic, M., Beckwith, M., Mackenzie, J., Bathish, R., & Lubman, D. I. (2019). Social identity differentiation predicts commitment to sobriety and wellbeing in residents of therapeutic communities. *Social Science & Medicine*, *237*, 112459. https://doi.org/10.1016/j.socscimed.2019.112459

Dingle, G.A., Stark, C., Cruwys, T., & Best, D. (2015). Breaking good: Breaking ties with social groups may be good for recovery from substance misuse. *British Journal of Social Psychology*, *54*, 236–254. https://doi.10.1111/bjso.12081

Directorate General for the Regulation of Gambling. (2015). Study on the prevalence, behaviour and characteristics of users of games of chance in Spain. *Dirección General de Ordenación del Juego 2019*. Retrieved March 18, 2020, from Estudio_Prevalencia_2015_en%20(3).pdf

Dobkin, P. L., Civita, M. D., Paraherakis, A., & Gill, K. (2002). The role of functional social support in treatment retention and outcomes among outpatient adult substance abusers. *Addiction*, *97*(3), 347–356. https://doi.org/10.1046/j.1360-0443.2002.00083.x

Durkee, T., Carli, V., Floderus, B., Wasserman, C., Sarchiapone, M., Apter, A., Balazs, J.A., Bobes, J., Brunner, R., Corcoran, P., Cosman, D., Haring, C., Hoven, C.W., Kaess, M., Kahn, J.-P., Nemes, B., Postuvan, V., Saiz, P.A., Värnik, P., Wasserman, D. & Cosman, D. (2016). Pathological internet use and risk-behaviors among European adolescents. *International Journal of Environmental Research and Public Health*, *13*(3), 294. https://doi:10.3390/ijerph13030294

Edgren, R., Castrén, S., Jokela, M., & Salonen, A. H. (2016). At-risk and problem gambling among Finnish youth: The examination of risky alcohol consumption, tobacco smoking, mental health and loneliness as gender-specific correlates. *Nordic Studies on Alcohol and Drugs*, *33*(1), 61–80. https://doi.org/10.1515/nsad-2016-0005

EMCDDA & ESPAD. (2016). ESPAD Report 2015 — Results from the European School Survey Project on Alcohol and Other Drugs, EMCDDA–ESPAD joint publications, Publications Office of the European Union, Luxembourg.

Erevik, E. K., Pallesen, S., Vedaa, Ø., Andreassen, C. S., & Torsheim, T. (2017). Alcohol use among Norwegian students: Demographics, personality and psychological health correlates of drinking patterns. *Nordic Studies on Alcohol and Drugs*, *34*(5), 415–429. https://doi.org/10.1177/1455072517709918

Erikson, E. (1968). *Identity: Youth and crisis*. New York: Norton.

European Casino Association. (2017). Country-by-Country Report (ECA Report). Retrieved April 27, 2020, from http://www.europeancasinoassociation.org/country-by-country-report/

European Casino Association. (2019). *Spain*. (ECA Report). Retrieved Sept. 9, 2020 from https://www.europeancasinoassociation.org/country-by-country-report/spain/

Eurostat. (2020). Being young in Europe today - digital world. Retrieved April 27, 2020, from https://ec.europa.eu/eurostat/statistics-explained/index.php/Being_young_in_Europe_today_-_digital_world

Eysenck, S. B., & Eysenck, H. J. (1977). The place of impulsiveness in a dimensional system of personality description. *British Journal of Social and Clinical Psychology*, *16*(1), 57–68. https://doi.org/10.1111/j.2044-8260.1977.tb01003.x

Fairman, B. J., Goldstein, R. B., Simons-Morton, B. G., Haynie, D. L., Liu, D., Hingson, R. W., & Gilman, S. E. (2020). Neighbourhood context and binge drinking from adolescence into early adulthood in a US national cohort. *International Journal of Epidemiology*, *49*(1), 103–112. https://doi.org/10.1093/ije/dyz133

Feeney, B. C., & Collins, N. L. (2015). A new look at social support: A theoretical perspective on thriving through relationships. *Personality and Social Psychology Review*, *19*(2), 113–147. https://doi.org/10.1177/1088868314544222

Feldstein, E.S.W., Sakhardande, A., & Blakemore, S. (2014) The effect of alcohol consumption on the adolescent brain: a systematic review of MRI and fMRI studies of alcohol-using youth. *Neuroimage Clinical*, *5*, 420–437. https://doi.org/10.1016/j.nicl.2014.06.011.

Festinger, L. (1954). A theory of social comparison processes. *Human Relations*, *7*(2), 117–140. https://doi: 10.1177/001872675400700202

Fiske, S. T. (2018). *Social beings: Core motives in social psychology*. John Wiley & Sons.

Foster, D. W., Neighbors, C., Rodriguez, L. M., Lazorwitz, B., & Gonzales, R. (2014). Self-identification as a moderator of the relationship between gambling-related perceived norms and gambling behavior. *Journal of Gambling Studies*, *30*(1), 125–140. https://doi.org/10.1007/s10899-012-9346-5

Foster, S., Trapp, G., Hooper, P., Oddy, W. H., Wood, L., & Knuiman, M. (2017). Liquor landscapes: Does access to alcohol outlets influence alcohol consumption in young adults? *Health & Place*, 45, 17–23. https://doi.org/10.1016/j.healthplace.2017.02.008

Frings, D. & Albery, I.P. (2015). The Social Identity Model of Cessation Maintenance: Formulation and initial evidence. *Addictive Behaviors*, *44*, 35–42. https://doi.org/10.1016/j.addbeh.2014.10.023

Furlong, A. (2012). *Youth studies: An introduction*. Routledge.

Gainsbury, S. M. (2015). Online gambling addiction: the relationship between internet gambling and disordered gambling. *Current Addiction Reports*, *2*(2), 185–193. https://doi.org/10.1007/s40429-015-0057-8

Gainsbury, S. M., Russell, A., Hing, N., Wood, R., Lubman, D., & Blaszczynski, A. (2015). How the Internet is changing gambling: Findings from an Australian prevalence survey. *Journal of Gambling Studies*, *31*(1), 1–15. https://doi.org/10.1007/s10899-013-9404-7

Gerin, W., Milner, D., Chawla, S., & Pickering T.G. (1995). Social support as a moderator of cardiovascular reactivity in women: a test of the direct effects and buffering hypotheses. *Psychosomatic Medicine*, *57*, 16–22.

Goldberg, D. P., & Blackwell, B. (1970). Psychiatric illness in general practice. A detailed study using a new method of case identification. *British Medical Journal*, *1*(5707), 439–443. https://doi.org/10.1136/bmj.2.5707.439

Goldberg-Looney, L. D., Sánchez-SanSegundo, M., Ferrer-Cascales, R., Albaladejo-Blazquez, N., & Perrin, P. B. (2016). Adolescent alcohol use in Spain: connections with friends, school, and other delinquent behaviors. *Frontiers in Psychology*, *7*, 269. https://doi.org/10.3389/fpsyg.2016.00269

Gomes, A.C., Rebelo, M.A.B., de Queiroz, A.C. et al. (2020). Socioeconomic status, social support, oral health beliefs, psychosocial factors, health behaviours and health-related quality of life in adolescents. *Quality of Life Research*, *29*, 141–151. https://doi.org/10.1007/s11136-019-02279-6

Gómez, P., Feijóo, S., Braña, T., Varela, J., & Rial, A. (2019). Minors and online gambling: Prevalence and related variables. *Journal of Gambling Studies*, 1–11. https://doi.org/10.1007/s10899-019-09923-3

Gómez, P., Rial, A., Braña, T., Golpe, S., & Varela, J. (2017). Screening of problematic Internet use among Spanish adolescents: Prevalence and related variables. *Cyberpsychology, Behavior, and Social Networking*, *20*(4), 259–267. https://doi.org/10.1089/cyber.2016.0262

Goodie, A. S., MacKillop, J., Miller, J. D., Fortune, E. E., Maples, J., Lance, C. E., & Campbell, W. K. (2013). Evaluating the South Oaks Gambling Screen with DSM-IV and DSM-5 criteria: Results from a diverse community sample of gamblers. *Assessment*, *20*(5), 523–531. https://doi.org/10.1177/1073191113500522

Greenaway, K. H., Cruwys, T., Haslam, S. A., & Jetten, J. (2016). Social identities promote well-being because they satisfy global psychological needs. *European Journal of Social Psychology*, *46*(3), 294–307. https://doi.org/10.1002/ejsp.2169

Grieve, R., Indian, M., Witteveen, K., Tolan, G. A., & Marrington, J. (2013). Face-to-face or Facebook: Can social connectedness be derived online? *Computers in Human Behavior*, *29*(3), 604–609. https://doi.org/10.1016/j.chb.2012.11.017

Griffiths, M. (1999). Gambling technologies: Prospects for problem gambling. *Journal of Gambling Studies*, *15*(3), 265–283. https://doi.org/10.1023/A:1023053630588

Griffiths, M. D. (2010). The use of online methodologies in data collection for gambling and gaming addictions. *International Journal of Mental Health and Addiction*, *8*(1), 8–20. https://doi. 10.1007/s11469-009-9209-1

Griffiths, M. D., & Parke, J. (2002). The social impact of internet gambling. *Social Science Computer Review*, *20*(3), 312–320. https://doi.org/10.1177/089443930202000308

Guertler, D., Rumpf, H. J., Bischof, A., Kastirke, N., Petersen, K. U., John, U., & Meyer, C. (2014). Assessment of problematic internet use by the compulsive internet use scale and the internet addiction test: A sample of problematic and pathological gamblers. *European Addiction Research*, *20*(2), 75–81. https://doi.org/10.1159/000355076

Gunuc, S., & Dogan, A. (2013). The relationships between Turkish adolescents' Internet addiction, their perceived social support and family activities. *Computers in Human Behavior*, *29*(6), 2197–2207. https://doi.org/10.1016/j.chb.2013.04.011

Guo, T. C., & Li, X. (2016). Positive relationship between individuality and social identity in virtual communities: Self-categorization and social identification as distinct forms of social identity. *Cyberpsychology, Behavior, and Social Networking, 19*(11), 680–685. https://doi.org/10.1089/cyber.2016.0290

Gupta, R. & Derevensky, J. (1998) Adolescent gambling behavior: a prevalence study and examination of the correlates associated with excessive gambling. *Journal of Gambling Studies*, *14*, 319–345.

Gupta, R., & Derevensky, J. L. (2008). Gambling practices among youth: Etiology, prevention and treatment. In C.A. Essau (Ed.), *Adolescent Addiction* (pp. 207–229). Academic Press.

Guttmannova, K., Skinner, M. L., Oesterle, S., White, H. R., Catalano, R. F., & Hawkins, J. D. (2019). The interplay between marijuana-specific risk factors and marijuana use over the course of adolescence. *Prevention Science*, *20*(2), 235–245. https://doi.org/10.1007/s11121-018-0882-9

Ha, J. H., Kim, S. Y., Bae, S. C., Bae, S., Kim, H., Sim, M., Lyoo, I.K., & Cho, S. C. (2007). Depression and Internet addiction in adolescents. *Psychopathology*, *40*(6), 424–430. https://doi.org/10.1159/000107426

Hall, G. S. (1904). *Adolescence: Its psychology and its relations to physiology, anthropology, sociology, sex, crime, religion, and education* (Vols. I & II). New York: D. Appleton & Co

Hall-Lande, J. A., Eisenberg, M. E., Christenson, S. L., & Neumark-Sztainer, D. (2007). Social isolation, psychological health, and protective factors in adolescence. *Adolescence*, *42*(166) 265–286.

Hardoon, K. K., Derevensky, J. L., & Gupta, R. (2002). An Examination of the Influence of Familial, Emotional, Conduct, and Cognitive Problems, and Hyperactivity Upon Youth Risk-taking and Adolescent Gambling Problems: Report to the Ontario Problem Gambling Research Centre. R & G Child Development Consultants, Incorporated.

Hardoon, K. K., Gupta, R., & Derevensky, J. L. (2004). Psychosocial variables associated with adolescent gambling. *Psychology of Addictive Behaviors*, *18*(2), 170–179. https://doi.org/10.1037/0893-164X.18.2.170

Haslam, N., Rothschild, L., & Ernst, D. (2000). Essentialist beliefs about social categories. *British Journal of Social Psychology*, *39*(1), 113–127. https://doi.org/10.1348/014466600164363

Heaney, C. A., & Israel, B. A. (2008). Social networks and social support. In K. Glanz, B. K. Rimer, & K. Viswanath (Eds.), *Health behavior and health education: Theory, research, and practice* (pp. 189–210). Jossey-Bass.

Helve, H., & Bynner, J. (2007). *Youth and social capital*. London: Tufnell Press.

Indlekofer, F., Piechatzek, M., Daamen, M., Glasmacher, C., Lieb, R., Pfister, H., Tucha, O., Lange, K. W., Wittchen, H. U., & Schütz, C. G. (2009). Reduced memory and attention performance in a population-based sample of young adults with a moderate lifetime use of cannabis, ecstasy and alcohol. *Journal of Psychopharmacology*, *23*(5), 495–509. https://doi.org/10.1177/0269881108091076

Hofstede, G., & Bond, M. H. (1984). Hofstede's culture dimensions: An independent validation using Rokeach's value survey. *Journal of Cross-Cultural Psychology*, *15*(4), 417–433. https://doi.org/10.1177/0022002184015004003

Holt-Lunstad, J., Smith, T. B., Baker, M., Harris, T., & Stephenson, D. (2015). Loneliness and social isolation as risk factors for mortality: a meta-analytic review. *Perspectives on Psychological Science*, *10*(2), 227–237. https://doi.org/10.1177/1745691614568352

Hong, J. S., Lee, N. Y., Grogan-Kaylor, A., & Huang, H. (2011). Alcohol and tobacco use among South Korean adolescents: An ecological review of the literature. *Children and Youth Services Review*, *33*(7), 1120–1126. https://doi:10.1016/j.childyouth.2011.02.004

Houghton, S., Hattie, J., Carroll, A., Wood, L., & Baffour, B. (2016). It hurts to be lonely! Loneliness and positive mental wellbeing in Australian rural and urban adolescents. *Journal of Psychologists and Counsellors in Schools*, *26*(1), 52–67. https://doi.10.1017/jgc.2016.1

Huber, P. J. (1967). The behavior of maximum likelihood estimates under nonstandard conditions. In L. Lecam & J. Neyman (Eds.) *Proceedings of the fifth Berkeley symposium on mathematical statistics and probability* (Vol. 1, No. 1, pp. 221–233).

Hughes, M. E., Waite, L. J., Hawkley, L. C., & Cacioppo, J. T. (2004). A short scale for measuring loneliness in large surveys: Results from two population-based studies. *Research on Aging*, *26*(6), 655–672. https://doi.org/10.1177/0164027504268574

Hume, M., & Mort, G. S. (2011). Fun, friend, or foe: Youth perceptions and definitions of online gambling. *Social Marketing Quarterly*, *17*(1), 109–133. https://doi.10.1080/15245004.2010.546939

Härkönen, J., Savonen, J., Virtala, E., & Mäkelä, P. (2016). *Results from the Finnish drinking habits surveys 1968–2016*. National Institute for Health and Welfare (THL). Report 3/2017. 78, Helsinki, Finland.

Ikonen, R. & Helakorpi, S. (2019). Results of the school health promotion study. Report 33/2019. Retrieved April 25, 2020, from http://www.julkari.fi/handle/10024/138562

Inchley, J., Currie, D., Vieno, A., Torsheim, T., Ferreira-Borges, C., Weber, M.M., Barnekow, & Breda, J. (Eds.) (2018). Adolescent alcohol-related behaviours: trends and inequalities in the WHO European Region, 2002–2014. Observations from the Health Behaviour in School-aged Children (HBSC) WHO collaborative cross-national study. Copenhagen, WHO Regional Office for Europe, 2018.

Inglehart, R., & Welzel, C. (2005). *Modernization, cultural change, and democracy: The human development sequence*. Cambridge University Press.

Instituto Nacional de Estadística (INE). (2019). Survey on equipment and use of information and communication technologies (ICT) in households. Year 2019. Retrieved March 18, 2020, from https://www.ine.es/en/prensa/tich_2019_en.pdf

International Center for Responsible Gaming. (2019). FAQS: What types of gambling do kids engage in and how often do they gamble? Retrieved Sep 14, 2020 from https://www.icrg.org/public-education-and-outreach/college-and-youth-gambling-programs/talking-children-about-gambling/faqs

Jackson, J., & Cochran, S. D. (1991). Loneliness and psychological distress. *The Journal of Psychology*, *125*(3), 257–262. https://doi.org/10.1080/00223980.1991.10543289

Jans, L., Leach, C. W., Garcia, R. L., & Postmes, T. (2015). The development of group influence on in-group identification: A multilevel approach. *Group Processes & Intergroup Relations*, *18*(2), 190–209. https://doi.org/10.1177/1368430214540757

Jernigan, D., Noel, J., Landon, J., Thornton, N., & Lobstein, T. (2017). Alcohol marketing and youth alcohol consumption: A systematic review of longitudinal studies published since 2008. *Addiction*, *112*, 7–20. https://doi.org/10.1111/add.13591.

Jessor, R., Donovan, J. E., & Costa, F. M. (1991). *Beyond adolescence: Problem behavior and young adult development*. New York: Cambridge University Press.

Jiang, J. (2018). Teens who are constantly online are just as likely to socialize with their friends offline. Pew Research Center report. Retrieved April 27, 2020, from https://www.pewresearch.org/fact-tank/2018/11/28/teens-who-are-constantly-online-are-just-as-likely-to-socialize-with-their-friends-offline/

Johnston, L. D., Miech, R. A., O'Malley, P. M., Bachman, J. G., Schulenberg, J. E. & Patrick, M.E. (2018). Monitoring the future national survey results on drug use, 1975-2017: Overview, key findings on adolescent drug use. Ann Arbor: Institute for Social Research, The University of Michigan. Retrieved April 30, 2020, from http://www.monitoringthefuture.org/pubs/monographs/mtfoverview2017.pdf

Kaakinen, M., Keipi, T., Räsänen, P., & Oksanen, A. (2018). Cybercrime victimization and subjective well-being: An examination of the buffering effect hypothesis among adolescents and young adults. *Cyberpsychology, Behavior, and Social Networking*, *21*(2), 129–137. https://doi.org/10.1089/cyber.2016.0728

Kaakinen, M., Sirola, A., Savolainen, I., & Oksanen, A. (2020). Shared identity and shared information in social media: development and validation of the identity bubble reinforcement scale. *Media Psychology*, *23*(1), 25–51. https://doi.org/10.1080/15213269.2018.1544910

Kamarck, T.W., Peterman, A., Raynor, D. (1998). The effects of the social environment on stress-related cardiovascular activation: current findings, prospects, and implications. *Annals of Behavioral Medicine*, *20*(4), 47–56. https://doi.org/10.1007/BF02886374

Kang, K., Ok, J. S., Kim, H., & Lee, K. S. (2019). The gambling factors related with the level of adolescent problem gambler. *International Journal of Environmental Research and Public Health*, *16*(12), 2110. https://doi:10.3390/ijerph16122110

Keipi, T., Näsi, M., Oksanen, A., & Räsänen, P. (2016). *Online hate and harmful content: Cross-national perspectives.* Taylor & Francis.

Kelly, T. M., Donovan, J. E., Chung, T., Bukstein, O. G., & Cornelius, J. R. (2009). Brief screens for detecting alcohol use disorder among 18–20 year old young adults in emergency departments: Comparing AUDIT-C, CRAFFT, RAPS4-QF, FAST, RUFT-Cut, and DSM-IV 2-Item Scale. *Addictive Behaviors*, *34*(8), 668–674. https://doi.org/10.1016/j.addbeh.2009.03.038

Kiecolt-Glaser, J. K., Garner, W., Speicher, C., Penn, G. M., Holliday, J., & Glaser, R. (1984). Psychosocial modifiers of immunocompetence in medical students. *Psychosomatic Medicine*, *46*(1), 7–14.

Kim, H., & Markus, H. R. (1999). Deviance or uniqueness, harmony or conformity? A cultural analysis. *Journal of Personality and Social Psychology*, *77*(4), 785–800. https://doi 10.1037/0022-3514.77.4.785

Koo, C., Wati, Y., Lee, C. C., & Oh, H. Y. (2011). Internet-addicted kids and South Korean government efforts: boot-camp case. *Cyberpsychology, Behavior, and Social Networking*, *14*(6), 391–394. https://doi.org/10.1089/cyber.2009.0331

Korea Center on Gambling Problems. (2016). Statistics on problem gambling. Retrieved April 5, 2020, from https://www.kcgp.or.kr/eng/main.do

Kroger, J., Martinussen, M., & Marcia, J. E. (2010). Identity status change during adolescence and young adulthood: A meta-analysis. *Journal of Adolescence*, *33*(5), 683–698. https://doi.org/10.1016/j.adolescence.2009.11.002

Kushlev, K., Proulx, J. D., & Dunn, E. W. (2017). Digitally connected, socially disconnected: The effects of relying on technology rather than other people. *Computers in Human Behavior*, *76*, 68–74. https://doi.org/10.1016/j.chb.2017.07.001

Kuss, D. J., & Griffiths, M. D. (2011). Online social networking and addiction—a review of the psychological literature. *International Journal of Environmental Research and Public Health*, *8*(9), 3528–3552. https://doi.org/10.3390/ijerph8093528

Kuss, D. J., Griffiths, M. D., Karila, L., & Billieux, J. (2014). Internet addiction: A systematic review of epidemiological research for the last decade. *Current Pharmaceutical Design*, *20*, 4026–4052. https://doi.org/10.2174/13816128113199990617

Lee, C. Y. S., & Goldstein, S. E. (2016). Loneliness, stress, and social support in young adulthood: Does the source of support matter? *Journal of Youth and Adolescence*, *45*(3), 568–580. https://doi.org/10.1007/s10964-015-0395-9

Lee, Y. S., Han, D. H., Kim, S. M., & Renshaw, P. F. (2013). Substance abuse precedes internet addiction. *Addictive Behaviors*, *38*(4), 2022–2025. https://doi.org/10.1016/j.addbeh.2012.12.024

Lehdonvirta, V., & Räsänen, P. (2011). How do young people identify with online and offline peer groups? A comparison between UK, Spain and Japan. *Journal of Youth Studies*, *14*, 91–108. https://doi.org/10.1080/13676261.2010.506530

LeNoue, S. R., & Riggs, P. D. (2016). Substance abuse prevention. C*hild and Adolescent Psychiatric Clinics of North America*, *25*(2), 297–305. https://doi.org/10.1016/j.chc.2015.11.007

Lesieur, H. R., & Blume, S. B. (1987). The South Oaks Gambling Screen (SOGS): a new instrument for the identification of pathological gamblers. *American Journal of Psychiatry*, *144*(9), 1184–1188. https://doi: 10.1176/ajp.144.9.1184

Leung, R. K., Toumbourou, J. W., & Hemphill, S. A. (2014). The effect of peer influence and selection processes on adolescent alcohol use: a systematic

review of longitudinal studies. *Health Psychology Review*, *8*(4), 426–457. https://doi.org/10.1080/17437199.2011.587961

Levine, M. P. (2012). Loneliness and eating disorders. *The Journal of Psychology*, *146*(1–2), 243–257. https://doi.org/10.1080/00223980.2011.606435

Li, W., O'Brien, J. E., Snyder, S. M., & Howard, M. O. (2016). Diagnostic criteria for problematic internet use among US university students: A mixed-methods evaluation. *PLoS One*, *11*(1). https://doi:10.1371/journal.pone.0145981

Lim, M. H., & Gleeson, J. F. (2014). Social connectedness across the psychosis spectrum: current issues and future directions for interventions in loneliness. *Frontiers in Psychiatry*, *5*, 154. https://doi.org/10.3389/fpsyt.2014.00154

Lin, L. Y., Sidani, J. E., Shensa, A., Radovic, A., Miller, E., Colditz, J. B., ... & Primack, B. A. (2016). Association between social media use and depression among US young adults. *Depression and Anxiety*, *33*(4), 323–331. https://doi.org/10.1002/da.22466

Lisdahl, K. M., Gilbert, E.R., Wright, N.E., & Shollenbarger, S. (2013). Dare to delay? The impacts of adolescent alcohol and marijuana use onset on cognition, brain structure, and function. *Frontiers in Psychiatry*, *4*, 53. https://doi.org/10.3389/fpsyt.2013.00053

Livingston, M., Chikritzhs, T., & Room, R. (2007). Changing the density of alcohol outlets to reduce alcohol-related problems. *Drug and Alcohol Review*, *26*(5), 557–566.

Luk, J. W., Worley, M. J., Winiger, E., Trim, R. S., Hopfer, C. J., Hewitt, J. K., ... & Wall, T. L. (2016). Risky driving and sexual behaviors as developmental outcomes of co-occurring substance use and antisocial behavior. *Drug and Alcohol Dependence*, *169*, 19–25. https://doi.org/10.1016/j.drugalcdep.2016.10.006

Lussier, I. D., Derevensky, J., Gupta, R., & Vitaro, F. (2014). Risk, compensatory, protective, and vulnerability factors related to youth gambling problems. *Psychology of Addictive Behaviors*, *28*(2), 404–413.

Mallett, S., Rosenthal, D., & Keys, D. (2005). Young people, drug use and family conflict: Pathways into homelessness. *Journal of Adolescence*, *28*(2), 185–199. https://doi:10.1016/j.adolescence.2005.02.002

Marcia, J. E. (1980). Identity in adolescence. In J. Adelson (Ed.), *Handbook of Adolescent Psychology*, (pp. 159–187). New York: Wiley.

Mawson, E., Best, D., Beckwith, M., Dingle, G. A., & Lubman, D. I. (2015). Social identity, social networks and recovery capital in emerging adulthood: A pilot

study. *Substance Abuse Treatment, Prevention, and Policy*, *10*(1), 45. https://doi.org/10.1186/s13011-015-0041-2

McCabe, S. E., Veliz, P., & Schulenberg, J. E. (2018). How collegiate fraternity and sorority involvement relates to substance use during young adulthood and substance use disorders in early midlife: A national longitudinal study. *Journal of Adolescent Health*, *62*(3), S35–S43. https://doi.org/10.1016/j.jadohealth.2017.09.029

McCambridge, J., McAlaney, J., & Rowe, R. (2011). Adult consequences of late adolescent alcohol consumption: a systematic review of cohort studies. *PLoS Medicine*, *8*(2), e1000413. https://doi.org/10.1371/journal.pmed.1000413

McCambridge, J. I. M., & Thomas, B. A. (2009). Short forms of the AUDIT in a Web-based study of young drinkers. *Drug and Alcohol Review*, *28*(1), 18–24. https://doi.org/10.1111/j.1465-3362.2008.00010.x

McComb, J. L., & Sabiston, C. M. (2010). Family influences on adolescent gambling behavior: A review of the literature. *Journal of Gambling Studies*, *26*(4), 503–520. https://doi.org/10.1007/s10899-010-9181-5

Meerkerk, G. J., Van Den Eijnden, R. J., Vermulst, A. A., & Garretsen, H. F. (2009). The compulsive internet use scale (CIUS): some psychometric properties. *Cyberpsychology & Behavior*, *12*(1), 1–6. https://doi.org/10.1089/cpb.2008.0181

Mercken, L., Snijders, T. A., Steglich, C., Vertiainen, E., & De Vries, H. (2010). Smoking-based selection and influence in gender-segregated friendship networks: A social network analysis of adolescent smoking. *Addiction*, *105*(7), 1280–1289. https://doi.org/10.1111/j.1360-0443.2010.02930.x

Merikangas, K. R., & McClair, V. L. (2012). Epidemiology of substance use disorders. *Human Genetics*, *131*(6), 779–789. https://doi.org/10.1007/s00439-012-1168-0

Merrilees, C. E., Cairns, E., Taylor, L. K., Goeke-Morey, M. C., Shirlow, P., & Cummings, E. M. (2013). Social identity and youth aggressive and delinquent behaviors in a context of political violence. *Political Psychology*, *34*(5), 695–711. https://doi.org/10.1111/pops.12030

Messerlian, C., Derevensky, J., & Gupta, R. (2005). Youth gambling problems: A public health perspective. *Health Promotion International*, *20*(1), 69–79. https://doi.org/10.1093/heapro/dah509

Miech, R., Johnston, L., & O'Malley, P. M. (2017). Prevalence and attitudes regarding marijuana use among adolescents over the past decade. *Pediatrics*, *140*(6), e20170982. https://doi.org/10.1542/peds.2017-0982

Míguez, M. C., & Becoña, E. (2015). Do cigarette smoking and alcohol consumption associate with cannabis use and problem gambling among Spanish adolescents? *Adicciones*, *27*(1).

Mikal, J. P., Rice, R. E., Kent, R. G., & Uchino, B. N. (2016). 100 million strong: A case study of group identification and deindividuation on Imgur. com. *New Media & Society*, *18*(11), 2485–2506. https://doi.org/10.1177/1461444815588766

Miller, P. G., Strang, J., & Miller, P. M. (Eds.). (2010). *Addiction research methods*. John Wiley & Sons. West Sussex: United Kingdom.

Minkkinen, J., Oksanen, A., Näsi, M., Keipi, T., Kaakinen, M., & Räsänen, P. (2015). Does social belonging to primary groups protect young people from the effects of prosuicide sites? *Crisis*, *37*(1), 31–41. https://doi.org/10.1027/0227-5910/a000356

Ministry of Gender Equality and Family. (2019). Major statistics of MOGEF. Retrieved April 7, 2020, from http://www.mogef.go.kr/eng/lw/eng_lw_f002.do

Ministerio de Sanidad, Servicios Sociales e Igualdad. (2016). Encuesta sobre uso de drogas en enseñanzas secundarias en España (ESTUDES) 1994-2014. Informe 2016: Alcohol, tabaco y drogas ilegales [*Survey of drug use in Spanish secondary education (ESTUDES) 1994-2014. 2016 report: Alcohol, tobacco, and illegal drugs*]. Madrid, Spain: Plan Nacional sobre Drogas.

Mitchell, S. G., Gryczynski, J., O'Grady, K. E., & Schwartz, R. P. (2013). SBIRT for adolescent drug and alcohol use: current status and future directions. *Journal of Substance Abuse Treatment*, *44*(5), 463–472. https://doi.org/10.1016/j.jsat.2012.11.005

Modecki, K. L. (2008). Addressing gaps in the maturity of judgment literature: Age differences and delinquency. *Law and Human Behavior*, *32*(1), 78–91. https://doi.org/10.1007/s10979-007-9087-7

Molinaro, S., Benedetti, E., Scalese, M., Bastiani, L., Fortunato, L., Cerrai, S., Canale, N., Chomynova P., Elekes, Z., Feijão, F., Fotiou, A., Kokkevi , A., Kraus, L., Rupšienė, L., Monshouwer, K., Nociar, A., Strizek, J., & Lazar, T. U. (2018). Prevalence of youth gambling and potential influence of substance use and other risk factors throughout 33 European countries: first results from the 2015 ESPAD study. *Addiction*, *113*(10), 1862–1873. https://doi: 10.1111/add.14275

Moreno, M. A., Jelenchick, L., Cox, E., Young, H., & Christakis, D. A. (2011). Problematic internet use among US youth: a systematic review. *Archives of*

Pediatrics & Adolescent Medicine, *165*(9), 797–805. https://doi:10.1001/archpediatrics.2011.58.

Moss, H. B., Chen, C. M., & Yi, H. Y. (2014). Early adolescent patterns of alcohol, cigarettes, and marijuana polysubstance use and young adult substance use outcomes in a nationally representative sample. *Drug and Alcohol Dependence*, *136*, 51–62. https://doi.org/10.1016/j.drugalcdep.2013.12.011.

Mund, M., Freuding, M. M., Möbius, K., Horn, N., & Neyer, F. J. (2020). The stability and change of loneliness across the life span: A meta-analysis of longitudinal studies. *Personality and Social Psychology Review*, *24*(1), 24–52. https://doi.10.1177/1088868319850738

National Institute on Alcohol Abuse and Alcoholism. (2020). Underage drinking. Retrieved April 10, 2020, from https://www.niaaa.nih.gov/publications/brochures-and-fact-sheets/underage-drinking

National Research Council. (1999). Committee on the Social and Economic Impact of Pathological Gambling. *Pathological gambling: A critical review*. Washington (DC). National Academies Press (US). C, Legal-Age Gambling Opportunities and Restrictions. Retrieved Sept. 9, 2020 from https://www.ncbi.nlm.nih.gov/books/NBK230619/

Neal, P., Delfabbro, P. H., O'Neil, M., Victoria. Dept. of Justice., Office of Gaming and Racing, & Australia. Ministerial Council on Gambling et al. (2005). *Problem gambling and harm: towards a national definition*. Office of Gaming and Racing, Dept. of Justice, Melbourne, Vic.

Neighbors, C., Lee, C. M., Lewis, M. A., Fossos, N., & Larimer, M. E. (2007). Are social norms the best predictor of outcomes among heavy-drinking college students? *Journal of Studies on Alcohol and Drugs*, *68*(4), 556–565. https://doi: 10.15288/jsad.2007.68.556

NIDA. (2014, January 14). Principles of adolescent substance use disorder treatment: A research-based guide. Retrieved April 24, 2020, from https://www.drugabuse.gov/publications/principles-adolescent-substance-use-disorder-treatment-research-based-guide

NIDA. (2018, June 6). Understanding drug use and addiction. Retrieved April 24, 2020, from https://www.drugabuse.gov/publications/drugfacts/understanding-drug-use-addiction

Nock, N. L., Minnes, S., & Alberts, J. L. (2017). Neurobiology of substance use in adolescents and potential therapeutic effects of exercise for prevention and

treatment of substance use disorders. *Birth Defects Research*, *109*(20), 1711–1729. https://doi.org/10.1002/bdr2.1182

Nordmyr, J., & Österman, K. (2016). Raising the legal gambling age in Finland: problem gambling prevalence rates in different age groups among past-year gamblers pre-and post-implementation. *International Gambling Studies*, *16*(3), 347–356. https://doi.org/10.1080/14459795.2016.1207698

North American Foundation for Gambling Addiction Help. (2016). Statistics of gambling addiction 201.6 Retrieved April 4, 2020, from https://nafgah.org/statistics-gambling-addiction-2016/

Nutt, D. J., King, L. A., & Phillips, L. D. (2010). Drug harms in the UK: a multicriteria decision analysis. *The Lancet*, *376*(9752), 1558–1565. https://doi.org/10.1016/S0140-6736(10)61462-6

Official Statistics of Finland. (2019). Suomalaisten internetin käyttö 2019. [*Finnish people's Internet use in 2019.*] Helsinki: Tilastokeskus. Retrieved April 4, 2020, from https://www.stat.fi/til/sutivi/2019/sutivi_2019_2019-11-07_kat_001_fi.html.

Oksanen, A., Savolainen, I., Sirola, A., & Kaakinen, M. (2018). Problem gambling and psychological distress: a cross-national perspective on the mediating effect of consumer debt and debt problems among emerging adults. *Harm Reduction Journal*, *15*(1), 45. https://doi.org/10.1186/s12954-018-0251-9

O'Keeffe, G.S. & Clarke-Pearson, K. (2011). The impact of social media on children, adolescents, and families. *Pediatrics, 127*, 800–804. https://doi.org/10.1542/peds.2011-0054

Oldham, M., Holmes, J., Whitaker, V., Fairbrother, H., & Curtis, P. (2018). *Youth drinking in decline*. Report. University of Sheffield, Sheffield.

O'Malley, P. M., Johnston, L. D., & Bachman, J. G. (1998). Alcohol use among adolescents. *Alcohol Health and Research World*, *22*(2), 85.

Opp, K.-D. (1982). The evolutionary emergence of norms. *British Journal of Social Psychology*, *21*(2), 139–149. https://doi: 10.1111/j.2044-8309.1982.tb00522.x

Orford, J. (2001a). Conceptualizing addiction: Addiction as excessive appetite. *Addiction*, *96*, 15–31. http://dx.doi.org/10.1046/j.1360-0443.2001.961152.x.

Orford, J. (2001b). *Excessive appetites: A psychological view of addictions*. Wiley.

Orford, J. (2010). *An unsafe bet?: The dangerous rise of gambling and the debate we should be having*. Chichester, West Sussex: Wiley-Blackwell.

Pape, H. (2012). Young people's overestimation of peer substance use: an exaggerated phenomenon? *Addiction*, *107*(5), 878–884. https://doi.org/10.1111/j.1360-0443.2011.03680.x

Park, S., & Kim, Y. (2016). Prevalence, correlates, and associated psychological problems of substance use in Korean adolescents. *BMC Public Health*, *16* (79), https://doi.org/10.1186/s12889-016-2731-8

Park, S. K., Kim, J. Y., & Cho, C. B. (2008). Prevalence of Internet addiction and correlations with family factors among South Korean adolescents. *Adolescence*, *43*(172), 895–909.

Patrick, M. E., Berglund, P. A., Joshi, S., & Bray, B. C. (2020). A latent class analysis of heavy substance use in young adulthood and impacts on physical, cognitive, and mental health outcomes in middle age. *Drug and Alcohol Dependence*, 108018. https://doi.org/10.1016/j.drugalcdep.2020.108018

Patrick, M. E., & Schulenberg, J. E. (2014). Prevalence and predictors of adolescent alcohol use and binge drinking in the United States. *Alcohol Research: Current Reviews*, *35*(2), 193–200.

Perkins, H. W., & Berkowitz, A. D. (1986). Perceiving the community norms of alcohol use among students: Some research implications for campus alcohol education programming. *International Journal of the Addictions*, *21*(9–10), 961–976. https://doi: 10.3109/10826088609077249

Perlman, D., & Peplau, L. A. (1981). Toward a social psychology of loneliness. In R. Gilmour, & S. Duck (Eds.), *Personal Relationships: 3. Relationships in Disorder* (pp. 31–56). London: Academic Press.

Peters, R., Yacoubian, G. S., Rhodes, W., Forsythe, K. J., Bowers, K. S., Eulian, V. M., Mangum, C.A., O'Neal, J.D., Queen, M., & Essien, E. J. (2007). Beliefs and social norms about codeine and promethazine hydrochloride cough syrup (CPHCS) use and addiction among multi-ethnic college students. *Journal of Psychoactive Drugs*, *39*(3), 277–282. https://doi.org/10.1080/02791072.2007.10400614

Pevalin, D. J. (2000). Multiple applications of the GHQ-12 in a general population sample: An investigation of long-term retest effects. *Social Psychiatry and Psychiatric Epidemiology*, *35*, 508–512. https://doi.org/10.1007/s001270050272

Pierce, M., Hayhurst, K., Bird, S. M., Hickman, M., Seddon, T., Dunn, G., & Millar, T. (2017). Insights into the link between drug use and criminality: Lifetime offending of criminally-active opiate users. *Drug and Alcohol Dependence*, *179*, 309–316. https://doi.org/10.1016/j.drugalcdep.2017.07.024

Potenza, M. N., Fiellin, D. A., Heninger, G. R., Rounsaville, B. J., & Mazure, C. M. (2002). Gambling. *Journal of General Internal Medicine*, *17*(9), 721–732.

Potenza, M. N., Wareham, J. D., Steinberg, M. A., Rugle, L., Cavallo, D. A., Krishnan-Sarin, S., & Desai, R. A. (2011). Correlates of at-risk/problem

Internet gambling in adolescents. *Journal of the American Academy of Child & Adolescent Psychiatry*, *50*(2), 150–159. https://doi: 10.1016/j.jaac.2010.11.006

Qualter, P., Vanhalst, J., Harris, R., Van Roekel, E., Lodder, G., Bangee, M., ... & Verhagen, M. (2015). Loneliness across the life span. *Perspectives on Psychological Science*, *10*(2), 250–264. https://doi.org/10.1177/1745691615568999

Ragelienė T. (2016). Links of adolescents identity development and relationship with peers: A systematic literature review. *Journal of the Canadian Academy of Child and Adolescent Psychiatry*, *25*(2), 97–105.

Raisamo, S., Halme, J., Murto, A., & Lintonen, T. (2013). Gambling-related harms among adolescents: a population-based study. *Journal of Gambling Studies*, *29*(1), 151–159. https://doi.10.1007/s10899-012-9298-9

Raisamo, S., Kinnunen, J.M., Pere, L., Lindfors, P., & Rimpelä, A. (2020). Adolescent gambling, gambling expenditure and gambling–related harms in Finland, 2011–2017. *Journal of Gambling Studies, 36*, 597–610. https://doi.org/10.1007/s10899-019-09892-7

Raisamo, S., & Lintonen, T. (2012). Misperceptions of peer gambling norms among adolescents: analysis of a national sample in Finland. *Open Journal of Preventive Medicine*, *2*(2), 131–136. http://dx.doi.org/10.4236/ojpm.2012.22019

Raitasalo, K., Huhtanen, P., & Miekkala, M. (2016). Alcohol and drug use among adolescents in Finland 1995–2015. ESPAD survey results. National Institute for Health and Welfare (THL). Report 19/2015.

Raitasalo, K., & Härkönen, J. (2019). Substance use and gambling among adolescents – ESPAD study 2019. ESPAD survey results. National Institute for Health and Welfare (THL). Statistical Report 40/2019.

Raninen, J., Livingston, M., & Leifman, H. (2014). Declining trends in alcohol consumption among Swedish youth—does the theory of collectivity of drinking cultures apply? *Alcohol and Alcoholism*, *49*(6), 681–686. https://doi.org/10.1093/alcalc/agu045

Reblin, M., & Uchino, B. N. (2008). Social and emotional support and its implication for health. *Current Opinion in Psychiatry*, *21*(2), 201–205. https://doi.org/10.1097/YCO.0b013e3282f3ad89

Reinarman, C. & Granfield, R. (2014). Addiction is not just a brain disease: Critical studies of addiction. In C. Reinarman & R. Granfield (Eds.), *Expanding addiction: Critical essays* (pp. 13–34). Routledge.

Reinecke, L., & Trepte, S. (2014). Authenticity and well-being on social network sites: A two-wave longitudinal study on the effects of online authenticity and

the positivity bias in SNS communication. *Computers in Human Behavior*, *30*, 95–102. https://doi.org/10.1016/j.chb.2013.07.030

Reno, R. R., Cialdini, R. B., & Kallgren, C. A. (1993). The transsituational influence of social norms. *Journal of Personality and Social Psychology*, *64*(1), 104–112. https://doi: 10.1037//0022-3514.64.1.104

Rinker, D. V., & Neighbors, C. (2014). Do different types of social identity moderate the association between perceived descriptive norms and drinking among college students? *Addictive Behaviors*, *39*(9), 1297–1303. https://doi.org/10.1016/j.addbeh.2014.03.018

Robins, R. W., Hendin, H. M., & Trzesniewski, K. H. (2001). Measuring global self-esteem: Construct validation of a single-item measure and the Rosenberg Self-Esteem Scale. *Personality and Social Psychology Bulletin*, *27*(2), 151–161. https://doi: 10.1177/0146167201272002

Robinson, C. D., Tomek, S., & Schumacker, R. E. (2013). Tests of moderation effects: Difference in simple slopes versus the interaction term. *Multiple Linear Regression Viewpoints*, *39*(1), 16–24.

Romer, D. (2010). Adolescent risk taking, impulsivity, and brain development: Implications for prevention. *Developmental Psychobiology: The Journal of the International Society for Developmental Psychobiology*, *52*(3), 263–276. https://doi.10.1002/dev.20442

Rubin, K. H., Bukowski, W. M., & Parker, J. G. (2006). Peer interactions, relationships, and groups. In N. Eisenberg, W. Damon, & R. M. Lerner (Eds.), *Handbook of child psychology: Social, emotional, and personality development* (p. 571–645). John Wiley & Sons Inc.

Russell, D., Peplau, L. A., & Cutrona, C. E. (1980). The revised UCLA Loneliness Scale: concurrent and discriminant validity evidence. *Journal of Personality and Social Psychology*, *39*(3), 472. https://doi.org/10.1037/0022-3514.39.3.472

Ryding, F. C., & Kaye, L. K. (2018). "Internet addiction": A conceptual minefield. *International Journal of Mental Health and Addiction*, *16*(1), 225–232. https://doi.org/10.1007/s11469-017-9811-6

Rönkä, S., Ollgren, J., Alho, H., Brummer-Korvenkontio, H., Gunnar, T., Karjalainen, K., Partanen, A., & Väre, T. (2020). The prevalence of high-risk amphetamine and opioid use in Finland in 2017. *Finnish Medical Journal Duodecim*, *136*(8), 927–935.

Salonen, A., Hagfors, H., Lind, K., & Kontto, J. (2019). Gambling and problem gambling – Finnish gambling 2019. National Institute for Health and Welfare (THL). Report 8/2020. Helsinki 2020.

Sancho, F. M., Miguel, M. J., & Aldás, J. (2011). Factors influencing youth alcohol consumption intention: An approach from consumer socialization theory. *Journal of Social Marketing*, *1*(3), 192–210. https://doi.org/10.1108/20426761111170704

Sanders, A., Stogner, J. M., & Miller, B. L. (2013). Perception vs. reality: An investigation of the misperceptions concerning the extent of peer novel drug use. *Journal of Drug Education*, *43*(2), 97–120. http://dx.doi.org/10.2190/DE.43.2.a

Saunders, B. T., & Robinson, T. E. (2013). Individual variation in resisting temptation: implications for addiction. *Neuroscience & Biobehavioral Reviews*, *37*(9), 1955–1975. https://doi.org/10.1016/j.neubiorev.2013.02.008

Schachter, S., & Hall, R. (1952). Group-derived restraints and audience persuasion. *Human Relations*, *5*(4), 397–406.

Schaeffer, K. (2019). Most U.S. teens who use cellphones do it to pass time, connect with others, learn new things. Pew Research Center report. Retrieved April 27, 2020, from https://www.pewresearch.org/fact-tank/2019/08/23/most-u-s-teens-who-use-cellphones-do-it-to-pass-time-connect-with-others-learn-new-things/

Schulenberg, J. E., & Patrick, M. E. (2012). Historical and developmental patterns of alcohol and drug use among college students: Framing the problem. In H. R. White & D. L. Rabiner (Eds.) *Duke series in child development and public policy. College drinking and drug use* (pp. 13–35). Guilford Press.

Seok, S., & DaCosta, B. (2012). The world's most intense online gaming culture: Addiction and high-engagement prevalence rates among South Korean adolescents and young adults. *Computers in Human Behavior*, *28*(6), 2143–2151. https://doi.org/10.1016/j.chb.2012.06.019

Shaffer, H. J. (1996). Understanding the means and objects of addiction: Technology, the internet, and gambling. *Journal of Gambling Studies*, *12*(4), 461–469. https://doi.org/10.1007/BF01539189

Sherif, M. (1936). *The psychology of social norms.* Oxford, England: Harper.

Sherif, M., Harvey, O. J., White, B. J., Hood, W. R., & Sherif, C. W. (1961). *Intergroup conflict and cooperation: The robbers cave experiment.* Norman, OK: University Book Exchange.

Sieving, R. E., Perry, C. L., & Williams, C. L. (2000). Do friendships change behaviors, or do behaviors change friendships? Examining paths of influence in young adolescents' alcohol use. *Journal of Adolescent Health*, *26*(1), 27–35. https://doi.org/10.1016/S1054-139X(99)00056-7

Simons-Morton, B., & Chen, R. S. (2006). Over time relationships between early adolescent and peer substance use. *Addictive Behaviors*, *31*(7), 1211–1223. https://doi.org/10.1016/j.addbeh.2005.09.006

Sinkkonen, H.M., Puhakka H., & Meriläinen, M. (2014). Internet use and addiction among Finnish Adolescents (15–19 years). *Journal of Adolescence, 37*(2), 123–131. https://doi.org/10.1016/j.adolescence.2013.11.008

Sirola, A., Savela, N., Savolainen, I., Kaakinen, M., & Oksanen, A. (2020). The role of virtual communities in gambling and gaming behaviors: A systematic review. *Journal of Gambling Studies*. https://doi.org/10.1007/s10899-020-09946-1

Smahel, D., Brown, B. B., & Blinka, L. (2012). Associations between online friendship and Internet addiction among adolescents and emerging adults. *Developmental Psychology*, *48*(2), 381–388. https://doi: 10.1037/a0027025

Smith, A. & Anderson, M. (2018). Social media use in 2018. Pew Research Center report. Retrieved March 13, 2020, from https://www.pewresearch.org/internet/2018/03/01/social-media-use-in-2018/

So, E. S., & Chin, Y. (2016). Propriety of internet use time for internet addiction among Korean adolescents. *Healthcare and Nursing*, *128*, 23–27. https://doi.org/10.14257/astl.2016.128.05

Sobel, M. E. (1982). Asymptotic confidence intervals for indirect effects in structural equation models. *Sociological Methodology, 13*, 290–312. https://doi.org/10.2307/270723

Soenens, B., Berzonsky, M. D., Vansteenkiste, M., Beyers, W., & Goossens, L. (2005). Identity styles and causality orientations: in search of the motivational underpinnings of the identity exploration process. *European Journal of Personality*, *19*(5), 427–442. https://doi: 10.1002/per.551

Spanish Federation of Gambling Players Rehabilitated. (2018). Youth and online game [*Jóvenes y Juego On-line*]. Retrieved April 5, 2020, from https://fejar.org/que-hacemos/recursos/

Splevins, K., Mireskandari, S., Clayton, K., & Blaszczynski, A. (2010). Prevalence of adolescent problem gambling, related harms and help-seeking behaviours among an Australian population. *Journal of Gambling Studies*, *26*(2), 189–204. https://doi.org/10.1007/s10899-009-9169-1

Spångberg, J., & Svensson, J. (2020). Gambling among 16-year-olds and associated covariates: A Nordic comparison. *Scandinavian Journal of Public Health*,

1403494820923814. Advance online publication. https://doi.org/10.1177/1403494820923814

Statista Research Department. (2019a). Percentage of adults in the United States who use social networks as of February 2019, by age group. Retrieved March 18, 2020, from https://www.statista.com/statistics/471370/us-adults-who-use-social-networks-age/

Statista Research Department. (2019b). Social media user penetration rate in South Korea in 2018, by age group. Retrieved March 18, 2020, from https://www.statista.com/statistics/763718/south-korea-social-media-penetration-by-age-group/

Statista Research Department. (2019c). Social media usage in Finland - Statistics & Facts. Retrieved April 4, 2020, from https://www.statista.com/topics/4173/social-media-usage-in-finland/

Statista Research Department. (2019d). Share of online users in the United States who report being addicted to social media as of April 2019, by age group. Retrieved April 7, 2020, from https://www.statista.com/statistics/1081292/social-media-addiction-by-age-usa/#statisticContainer

Statista Research Deparment. (2019e). Internet usage of teenagers in the United States - Statistics & Facts. Retrieved April 27, 2020, from https://www.statista.com/topics/2016/teenagers-internet-usage-in-the-us/

Statista Research Deparment. (2019f). Forecast of the internet user penetration rate in Spain 2015-2022. Retrieved March 18, 2020, from https://www.statista.com/statistics/567602/predicted-internet-user-penetration-rate-in-spain/

Statista Research Department. (2020a). Internet usage in South Korea - Statistics & Facts. Retrieved March 18, 2020, from https://www.statista.com/topics/2230/internet-usage-in-south-korea/

Statista Research Department. (2020b). Forecast of the internet user penetration rate in Finland from 2018 to 2024. Retrieved March 18, 2020, from https://www.statista.com/statistics/567480/predicted-internet-user-penetration-rate-in-finland/

Statista Research Department. (2020c). Global number of internet users 2005-2019. Retrieved April 25, 2020, from https://www.statista.com/statistics/273018/number-of-internet-users-worldwide/

Staton, M., Leukefeld, C., Logan, T. K., Zimmerman, R., Lynam, D., Milich, R., ... & Clayton, R. (1999). Risky sex behavior and substance use among young adults. *Health & Social Work*, *24*(2), 147–154. doi.org/10.1093/hsw/24.2.147

Stein, J. Y., & Tuval-Mashiach, R. (2015). The social construction of loneliness: An integrative conceptualization. *Journal of Constructivist Psychology*, *28*(3), 210–227. https://doi.org/10.1080/10720537.2014.911129

Steinberg, L. (2008). A social neuroscience perspective on adolescent risk-taking. *Developmental Review*, *28*(1), 78–106. https://doi.org/10.1016/j.dr.2007.08.002

Steinberg, L., & Monahan, K. C. (2007). Age differences in resistance to peer influence. *Developmental Psychology*, *43*(6), 1531–1543. https://doi.org/10.1037/0012-1649.43.6.1531

Steinberg, L., & Morris, A. S. (2001). Adolescent development. *Annual Review of Psychology*, *52*(1), 83–110.

Stinchfield, R. (2002). Reliability, validity, and classification accuracy of the South Oaks Gambling Screen (SOGS). *Addictive Behaviors*, *27*, 1–19. https://doi.org/10.1016/S0306 -4603(00)00158 -1.

Stogner, J., Boman, J. H., IV, & Lee Miller, B. (2015). Assessing the relationship between divergent drinking and perceptions of friendship quality between students. *Journal of Child & Adolescent Substance Abuse*, *24*, 387–396. https://doi.org/10.1080/1067828X.2013.872065

Stroud, C., Walker, L. R., Davis, M., & Irwin Jr, C. E. (2015). Investing in the health and well-being of young adults. *Journal of Adolescent Health*, *56*(2), 127–129. https://doi.org/10.1016/j.jadohealth.2014.11.012

Substance Abuse and Mental Health Services Administration [SAMHSA]. (2013). The CBHSQ Report: A day in the life of American adolescents: Substance use facts update. Rockville, MD: Substance Abuse and Mental Health Services Administration

Substance Abuse and Mental Health Services Administration. (2014). Results from the 2013 National Survey on Drug Use and Health: Summary of national findings, NSDUH series H-48, HHS Publication No. (SMA) 14–4863. Rockville, MD: Substance Abuse and Mental Health Services Administration.

Swahn, M. H., Bossarte, R. M., Ashby, J. S., & Meyers, J. (2010). Pre-teen alcohol use initiation and suicide attempts among middle and high school students: findings from the 2006 Georgia Student Health Survey. *Addictive Behaviors*, *35*(5), 452–458. doi.org/10.1016/j.addbeh.2009.12.017

Swendsen, J., & Le Moal, M. (2011). Individual vulnerability to addiction. *Annals of the New York Academy of Sciences*, *1216*(1), 73–85. https://doi.org/10.1111/j.1749-6632.2010.05894.x

Tajfel, H., Billig, M. G., Bundy, R. P., & Flament, C. (1971). Social categorization and intergroup behavior. *European Journal of Social Psychology*, *1*(2), 149–178. https://doi:10.1002/ejsp.2420010202

Tajfel, H., & Turner, J. C. (1979). An integrative theory of intergroup conflict. In W. G. Austin & S. Worchel (Eds.), *The social psychology of intergroup relations* (pp. 33–47). Monterey, CA: Brooks Cole.

Tajfel, H., & Turner, J. C. (1986). The social identity theory of intergroup behavior. In S. Worchel, & W. G. Austin (Eds.), *Psychology of Intergroup Relations* (pp. 7–24). Chicago: Nelson Hall

Tang, C. S. K., Wu, A. M., Tang, J. Y., & Yan, E. C. (2010). Reliability, validity, and cut scores of the South Oaks Gambling Screen (SOGS) for Chinese. *Journal of Gambling Studies*, *26*(1), 145–158. https://doi.org/10.1007/s10899-009-9147-7

Tang, J. H., Chen, M. C., Yang, C. Y., Chung, T. Y., & Lee, Y. A. (2016). Personality traits, interpersonal relationships, online social support, and Facebook addiction. *Telematics and Informatics*, *33*(1), 102–108. https://doi.org/10.1016/j.tele.2015.06.003

Tapert, S. F., Aarons, G. A., Sedlar, G. R., & Brown, S. A. (2001). Adolescent substance use and sexual risk-taking behavior. *Journal of Adolescent Health*, *28*(3), 181–189. https://doi.10.1016/s1054-139x(00)00169-5

Tarrant, M. (2002). Adolescent peer groups and social identity. *Social Development*, *11*, 110–123. https://doi.org/10.1111/1467-9507.00189.

Thoits, P. A. (2011). Mechanisms linking social ties and support to physical and mental health. *Journal of Health and Social Behavior*, *52*(2), 145–161. https://doi.org/10.1177/0022146510395592

Thorsteinsson, E. B. & Davey, L. (2014). Adolescents' compulsive Internet use and depression: A longitudinal study. *Open Journal of Depression*, *3*(01), 13–17. https://doi.10.4236/ojd.2014.31005

Trepte, S., & Loy, L. S. (2017). Social identity theory and self-categorization theory. *The International Encyclopedia of Media Effects*, 1–13. https://doi. 10.1002/9781118783764.wbieme0088

Triandis, H. C. (1995). *New directions in social psychology. Individualism & collectivism*. Westview Press.

Trucco, E. M., Colder, C. R., & Wieczorek, W. F. (2011). Vulnerability to peer influence: A moderated mediation study of early adolescent alcohol use initiation. *Addictive Behaviors*, *36*(7), 729–736. https://doi.org/10.1016/j.addbeh.2011.02.008

Tsimtsiou, Z., Haidich, A., Drontsos, A., Dantsi, F., Sekeri, Z., Drosos, E., Trikilis, N., Dardavesis, T., Nanos, P., & Arvanitidou, M. (2017). Pathological Internet use, cyberbullying and mobile phone use in adolescence: a school-based study in Greece. *International Journal of Adolescent Medicine and Health*, *30*(6), 20160115. https://doi.org/10.1515/ijamh-2016-0115

Tucker, J. S., de la Haye, K., Kennedy, D. P., Green Jr, H. D., & Pollard, M. S. (2014). Peer influence on marijuana use in different types of friendships. *Journal of Adolescent Health*, *54*(1), 67–73. https://doi.org/10.1016/j.jadohealth.2013.07.025

Turja, T., Oksanen, A., Kaakinen, M., Sirola, A., Kaltiala-Heino, R., & Räsänen, P. (2017). Proeating disorder websites and subjective well-being: A four-country study on young people. *International Journal of Eating Disorders*, *50*(1), 50–57. https://doi.org/10.1002/eat.22589

Turner, J. C. (1985). Social categorization and the self-concept: A social cognitive theory of group behavior. In E. J. Lawler (Ed.), Advances in group processes: Theory and research (Vol. 2, pp. 77–122). Greenwich, CT: JAI.

Turner, J. C. (1991). *Social Influence*. Pacific Grove, CA: Open University Press.

Turner, J. C., Oakes, P. J., Haslam, S. A., & McGarty, C. (1994). Self and collective: Cognition and social context. *Personality and Social Psychology Bulletin*, *20*, 454–463. https://doi:10.1177/0146167294205002

Uchino, B. N. (2006). Social support and health: a review of physiological processes potentially underlying links to disease outcomes. *Journal of Behavioral Medicine*, *29*(4), 377–387. https://doi.10.1007/s10865-006-9056-5

United Nations. (1981). *Youth*. The General Assembly resolution 36/28 of 1981. Retrieved May 18, 2020, from https://www.un.org/en/sections/issues-depth/youth-0/index.html

Valkenburg, P. M., & Peter, J. (2011). Online communication among adolescents: An integrated model of its attraction, opportunities, and risks. *Journal of Adolescent Health*, *48*(2), 121–127. https://doi:10.1016/j.jadohealth.2010.08.020

Van den Eijnden, R. J., Lemmens, J. S., & Valkenburg, P. M. (2016). The social media disorder scale. *Computers in Human Behavior*, *61*, 478–487. doi.org/10.1016/j.chb.2016.03.038

Van den Eijnden, R.J.J.M., Meerker, G.-J., Vermulst, Ad A., Spijkerman, R., & Engels, R.C.M.E. (2008). Communication, compulsive Internet use, and psychosocial well-being among adolescents: A longitudinal study. *Developmental Psychology*, *44*(3), 655–665. https://doi.10.1037/0012-1649.44.3.655

Van Hoorn, J., van Dijk, E., Meuwese, R., Rieffe, C., & Crone, E. A. (2016). Peer influence on prosocial behavior in adolescence. *Journal of Research on Adolescence*, *26*(1), 90–100. https://doi.org/10.1111/jora.12173

Van Petegem, S. V., Beyers, W., Vansteenkiste, M., & Soenens, B. (2012). On the association between adolescent autonomy and psychosocial functioning: Examining decisional independence from a self-determination theory perspective. *Developmental Psychology*, *48*(1), 76–88. https://doi: 10.1037/a0025307

Van Rooij, A. J., Schoenmakers, T. M., Van de Eijnden, R. J., & Van de Mheen, D. (2010). Compulsive internet use: the role of online gaming and other internet applications. *Journal of Adolescent Health*, *47*(1), 51–57. https://doi.org/10.1016/j.jadohealth.2009.12.021

Viner, R. M., Ozer, E. M., Denny, S., Marmot, M., Resnick, M., Fatusi, A., & Currie, C. (2012). Adolescence and the social determinants of health. *The Lancet*, *379*(9826), 1641–1652. https://doi.org/10.1016/S0140-6736(12)60149-4

Volberg, R. A., Gupta, R., Griffiths, M. D., Olason, D. T., & Delfabbro, P. (2010). An international perspective on youth gambling prevalence studies. *International Journal of Adolescent Medicine and Health*, *22*(1), 3–38. https://doi.org/10.1515/IJAMH.2010.22.1.3

Volkow, N. D., Koob, G. F., & McLellan, A. T. (2016). Neurobiologic advances from the brain disease model of addiction. *New England Journal of Medicine*, *374*(4), 363–371. https://doi.10.1056/NEJMra1511480

Weiss, R.S. (1973). *Loneliness: The Experience of Emotional and Social Isolation*. Cambridge, MA: The MIT Press.

Welch, K. A., Carson, A., & Lawrie, S. M. (2013). Brain structure in adolescents and young adults with alcohol problems: systematic review of imaging studies. *Alcohol and Alcoholism*, *48*(4), 433–444. https://doi.org/10.1093/alcalc/agt037

Welte, J. W., Barnes, G. M., Tidwell, M. C., Hoffman, J. H., & Wieczorek, W. F. (2015). Gambling and problem gambling in the United States: Changes between 1999 and 2013. *Journal of Gambling Studies*, *31*(3), 695–715. https://doi.org/10.1007/s10899-014-9471-4

West, R. (2006). *Theory of addiction*. Blackwell Publishing, Oxford: United Kingdom.

White, H. (1982). Maximum likelihood estimation of misspecified models. Econometrica: *Journal of the Econometric Society*, 1–25. https://doi.10.2307/1912526

White, A., & Hingson, R. (2013). The burden of alcohol use: Excessive alcohol consumption and related consequences among college students. *Alcohol Research: Current Reviews*, *35*(2), 201–218.

Williams, R. J., Lee, C. K., & Back, K. J. (2013). The prevalence and nature of gambling and problem gambling in South Korea. *Social Psychiatry and Psychiatric Epidemiology*, *48*(5), 821–834. doi.10.1007/s00127-012-0580-z

Williams, R. J., West, B. L., & Simpson, R. I. (2012). *Prevention of problem gambling: A comprehensive review of the evidence and identified best practices*. Ontario Problem Gambling Research Centre and the Ontario Ministry of Health and Long Term Care.

Winters, K. C., & Arria, A. (2011). Adolescent brain development and drugs. *The Prevention Researcher*, *18*(2), 21–24.

Woods, H. C. and Scott, H. (2016) #Sleepyteens: social media use in adolescence is associated with poor sleep quality, anxiety, depression and low self-esteem. *Journal of Adolescence*, *51*, 41–49. https://doi:10.1016/j.adolescence.2016.05.008

Wright, K. (2016). Social networks, interpersonal social support, and health outcomes: A health communication perspective. *Frontiers in Communication*, 1, 10. https://doi.org/10.3389/fcomm.2016.00010

Wu, X. S., Zhang, Z. H., Zhao, F., Wang, W. J., Li, Y. F., Bi, L., et al. (2016). Prevalence of Internet addiction and its association with social support and other related factors among adolescents in China. *Journal of Adolescence*, *52*, 103–111. https://doi.org/10.1016/j.adole scenc e.2016.07.012.

Yao, M. Z., & Zhong, Z. J. (2014). Loneliness, social contacts and internet addiction: A cross-lagged panel study. *Computers in Human Behavior*, *30*, 164–170. https://doi.org/10.1016/j.chb.2013.08.007.

APPENDIX A:

YouGamble 2018 U.S. survey: Experimental section vignette messages.

Narration	Negative stance	Positive stance
Experience-driven narration	"Me and many of my friends suffer from gambling problems. Gambling causes me problems, and it has caused significant damage to me and my family's well-being. Behind the following link, you can read more about Americans' experiences on gambling."	"Me and many of my friends gamble. Gambling brings me enjoyment, and it has brought significant benefits to me and my family's well-being. Behind the following link, you can read more about Americans' experiences on gambling."
Fact-driven narration	"According to a recent report, more than 5 million Americans suffer from gambling problems. Gambling causes problems, and it causes significant damage to the society and people's well-being. Behind the following link, you can read more research findings on gambling."	"According to a recent report, 77 % of Americans gamble. Gambling brings enjoyment, and significant benefits to the society and people's well-being. Behind the following link, you can read more research findings on gambling."

PUBLICATIONS

PUBLICATION I

Addictive behaviors and psychological distress among adolescents and emerging adults: A mediating role of peer-group identification

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Addictive Behaviors Reports, *7*, 75–81.
https://doi.org/10.1016/j.abrep.2018.03.002

Addictive Behaviors Reports 7 (2018) 75–81

Contents lists available at ScienceDirect

Addictive Behaviors Reports

journal homepage: www.elsevier.com/locate/abrep

Addictive behaviors and psychological distress among adolescents and emerging adults: A mediating role of peer group identification

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ARTICLE INFO

Keywords:
Social identification
Primary groups
Psychological distress
Addiction

ABSTRACT

Objective: Research suggests the sense of belonging to primary groups functions as an important social resource for youth well-being, but it can be compromised among those dealing with addiction. The current study examined how adolescents' and emerging adults' identification with a primary peer group consisting of friends, mediates the relationship between addictive behaviors and psychological distress.

Method: The study utilized demographically balanced survey data on 1200 Finnish participants aged 15 to 25 (mean age 21.29, 50% female). Measures were included for psychological distress, excessive drinking, excessive drug use, excessive gambling, excessive Internet use, and peer group identification.

Results: All forms of addictive behaviors had a significant direct relationship with higher psychological distress. Excessive drug use, gambling and Internet use were associated with a weaker identification with a peer group, which predicted higher psychological distress. Contrary to the above findings, excessive drinking was linked to stronger peer group identification, mediating psychological distress downwards.

Conclusions: These findings support past research and provide a mediation model explanation onto how weaker social relations add to negative well-being consequences in different addictive behaviors, thus underlining the importance of expanding our understanding of social group outcomes among young individuals.

1. Introduction

Adolescents' and emerging adults' psychological well-being and overall health are a continuous concern world-wide (Arnett, 2005; Salam, Das, Lassi, & Bhutta, 2016; Torikka, Kaltiala-Heino, Rimpelä, Marttunen, Luukkaala, and Rimpelä, 2014). These are critical time-periods in human development as many harmful and often-times life-long behavior patterns stem during them (Mawson, Best, Beckwith, Dingle, & Lubman, 2015; Merikangas & McClair, 2012). Research has consistently shown that adolescents and emerging adults engage in detrimental and health-threatening behaviors, which inevitably influence their psychological well-being. These behaviors include alcohol and drug use, unsafe sex, poor diet choices, and even delinquent acts characterized by peer influence and heightened risk-taking (Balogh, Mayes, & Potenza, 2013; Salam et al., 2016).

Addictive behaviors of the youth are a particular cause for significant negative outcomes, as they may develop into long lasting habits and have detrimental effects on individuals' physical health (Balogh et al., 2013), social relationships (Yao & Zhong, 2014; Dhir, Chen, & Nieminen, 2015) and financial status (Canale, Griffiths, Vieno, Siciliano, & Molinaro, 2016). Well-being, defined through a set of psychological features, including personal relationships and lack of distress (Ryff & Singer, 1996; Sagone & De Caroli, 2014), is vital to positive human functioning but highly susceptible to addictive behaviors. Additional challenge in supporting youths' well-being arises as addictions and addictive behaviors can occur in many forms. Although addiction is commonly associated with substance misuse, there exists a wide range of objects and activities one can become addicted to (West, 2006; Jorgenson, Hsiao, & Yen, 2016; Orford, 2001a, 2001b).

In this study, we attempt to provide a supplementary explanation onto how addictive behaviors and psychological well-being fluctuate among adolescents and emerging adults, when social identification with a primary peer group functions as a mediator. We focus on examining four types of addictions: alcohol, drugs, gambling, and the Internet. Here, addictions are discussed in terms of excessive behaviors, as suggested by Orford (2001a, 2001b). Next, we explain briefly why these four addiction types were chosen and why examining social identification's mediating role in addiction is important.

1.1. Excessive drinking

Excessive drinking, particularly among youth, is a long-prevailing

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https://doi.org/10.1016/j.abrep.2018.03.002
Received 30 January 2018; Received in revised form 7 March 2018; Accepted 9 March 2018
Available online 14 March 2018

global issue (Johnston, O'Malley, Bachman, Schulenberg, & Miech, 2016; World Health Organization, 2014). In the United States, for instance, alcohol is the most frequently used and misused substance among youth, with an 18% prevalence rate in monthly binge drinking. For males, this typically equals five or more drinks and, for females, four or more drinks within approximately two hours (Centers for Disease Control and Prevention [CDC], 2016; CDC, 2017). Additionally, heaviest episodic alcohol consumption is taking place among youths between 15 and 19 years-old (Jernigan, Noel, Landon, Thornton, & Lobstein, 2017). Similarly, in Finland, 37% of adolescents reported they had experienced with alcohol (i.e., been drunk) at least once during their lifetime, and 7% reported drinking on a weekly basis with the intention of getting drunk (Raitasalo, Huhtanen, & Miekkala, 2016).

Excessive drinking of alcohol in any age group is a serious public health concern, but especially among young people during important developmental stages. As past research has shown, it can impact brain development, lead to intoxication, accidents, infectious diseases, or even death (Mitchell, Gryczynski, O'Grady, & Schwartz, 2013; Rosenquist, Murabito, Fowler, & Christakis, 2010).

1.2. Excessive drug use

Drugs characterize another group of substances that has an immense potential to seriously impact the health and well-being of the individual and society alike (Macleod et al., 2004; Mitchell et al., 2013; Nutt, King, & Phillips, 2010). Past research has consistently shown that drug use and misuse are often at their highest during emerging adulthood, which may lead to a heightened risk of substance use disorders later in life (Arnett, 2005; Moss, Chen, & Yi, 2014; Mitchell et al., 2013). In Finland, to illustrate, the overall drug supply and use have increased during the past two decades and statistics indicate that drugs are most often offered to youngsters in the 15–24 age-group: 13% reported having been offered drugs during the past year (Karjalainen, Savonen, & Hakkarainen, 2016). At the same time, people's collective attitudes towards drugs have become more lenient and are particularly liberal towards experimentation with cannabis (Raitasalo et al., 2016; Hakkarainen, Karjalainen, Raitasalo, & Sorvala, 2015). A partial reason for this attitudinal shift is believed to be attributable to an observed increase in the amount of social relationships general people have with individuals who regularly sell or use drugs. It is suggested that personal affiliations with drug users may lessen the fear and concern typically associated with drugs and drug use (Hakkarainen, Karjalainen, Ojajärvi, & Salasuo, 2015; Karjalainen et al., 2016).

Repeated use of illicit -or even certain legally allowed drugs, can become detrimental to their users and have many negative consequences: on top of being destructive to health, they increase the likelihood of accidents and involvement in criminal activities (DeLisi, Angton, Behnken, & Kusow, 2015; Orford, 2001b), and can damage people's social relationships and financial situation (Arria et al., 2013; Degenhardt, Coffey, Moran, Carlin, & Patton, 2007). Excessive drug use can lead to further problems, such as poor decision making and additional addictions, due to the possible altering of the functions of the motivational circuitry of the brain (Balogh et al., 2013). Moreover, drug use issues that begin in adolescence are more likely to persist into adulthood (Merikangas & McClair, 2012).

1.3. Excessive gambling

Like other addictive behaviors, excessive gambling can have extensive harmful impacts both on individual and societal level (Salonen & Raisamo, 2015; St-Pierre & Derevensky, 2016). Even though various gaming activities are illegal for youths under 18 years old in many countries, gambling is a popular activity among adolescents and emerging adults worldwide (Blinn-Pike, Worthy, & Jonkman, 2010; Canale et al., 2016; Calado, Alexandre, & Griffiths, 2017). As a result, youth problem gambling is a growing international concern (Elton-Marshall, Leatherdale, & Turner, 2016; Kristiansen, Reith, & Trabjerg, 2017; Volberg, Gupta, Griffiths, Ólason, & Delfabbro, 2010). Excessive gambling is an evolving issue also due to the advances in technology; as multiple new forms of gaming activities are now taking place online, they become easier and faster for young people to access (Elton-Marshall et al., 2016).

According to the Finnish National Institute of Health and Wellbeing (THL), gambling activities start typically at the age of 16. Risky gambling behavior has increased during the past years and it is most common among individuals between 18 and 24 years of age (Salonen & Raisamo, 2015). When excessive, gambling can induce emotional distress, cause serious financial issues, facilitate other risky behaviors, such as illicit substance use, and strain social relationships (Calado et al., 2017; Raisamo, Halme, Murto, & Lintonen, 2013; Splevins, Mireskandari, Clayton, & Blaszczynski, 2010).

1.4. Excessive Internet use

In a relatively short amount of time, the Internet has become an inseparable part of people's lives. It is estimated that about 40% of the world population has Internet connection (Kuss, Griffiths, Karila, & Billieux, 2014). However, because modern portable devices (e.g., smartphones, tablets, and laptops) include Internet, the percentage might be even higher. Yao and Zhong (2014) estimate that an average Internet user spends an equal or a greater amount of time online as offline. While the Internet has many benefits, its use has brought within new types of problems and challenges, especially in terms of adolescent psychosocial development (Durkee et al., 2016; Kuss, Van Rooij, Shorter, Griffiths, & van de Mheen, 2013). Like substance use and gambling behavior, Internet use can become excessive and start to interfere normal functioning (Yau, Potenza, & White, 2012).

Past research has investigated excessive Internet use under many terms, including *Internet addiction*, *compulsive*, *excessive*, and *pathological Internet use*, yet regardless of the term used, heavy Internet use and its addictive properties have been relatively difficult to measure. Multiple studies (e.g., Durkee et al., 2016; Dhir et al., 2015; Kuss et al., 2014; Cheng & Li, 2014; Sinkkonen, Puhakka, & Meriläinen, 2014) have attempted to map how common pathological Internet use (PIU), or Internet addiction (IA), is, and what types of people are more likely to use the Internet compulsively. The studies consistently found that adolescents were more likely to both engage in compulsive Internet use and even become addicted to it -they were also more vulnerable to its negative effects. Cheng and Li (2014) estimate that the global prevalence rate for pathological Internet use is approximately 6%. A youth study in Finland found that 22.9% of adolescent participants used the Internet excessively and 1.3% were identified as PIUs (Sinkkonen et al., 2014). Internet addiction, as discussed in past research, is highly problematic and can lead to poor eating and sleeping habits, lower academic performances, and lessen traditional face-to-face interactions with friends and family (Durkee et al., 2016; Balogh et al., 2013; Kuss et al., 2014; Yao & Zhong, 2014).

1.5. The role of social relationships

Social relationships are a major determinant of well-being for people at large (Baumeister & Leary, 1995; Thoits, 2011), but especially for young people (Best, Manktelow, & Taylor, 2014; Lavy & Sand, 2012). One possible linkage between social relationships and subsequent well-being is social identification, often operationalized as a subjective sense of belonging to a certain group (Cruwys, Steffens, Haslam, Haslam, Jetten, & Dingle, 2017; Jetten, Haslam, Haslam, Dingle, & Jones, 2014; Buckingham, Frings, & Albery, 2013). Social identification refers to a process in which individuals' identity is partly determined by the connectedness to certain social groups (Tajfel & Turner, 1979). These ‘in-groups’, and social support derived from them, have been shown to have significant outcomes in terms of psychological

well-being (Frings & Albery, 2015; Greenaway, Cruwys, Haslam, & Jetten, 2016; Mawson et al., 2015).

As discussed in Sections 1.1 through 1.4, excessive behaviors have several adverse consequences on health and well-being. In addition, they often disrupt the dynamics of people's social relationships (Yao & Zhong, 2014; Dhir et al., 2015). For example, adolescents with problematic gambling habits often replace their social ties with gambling-related connections and distance themselves from their pre-existing peer groups, while excessive Internet users often substitute social interactions with family to online communications with similar users (Blinn-Pike et al., 2010; Dhir et al., 2015). However, it is noteworthy that the relationship between addictive behaviors and social outcomes may not always be negative: in earlier research, alcohol use has been linked to stronger connection to and investment in peer groups (Brechwald & Prinstein, 2011; Boman IV, Stogner, & Lee Miller, 2013; Stogner, Boman IV, & Lee Miller, 2015). Thus, more research is needed in understanding how social relationships and their changing role in young people's lives can result in either negative or positive individual and group outcomes.

This study aims to contribute to this research gap by considering a wide range of addictive behaviors and their impact on peer group identification and psychological distress among young people. As young people are particularly vulnerable to the costs of addictive behaviors (Balogh et al., 2013; Calado et al., 2017), recognizing the potential mediating role of social identification on well-being can provide further insight in understanding additional causes of addiction-related harms in young people as well as induce clinical and policy changes.

2. Method

2.1. Participants

A total of 1200 participants entered into the study from a pool of volunteers administered by Survey Sampling International. The sample consisted of Finnish young people aged 15 to 25 (Mean Age = 21.29, $SD = 2.85$, 50% female) and was demographically balanced in terms of age, gender, and living area. The research was approved by the Ethics Committee of Tampere region in Finland. All respondents were informed about the aims of the study and their participation in the study was fully voluntary. The participants were informed they could withdraw from the study at any time. The survey was fully anonymous and participating in the study did not inflict any harm to the participants.

2.2. Survey

The *YouGamble* online-survey was conducted during March–April 2017 using LimeSurvey software, and it was optimized for both computers and mobile devices. Average survey response time was 15.50 min. The survey included measures for all target variables, including hazardous alcohol use, drug use, gambling behavior, compulsive Internet use, psychological wellbeing, and identifying with a primary peer group.

2.3. Measures

Excessive alcohol use was measured by a 3-item Alcohol Use Disorders Identification Test, AUDIT-C. The measure is validated for several populations and provides a reliable and quick way to identify individuals with hazardous drinking habits (Bush, Kivlahan, McDonell, Fihn, & Bradley, 1998; Rubinsky, Dawson, Williams, Kivlahan, & Bradley, 2013). The measure had good internal consistency ($\alpha = 0.82$).

Excessive Drug Use was measured by a set of five questions screening for the use of different drugs with intoxicative intentions. A dummy variable was created to identify those individuals who had not used drugs regularly and those who had used regularly or are still using one or more of the following substances: cannabis, stimulants, hallucinogens, opioids, or other pharmaceuticals. The proportion of those who had used drugs either in the past or were currently using was 5.24%, half of which were cannabis users.

Excessive Gambling was measured by the South Oaks Gambling Screen (SOGS) which is regularly used in studies screening for pathological gambling behavior (Castrén et al., 2013; Edgren, Castrén, Mäkelä, Pörtfors, Alho, and Salonen, 2016; Salonen & Raisamo, 2015). The scale was slightly modified to accommodate the Finnish version of the SOGS and included a question set of 20 items and has good internal consistency ($\alpha = 0.89$).

Excessive Internet Use was assessed by the Compulsive Internet Use Scale, CIUS (Meerkerk, Van Den Eijnden, Vermulst, & Garretsen, 2009). The scale has good psychometric properties and consists of 14 items, each targeting the consequences and states of mind involved in Internet use. Responses range on a five-point scale from 0 (never) to 4 (very often) with a higher score indicating compulsive Internet use. The sale had excellent internal consistency ($\alpha = 0.93$).

Psychological distress was measured with the General Health Questionnaire, GHQ-12 (Goldberg et al., 1997; Pevalin, 2000). The instrument is extensively used in clinical settings and widely utilized in mental health research. The scale has good internal consistency ($\alpha = 0.88$) and reliability. A total of 12 questions with a 4-point scale (0–3) screen for psychological well-being. A higher score indicates higher psychological distress.

Identifying with a Primary Peer Group consisting of friends was assessed with an inquiry regarding the subjective sense of belonging to a primary peer group. The item asked; "How strongly do you feel you belong to the following: A Peer Group?" Answers were provided on a scale ranging from 1 (no belonging at all) to 10 (very strong belonging).

2.4. Statistical analysis

Descriptive statistics were calculated as means (M) and standard deviations (SD) for continuous variables, and as frequencies (n) and relational proportions (%) for categorical variables. This information is presented in Table 1. The mediation analysis was conducted with multistep regression approach suggested by Baron and Kenny (1986). In the approach, four regression models were estimated for each form of addictive behavior (Table 2). The statistical significance of indirect associations was assessed based on these models by using Sobel tests (Sobel, 1982). Gender and age were used as covariates in all models.

3. Results

According to our full models including addictive behaviors, social identification as a moderator and covariates, excessive drinking ($b = 0.4$, $SE = 0.06$, $t(1199) = 7.09$, $p < .001$), excessive drug use ($b = 2.3$, $SE = 0.77$, $t(1199) = 3.00$, $p = .003$), excessive gambling ($b = 0.4$, $SE = 0.07$, $t(1199) = 5.86$, $p < .001$), and excessive Internet use ($b = 0.1$, $SE = 0.02$, $t(1199) = 8.42$, $p < .001$) all had a significant positive relationship with psychological distress. In addition, there was a significant relationship between all forms of addictive behaviors and social identification (Table 2 and Fig. 1). This association was negative in excessive drug use ($b = -1.13$, $SE = 0.31$, $t(1199) = -3.61$, $p < .001$), excessive gambling ($b = -0.11$, $SE = 0.03$, $t(1199) = -3.55$, $p < .001$), and excessive Internet use ($b = -0.02$, $SE = 0.01$, $t(1199) = -3.12$, $p = .002$). Excessive drinking, however, was positively associated with peer group identification ($b = 0.11$, $SE = 0.02$, $t(1199) = 4.49$, $p < .001$).

According to Sobel tests, the indirect effects between addictive behaviors and psychological distress via social identification were significant in the case of excessive drinking ($z = -4.06$, $p < .001$) excessive drug use ($z = 3.30$ $p < .001$), excessive gambling ($z = 3.45$, $p = .001$), and excessive Internet use ($z = 2.91$, $p = .004$). Notably, excessive drinking was the only form of addictive behavior to be indirectly associated with lower psychological distress ($b = -0.07$,

$SE = 0.02$), while the indirect association was higher in case of excessive drug use ($b = 0.65$, $SE = 0.20$), excessive gambling ($b = 0.06$, $SE = 0.02$), and excessive Internet use ($b = 0.01$, $SE = 0.00$). The total effects, including both the direct and indirect effects, were positive in case of all forms of addictive behavior (see Table 2).

4. Discussion

While research on social relationships' impact on youth behavior is abundant, no previous research, to our knowledge, has considered how addictive behaviors intervene with social identification mechanisms and thus impact youths' psychological well-being. Here, our aim was to provide a mediation model explanation for this interplay. In line with earlier research, we found that all addictive behaviors examined had a direct negative impact on psychological well-being. In terms of our mediation model, we found significant indirect effects where the strength of social identification mediated psychological well-being. The indirect effect was negative in terms of excessive drug use, excessive gambling, and excessive Internet use. Excessive drinking, in contrast, had a positive indirect effect on psychological well-being. Consequently, our analysis suggests that social identification among alcohol users can function as a unitive factor safeguarding psychological well-being. Among excessive gamblers, drug users and excessive Internet users, social identification is weakened and therefore increases the level of experienced psychological distress. This accentuates the complex social outcomes addictions possess.

In line with previous studies, our results show that a sense of belonging to a primary group is meaningful to individuals and has significant health related consequences (Buckingham et al., 2013; Cruwys et al., 2017; Jetten et al., 2014). Within the current study, the contradiction between high and low social identification and their consequence in each given addictive behavior (excessive drinking, drug use, Internet use, and gambling), is likely due to the different underlying characteristics of these behaviors. In many adolescent and emerging adult peer groups, alcohol drinking can be regarded as an extravert and normative behavior which helps individuals to integrate themselves into a desired primary group (Brechwald & Prinstein, 2011; Demant & Järvinen, 2006; Neighbors et al., 2011). It can also be expected that these types of extrovertedly oriented peer groups are easier for youths to find. We suggest that the higher well-being among alcohol consuming youth lies in these social ties.

It is also notable that heavy drinking behavior can strengthen friendships among youth who share this behavior (Boman IV et al., 2013). Past research has found that adolescents who share similar drinking patterns experience their quality of friendship to be higher (Stogner et al., 2015). Thus, it is possible that higher social identification with alcohol consuming peers correspondingly indicates higher quality friendships among those youths, which then contributes to experiencing higher psychological well-being. It is worth noting, however, that even given this positive mediation effect, the total effect of alcohol consumption on young people's well-being is still negative.

Unlike alcohol consumption, other forms of addictive behaviors appear to disintegrate young people from their peer groups. This is in line with earlier research reporting harmful social consequences of addictive behaviors (see e.g. Blinn-Pike et al., 2010; Dhir et al., 2015; Yao & Zhong, 2014). Using drugs, surfing the Internet, and taking part in gambling activities, could be, particularly in their excessive forms, viewed as lonesome behaviors more likely to be carried out by individuals who do not have an immediate primary group to identify with. We further propose that, in young individuals who excessively engage in these behaviors, the need to belong to a primary social group is hindered and, to an extent, the behaviors themselves function as a replacement for missing social relationships. This then manifests in higher psychological distress and lower well-being.

4.1. Limitations and future directions

While the study provides major results, it did not examine if the participants did indeed engage in these potentially lonesome addictive behaviors – excessive drug use, gambling and Internet use – alone. Future research should thus evaluate whether these behaviors are done in isolation. Further investigation is also needed to determine whether social identification's impact among alcohol consuming youth is unique, or whether it can influence addictive behaviors and well-being across addictions when the behaviors are carried out with peers. Lastly, due to the limits of the cross-sectional method, it cannot be determined whether weak social identification is a result or cause of addictive behaviors.

4.2. Conclusions

This study described a relationship between addictive behaviors and psychological distress through the mediating effect of primary group identification. The study was able to demonstrate that the said effect exists, thus expanding existing research on peer group outcomes. As previous research has shown, identification with primary social groups can function as a protective measure against harmful health- and addictive behaviors (Jetten et al., 2014; Rosenquist et al., 2010). In our study, increased social identification buffered young people against mental health problems related to alcohol consumption. Building upon the work of Cloud and Granfield (2008), proposing that social identification can provide important *recovery capital* in difficult substance use behaviors, the current study further recognizes the need for including and applying social identity means in addiction intervention and prevention work, especially when working with young populations on both public and clinical levels. As this study recognizes that addictive behaviors may be related to social identification in different ways, depending on their level of acceptance and normativity among adolescent and emerging adult peer groups, guiding and supporting youths' social engagements hold great potential in addiction prevention and recovery.

Author disclosure statementsStatement 1. Role of funding sources

The authors of this manuscript would like to respectfully disclose that funding for this study was provided by the Finnish Foundation for Alcohol Studies (25024196). The funder had no role in the designing of the study, neither did they participate in the collection, analysis or interpretation of the data. The funder did not contribute or influence the writing the manuscript, or the decision to submit the paper for publication.Statement 2. Contributors

Authors Savolainen, I. and Oksanen, A. designed the study and wrote the procedure. Author Sirola, A. conducted most of the literature searches and provided insights of previous research studies. Author Kaakinen, M. conducted the statistical analysis. Author Savolainen, I. wrote the first draft of the manuscript and all authors participated in the final editing process. Each author has contributed a significant amount of time and effort to the work at hand and accepts the submission.Statement 3. Conflict of interest

The authors report that no conflict of interest exists regarding the content of the current manuscript.

Appendix A

Table 1
Descriptive statistics. Continuous variables as means (*M*) and standard deviations (*SD*). Categorical variables as frequencies (*n*) and relational proportions (%).

Continuous variables	Range	*M*	*SD*
Psychological distress	0–36	14.1	6.3
Social identification to peer group	1–10	6.8	2.5
Alcohol consumption	0–13	4.1	3.0
Problem gambling	0–20	1.6	2.6
Compulsive Internet use	0–56	18.8	11.1
Age	15–25	21.3	2.8
Categorical variables	coding	%	*n*
Gender	male	50	600
	female	50	600
Drug use	no	94.6	1135
	yes	5.4	65

Table 2
Regression results of our mediation analyses for each form of addictive behavior.

	Excessive drinking			Excessive drug use			Excessive gambling			Excessive internet use		
Path	*b*(*SE*)	*Z*	*p*	*b*(*SE*)	*Z*	*p*	*b*(*SE*)	*Z*	*p*	*b*(*SE*)	*Z*	*p*
a: Addictive Beh. → S. Identif.	0.11(0.02)	4.49	< .001	−1.13(0.31)	−3.61	< .001	−0.11(0.03)	−3.84	< .001	−0.02(0.01)	−3.12	.002
b: S. Identif. → Psych. Dist.	−0.66(0.07)	−9.49	< .001	−0.57(0.07)	−8.14	< .001	−0.55(07)	−7.89	< .001	−0.54(0.07)	−7.93	< .001
c: Addictive Beh. → Psych. Dist.	0.35(0.06)	5.70	< .001	2.95(0.78)	3.77	< .001	0.46(0.07)	6.60	< .001	0.14(0.02)	8.94	< .001
c': Addictive Beh. → Psych. Dist.	0.42(0.06)	7.09	< .001	2.30(0.77)	3.00	.003	0.40(0.07)	5.86	< .001	0.13(0.02)	8.42	< .001
Addictive Beh. → S. Identif. → Psych. Dist.	−0.07(0.02)	−4.06	< .001	0.65(0.20)	3.30	< .001	0.06(0.02)	3.24	.001	0.01(0.00)	2.90	.004
Total effect	0.35(0.06)	5.70	< .001	2.95(0.78)	3.77	< .001	0.46(0.07)	6.60	< .001	0.14(0.02)	8.94	< .001
Proportion of total effect mediated			−.21			.22			.13			.08

Note. Paths *a* and *b* are mediation paths. Path *c* is the direct effect without including the mediator in the model. Path *c*' is the direct effect after the mediator is included in the model. Addictive Beh. = addictive behavior, S. Identif. = social identification, Psych. Dist. = psychological distress, b = unstandardized regression coefficient, SE = standard error.

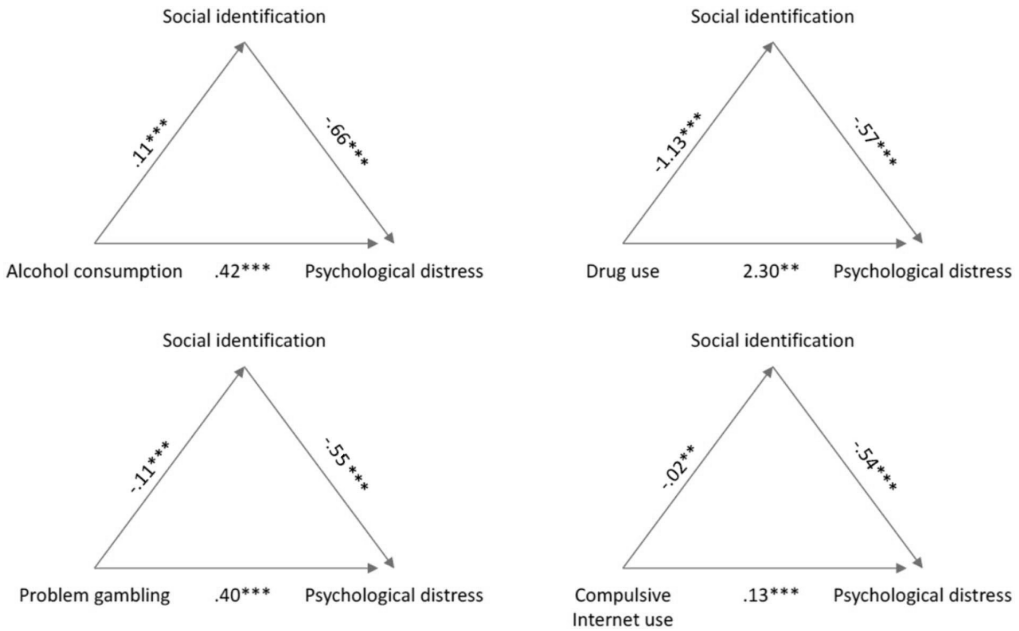

Fig. 1. The mediating role of social identification on psychological distress assessed for four types of excessive behaviors.

References

Arnett, J. J. (2005). The developmental context of substance use in emerging adulthood. *Journal of Drug Issues, 35*, 235–253. http://dx.doi.org/10.1177/002204260503500202.

Arria, A. M., Garnier-Dykstra, L. M., Cook, E. T., Caldeira, K. M., Vincent, K. B., Baron, R. A., & O'Grady, K. E. (2013). Drug use patterns in young adulthood and post-college employment. *Drug and Alcohol Dependence, 127*, 23–30. http://dx.doi.org/10.1016/j.drugalcdep.2012.06.001.

Balogh, K. N., Mayes, L. C., & Potenza, M. N. (2013). Risk-taking and decision-making in youth: Relationships to addiction vulnerability. *Journal of Behavioral Addictions, 2*, 1–9. http://dx.doi.org/10.1556/JBA.2.2013.1.1.

Baron, R. M., & Kenny, D. A. (1986). The moderator-mediator variable distinction in social psychological research: Conceptual, strategic, and statistical considerations. *Journal of Personality and Social Psychology, 51*, 1173–1182. http://dx.doi.org/10.1037/0022-3514.51.6.1173.

Baumeister, R. F., & Leary, M. R. (1995). The need to belong: Desire for interpersonal attachments as a fundamental human motivation. *Psychological Bulletin, 117*, 497–529. http://dx.doi.org/10.1037/0033-2909.117.3.497.

Best, P., Manktelow, R., & Taylor, B. (2014). Online communication, social media and adolescent wellbeing: A systematic narrative review. *Children and Youth Services Review, 41*, 27–36. http://dx.doi.org/10.1016/j.childyouth.2014.03.001.

Blinn-Pike, L., Worthy, S. L., & Jonkman, J. N. (2010). Adolescent gambling: A review of an emerging field of research. *Journal of Adolescent Health, 47*, 223–236. http://dx.doi.org/10.1016/j.jadohealth.2010.05.003.

Boman, J. H., IV, Stogner, J., & Lee Miller, B. (2013). Binge drinking, marijuana use, and friendships: The relationship between similar and dissimilar usage and friendship quality. *Journal of Psychoactive Drugs, 45*, 218–226. http://dx.doi.org/10.1080/02791072.2013.803646.

Brechwald, W. A., & Prinstein, M. J. (2011). Beyond homophily: A decade of advances in understanding peer influence processes. *Journal of Research on Adolescence, 21*(1), 166–179. http://dx.doi.org/10.1111/j.1532-7795.2010.00721.x.

Buckingham, S. A., Frings, D., & Albery, I. P. (2013). Group membership and social identity in addiction recovery. *Psychology of Addictive Behaviors, 27*, 1132–1140. http://dx.doi.org/10.1037/a00324r80 Advance online publication.

Bush, K., Kivlahan, D. R., McDonell, M. B., Fihn, S. D., & Bradley, K. A. (1998). The AUDIT alcohol consumption questions (AUDIT-C): An effective brief screening test for problem drinking. *Archives of Internal Medicine, 158*, 1789–1795. http://dx.doi.org/10.1001/archinte.158.16.1789.

Calado, F., Alexandre, J., & Griffiths, M. D. (2017). Prevalence of adolescent problem gambling: A systematic review of recent research. *Journal of Gambling Studies, 33*(2), 397–424. http://dx.doi.org/10.1007/s10899-016-9627-5.

Canale, N., Griffiths, M. D., Vieno, A., Siciliano, V., & Molinaro, S. (2016). Impact of internet gambling on problem gambling among adolescents in Italy: Findings from a large-scale nationally representative survey. *Computers in Human Behavior, 57*, 99–106. http://dx.doi.org/10.1016/j.chb.2015.12.020.

Castrén, S., Basnet, S., Salonen, A. H., Pankakoski, M., Ronkainen, J. E., Alho, H., & Lahti, T. (2013). Factors associated with disordered gambling in Finland. *Substance Abuse Treatment, Prevention, and Policy, 8*. http://dx.doi.org/10.1186/1747-597X-8-24.

Centers for Disease Control and Prevention (2016, October 16). Underage drinking. Retrieved from https://www.cdc.gov/alcohol/fact-sheets/underage-drinking.htm.

Centers for Disease Control and Prevention (2017, June 7). Fact sheets - binge drinking. Retrieved from https://www.cdc.gov/alcohol/fact-sheets/binge-drinking.htm.

Cheng, C., & Li, A. Y. L. (2014). Internet addiction prevalence and quality of (real) life: A meta-analysis of 31 nations across seven world regions. *Cyberpsychology, Behavior and Social Networking, 17*, 755–760. http://dx.doi.org/10.1089/cyber.2014.0317.

Cloud, W., & Granfield, R. (2008). Conceptualizing recovery capital: Expansion of a theoretical construct. *Substance Use & Misuse, 43*, 1971–1986. http://dx.doi.org/10.1080/10826080802289762.

Cruwys, T., Steffens, N. K., Haslam, S. A., Haslam, C., Jetten, J., & Dingle, G. A. (2017). Social identity mapping: A procedure for visual representation and assessment of subjective multiple group memberships. *British Journal of Social Psychology, 55*, 613–642. http://dx.doi.org/10.1111/bjso.12155.

Degenhardt, L., Coffey, C., Moran, P., Carlin, J. B., & Patton, G. C. (2007). The predictors and consequences of adolescent amphetamine use: Findings from the Victoria adolescent health cohort study. *Addiction, 102*, 1076–1084. http://dx.doi.org/10.1111/j.1360-0443.2007.01839.x.

DeLisi, M., Angton, A., Behnken, M. P., & Kusow, A. M. (2015). Do adolescent drug users fare the worst? Onset type, juvenile delinquency, and criminal careers. *International Journal of Offender Therapy and Comparative Criminology, 59*(2), 180–195. http://dx.doi.org/10.1177/0306624X13505426.

Demant, J., & Järvinen, M. (2006). Constructing maturity through alcohol experience–focus group interviews with teenagers. *Addiction Research and Theory, 14*(6), 589–602. http://dx.doi.org/10.1080/16066350600691683.

Dhir, A., Chen, S., & Nieminen, M. (2015). Predicting adolescent internet addiction: The roles of demographics, technology accessibility, unwillingness to communicate and sought internet gratifications. *Computers in Human Behavior, 51*, 24–33. http://dx.doi.org/10.1016/j.chb.2015.04.056.

Durkee, T., Carli, V., Floderus, B., Wasserman, C., Sarchiapone, M., Apter, A., ... Cosman, D. (2016). Pathological internet use and risk-behaviors among European adolescents. *International Journal of Environmental Research and Public Health, 13*, 294. http://dx.doi.org/10.3390/ijerph13030294.

Edgren, R., Castrén, S., Mäkelä, M., Pörtfors, P., Alho, H., & Salonen, A. H. (2016). Reliability of instruments measuring at-risk and problem gambling among young individuals: A systematic review covering years 2009–2015. *Journal of Adolescent Health, 58*, 600–615. http://dx.doi.org/10.1016/j.jadohealth.2016.03.007.

Elton-Marshall, T., Leatherdale, S. T., & Turner, N. E. (2016). An examination of internet and land-based gambling among adolescents in three Canadian provinces: Results from the youth gambling survey (YGS). *BMC Public Health, 16*, 277. http://dx.doi.

org/10.1186/s12889-016-2933-0.
Frings, D., & Albery, I. P. (2015). The social identity model of cessation maintenance: Formulation and initial evidence. *Addictive Behaviors, 44*, 35–42. http://dx.doi.org/10.1016/j.addbeh.2014.10.023.
Goldberg, D. P., Gater, R., Sartorius, N., Ustun, T. B., Piccinelli, M., Gureje, O., & Rutter, C. (1997). The validity of two versions of the GHQ in the WHO study of mental illness in general health care. *Psychological Medicine, 27*, 191–197.
Greenaway, K. H., Cruwys, T., Haslam, S. A., & Jetten, J. (2016). Social identities promote well-being because they satisfy global psychological needs. *European Journal of Social Psychology, 46*(3), 294–307. http://dx.doi.org/10.1002/ejsp.2169.
Hakkarainen, P., Karjalainen, K., Ojajärvi, A., & Salasuo, M. (2015). Huumausaineiden ja kuntodopingin käyttö ja niitä koskevat mielipiteet Suomessa vuonna 2014. [Drug use, doping and public opinion in Finland: Results from the 2014 Drug Survey]. *Yhteiskuntapolitiikka, 80*, 319–333.
Hakkarainen, P., Karjalainen, K., Raitasalo, K., & Sorvala, V. M. (2015). School's in! Predicting teen cannabis use by conventionality, cultural disposition and social context. *Drugs: Education, Prevention and Policy, 22*, 344–351. http://dx.doi.org/10.3109/09687637.2015.1024611.
Jernigan, D., Noel, J., Landon, J., Thornton, N., & Lobstein, T. (2017). Alcohol marketing and youth alcohol consumption: A systematic review of longitudinal studies published since 2008. *Addiction, 112*, 7–20. http://dx.doi.org/10.1111/add.13591.
Jetten, J., Haslam, C., Haslam, S. A., Dingle, G., & Jones, J. M. (2014). How groups affect our health and well-being: The path from theory to policy. *Social Issues and Policy Review, 8*, 103–130. http://dx.doi.org/10.1111/sipr.12003.
Johnston, L. D., O'Malley, P. M., Bachman, J. G., Schulenberg, J. E., & Miech, R. A. (2016). *Monitoring the future national survey results on drug use, 1975–2015: Volume II, college students and adults ages 19–55.* Ann Arbor: Institute for Social Research, The University of Michigan. (Available at) http://monitoringthefuture.org/pubs.html#monographs.
Jorgenson, A. G., Hsiao, R. C. J., & Yen, C. F. (2016). Internet addiction and other behavioral addictions. *Child and Adolescent Psychiatric Clinics, 25*, 509–520. http://dx.doi.org/10.1016/j.chc.2016.03.004.
Karjalainen, K., Savonen, J., & Hakkarainen, P. (2016). *Suomalaisten huumeiden käyttö ja huumeasenteet– Huumeaiheiset väestökyselyt Suomessa 1992–2014 [Drug use and drug attitudes among Finns –Drug-related population surveys in Finland 1992–2014]. National Institute for Health and Welfare (THL) Report 2/2016.* (126 pages. Helsinki, Finland 2016).
Kristiansen, S., Reith, G., & Trabjerg, C. M. (2017). 'The notorious gambling class': Patterns of gambling among young people in Denmark. *Journal of Youth Studies, 20*, 366–381. http://dx.doi.org/10.1080/13676261.2016.1232480.
Kuss, D. J., Griffiths, M. D., Karila, L., & Billieux, J. (2014). Internet addiction: A systematic review of epidemiological research for the last decade. *Current Pharmaceutical Design, 20*, 4026–4052. http://dx.doi.org/10.2174/13816128113199990617.
Kuss, D. J., Van Rooij, A. J., Shorter, G. W., Griffiths, M. D., & van de Mheen, D. (2013). Internet addiction in adolescents: Prevalence and risk factors. *Computers in Human Behavior, 29*, 1987–1996. http://dx.doi.org/10.1016/j.chb.2013.04.002.
Lavy, V., & Sand, E. (2012). *The friends factor: How Students' social networks affect their academic achievement and well-being? (no. w18430).* National Bureau of Economic Research.
Macleod, J., Oakes, R., Copello, A., Crome, I., Egger, M., Hickman, M., ... Smith, G. D. (2004). Psychological and social sequelae of cannabis and other illicit drug use by young people: A systematic review of longitudinal, general population studies. *The Lancet, 363*(9421), 1579–1588. http://dx.doi.org/10.1016/S0140-6736(04)16200-4.
Mawson, E., Best, D., Beckwith, M., Dingle, G. A., & Lubman, D. I. (2015). Social identity, social networks and recovery capital in emerging adulthood: A pilot study. *Substance Abuse Treatment, Prevention, and Policy, 45*. http://dx.doi.org/10.1186/s13011-015-0041-2.
Meerkerk, G. J., Van Den Eijnden, R. J., Vermulst, A. A., & Garretsen, H. F. (2009). The compulsive internet use scale (CIUS): some psychometric properties. *Cyberpsychology & Behavior, 12*, 1–6. http://dx.doi.org/10.1089/cpb.2008.0181.
Merikangas, K. R., & McClair, V. L. (2012). Epidemiology of substance use disorders. *Human Genetics, 131*, 779–789. http://dx.doi.org/10.1007/s00439-012-1168-0.
Mitchell, S. G., Gryczynski, J., O'Grady, K. E., & Schwartz, R. P. (2013). SBIRT for adolescent drug and alcohol use: Current status and future directions. *Journal of Substance Abuse Treatment, 44*, 463–472. http://dx.doi.org/10.1016/j.jsat.2012.11.005.
Moss, H. B., Chen, C. M., & Yi, H. Y. (2014). Early adolescent patterns of alcohol, cigarettes, and marijuana polysubstance use and young adult substance use outcomes in a nationally representative sample. *Drug and Alcohol Dependence, 136*, 51–62. http://dx.doi.org/10.1016/j.drugalcdep.2013.12.011.
Neighbors, C., Jensen, M., Tidwell, J., Walter, T., Fossos, N., & Lewis, M. A. (2011). Social-norms interventions for light and nondrinking students. *Group Processes & Intergroup Relations, 14*, 651–669. http://dx.doi.org/10.1177/1368430210398014.
Nutt, D. J., King, L. A., & Phillips, L. D. (2010). Drug harms in the UK: A multicriteria decision analysis. *The Lancet, 376*, 1558–1565. http://dx.doi.org/10.1016/S0140-6736(10)61462-6.
Orford, J. (2001a). Addiction as excessive appetite. *Addiction, 96*, 15–31. http://dx.doi.org/10.1046/j.1360-0443.2001.961152.x.
Orford, J. (2001b). *Excessive appetites: A psychological view of addictions.* Wiley.
Pevalin, D. J. (2000). Multiple applications of the GHQ-12 in a general population sample: An investigation of long-term retest effects. *Social Psychiatry and Psychiatric Epidemiology, 35*, 508–512.
Raisamo, S., Halme, J., Murto, A., & Lintonen, T. (2013). Gambling-related harms among adolescents: A population-based study. *Journal of Gambling Studies, 29*, 151–159. http://dx.doi.org/10.1007/s10899-012-9298-9.
Raitasalo, K., Huhtanen, P., & Miekkala, M. (2016). *Nuorten päihteiden käyttö 1995–2015. ESPAD -tutkimuksen tulokset [Alcohol and Drug Use among Adolescents in Finland 1995–2015. ESPAD survey results]. National Institute for Health and Welfare (THL). Report 19/2015.*
Rosenquist, J. N., Murabito, J., Fowler, J. H., & Christakis, N. A. (2010). The spread of alcohol consumption behavior in a large social network. *Annals of Internal Medicine, 152*, 426–433. http://dx.doi.org/10.1059/0003-4819-152-7-201004060-00007.
Rubinsky, A. D., Dawson, D. A., Williams, E. C., Kivlahan, D. R., & Bradley, K. A. (2013). AUDIT-C scores as a scaled marker of mean daily drinking, alcohol use disorder severity, and probability of alcohol dependence in a US general population sample of drinkers. *Alcoholism: Clinical and Experimental Research, 37*, 1380–1390. http://dx.doi.org/10.1111/acer.12092.
Ryff, C. D., & Singer, B. (1996). Psychological well-being: Meaning, measurement, and implications for psychotherapy research. *Psychotherapy and Psychosomatics, 65*, 14–23. http://dx.doi.org/10.1159/000289026.
Sagone, E., & De Caroli, M. E. (2014). Relationships between psychological well-being and resilience in middle and late adolescents. *Procedia-Social and Behavioral Sciences, 141*, 881–887. http://dx.doi.org/10.1016/j.sbspro.2014.05.154.
Salam, R. A., Das, J. K., Lassi, Z. S., & Bhutta, Z. A. (2016). Adolescent health and well-being: Background and methodology for review of potential interventions. *Journal of Adolescent Health, 59*, 4–10. http://dx.doi.org/10.1016/j.jadohealth.2016.07.023.
Salonen, A., & Raisamo, S. (2015). *Suomalaisten rahapelaaminen 2015-Rahapelaaminen, rahapeliongelmat ja rahapelaamiseen liittyvät asenteet ja mielipiteet 15–74-vuotiailla. [Finnish gambling 2015. Gambling, gambling problems, and attitudes and opinions on gambling among Finns aged 15–74.] National Institute for Health and Welfare (THL). Report 16/2015.*
Sinkkonen, H. M., Puhakka, H., & Meriläinen, M. (2014). Internet use and addiction among Finnish adolescents (15–19years). *Journal of Adolescence, 37*(2), 123–131. http://dx.doi.org/10.1016/j.adolescence.2013.11.008.
Sobel, M. E. (1982). Asymptotic confidence intervals for indirect effects in structural equation models. *Sociological Methodology, 13*, 290–312. http://dx.doi.org/10.2307/270723.
Splevins, K., Mireskandari, S., Clayton, K., & Blaszczynski, A. (2010). Prevalence of adolescent problem gambling, related harms and help-seeking behaviours among an Australian population. *Journal of Gambling Studies, 26*, 189–204. http://dx.doi.org/10.1007/s10899-009-9169-1.
Stogner, J., Boman, J. H., IV, & Lee Miller, B. (2015). Assessing the relationship between divergent drinking and perceptions of friendship quality between students. *Journal of Child & Adolescent Substance Abuse, 24*, 387–396. http://dx.doi.org/10.1080/1067828X.2013.872065.
St-Pierre, R., & Derevensky, J. L. (2016). Youth gambling behavior: Novel approaches to prevention and intervention. *Current Addiction Reports, 3*, 157–165. http://dx.doi.org/10.1007/s40429-016-0104-0.
Tajfel, H., & Turner, J. C. (1979). An integrative theory of intergroup conflict. In W. G. Austin, & S. Worchel (Eds.). *The social psychology of intergroup relations* (pp. 33–47). Monterey, CA: Brooks Cole.
Thoits, P. (2011). Mechanisms linking social ties and support to physical and mental health. *Journal of Health and Social Behavior, 52*, 145–161. http://dx.doi.org/10.1177/0022146510395592.
Torikka, A., Kaltiala-Heino, R., Rimpelä, A., Marttunen, M., Luukkaala, T., & Rimpelä, M. (2014). Self-reported depression is increasing among socio-economically disadvantaged adolescents – Repeated cross-sectional surveys from Finland from 2000 to 2011. *BMC Public Health, 14*. http://dx.doi.org/10.1186/1471-2458-14-408.
Volberg, R. A., Gupta, R., Griffiths, M. D., Ólason, D. T., & Delfabbro, P. (2010). An international perspective on youth gambling prevalence studies. *International Journal of Adolescent Medicine and Health, 22*, 3–38. http://dx.doi.org/10.1515/IJAMH.2010.22.1.3.
West, R. (2006). *Theory of addiction.* Oxford: Blackwell.
World Health Organization (WHO) (2014). *Global status report on alcohol and health.* Luxemburg: WHO Press.
Yao, M. Z., & Zhong, Z. J. (2014). Loneliness, social contacts and internet addiction: A cross-lagged panel study. *Computers in Human Behavior, 30*, 164–170. http://dx.doi.org/10.1016/j.chb.2013.08.007.
Yau, Y. H., Potenza, M. N., & White, M. A. (2012). Problematic internet use, mental health and impulse control in an online survey of adults. *Journal of Behavioral Addictions, 2*, 72–81. http://dx.doi.org/10.1556/JBA.1.2012.015.

PUBLICATION II

Peer group identification as a determinant of youth behavior and the role of perceived social support in problem gambling

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Journal of Gambling Studies, *35*(1), 15–30
https://doi.org/10.1007/s10899-018-9813-8

Journal of Gambling Studies
https://doi.org/10.1007/s10899-018-9813-8

ORIGINAL PAPER

Peer Group Identification as Determinant of Youth Behavior and the Role of Perceived Social Support in Problem Gambling

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Abstract

Gambling opportunities have increased rapidly during recent years. Previous research shows that gambling is a popular activity among youth, which may contribute to problem gambling. This study examined how social identification with online and offline peer groups associates with youth problem gambling behavior and if perceived social support buffers this relationship. Data were gathered with an online survey with 1212 American and 1200 Finnish participants between 15 and 25 years of age. Measures included the South Oaks Gambling Screen for problem gambling, and items for peer group identification and perceived social support. It was found that youth who identify strongly with offline peer groups were less likely to engage in problem gambling, while strong identification with online peer groups had the opposite effect. We also found that the associations between social identification and problem gambling behavior were moderated by perceived social support. Online peer groups may be a determinant in youth problem gambling. Focusing on offline peer groups and increasing social support can hold significant potential in youth gambling prevention.

Keywords Social identification · Social support · Problem gambling behavior · Youth

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Published online: 21 November 2018

Introduction

Over the past decade, gambling has increased its popularity as a recreational activity (Molinaro et al. 2018; Orford 2010), particularly among individuals between 11 and 25 years of age, or, youth (Calado et al. 2017; UNESCO 2017). Even though gambling is illegal for underaged youth, new gambling technologies have made different forms of gambling widespread and much easier for even the youngest individuals to access (Blinn-Pike et al. 2010; Canale et al. 2016; Elton-Marshall et al. 2016). Above all, Internet gambling has transformed the traditional gambling landscape by offering convenient, instant, and constant access to novel gambling forms (Gainsbury et al. 2015; Griffiths and Parke 2010). Among a sample of ≥ 18-year-old college student problem gamblers, Petry and Gonzalez-Ibanez (2015) found that nearly half (49%) had gambled on the Internet during the month prior to the study. The sample included only those students who had scored more than 3 points on a combined gambling measure, consisting of the South Oaks Gambling Screen (SOGS) and money spent on gambling during the past 2 months. More recently, Molinaro et al. (2018) reported that 22.6% of 16-year-old students had gambled during the past year, 16.2% of them online.

Past research further indicates that the prevalence rate of gambling engagement is considerably high among youth and predominantly focused on private betting on skill-based games (Elton-Marshall et al. 2016; Volberg et al. 2010). An extensive review study from the turn of the decade found that, compared to 11% of adults, 28% of youth reported having bet on games of skill, such as card games, in the past year (Volberg et al. 2010). A more recent review consisting of 44 studies on gambling among 11- to 24-year-olds, concluded that up to 12.3% of youth within that age range qualify as problem gamblers across five continents (Calado et al. 2017).

Gambling activities can provide individuals with many subjective benefits, such as excitement, entertainment, and a perceived sense of acquiring wealth without much effort (Derevensky and Gilbeau 2015; Kim et al. 2017). However, both recreational and problematic gambling alike are associated with several psychosocial, physical, and mental health problems (Fröberg et al. 2015; Kong et al. 2013). Past research has found associations between gambling engagement and substance abuse (Calado et al. 2017; Kessler et al. 2008), increased financial difficulties (Raisamo et al. 2013), and poor school performance, as well as damaged social relationships (Raisamo et al. 2013; Splevins et al. 2010). Problem gambling is a growing global issue that may further manifest in a range of mental health problems, such as depression, anxiety, mood difficulties, and aggression (Lloyd et al. 2010; Yip et al. 2011). As these issues can become increasingly prevalent when the onset of gambling occurs prior to adulthood (Kong et al. 2013), new research perspectives are needed to explain youth gambling behavior and motives, as well as other underlying mechanisms.

Social Identity as a Determinant of Behavior

Social relationships are recognized as a key determinant of overall well-being (Baumeister and Leary 1995; Thoits 2011) and behavior (Cruwys et al. 2015; Holt-Lunstad 2010) for people in general, but especially for young individuals in the 15–25 age group (Best et al. 2014a; Dishion and Tipsord 2011; Tarrant 2002). One possible linkage between social

relationships and subsequent behavior is social identification, which is operationalized as the subjective sense of belonging to a certain group (Buckingham et al. 2013; Cruwys et al. 2017; Jetten et al. 2014). Social identification, as introduced by Tajfel and Turner (1979), refers to a process in which an individual's identity is partly determined by his or her connectedness to desired social groups. These "in-groups" provide individuals with a sense of belonging and purpose, which have been shown to have significant outcomes in terms of personal capital and guide behavioral choices beyond normative peer influence (Best et al. 2014b; Frings and Albery 2015; Mawson et al. 2015).

According to the social identity theory (SIT), becoming a member of an "in-group" consisting of peers or similar others is beneficial for an individual (Tajfel and Turner 1979), as it enhances self-esteem, positive self-concept, and contributes to decision-making processes (Buckingham et al. 2013). Social psychological research has consistently recognized the impact that social identities have in shaping not only individuals' beliefs, but various behaviors as well, ranging from positive health promotion to negative health-destructive behaviors (Jetten et al. 2012, 2014; Oyserman et al. 2007). Once social identity with a desired group is established, the individual is more motivated to behave in accordance with the groups' perceived norms (Turner 1991; Marino et al. 2016). These social identity effects may be even more pronounced among youth who are still constructing their identities (Becht et al. 2017).

Kobus (2003) found that adolescents between ages 11 and 20 were more likely to engage in smoking behavior when their peer group identity was salient. Oyserman et al. (2007) concluded that, across seven experiments, race-related social identities were associated with either health-promotion or unhealthy behavior, depending on the social group with which the participants identified. Congruently, health-promoting behaviors were associated with belonging to the white and middle-class in-group identity, while unhealthy behaviors were associated with racial minority identities. A study by Foster et al. (2014) on college student gambling found that gambling behavior was associated with a stronger social identity with other gambling students, rather than the student body in general. Social identity was also found to moderate the association between perceived college norms and gambling behavior, as gambling students were more likely to perceive it as a normative behavior among their peers (Foster et al. 2014).

Peer relationships have a heightened importance among adolescents and young adults, and most adolescents report that they belong to a peer group (Chow et al. 2011; Flynn et al. 2017; Tarrant 2002). Due to the changing structure of the social world, individuals can now find meaningful groups with which to identify in both offline (Sussman et al. 2007) and online (Davis 2012; Mikal et al. 2016) environments. Ever since the introduction and exponential growth in popularity of the first social networking services, such as MySpace, Bebo, and Facebook—and, later on, Instagram, Twitter, and Snapchat—people have been connecting with ever-widening circles of other users and creating associations with individuals around the globe (Livingstone 2008; Tsitsika et al. 2014; Young 2011).

Social media is particularly attractive to young users: About 90% of young adults in the United States use social media platforms and more than half of them visit the sites daily (Villanti et al. 2017; Lin et al. 2016). Research has found that social media services are used mainly for communication with friends from the past and present (Davis 2012; Neira et al. 2014), sharing thoughts and interesting content (Kaplan and Haenlein 2010), and for self-disclosure and expression (Best et al. 2014a; Livingstone 2008). Research has also suggested that through online networks, individuals can more easily come in contact with like-minded others and share mutual ideas and content (Aiello et al. 2012; Sirola et al. 2018). Despite the fact that online and offline social networks tend to overlap, online social

ties have been identified as an independent source of social connectedness that are not reducible to the ones originating from face-to-face interactions (Cole et al. 2017). Moreover, online social groups are valued as being equally important as those offline and building one's identity through online venues and groups seems to be a growing modern norm (Borca et al. 2015; Lehdonvirta and Räsänen 2011).

Given its increasing popularity, youth gambling generates a new type of question in terms of social identities and the gambling phenomenon. Past research has been able to identify several individual, familial, and contextual factors associated with youth gambling (Buckle et al. 2013; Dussault et al. 2017), yet little research has examined whether social identity functions as an implicit mechanism reducing or inducing the behavior. It has been systematically reported that youth gambling and problem gambling are associated with the male gender (Splevins et al. 2010), young age, lower education level (Gainsbury et al. 2015; Hing et al. 2017), family-induced gambling experiences (Gupta and Derevensky 1997; Volberg et al. 2010) and having a positive attitude toward gambling (Dixon et al. 2016). These common features of gamblers and problem gamblers might suggest that gambling youth are socially motivated to either participate in the behavior or assimilate with a desired peer group via the behavior.

Perceived Social Support

As discussed above, social identities' impact on health and well-being is considerable. Equally important to health and well-being is the support derived from these social relationships (Cohen and Wills 1985; Dussault et al. 2016). These social mechanisms commonly go together, especially in psychology and health literature, where their impact is widely documented in patient and addiction recovery outcomes (Buckingham et al. 2013; Dingle et al. 2015a, b). For instance, Best et al. (2014a) found that rethinking identity processes allowed therapeutic community patients to recognize the social resources accessible for them while in alcohol and drug addiction. In the study, the patients explored potential transitional identities from "user" to "therapeutic community member." Through this rethinking practice, the patients were better able to gain a sense of belonging and support. These were later associated with improved health outcomes, such as life-satisfaction and abstinence from drinking at follow-up (Best et al. 2014a).

In another study, Wu et al. (2016) found that social support was significantly associated with lower levels of Internet addiction among adolescents. These results were further supported by a meta-analysis showing evidence that adolescents and young adults with low support are at a higher risk of becoming addicted to Internet use (Lei et al. 2018). In terms of gambling behavior, research suggests that lack of perceived social support is a risk factor in youth gambling. One study found that youth who were at-risk or probable pathological gamblers also reported that they felt a lack of social support (Hardoon et al. 2004). Similarly, Petry and Weiss (2009) concluded that social support received from family members and friends significantly mediated both short-term and long-term gambling outcomes among pathological gamblers.

Previous research on perceived social support as a resource for recovery has further found that young individuals estimate their total personal, social, and recovery capital to be lower than that of older individuals, suggesting that these resources continue to strengthen over time and in conjunction with stronger social identities (Mawson et al. 2015). Given that social support received from meaningful groups can have significant outcomes in terms

of decision making and the consequences that follow, youth are a particularly vulnerable group to the effects of perceived low social support. To this effect, earlier research findings indicate that strong social belonging and support can buffer youths against harmful online experiences (Kaakinen et al. 2018; Minkkinen et al. 2016). Notably, it was only the offline social relations that were found to have a buffering effect, while online social relations did not. In line with this finding, offline and online social connections have been reported to correlate with online risk behavior in inverse ways; while social ties offline are linked to a decreased likelihood of risk behavior, online relationships seem to have a reverse, increasing effect (Kaakinen et al. 2018). Considering the amplitude of harmful content and risky groups to which youth are exposed to online every day, investigating young individuals' perceived social support capital is important and has extensive implications.

Social identities, in a form of meaningful group memberships and social support, are both social psychological explanations as to why social ties are important for human well-being (Jetten et al. 2014). More specifically, it has been suggested that social identities might contribute to well-being by making social support more accessible to individuals (Haslam et al. 2005). There is, however, a gap in research literature that assesses whether the positive outcomes of social identification are actualized when there is a lack of perceived social support. This would further guide our understanding of social identity dynamics and well-being.

The Current Study

In the current study, youth between the ages of 15 and 25 are the population of interest and investigation, as these years include distinct developmental periods characterized by identity uncertainty and exploration (Archer 1982; Mawson et al. 2015). During these times, youth experiment with the diverse identities salient to them via different personal and social contexts online and offline. Using social identity theory as a theoretical framework, this cross-cultural study seeks to provide a supplementary explanation to youth problem gambling.

The aim of this research is to investigate and compare how social identification with peer groups online and offline is associated with problem gambling behavior among American and Finnish youths. More specifically, this research seeks to determine whether social identification is related to higher social support and if this relationship may safeguard youth from engaging in problem gambling, as theory indicates. While the beneficial outcomes of social identification and social support are widely reported (Haslam et al. 2005; Jetten et al. 2014), more research is needed on whether social identity is related to reduced destructive behavior (i.e., problem gambling) if perceived social support is absent.

The two countries were chosen because they are both technologically advanced Western countries while culturally diverse. Within both the United States and Finland, youth engage in gambling despite the existing gambling laws that aim to restrict such activity among underage individuals (i.e., those under 18 years of age in Finland and those under 21 years of age in several states of the United States). Cross-cultural research can provide deeper insight in understanding youth gambling. It is also needed to establish whether these social psychological phenomena exist in different cultural contexts. To our knowledge, no previous research has examined whether social identities of youth steer problem gambling behavior and if this possible effect is consistent across developed Western countries. Consequently, this study aims to contribute to the existing body of research by focusing on

inspecting online and offline social identities as pathways to problem gambling behavior among youth, as well as by further examining whether perceived social support can moderate this connection.

Within both samples, we hypothesized that strong identification with an offline peer group is associated with lower engagement in problem gambling behavior (H1), while strong identification with an online peer group is associated with higher engagement in problem gambling behavior (H2). It was expected that high perceived social support is associated with less problem gambling behavior (H3). It was further hypothesized that perceived social support moderates the association between social identification and problem gambling behavior (H4).

Method

Participants

Participants were recruited from a volunteer pool administered by Survey Sampling International (SSI). The samples consisted of a total of 1212 American participants aged 15–25 ($M = 20.05$, $SD = 3.19$, 50.17% female) and 1200 Finnish young people aged 15–25 ($M = 21.29$, $SD = 2.85$, 50.00% female). Both samples were demographically balanced in terms of age, gender, and living area. The Academic Ethics Committee of the Tampere Region approved the research before implementation. Participation in the study was fully voluntary and all respondents were informed of the aims of the study prior to participation. The participants were aware that they could withdraw from the study at any time. Participation in the study did not inflict any harm on the participants.

Survey

Data were collected with the *YouGamble* online survey conducted from March to April 2017 in Finland and in January 2018 in the United States. Both datasets were collected with LimeSurvey software by using identical survey formats. The surveys were optimized for both computers and mobile devices. The average survey response time was 14 min and 49 s in the United States and 15 min 30 s in Finland. The original survey was in Finnish. It was translated into English and back-translated again to ensure consistency and accurate matching of the survey items. Some questions were slightly modified to better fit the cultural setting in each country. The surveys were fully anonymous and included measures for all target variables, including gambling behavior, perceived social support, and identification with a primary peer group.

Measures

The South Oaks Gambling Screen (SOGS) was used to measure the frequency and intensity of problem gambling behavior. The SOGS is regularly used in studies to screen for pathological gambling behavior (Lesieur and Blume 1987; Salonen et al. 2017). Some of the test items were slightly modified to accommodate for cultural variations in gambling. The scale had good internal consistency in both the American ($\alpha = .90$) and Finnish ($\alpha = .89$) sample. The items were summed up to a continuous scale measuring the level of engagement in problem gambling behavior. Earlier studies have identified problems with the SOGS

cut-off scores which may lead to biased estimates of gambling problems and high rates of false positives (Battersby et al. 2002; Stinchfield 2002). To account for this, the SOGS was used as a continuous measure in our analyses, measuring the intensity of problem gambling behavior, instead of categorizing respondents to problem gamblers. Using the SOGS measure as a continuous variable also responds to the methodological criticisms raised from categorizing continuous outcome variables (Altman 2014). The suggested SOGS cut-off scores; 0–2 = no problem gambling, 3–7 = at-risk gambling, and ≥ 8 = probable pathological gambling, were used to provide descriptive statistics (Goodie et al. 2013).

Identification with a primary peer group consisting of friends or an online community was assessed with a survey item that inquired about the subjective sense of belonging to a primary peer group. The item was written as: "How strongly do you feel you belong to the following?" The group-type options provided for this inquiry included "a friendship group" and "an online community." Answers could be provided on a scale ranging from 1 (*no belonging at all*) to 10 (*very strong belonging*).

Perceived social support was assessed with a survey item asking about the support an individual receives from close ones. The item asked: "Do you feel you receive support from your close ones when you need it?" Three answer choices were provided for the item: 1 = *Rarely*, 2 = *Sometimes*, 3 = *Often*. This question was then turned into a dummy variable (0 = *rarely*; 1 = *sometimes or often*).

Statistical Analysis

Descriptive statistics for all continuous variables were calculated as means (*M*) and standard deviations (*SD*), and as frequencies (*n*) and relational proportions (%) for categorical variables. This information is presented in detail in Table 1. In order to compare differences

Table 1 Descriptive statistics. Continuous variables reported as means (M) and standard deviations (SD), categorical variables as frequencies (n) and relational proportions (%)

Variable	United States			Finland		
	M	*SD*	Range	*M*	*SD*	Range
Problem gambling	1.27	2.55	0–20	1.59	2.56	0–20
Identification w/offline peers	6.72	2.62	1–10	6.83	2.49	1–10
Identification w/online peers	5.38	2.69	1–10	5.04	2.61	1–10
Age	20.05	3.19	15–25	21.29	2.85	15–25
Categorical variables	Coding	*n*	%	Coding	*n*	%
Gender	Male	604	49.83	Male	600	50
	Female	608	50.17	Female	600	50
Perceived social support	Weak	212	17.49	Weak	112	9.33
	Strong	1000	82.51	strong	1088	90.67
SOGS cut-off score	0–2	1011	83.42	0–2	946	78.83
	3–7	157	12.95	3–7	210	17.50
	≥ 8	44	3.63	≥ 8	44	3.67

The South Oaks Gambling Screen (SOGS) cut-off scores used were: *no problem gambling* (0–2), *at risk gambling* (3–7) and *probable pathological gambling* (≥ 8)

Table 2 Main effects of the model predicting problem gambling in the United States (N = 1212) and Finland (N = 1200)

Variable	US				Finland			
	B	*SE*	*p*	*β*	*B*	*SE*	*p*	*β*
Identifying w/offline peers	**− 0.07**	**0.03**	**0.034**	**− 0.07**	**− 0.11**	**0.03**	**0.001**	**− 0.11**
Identifying w/online peers	**0.17**	**0.03**	**0.000**	**0.17**	0.01	0.03	0.868	0.01
Perceived social support	**− 0.71**	**0.20**	**0.000**	**− 0.10**	− 0.10	0.26	0.709	− 0.011
Age	**0.16**	**0.02**	**0.000**	**0.19**	0.01	0.03	0.718	0.01
Gender	**− 0.75**	**0.15**	**0.000**	**− 0.14**	**− 1.22**	**0.15**	**0.000**	**− 0.24**

Statistically significant results ($p < .05$) boldfaced. Gender was represented as a dummy variable with code 1 serving as the male reference group. Perceived social support measured as a dummy variable with code 1 serving as the "strong support" reference group

Table 3 Regression results of the moderation analyses for problem gambling in the United States (N = 1212) and Finland (N = 1200)

Variable	US				Finland			
	B	*SE*	*p*	*β*	*B*	*SE*	*p*	*β*
Identification with offline peers	0.05	0.07	0.523	0.05	0.08	0.09	0.408	0.07
Identification with online peers	**0.17**	**0.07**	**0.015**	**0.17**	**0.25**	**0.10**	**0.011**	**0.26**
Perceived social support	**− 0.86**	**0.22**	**0.000**	**− 0.12**	**2.19**	**0.56**	**0.000**	**0.25**
Perceived social support × identific w/offline peers	− 0.15	0.08	0.078	− 0.12	**− 0.22**	**0.10**	**0.024**	**− 0.26**
Perceived social support × identific w/online peers	0.00	0.08	0.984	0.00	**− 0.27**	**0.10**	**0.009**	**− 0.31**
Age	**0.15**	**0.02**	**0.000**	**0.18**	0.01	0.03	0.794	0.01
Gender	**− 0.75**	**0.15**	**0.000**	**− 0.14**	**− 1.18**	**0.15**	**0.000**	**− 0.23**

Statistically significant results ($p < .05$) boldfaced. Gender was represented as a dummy variable with code 1 serving as the male reference group. Perceived social support measured as a dummy variable with code 1 serving as the "strong support" reference group

between the two countries and statistically test the hypotheses, linear regression analysis was conducted. Two separate regression models were conducted for both countries to analyze the direct effects of social identification and support on problem gambling behavior (see Table 2).

Interaction analysis was conducted with regression analysis while treating perceived social support as a moderator. This approach was also applied separately for both countries to allow for better observation of the ways in which the effects vary by a given country. These results are reported in Table 3. We conducted the moderation analysis by first testing the statistical significances of both interaction terms in the regression models. Secondly, the slope difference analysis suggested by Robinson et al. (2013) was used to analyze a difference in the independent variables' regression coefficients over the values of the dichotomous moderator variable. The slope difference test is less conservative than interaction term testing and, thus, is less prone to Type II errors (failing to reject a false null hypothesis). In the interaction analysis, social identification variables were mean-centered in both samples to avoid multicollinearity. Gender and age were treated as controls in all models.

Results

According to our models, identification with a primary offline peer group had a significant association with lower problem gambling behavior (see Table 2). This was true both in the United States ($B = -.07$, $SE = .03$, $t(1211) = -2.12$, $p = .034$) and in Finland ($B = -.11$, $SE = .03$, $t(1199) = -3.34$, $p = .001$). Identifying with a primary online peer group was associated with higher engagement in problem gambling behavior, but the effect was significant only among U.S. youths ($B = .17$, $SE = .03$, $t(1211) = 5.68$, $p < .001$). This finding supports our hypothesis that strong identification with online peers is associated with higher gambling behavior. High perceived social support was associated with lower problem gambling behavior, but this direct effect was also significant only among the U.S. sample ($B = -.71$ $SE = .20$, $t(1211) = -3.53$, $p < .001$). Of our covariates, only gender was associated with engaging in problem gambling behavior in both countries, as male respondents reported significantly higher rates of problem gambling behavior than females in the U.S. ($B = -.75$, $t(1211) = -5.8$, $p < .001$) and in Finland ($B = -1.22$, $SE = .15$, $t(1199) = -8.13$, $p < .001$). Age, in turn, was not associated with problem gambling behavior in Finland ($B = .01$, $SE = .03$, $t(1199) = .26$, $p = .718$), but was associated with it in the United States ($B = .16$, SE = .02, $t(1211) = 6.72$, $p < .001$).

In terms of our moderation analysis (Table 3), it was found that high perceived social support significantly moderated the association between engagement in problem gambling behavior and peer group identification with both offline ($B = -.22$, $SE = .10$, $t(1199) = -2.27$, $p = .024$) and online ($B = -.27$, $SE = .10$, $t(1199) = -2.61$, $p = .009$) peers among Finnish youths. With the U.S. sample, the interaction term between high perceived social support, social identification, and problem gambling behavior was not significant in either offline ($B = -.15$, $SE = .08$, $t(1211) = -1.76$, $p = .078$) or online ($B = .00$, $SE = .08$, $t(1211) = -.02$, $p = .984$) peer groups. According to the slope difference test, the slope for social identification with an offline peer group differed significantly between those who report perceived social support and those who do not ($F(1, 1204) = 16.50$, $p < .001$). In case of online identification, such a difference did not exist ($F(1, 1204) = 0.00$, $p = .964$). Notably, identification with offline peer groups was only associated with decreased problem gambling behavior if respondents also reported at least some degree of social support.

Discussion

This study examined the effects of peer group identification on problem gambling behavior among American and Finnish youth. Our data suggested that both U.S. and Finnish youth identify with peers online and offline and engage in gambling activities to a similar degree. Our multivariate results, in turn, found varying but significant relationships between the examined variables within both samples. Social identification with an offline peer group was associated with lower levels of problem gambling behavior among both U.S. and Finnish youths. In the United States, identification with an online peer group was associated with higher levels of problem gambling behavior. Also, among U.S. youths, social support was associated with lower levels of problem gambling behavior.

In both the U.S. and Finnish samples, perceived social support moderated the association between problem gambling behavior and social identification offline, as the negative association existed only if respondents also reported perceived social support. In the

Finnish sample, the moderation effect was found with online identification as well. In this case, online identification was associated with higher levels of problem gambling behavior among those who did not report perceived social support.

The results of the study mostly supported our hypotheses. Our findings also supported prior research on social identification with primary offline groups functioning as an element in determining youth behavior. The observed positive association between online identification and engagement in problem gambling behavior in the United States is consistent with earlier studies emphasizing that offline and online social ties may have different outcomes in terms of youth health and well-being (Kaakinen et al. 2018; Minkkinen et al. 2016). The association between perceived social support and lower levels of problem gambling behavior in the United States was also consistent with prior literature on social support theory, its effects and benefits: Those individuals who perceive they receive support when needed also report lower levels of problem gambling behavior.

According to our results regarding the moderation effect, it appears that the outcomes of social identification fluctuate as an effect of the support received from social relations. It is likely that there are qualitative differences in friend groups (e.g., a perceived normative stance toward gambling) and between those groups who report social support and those who do not, and these differences then may determine how social identity relates to addictive or otherwise harmful behaviors. This is in line with earlier research findings highlighting that identification may have different consequences on behavior depending on the groups with which one identifies (Foster et al. 2014; Mawson et al. 2015; Oyserman et al. 2007). The inverse results concerning online community identification in the United States probably reflect this same issue. In both the United States and Finland, offline peers seem to safeguard against problem gambling behavior when youth also report perceived social support. This could also be an indication that, with real-life peers, other types of activities are preferred, such as engaging in drinking or partying (Boman et al. 2013).

Further, in the United States, physical gambling venues are separated from other types of businesses and highly restricted from underaged individuals. This division might increase gambling's enigmatic and "coolness" value in the eyes of youth and steer them toward gambling-related social contacts online, where others who share that interest can easily gather and meet. In the Finnish context, in turn, gambling can be performed with relative ease, even in real-life settings: slot machines, lottery, and scratch tickets are readily available at public venues, such as grocery stores and kiosks. It is not uncommon for groups of youths to gather around these venues and play when unobserved by the authorities. For youths who engage in gambling, the behavior might induce togetherness and a sense of shared experience. It is also possible that these youths possess social connections without the sense of perceived social support, which then fail to function as a protective factor. This social dynamic has been found to even increase gambling behavior, particularly among males (Yücel et al. 2015). Online identification was found to be a risk factor for problem gambling among those Finnish youth who did not receive social support from their social networks. Thus, it is further suggested that those youth with weak social ties offline might seek like-minded others online with whom they come to share gambling-related ideas and content (Aiello et al. 2012; Sirola et al. 2018).

Overall, our analyses showed that problem gambling behavior among youths might be, at least partially, identity-based and motivated. As gambling has become more popular among young people in recent years, it could be inferred that those youths interested in gambling are more motivated to seek and engage with online social networks that share their interest in gambling activities. A recent study examining family influence on gambling (Westberg et al. 2017), found that children and adolescents who witnessed gambling

within the family, also perceived it as a part of their family identity. These children and adolescents were further found to normalize gambling behavior, not only in their immediate social surrounding, but in the general society as well, and consequently, engage in the behavior accordingly. Thus, it is conceivable that youth who explore and strengthen their identity through gambling peer groups might come to perceive the behavior as normative and desired (see also Foster et al. 2014) and thus engage in the activity in increasing volumes.

Consistent with previous literature suggesting that gambling can be considered a lonesome behavior (Edgren et al. 2016; Khazaal et al. 2017), we anticipated it to be carried out more frequently by individuals who do not have immediate primary groups with which to identify (Savolainen et al. 2018). Gambling is then used as a gateway to acceptance with, and integration into, peer groups. This might be particularly true with youths who take part in online communities, where they are exposed to vast amounts of behavior-specific content. Within these immediate online environments, specific behavioral content may quickly become the perceived norms and youth will begin to follow them. Consistent with the notion that similar-minded peers can be found online, our study found that those youths who reported belonging with mainly online peer groups, were also more likely to engage in problem gambling behavior.

This study has several implications that pertain to policy and practice. Instead of focusing on gambling on a one-person level, looking at the individual as a part of a social context and the support s/he has available can have significant outcomes in terms of preventing youth from engaging in problem gambling behavior. Given that much of youth gambling nowadays takes place online, as well as the research findings that the high use of social networking services is connected to poor psychological functioning among children and adolescents (Sampasa-Kanyinga and Lewis 2015), it can be predicted that spending excessive amounts of time in online gambling communities and sites induces similar negative outcomes in addition to the harm caused by problem gambling itself. Peer groups should be acknowledged as meaningful social contexts for youths. It is suggested that youths are better informed and educated about the importance of their social environments and the influences they may inflict. Shifting memberships from one peer group to another (e.g., from gambling groups to non-gambling groups) may be helpful in refraining from problematic behavior and reconstructing healthy social identities. Furthermore, the inclusion of social support means into prevention work could buffer young gamblers against problem gambling and decrease the amount of time used gambling.

Limitations and Future Directions

While this study provides additional insight in existing gambling literature, some limitations must be acknowledged. The cross-sectional design utilized in this study does not allow for concluding that the examined associations have a causal relationship. Thus, it cannot be determined whether gambling behavior takes place prior to identification with peers, or if it is adapted through social identification mechanisms. Future research using longitudinal methods should thus examine whether or not the said causality exists. As this study did not scrutinize those with whom youth engage in the activity, future research should investigate whether it is carried out in isolation or in groups of other individuals.

Future research should also examine whether social support derived from family differs qualitatively from that received from peers, and if these have varying outcomes in terms of problem gambling prevention, given that this study did not separate the quality or nature

of the social support received. Additional research is needed to investigate how online and offline peer group relationships differ qualitatively, functionally, and interpersonally, as they can have varying effects on youth behavior. This study anticipated that peer relationship type and their outcomes would differ across online and offline groups, yet it was not examined what underlying features drove these differences.

Conclusion

This study examined the relationship between peer group identification and problem gambling behavior among young individuals in the United States and Finland. It was found that youth who identify strongly with offline peer groups are less likely to engage in problem gambling behavior, while identification with an online peer group had the opposite effect. Perceived social support moderates the association between peer group identification and problem gambling behavior. In both the U.S. and Finnish samples, offline identification was only associated with lower levels of problem gambling behavior if respondents also reported receiving social support. In the Finnish sample, problem gambling behavior was more prevalent among those youths who strongly identified with an online peer group but lacked social support. These results support previous research that youth behavior is partly determined by social identification but, here, social support was found to significantly moderate this mechanism.

Funding This study was funded by the Finnish Foundation for Alcohol Studies (Grand No. 25024196).

Compliance with Ethical Standards

Conflict of interest The authors declare that they have no conflict of interest.

References

Aiello, L. M., Barrat, A., Schifanella, R., Cattuto, C., Markines, B., & Menczer, F. (2012). Friendship prediction and homophily in social media. *ACM Transactions on the Web (TWEB), 6*(2), 9. https://doi.org/10.1145/2180861.2180866.

Altman, D. G. (2014). Categorizing continuous variables. *Wiley StatsRef: Statistics Reference Online*. https://doi.org/10.1002/9781118445112.stat04857.

Archer, S. L. (1982). The lower age boundaries of identity development. *Child Development*, *53*, 1551–1556.

Battersby, M. W., Thomas, L. J., Tolchard, B., & Esterman, A. (2002). The South Oaks Gambling Screen: A review with reference to Australian use. *Journal of Gambling Studies, 18*(3), 257–271. https://doi.org/10.1023/A:101689522.

Baumeister, R. F., & Leary, M. R. (1995). The need to belong: Desire for interpersonal attachments as a fundamental human motivation. *Psychological Bulletin, 117,* 497–529.

Becht, A. I., Nelemans, S. A., Branje, S. J., Vollebergh, W. A., Koot, H. M., & Meeus, W. H. (2017). Identity uncertainty and commitment making across adolescence: Five-year within-person associations

using daily identity reports. *Developmental Psychology, 53,* 2103–2112. https://doi.org/10.1037/dev0000374.

Best, D., Lubman, I., Savic, M., Wilson, A., Dingle, G., Alexander Haslam, S., et al. (2014a). Social and transitional identity: exploring social networks and their significance in a therapeutic community setting. *Therapeutic Communities: The International Journal of Therapeutic Communities, 35,* 10–20. https://doi.org/10.1108/TC-04-2013-0007.

Best, P., Manktelow, R., & Taylor, B. (2014b). Online communication, social media and adolescent well-being: A systematic narrative review. *Children and Youth Services Review, 41,* 27–36. https://doi.org/10.1016/j.childyouth.2014.03.001.

Blinn-Pike, L., Worthy, S. L., & Jonkman, J. N. (2010). Adolescent gambling: A review of an emerging field of research. *Journal of Adolescent Health, 47,* 223–236. https://doi.org/10.1016/j.jadohealth.2010.05.003.

Boman, J. H., IV, Stogner, J., & Lee Miller, B. (2013). Binge drinking, marijuana use, and friendships: The relationship between similar and dissimilar usage and friendship quality. *Journal of Psychoactive Drugs, 45,* 218–226. https://doi.org/10.1080/02791072.2013.803646.

Borca, G., Bina, M., Keller, P. S., Gilbert, L. R., & Begotti, T. (2015). Internet use and developmental tasks: Adolescents' point of view. *Computers in Human Behavior, 52,* 49–58. https://doi.org/10.1016/j.chb.2015.05.029.

Buckingham, S. A., Frings, D., & Albery, I. P. (2013). Group membership and social identity in addiction recovery. *Psychology of Addictive Behaviors, 27,* 1132–1140. https://doi.org/10.1037/a0032480.

Buckle, J. L., Dwyer, S. C., Duffy, J., Brown, K. L., & Pickett, N. D. (2013). Personality factors associated with problem gambling behavior in university students. *Journal of Gambling Issues, 28,* 1–17. https://doi.org/10.4309/jgi.2013.28.19.

Calado, F., Alexandre, J., & Griffiths, M. D. (2017). Prevalence of adolescent problem gambling: A systematic review of recent research. *Journal of Gambling Studies, 33,* 397–424. https://doi.org/10.1007/s10899-016-9627-5.

Canale, N., Griffiths, M. D., Vieno, A., Siciliano, V., & Molinaro, S. (2016). Impact of Internet gambling on problem gambling among adolescents in Italy: Findings from a large-scale nationally representative survey. *Computers in Human Behavior, 57,* 99–106. https://doi.org/10.1016/j.chb.2015.12.020.

Chow, C., Roelse, H., Buhrmester, D., & Underwood, M. K. (2011). Transformations in friend relationships across the transition into adulthood. In B. Laursen & W. A. Collins (Eds.), *Relationship pathways: From adolescence to young adulthood* (pp. 91–113). Thousand Oaks, CA: Sage Publications Inc. https://doi.org/10.4135/9781452240565.n5.

Cohen, S., & Wills, T. A. (1985). Stress, social support, and the buffering hypothesis. *Psychological Bulletin, 98,* 310.

Cole, D. A., Nick, E. A., Zelkowitz, R. L., Roeder, K. M., & Spinelli, T. (2017). Online social support for young people: Does it recapitulate in-person social support; can it help? *Computers in Human Behavior, 68,* 456–464. https://doi.org/10.1016/j.chb.2016.11.058.

Cruwys, T., Bevelander, K. E., & Hermans, R. C. (2015). Social modeling of eating: A review of when and why social influence affects food intake and choice. *Appetite, 86,* 3–18. https://doi.org/10.1016/j.appet.2014.08.035.

Cruwys, T., Steffens, N. K., Haslam, S. A., Haslam, C., Jetten, J., & Dingle, G. A. (2017). Social identity mapping: A procedure for visual representation and assessment of subjective multiple group memberships. *British Journal of Social Psychology, 55,* 613–642. https://doi.org/10.1111/bjso.12155.

Davis, K. (2012). Friendship 2.0: Adolescents' experiences of belonging and self-disclosure online. *Journal of Adolescence, 35,* 1527–1536. https://doi.org/10.1016/j.adolescence.2012.02.013.

Derevensky, J. L., & Gilbeau, L. (2015). Adolescent gambling: Twenty-five years of research. *Canadian Journal of Addiction, 6,* 4–12.

Dingle, G. A., Cruwys, T., & Frings, D. (2015a). Social identities as pathways into and out of addiction. *Frontiers in Psychology, 6,* 1795. https://doi.org/10.3389/fpsyg.2015.01795.

Dingle, G. A., Stark, C., Cruwys, T., & Best, D. (2015b). Breaking good: Breaking ties with social groups may be good for recovery from substance misuse. *British Journal of Social Psychology, 54,* 236–254. https://doi.org/10.1111/bjso.12081.

Dishion, T. J., & Tipsord, J. M. (2011). Peer contagion in child and adolescent social and emotional development. *Annual Review of Psychology, 62,* 189–214. https://doi.org/10.1146/annurev.psych.093008.100412.

Dixon, R. W., Youssef, G. J., Hasking, P., Yücel, M., Jackson, A. C., & Dowling, N. A. (2016). The relationship between gambling attitudes, involvement, and problems in adolescence: Examining the moderating role of coping strategies and parenting styles. *Addictive Behaviors, 58,* 42–46. https://doi.org/10.1016/j.addbeh.2016.02.011.

Dussault, F., Brendgen, M., Vitaro, F., Carbonneau, R., Boivin, M., & Tremblay, R. E. (2016). Co-morbidity between gambling problems and depressive symptoms: A longitudinal perspective of risk and protective factors. *Journal of Gambling Studies, 32,* 547–565. https://doi.org/10.1007/s10899-015-9546-x.

Dussault, F., Brunelle, N., Kairouz, S., Rousseau, M., Leclerc, D., Tremblay, J., et al. (2017). Transition from playing with simulated gambling games to gambling with real money: A longitudinal study in adolescence. *International Gambling Studies, 17,* 386–400. https://doi.org/10.1080/14459795.2017.1343366.

Edgren, R., Castrén, S., Jokela, M., & Salonen, A. H. (2016). At-risk and problem gambling among Finnish youth: The examination of risky alcohol consumption, tobacco smoking, mental health and loneliness as gender-specific correlates. *Nordic Studies on Alcohol and Drugs, 33,* 61–80. https://doi.org/10.1515/nsad-2016-0005.

Elton-Marshall, T., Leatherdale, S. T., & Turner, N. E. (2016). An examination of internet and land-based gambling among adolescents in three Canadian provinces: Results from the youth gambling survey (YGS). *BMC Public Health, 16,* 277. https://doi.org/10.1186/s12889-016-2933-0.

Flynn, H. K., Felmlee, D. H., & Conger, R. D. (2017). The social context of adolescent friendships: Parents, peers, and romantic partners. *Youth & Society, 49,* 679–705. https://doi.org/10.1177/0044118X14559900.

Foster, D. W., Neighbors, C., Rodriguez, L. M., Lazorwitz, B., & Gonzales, R. (2014). Self-identification as a moderator of the relationship between gambling-related perceived norms and gambling behavior. *Journal of Gambling Studies, 30,* 125–140. https://doi.org/10.1007/s10899-012-9346-5.

Frings, D., & Albery, I. P. (2015). The social identity model of cessation maintenance: Formulation and initial evidence. *Addictive Behaviors, 44,* 35–42. https://doi.org/10.1016/j.addbeh.2014.10.023.

Fröberg, F., Rosendahl, I. K., Abbott, M., Romild, U., Tengström, A., & Hallqvist, J. (2015). The incidence of problem gambling in a representative cohort of Swedish female and male 16–24-year-olds by sociodemographic characteristics, in comparison with 25–44 year-olds. *Journal of Gambling Studies, 31,* 621–641. https://doi.org/10.1007/s10899-014-9450-9.

Gainsbury, S. M., Russell, A., Wood, R., Hing, N., & Blaszczynski, A. (2015). How risky is Internet gambling? A comparison of subgroups of Internet gamblers based on problem gambling status. *New Media & Society, 17,* 861–879. https://doi.org/10.1177/1461444813518185.

Goodie, A. S., MacKillop, J., Miller, J. D., Fortune, E. E., Maples, J., Lance, C. E., et al. (2013). Evaluating the South Oaks Gambling Screen with DSM-IV and DSM-5 criteria: Results from a diverse community sample of gamblers. *Assessment, 20*(5), 523–531. https://doi.org/10.1177/1073191113500522.

Griffiths, M. D., & Parke, J. (2010). Adolescent gambling on the Internet: A review. *International Journal of Adolescent Medicine and Health, 22,* 59–75.

Gupta, R., & Derevensky, J. (1997). Familial and social influences on juvenile gambling behavior. *Journal of Gambling Studies, 13,* 179–192. https://doi.org/10.1023/A:1024915231379.

Hardoon, K. K., Gupta, R., & Derevensky, J. L. (2004). Psychosocial variables associated with adolescent gambling. *Psychology of Addictive Behaviors, 18,* 170. https://doi.org/10.1037/0893-164X.18.2.170.

Haslam, S. A., O'Brien, A., Jetten, J., Vormedal, K., & Penna, S. (2005). Taking the strain: Social identity, social support, and the experience of stress. British Journal of Social Psychology, *44*, 355–370. https://doi.org/10.1348/014466605X37468.

Hing, N., Russell, A. M., & Browne, M. (2017). Risk factors for gambling problems on online electronic gaming machines, race betting and sports betting. *Frontiers in Psychology, 8,* 779–793. https://doi.org/10.3389/fpsyg.2017.00779.

Holt-Lunstad, J., Smith, T. B., & Layton, J. B. (2010). Social relationships and mortality risk: a meta-analytic review. *PLoS medicine*, *7*(7), e1000316. https://doi.org/10.1371/journal.pmed.1000316.

Jetten, J., Haslam, C., & Alexander, S. H. (Eds.). (2012). *The social cure: Identity, health and well-being*. New York, NY: Psychology Press.

Jetten, J., Haslam, C., Haslam, S. A., Dingle, G., & Jones, J. M. (2014). How groups affect our health and well-being: The path from theory to policy. *Social Issues and Policy Review, 8,* 103–130. https://doi.org/10.1111/sipr.12003.

Kaakinen, M., Keipi, T., Räsänen, P., & Oksanen, A. (2018). Cybercrime victimization and subjective well-being: An examination of the buffering effect hypothesis among adolescents and young adults. *Cyberpsychology, Behavior, and Social Networking, 21,* 129–137. https://doi.org/10.1089/cyber.2016.0728.

Kaplan, A. M., & Haenlein, M. (2010). Users of the world, unite! The challenges and opportunities of Social Media. *Business Horizons, 53,* 59–68. https://doi.org/10.1016/j.bushor.2009.09.003.

Kessler, R. C., Hwang, I., LaBrie, R., Petukhova, M., Sampson, N. A., Winters, K. C., et al. (2008). DSM-IV pathological gambling in the National Comorbidity Survey Replication. *Psychological Medicine, 38,* 1351–1360. https://doi.org/10.1017/S0033291708002900.

Khazaal, Y., Chatton, A., Achab, S., Monney, G., Thorens, G., Dufour, M., et al. (2017). Internet gamblers differ on social variables: A latent class analysis. *Journal of Gambling Studies, 33,* 881–897. https://doi.org/10.1007/s10899-016-9664-0.

Kim, H. S., Wohl, M. J., Gupta, R., & Derevensky, J. L. (2017). Why do young adults gamble online? A qualitative study of motivations to transition from social casino games to online gambling. *Asian Journal of Gambling Issues and Public Health, 7,* 6–17. https://doi.org/10.1186/s40405-017-0025-4.

Kobus, K. (2003). Peers and adolescent smoking. *Addiction, 98,* 37–55. https://doi.org/10.1046/j.1360-0443.98.s1.4.x.

Kong, G., Tsai, J., Pilver, C. E., Tan, H. S., Hoff, R. A., Cavallo, D. A., et al. (2013). Differences in gambling problem severity and gambling and health/functioning characteristics among Asian-American and Caucasian high-school students. *Psychiatry Research, 210,* 1071–1078. https://doi.org/10.1016/j.psychres.2013.10.005.

Lehdonvirta, V., & Räsänen, P. (2011). How do young people identify with online and offline peer groups? A comparison between UK, Spain and Japan. *Journal of Youth Studies, 14,* 91–108. https://doi.org/10.1080/13676261.2010.506530.

Lei, H., Li, S., Chiu, M. M., & Lu, M. (2018). Social support and Internet addiction among mainland Chinese teenagers and young adults: A meta-analysis. *Computers in Human Behavior, 85,* 200–209. https://doi.org/10.1016/j.chb.2018.03.041.

Lesieur, H. R., & Blume, S. B. (1987). The South Oaks Gambling Screen (SOGS): A new instrument for the identification of pathological gamblers. *American Journal of Psychiatry, 144,* 1184–1188.

Lin, L., Sidani, J. E., Shensa, A., Radovic, A., Miller, E., Colditz, J. B., et al. (2016). Association between social media use and depression among US young adults. *Depression and Anxiety, 33,* 323–331. https://doi.org/10.1002/da.22466.

Livingstone, S. (2008). Taking risky opportunities in youthful content creation: Teenagers' use of social networking sites for intimacy, privacy and self-expression. *New Media & Society, 10,* 393–411. https://doi.org/10.1177/1461444808089415.

Lloyd, J., Doll, H., Hawton, K., Dutton, W. H., Geddes, J. R., Goodwin, G. M., et al. (2010). Internet gamblers: A latent class analysis of their behaviours and health experiences. *Journal of Gambling Studies, 26,* 387–399. https://doi.org/10.1007/s10899-010-9188-y.

Marino, C., Vieno, A., Pastore, M., Albery, I. P., Frings, D., & Spada, M. M. (2016). Modeling the contribution of personality, social identity and social norms to problematic Facebook use in adolescents. *Addictive Behaviors, 63,* 51–56. https://doi.org/10.1016/j.addbeh.2016.07.001.

Mawson, E., Best, D., Beckwith, M., Dingle, G. A., & Lubman, D. I. (2015). Social identity, social networks and recovery capital in emerging adulthood: A pilot study. *Substance Abuse Treatment, Prevention, and Policy, 10,* 45. https://doi.org/10.1186/s13011-015-0041-2.

Mikal, J. P., Rice, R. E., Kent, R. G., & Uchino, B. N. (2016). 100 million strong: A case study of group identification and deindividuation on Imgur.com. *New Media & Society, 18,* 2485–2506. https://doi.org/10.1177/1461444815588766.

Minkkinen, J., Oksanen, A., Näsi, M., Keipi, T., Kaakinen, M., & Räsänen, P. (2016). Does social belonging to primary groups protect young people from the effects of pro-suicide sites? A comparative study of four countries. *Crisis: The Journal of Crisis Intervention and Suicide Prevention, 37,* 31–41. https://doi.org/10.1027/0227-5910/a000356.

Molinaro, S., Benedetti, E., Scalese, M., Bastiani, L., Fortunato, L., Cerrai, S., et al. (2018). Prevalence of youth gambling and potential influence of substance use and other risk factors across 33 European countries: First results from the 2015 ESPAD study. *Addiction*. https://doi.org/10.1111/add.14275.

Neira, B., Corey, J., & Barber, B. L. (2014). Social networking site use: Linked to adolescents' social self-concept, self-esteem, and depressed mood. *Australian Journal of Psychology, 66,* 56–64. https://doi.org/10.1111/ajpy.12034.

Orford, J. (2010). *An unsafe bet? The dangerous rise of gambling and the debate we should be having*. Chichester: Wiley.

Oyserman, D., Fryberg, S. A., & Yoder, N. (2007). Identity-based motivation and health. *Journal of Personality and Social Psychology, 93,* 1011. https://doi.org/10.1037/0022-3514.93.6.1011.

Petry, N. M., & Gonzalez-Ibanez, A. (2015). Internet gambling in problem gambling college students. *Journal of Gambling Studies, 31,* 397–408. https://doi.org/10.1007/s10899-013-9432-3.

Petry, N. M., & Weiss, L. (2009). Social support is associated with gambling treatment outcomes in pathological gamblers. *The American Journal on Addictions, 18,* 402–408. https://doi.org/10.3109/10550490903077861.

Raisamo, S., Halme, J., Murto, A., & Lintonen, T. (2013). Gambling-related harms among adolescents: A population-based study. *Journal of Gambling Studies, 29,* 151–159. https://doi.org/10.1007/s10899-012-9298-9.

Robinson, C. D., Tomek, S., & Schumacker, R. E. (2013). Tests of moderation effects: Difference in simple slopes versus the interaction term. *Multiple Linear Regression Viewpoints*, *39*(1), 16–24.

Salonen, A. H., Rosenström, T., Edgren, R., Volberg, R., Alho, H., & Castrén, S. (2017). Dimensions of the South Oaks Gambling Screen in Finland: A cross-sectional population study. *Scandinavian Journal of Psychology, 58,* 228–237. https://doi.org/10.1111/sjop.12357.

Sampasa-Kanyinga, H., & Lewis, R. F. (2015). Frequent use of social networking sites is associated with poor psychological functioning among children and adolescents. *Cyberpsychology, Behavior, and Social Networking, 18,* 380–385. https://doi.org/10.1089/cyber.2015.0055.

Savolainen, I., Kaakinen, M., Sirola, A., & Oksanen, A. (2018). Addictive behaviors and psychological distress among adolescents and emerging adults: A mediating role of peer-group identification. *Addictive Behaviors Reports*. https://doi.org/10.1016/j.abrep.2018.03.002.

Sirola, A., Kaakinen, M., & Oksanen, A. (2018). Excessive gambling and online gambling communities. *Journal of Gambling Studies, 34*(4), 1313–1325. https://doi.org/10.1007/s10899-018-9772-0.

Splevins, K., Mireskandari, S., Clayton, K., & Blaszczynski, A. (2010). Prevalence of adolescent problem gambling, related harms and help-seeking behaviours among an Australian population. *Journal of Gambling Studies, 26,* 189–204. https://doi.org/10.1007/s10899-009-9169-1.

Stinchfield, R. (2002). Reliability, validity, and classification accuracy of the South Oaks Gambling Screen (SOGS). *Addictive Behaviors, 27,* 1–19. https://doi.org/10.1016/S0306-4603(00)00158-1.

Sussman, S., Pokhrel, P., Ashmore, R. D., & Brown, B. B. (2007). Adolescent peer group identification and characteristics: A review of the literature. *Addictive Behaviors, 32*(8), 1602–1627. https://doi.org/10.1016/j.addbeh.2006.11.018.

Tajfel, H., & Turner, J. C. (1979). An integrative theory of intergroup conflict. In W. G. Austin & S. Worchel (Eds.), *The Social Psychology of Intergroup Relations* (pp. 33–47). Monterey, CA: Brooks Cole.

Tarrant, M. (2002). Adolescent peer groups and social identity. *Social Development, 11,* 110–123. https://doi.org/10.1111/1467-9507.00189.

Thoits, P. (2011). Mechanisms linking social ties and support to physical and mental health. *Journal of Health and Social Behavior, 52,* 145–161.

Tsitsika, A. K., Tzavela, E. C., Janikian, M., Ólafsson, K., Iordache, A., Schoenmakers, T. M., et al. (2014). Online social networking in adolescence: Patterns of use in six European countries and links with psychosocial functioning. *Journal of Adolescent Health, 55,* 141–147.

Turner, J. C. (1991). *Social influence*. Pacific Grove, CA: Open University Press.

United Nations Educational, Scientific and Cultural Organization. (2017). *About Youth*. Retrieved from http://www.unesco.org/new/en/social-and-human-sciences/themes/youth/about-youth/.

Villanti, A. C., Johnson, A. L., Ilakkuvan, V., Jacobs, M. A., Graham, A. L., & Rath, J. M. (2017). Social media use and access to digital technology in US young adults in 2016. *Journal of Medical Internet Research*. https://doi.org/10.2196/jmir.7303.

Volberg, R. A., Gupta, R., Griffiths, M. D., Olason, D. T., & Delfabbro, P. (2010). An international perspective on youth gambling prevalence studies. *International Journal of Adolescent Medicine and Health, 22,* 3–38.

Westberg, K., Beverland, M. B., & Thomas, S. L. (2017). The unintended normalization of gambling: Family identity influences on the adoption of harmful consumption practices. *Journal of Macromarketing, 37,* 426–443. https://doi.org/10.1177/0276146717720979.

Wu, X. S., Zhang, Z. H., Zhao, F., Wang, W. J., Li, Y. F., Bi, L., et al. (2016). Prevalence of Internet addiction and its association with social support and other related factors among adolescents in China. *Journal of Adolescence, 52,* 103–111. https://doi.org/10.1016/j.adolescence.2016.07.012.

Yip, S. W., White, M. A., Grilo, C. M., & Potenza, M. N. (2011). An exploratory study of clinical measures associated with subsyndromal pathological gambling in patients with binge eating disorder. *Journal of Gambling Studies, 27,* 257–270. https://doi.org/10.1007/s10899-010-9207-z.

Young, K. (2011). Social ties, social networks and the Facebook experience. *International Journal of Emerging Technologies and Society, 9,* 20.

Yücel, M., Whittle, S., Youssef, G. J., Kashyap, H., Simmons, J. G., Schwartz, O., et al. (2015). The influence of sex, temperament, risk-taking and mental health on the emergence of gambling: A longitudinal study of young people. *International Gambling Studies, 15,* 108–123. https://doi.org/10.1080/14459795.2014.1000356.

PUBLICATION III

The role of perceived loneliness in youth addictive behaviors: Cross-national survey study

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JMIR Mental Health, *7*(1), e14035
https://doi.org/10.2196/14035

Original Paper

The Role of Perceived Loneliness in Youth Addictive Behaviors: Cross-National Survey Study

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Abstract

Background: In the ever-growing and technologically advancing world, an increasing amount of social interaction takes place through the Web. With this change, loneliness is becoming an unprecedented societal issue, making youth more susceptible to various physical and mental health problems. This societal change also influences the dynamics of addiction.

Objective: Employing the cognitive discrepancy loneliness model, this study aimed to provide a social psychological perspective on youth addictions.

Methods: A comprehensive survey was used to collect data from American (N=1212; mean 20.05, SD 3.19; 608/1212, 50.17% women), South Korean (N=1192; mean 20.61, SD 3.24; 601/1192, 50.42% women), and Finnish (N=1200; mean 21.29, SD 2.85; 600/1200, 50.00% women) youths aged 15 to 25 years. Perceived loneliness was assessed with the 3-item Loneliness Scale. A total of 3 addictive behaviors were measured, including excessive alcohol use, compulsive internet use, and problem gambling. A total of 2 separate models using linear regression analyses were estimated for each country to examine the association between perceived loneliness and addiction.

Results: Loneliness was significantly related to only compulsive internet use among the youth in all 3 countries (P<.001 in the United States, South Korea, and Finland). In the South Korean sample, the association remained significant with excessive alcohol use (P<.001) and problem gambling (P<.001), even after controlling for potentially confounding psychological variables.

Conclusions: The findings reveal existing differences between youths who spend excessive amounts of time online and those who engage in other types of addictive behaviors. Experiencing loneliness is consistently linked to compulsive internet use across countries, although different underlying factors may explain other forms of addiction. These findings provide a deeper understanding in the mechanisms of youth addiction and can help improve prevention and intervention work, especially in terms of compulsive internet use.

(JMIR Ment Health 2020;7(1):e14035) doi: 10.2196/14035

KEYWORDS

youth; problem behavior; excessive alcohol consumption; internet; gambling; loneliness

Introduction

Background

Addictive behaviors are a continuous burden to public health, affecting millions of individuals globally. Adolescents and emerging adults are particularly vulnerable to the harms of addictions, as they can disrupt healthy development [1], cause long-term health defects [2], damage social relationships [3], and devastate future financial competences [4]. It is widely known that youths typically engage in behaviors that are harmful, sometimes deviant, and place them at risk for injury,

disease, and even unintentional mortality [5,6]. Hence, youths can be considered more susceptible to initiating at least some type of addictive behavior during the periods of adolescence and emerging adulthood.

Addictive behaviors are difficult to prevent and address because they originate progressively, are often concealed by the individual affected, and impact the person comprehensively on biological, psychological, and social levels [7]. Commonly, addiction is associated with substance misuse, and alcohol is still the most frequently used and misused substance among the youth [8]. Studies have consistently shown that adolescents are most likely to engage in heavy episodic alcohol consumption [9,10]. An additional challenge of addiction is that, in addition to substances, a wide range of objects and activities exist to which one can become addicted [11]. The 5th edition of the Diagnostic and Statistical Manual of Mental Disorders now recognizes behavioral addictions, such as excessive gambling, under nonsubstance-related disorders [12].

Gambling has increased its popularity as a recreational activity among the youth during the past years [13]. Even though many laws and regulations prohibit underage individuals from engaging in gambling activities, new gambling technologies, especially online gambling, allow easy and constant access to the activities, often without viable age restrictions [4,14]. Past research has found that gambling activities are typically initiated at the age of 16 years, whereas gambling problems are most common among individuals between ages 18 and 24 years [15]. Moreover, a recent study discovered that 12.3% of the youth across 5 continents qualify as problem gamblers [16].

Internet use is another everyday behavior that can become excessive or compulsive and cause significant harm to an individual over time [17]. The internet has become practically an inseparable part of people's lives, and although its benefits are preeminent, it can interfere normal functioning and routines when used excessively. Past research on excessive internet use has identified associations with negative adolescent psychosocial development [18], mood abnormalities [19], and lower school performance [20]. Adolescents are more likely to engage in compulsive internet use, become addicted to the use, and are found to be more vulnerable to its negative effects [21].

As technology keeps advancing rapidly, it simultaneously changes the structure of the social world. People must adapt to these societal progresses quickly, and oftentimes, youths are leading this adaptation process. As modern devices allow individuals to stay connected continuously, find contacts across unprecedented distances, and even create virtual companionships, they are paradoxically becoming more disconnected from each other. This manifests in lessened face-to-face interaction with physical social connections [22] and allows for new types of social exclusion such as cyber bullying [23]. This societal change might further result in increased perceived loneliness, specifically among young individuals, to whom peer relationships are salient and exploring different social identities is relevant [24,25]. Loneliness experienced in youth can have significant consequences in terms of mental health and overall well-being [26], and a potential reason for youth addictive behaviors may lie in perceived loneliness.

Loneliness is a common and distressing experience that people typically attempt to avoid [27]. Loneliness has been challenging to define, and different typologies of it have been distinguished. Past research has generally described loneliness as a subjective feeling of an individual that occurs as a natural response to certain situations [28]. It is often accompanied by feelings of anxiety, emptiness, and social isolation [28,29]. Many background variables are associated with loneliness, but the subjective evaluation of one's realized social relationships has been shown to be one of the most important determinants of experiencing loneliness [30].

The cognitive discrepancy model by Perlman and Peplau [27] offers a blueprint for social psychological theory of loneliness, and it is broadly used in conceptualizing loneliness. The model states that individuals experience loneliness when their personal network of social relations is either quantitatively or qualitatively deficient. When an individual's expectations of his or her interpersonal interactions do not meet with the existing ones, it results in loneliness [27].

Loneliness can have severe and long-lasting consequences. Past research has identified loneliness as a risk factor in a range of destructive health behaviors. For instance, social isolation and loneliness are associated with a greater risk of smoking and being inactive [31]. Previous research has also linked loneliness to problematic internet use [19]. To a more severe effect, loneliness and social isolation have been consistently found to result in higher likelihood of premature mortality, emphasizing social relationships' fundamental role in people's life [26]. Although much research on the effects of loneliness examines adult populations, similar effects also exist among young individuals: A study on college freshmen concluded that loneliness was associated with a lower immune response, poorer sleep quality, and elevations in cortisol levels [32]. Another study found indications that loneliness increases the risk of substance use among adolescents in the United States and Russia [33].

In this study, we examine the association of loneliness with a range of youth addictive behaviors in 3 diverse countries: the United States, South Korea, and Finland. These countries were chosen for their distinct cultural features [34] while being technologically analogous, advanced, and affluent. However, rich environmental and social resources do not safeguard youths from experiencing negative emotions and engaging in destructive behaviors: youths from these cultures experience declines in global life-satisfaction and well-being in the onset and progression of adolescence [35]. In addition, negative social experiences (eg, loneliness, discrimination, and self-concept) are related to lower subjective well-being among the youth in these countries [35].

Comparing the 3 countries in terms of addictive behaviors is also feasible: Recent statistics indicate that up to 95% of the youths in these countries are active internet users [36]. Alcohol consumption among the youth in the United States and Finland is comparably high, whereas, in comparison, South Korean youths consume less alcohol [37]. Similarly, the United States

and Finland show average prevalence of problem gambling, whereas the rate is below average in South Korea [38].

Objectives

Guided by the social psychological cognitive discrepancy loneliness model [27] as our theoretical framework, and existing literature on loneliness and well-being [19,26,31], this study aimed to explore how influential perceived loneliness is in youth addictive behaviors. More specifically, we investigated if loneliness is related to a range of addictions—excessive alcohol use, compulsive internet use, and problem gambling in varying ways—and if the examined relationships are consistent across different cultures.

Methods

Data Collection Procedure

Data were collected using an online survey from March to April 2017 in Finland, in January 2018 in the United States, and in February 2018 in South Korea. The study was originally conducted in Finland and expanded to the United States and South Korea for cross-national comparison. All datasets were collected with LimeSurvey software (LimeSurvey GmbH) using identical survey formats. The surveys were optimized for both computers and mobile devices. The original survey was in Finnish. It was translated into English by bilingual professional-level translators and back-translated again to ensure consistency and accurate matching of all items. The English survey was translated to Korean, which was also back-translated to English by bilingual, professional-level translators fluent in both English and Korean. The survey included measures for all target variables, including excessive alcohol use, problem gambling, compulsive internet use, and perceived loneliness. Existing translations of the validated target measures were used when available. To fit the cultural settings as accurately as possible in all 3 countries, the formatting and terminology used were slightly modified for some items [39]. The average survey response time was similar across the 3 countries, with each version of the survey taking about 15 min to complete.

Participants

The samples consisted of a total of 1212 American (mean 20.05, SD 3.19; 608/1212, 50.17% women), 1192 South Korean (mean 20.61, SD 3.24; 601/1192, 50.42% women), and 1200 Finnish (mean 21.29, SD 2.85; 600/1200, 50.00% women) participants aged 15 to 25 years. All samples were demographically balanced in terms of age, gender, and living area. The participants were recruited from a pool of volunteers administered by using Dynata: a global data collection provider that manages online panels in several countries. By managing quotas via balanced start methodology, it is possible to attain data that are consistent and match the demographic profile of each examined country. Owing to the convenience sampling with set quotas, nonresponse rates cannot be reported. There are no missing data. The local Academic Ethics Committee approved this research before implementation. Participation in the study was anonymous and voluntary. All ethical guidelines were followed.

Measures

The participants were asked to provide some key demographic information, including age, gender, and living situation. This information was acquired through individual questions in the surveys. Living situation was asked with the inquiry: Are you currently... with answer choices ranging from “Living alone?” to “Living with parents” or “Other.” For the analysis, living situation was recoded into a “Living alone” dummy variable (0=no, 1=yes). This variable was included in the analyses to account for the participants’ social disposition through living situation.

To analyze the relationship between loneliness and a range of addictive behaviors, we employed validated and reliable measures for all target addictive behaviors. To identify excessive alcohol use among the youth, the 3-item Alcohol Use Disorders Identification Test-Consumption (AUDIT-C) was used. The AUDIT-C is a brief, reliable, and effective way of measuring hazardous drinking habits in a survey [40]. The questionnaire is validated for several populations and has been found to perform well in the screening of alcohol misuse across studies [41]. The South Oaks Gambling Screen (SOGS) was utilized to measure the frequency and intensity of gambling behavior. The SOGS is a reliable (alpha=.90 in the US sample, alpha=.82 in the Korean sample, and alpha=.89 in the Finnish sample) and regularly used measure to screen for pathological gambling behavior [42]. Some of the test items were slightly modified to accommodate for cultural variations in gambling practices.

The Compulsive Internet Use Scale (CIUS) was used to measure compulsive internet use. The scale measures internet use behavior effectively and evaluates whether usage is compulsive [43]. The scale has good psychometric properties and reliability statistics (alpha=.95 in the United States, alpha=.95 in South Korea, and alpha=.93 in Finland). The CIUS consists of 14 items, each of which targets the consequences and states of mind involved in internet use. Responses range on a 5-point scale from 0 (never) to 4 (very often), with a higher score indicating compulsive internet use. The 3-item Loneliness Scale was used to measure perceived loneliness. The scale is a short measure originally adapted from the standard Loneliness Scale, the Revised UCLA Loneliness Scale [44]. It was designed for efficiently measuring loneliness in large-scale social surveys. We applied the short measure to keep the survey brief for young respondents. The short measure has been shown to be internally consistent with both discriminant and concurrent validity, and its results are comparable with those of the full measure [45]. The 3-item scale asks, “How often do you feel” (1) “that you lack companionship?” (2) “left out?” (3) “isolated from others?” Answer choices provided are: “1=hardly ever; 2=some of the time; and 3=often.” The variable was turned into a sum composite.

Possible confounding variables were taken into consideration. We identified 3 variables that were additionally included in the analyses because they may be confounded with loneliness; psychological distress, belonging to a friendship group, and belonging to an online community [46,47]. In addition, belonging to a friendship group and perceived loneliness were inversely correlated, making belonging to a friendship group a

feasible control variable. Psychological distress was measured with the General Health Questionnaire-12. The scale has good internal consistency and reliability (alpha=.88 in all 3 country samples). Belonginess to a friendship group and an online community were evaluated with the item asking: How strongly do you feel you belong to the following? Designated groups and communities were indicated as "A friendship group? and "An online community?" Answers were provided with a 10-point Likert scale (1=not at all, 10=very strongly).

Statistical Analysis

Analyses were conducted by first calculating descriptive statistics for all variables. These are reported as means and standard deviations for continuous variables and as frequencies (n) and relational proportions (%) for categorical variables. We conducted Kruskal-Wallis tests to compare whether statistically significant mean differences exist between the 3 countries in terms of perceived loneliness, excessive alcohol use, compulsive internet use, and problem gambling.

A total of 2 separate multiple linear regression models were estimated for each country. The assumptions of ordinary least squares (OLS) regression were met, but because of heteroscedasticity of the residuals, we carried out the analyses by producing robust SEs [48,49]. The first model included 3 regression estimates for each addictive behavior in each country, with predictors and demographic factors. The second model included 3 regression estimates for each addictive behavior in each country, with predictors and demographic factors, controlling for the 3 potentially confounding psychological factors; belonging to a friendship group, belonging to an online community, and psychological distress. We also tested for potentially confounding interactions, including age and gender, but these did not change the main results concerning the relationship between loneliness and addictive behaviors. They were, hence, left out.

Tests of collinearity were run after each model to assess the variance inflation rate. No collinearity was observed in the models, with mean variance inflation factors ranging from 1.22 to 1.26, indicating only moderate correlation [50,51]. Correlations between dependent variables were also investigated. These are reported in Multimedia Appendix 1. To confirm the consistency of findings, the analyses were repeated (1) after removing potential outliers from the dataset, (2) with zero-inflated Poisson regression, and (3) with logistic regression analysis by using recommended cutoff scores for each addiction measure: ≥3 for the AUDIT-C [40,52], ≥21 for the CIUS [53,54], and ≥8 for the SOGS [55,56]. Zero-inflated Poisson regression has been noted as the most reliable regression model and especially suitable for addiction research having excess zeros in the data. This also solves problems related to cutoff scores that have been discussed in addiction research [57].

Results

Descriptive Statistics

The descriptive statistics (presented in detail in Tables 1 and 2) show that perceived loneliness was proportionately high in the United States and Finland (mean 5.52 in both countries), followed by South Korea (mean 5.23). These mean differences were statistically significant when comparing the United States and Finland with South Korea (P<.001). Excessive alcohol use was highest in Finland (mean 4.14), followed by South Korea (mean 3.85) and the United States (mean 2.29). These mean differences were significant between the United States and South Korea (P<.001), the United States and Finland (P<.001), and between Finland and South Korea (P<.001). Compulsive internet use was highest among youths in South Korea (mean 23.13), followed by American (mean 21.72) and Finnish youths (mean 18.80). These mean differences were significant between the United States and South Korea (P<.001) and between South Korea and Finland (P<.001). Mean problem gambling scores were highest in Finland (mean 1.60), followed by the United States (mean 1.34) and South Korea (mean 1.04). These mean differences were significant between all 3 countries (P<.001 in each country comparison).

Table 1. Descriptive statistics.

Variable	United States		South Korea		Finland	
	Mean (SD)	Range	Mean (SD)	Range	Mean (SD)	Range
Excessive alcohol use	2.29 (2.69)	0-13	3.85 (3.51)	0-13	4.14 (2.98)	0-13
Compulsive internet use	21.72 (13.54)	0-56	23.13 (12.81)	0–-56	18.80 (11.13)	0-56
Problem gambling	1.34 (2.69)	0-20	1.04 (2.86)	0-20	1.60 (2.56)	0-20
Perceived loneliness	5.52 (1.86)	3-9	5.23 (1.73)	3-9	5.52 (1.78)	3-9
Belonging to friends	6.72 (2.62)	1-10	6.80 (2.21)	1-10	6.83 (2.48)	1-10
Belonging online[a]	5.38 (2.69)	1-10	4.38 (2.48)	1-10	5.03 (2.60)	1-10
Psychological distress	13.49 (6.75)	0-36	13.61 (5.98)	0-36	14.15 (6.34)	0-36
Age	20.05 (3.19)	15-25	20.61 (3.24)	15-25	21.29 (2.85)	15-25

[a]Belonging to an online community.

Table 2. Descriptive statistics of categorical variables.

Variables	United States, n (%)	South Korea, n (%)	Finland, n (%)
Gender			
Male	604 (49.83)	591 (49.58)	600 (50.0)
Female	608 (50.17)	601 (50.42)	600 (50.0)
Living alone (yes)	136 (11.2)	139 (11.7)	396 (33.0)

Results of Model 1

According to our model 1, loneliness was significantly associated with alcohol use in the United States (beta=.12; *P*<.001) and South Korea (beta=.06; *P*=.02), but not in Finland (beta=.01; *P*=.82). Out of the demographic factors, higher age was significantly related to excessive alcohol use across the 3 countries. The male gender predicted excessive alcohol use in the United States (beta=–.10; *P*<.001) and Finland (beta=–.06; *P*=.03) but not in South Korea (beta=–.04; *P*=.13). Living alone was a statistically significant predictor of excessive alcohol use in South Korea (beta=.10; *P*=.001; see Table 3). Compulsive internet use was significantly associated with loneliness in all countries (beta=.41, *P*<.001 in the United States; beta=.30, *P*<.001 in South Korea; and beta=.28, *P*<.001 in Finland). Lower age was a significant predictor of compulsive internet use in South Korea (beta=–.16; *P*<.001) and Finland (beta=–.13; *P*<.001). In the United States, the male gender (beta=–.05; *P*=.04) and living alone (beta=.06; *P*=.03) predicted compulsive internet use (Table 4).

Table 3. Main effects of ordinary least squares regression models with robust standard errors predicting excessive alcohol use (Alcohol Use Disorders Identification Test-Consumption) in 3 countries.

Model	United States				South Korea				Finland			
	B[a]	SE	Beta	*P* value	B	SE	Beta	*P* value	B	SE	Beta	*P* value
Model 1												
Constant	–4.9[b]	0.50[b]	—[c]	<.001[b]	–5.1[b]	0.69[b]	—	<.001[b]	–.51	0.67	—	.44
Perceived loneliness	.18[b]	0.04[b]	.12[b]	<.001[b]	.13[b]	0.06[b]	.06[b]	.02[b]	0.01	0.05	0.01	.82
Age (years)	.35[b]	0.02[b]	.41[b]	<.001[b]	.42[b]	0.03[b]	.38[b]	<.001[b]	.24[b]	0.03[b]	.23[b]	<.001[b]
Gender[d]	–.53[b]	0.14[b]	–.10[b]	<.001[b]	–.28	0.18	–.04	.13	–.37[b]	0.17[b]	–.06[b]	.034[b]
Living alone[e]	0.27	0.24	0.03	.27	1.1[b]	0.31[b]	.10[b]	.001[b]	0.28	0.19	0.04	.15
R^2	0.21	—	—	—	0.18	—	—	—	0.06	—	—	—
Model 2												
Constant	–5.5	0.58	—	>.001	–7.1[b]	0.90[b]	—	<.001[b]	–1.9	0.83	—	.02
Perceived loneliness	0.07	0.04	0.05	.13	.22[b]	0.06[b]	.11[b]	.001[b]	–.02	0.06	–.01	.68
Age (years)	.33[b]	0.02[b]	.40[b]	<.001[b]	.42[b]	0.03[b]	.39[b]	<.001[b]	.22[b]	0.03[b]	.21[b]	<.001[b]
Gender[d]	–.56[b]	0.14[b]	–.10[b]	<.001[b]	–.33	0.19	–.05	.07	–.70[b]	0.17[b]	–.12[b]	<.001[b]
Living alone[e]	0.26	0.24	0.03	.27	.95[b]	0.31[b]	.09[b]	.003[b]	0.3	0.18	0.05	.11
Belonging to friends	0.06	0.03	0.06	.06	.25[b]	0.05[b]	.16[b]	<.001[b]	.24[b]	0.04[b]	.20[b]	<.001[b]
Belonging to an online community	0.02	0.03	0.02	.52	–.08	0.04	–.06	.05	–.12[b]	0.03[b]	–.10[b]	.001[b]
Psychological distress	.08[b]	0.01[b]	.20[b]	<.001[b]	0.01	0.02	0.02	.59	.10[b]	0.01[b]	.21[b]	<.001[b]
R^2	0.24	—	—	—	0.2	—	—	—	0.12	—	—	—

[a]Unstandardized regression coefficient.

[b]Statistically significant results (*P*<.05).

[c]Value not applicable.

[d]Gender reference category male.

[e]Living alone measured with a dummy variable (0=No, 1=Yes).

Table 4. Main effects of ordinary least squares regression models with robust standard errors predicting compulsive internet use (Compulsive Internet Use Scale) in 3 countries.

Model	United Sates				South Korea				Finland			
	B[a]	SE	Beta	*P* value	B	SE	Beta	*P* value	B	SE	Beta	*P* value
Model 1												
Constant	8.2[b]	2.6[b]	—[c]	.002[b]	23.6[b]	2.5[b]	—	<.001[b]	19.8[b]	2.6[b]	—	<.001[b]
Perceived loneliness	3.02[b]	0.21[b]	.41[b]	<.001[b]	2.2[b]	0.22[b]	.30[b]	<.001[b]	1.8[b]	0.18[b]	.28[b]	<.001[b]
Age (years)	–.06	0.11	–.01	.58	–.63[b]	0.11[b]	–.16[b]	<.001[b]	–.51[b]	0.11[b]	–.13[b]	<.001[b]
Gender[d]	–1.5[b]	0.72[b]	–.05[b]	.04[b]	0.54	0.7	0.02	.44	0.24	0.62	0.01	.7
Living alone[e]	2.7[b]	1.2[b]	.06[b]	.03[b]	0.78	1.1	0.02	.48	–.40	0.68	–.02	.56
R^2	0.18	—	—	—	0.11	—	—	—	0.09	—	—	—
Model 2												
Constant	–3.0	2.9	—	.3	6.3	3	—	.04	9.3	3.1	—	.003
Perceived loneliness	2.2[b]	0.23[b]	.30[b]	<.001[b]	1.6[b]	0.24[b]	.21[b]	<.001[b]	1.4[b]	0.21[b]	.23[b]	<.001[b]
Age (years)	–.07	0.11	–.02	.52	–.35[b]	0.11[b]	–.09[b]	.001[b]	–.34[b]	0.11[b]	–.09[b]	.002[b]
Gender[d]	–1.2	0.68	–.04	.09	0.26	0.67	0.01	.7	0.64	0.63	0.03	.31
Living alone[e]	2.5[b]	1.1[b]	.06[b]	.02[b]	0.62	1	0.02	.55	–.52	0.66	–.02	.43
Belonging to friends	0.13	0.15	0.02	.41	.51[b]	0.18[b]	.09[b]	.01[b]	–.12	0.14	–.03	.37
Belonging to an online community	1.4[b]	0.14[b]	.27[b]	<.001[b]	1.2[b]	0.16[b]	.24[b]	<.001[b]	.98[b]	0.13[b]	.23[b]	<.001[b]
Psychological distress	.54[b]	0.06[b]	.27[b]	<.001[b]	.48[b]	0.08[b]	.22[b]	<.001[b]	.29[b]	0.06[b]	.16[b]	<.001[b]
R^2	0.3	—	—	—	0.19	—	—	—	0.16	—	—	—

[a]Unstandardized regression coefficient.

[b]Statistically significant results (*P*<.05).

[c]Value not applicable.

[d]Gender reference category male.

[e]Living alone measured with a dummy variable (0=No, 1=Yes).

In addition, in model 1, problem gambling was significantly related to loneliness in all 3 countries: in the United States (beta=.10; *P*=.001), South Korea (beta=.18; *P*<.001), and Finland (beta=.11; *P*=.001). Age was significantly related to problem gambling in the United States and South Korea, but this association was inverse. In the United States, higher age associated with problem gambling (beta=.15; *P*<.001), whereas in South Korea, lower age was associated with problem gambling (beta=–.09; *P*=.01). Across the 3 countries, the male gender was highly related to problem gambling (beta=–.14; *P*<.001 in the United States; beta=–.16; *P*<.001 in South Korea; and beta=–.26; *P*<.001 in Finland). In the United States, living alone was a significant predictor of problem gambling (beta=.13; *P*=.001; Table 5).

Table 5. Main effects of ordinary least squares regression models with robust standard errors predicting problem gambling (South Oaks Gambling Screen) in 3 countries.

Model	United States				South Korea				Finland			
	B[a]	SE	Beta	*P* value	B	SE	Beta	*P* value	B	SE	Beta	*P* value
Model 1												
Constant	–.91	0.54	—[b]	.1	1.7[c]	0.40[c]	—	<.001[c]	2.4[c]	0.60[c]	—	<.001[c]
Perceived loneliness	.14[c]	0.04[c]	.10[c]	.001[c]	.21[c]	0.04[c]	.18[c]	<.001[c]	.16[c]	0.04[c]	.11[c]	.001[c]
Age (years)	.13[c]	0.03[c]	.15[c]	<.001[c]	–.05[c]	0.02[c]	–.09[c]	.01[c]	0.01	0.03	0.01	.67
Gender[d]	–.76[c]	0.15[c]	–.14[c]	<.001[c]	–.63[c]	0.11[c]	–.16[c]	<.001[c]	–1.3[c]	0.15[c]	–.26[c]	<.001[c]
Living alone[e]	1.1[c]	0.32[c]	.13[c]	.001[c]	0.42	0.25	0.07	.09	0.05	0.17	0.01	.76
R^2	0.08	—	—	—	0.06	—	—	—	0.07	—	—	—
Model 2												
Constant	–1.7[c]	0.77[c]	—	.02[c]	0.89	0.64	—	.17	3.1[c]	1.0[c]	—	.002[c]
Perceived loneliness	0.01	0.05	0	.91	.14[c]	0.04[c]	.12[c]	.001[c]	0.01	0.06	0.01	.81
Age (years)	.12[c]	0.02[c]	.14[c]	<.001[c]	–.03	0.02	–.05	.1	0	0.03	0	.94
Gender[d]	–.74[c]	0.14[c]	–.14[c]	<.001[c]	–.63[c]	0.12[c]	–.16[c]	<.001[c]	–1.4[c]	0.16[c]	–.28[c]	<.001[c]
Living alone[e]	1.0[c]	0.32[c]	.12[c]	.001[c]	0.45	0.24	0.07	.07	0.06	0.17	0.01	.75
Belong to friends	–.02	0.03	–.02	.47	–.03	0.03	–.03	.35	–.07	0.04	–.07	.11
Belonging to an online community	.16[c]	0.03[c]	.16[c]	<.001[c]	.12[c]	0.03[c]	.14[c]	<.001[c]	0.01	0.03	0.01	.83
Psychological distress	.08[c]	0.01[c]	.20[c]	<.001[c]	.03[c]	0.01[c]	.10[c]	.02[c]	.07[c]	0.02[c]	.17[c]	<.001[c]
Adjusted R^2	0.13	—	—	—	0.08	—	—	—	0.09	—	—	—

[a]Unstandardized regression coefficient.

[b]Value not applicable.

[c]Statistically significant results (*P*<.05).

[d]Gender reference category male.

[e]Living alone measured with a dummy variable (0=No, 1=Yes).

Results of Model 2

Model 2 added the potentially confounding factors to the analyses. According to the model, loneliness was significantly associated with alcohol use only within the South Korean sample (beta=.11; *P*=.001). Higher age remained a significant predictor of excessive alcohol use in all 3 countries (beta=.40; *P*<.001 in the United States; beta=.39; *P*<.001 in South Korea; and beta=.21; *P*<.001 in Finland). Similarly, the male gender continued to predict excessive alcohol use in the United States (beta=–.10, *P*<.001) and Finland (beta=–.12; *P*<.001). Living alone endured the confounds and remained a statistically significant predictor of excessive alcohol use in South Korea (beta=.09; *P*=.003).

The relationship between loneliness and compulsive internet use remained highly significant in all 3 countries: in the United States (beta=.30; *P*<.001), South Korea (beta=.21; *P*<.001), and Finland (beta=.23; *P*<.001). Lower age was also a significant predictor of compulsive internet use in South Korea (beta=–.09; *P*=.001) and Finland (beta=–.09; *P*=.002). The effects of gender were no longer observed (beta=–.04, *P*=.09 in the United States; beta=.01, *P*=.70 in South Korea; and beta=.03, *P*=.31 in Finland). Living alone persisted as a predictor of compulsive internet use among youths in the United States (beta=.06; *P*=.02).

With the added confounds, loneliness continued to significantly associate with problem gambling only within the South Korean sample (beta=.12; *P*=.001). In the United States, higher age remained associated with problem gambling (beta=.14; *P*<.001), whereas in South Korea, the effect of age was no longer significant (beta=–.05; *P*=.10). Furthermore, in model 2, the male gender was strongly related to problem gambling in all 3 countries (beta=–.14, *P*<.001 in the United States; beta=–.16, *P*<.001 in South Korea; and beta=–.28, *P*<.001 in Finland). In addition, living alone remained a significant predictor of

problem gambling within youths in the United States (beta=.12; *P*=.001). Full models are reported in Tables 3 to 5.

The additional OLS regression analyses with removed potential outliers reproduced the above findings. Only excessive alcohol use became significant in model 2 of the US sample (beta=.07; *P*=.02). The supplementary robustness checks of the analyses were done by running the models with zero-inflated Poisson regression (Multimedia Appendix 1) and logistic regression analysis using cutoff scores for addictive behaviors (Multimedia Appendix 2). These analyses showed that loneliness was associated with compulsive internet use in all countries, whereas excessive alcohol use and problem gambling remained significant only in South Korea.

Discussion

Principal Findings

Analyzing data from 3 different countries, this study examined the association of perceived loneliness with different addictive behaviors among adolescents and young adults. Loneliness was consistently associated with compulsive internet use across the 3 countries: the United States, South Korea, and Finland. An association between loneliness and excessive alcohol use was observed among youths in South Korea. Similarly, loneliness was related to problem gambling among South Korean youths. These findings were consistent when testing for confounding interactions of age and gender, indicating that to an extent, loneliness is associated with addiction, irrespective of gender or age. These results provide support for previous research [19,21] and further emphasize that loneliness is a potential risk factor particularly in compulsive internet use. Youths who experience loneliness seem more likely to follow online-oriented addiction trajectories across countries. Those youths who are more fulfilled with their interpersonal relationships might experiment with other types of disruptive behaviors, such as problem gambling and excessive alcohol consumption.

Following the cognitive discrepancy loneliness model, we suggest that lonely youths might feel as though their social needs are not adequately satisfied, which manifests in spending excessive amounts of time online. It is also possible that these youths would search for meaningful, like-minded social interactions [58,59] and identities through different online communities [60].

Cultural Significance of Findings

The extent to which youths engage in different types of addictive behaviors might reveal explanatory differences about youths in their cultural settings. Within this study, we found similarities between youths in terms of loneliness and engagement in internet use. Prevalence statistics indicate that the youth in these 3 countries are skilled internet users [36], and this finding further suggests that the internet is particularly attractive to lonely youth. However, we propose that the youth living in diverse settings have different motivations for spending excessive time online: for the individualistic American and Finnish youths, the internet is a place of expressing oneself and building a presence that is loosely connected to other users, whereas collectivistic South Korean youths might seek for virtual companionship with whom to share mutual values and support with [34]. In addition, the results indicate that compulsive internet use is highly associated with younger age, emphasizing the importance of early interventions.

In South Korea, loneliness was also found to be significantly related to excessive alcohol use and problem gambling. This result might indicate that perceived loneliness among collectivistic South Korean youth results in more serious consequences than among youths in the United States and Finland [61]. Addictive behaviors may further function as a way of coping with uncertainty caused by the deviation away from the South Korean societal status quo. These results may also reflect current behavioral trends prevailing among youths across the world. Extensive Health Behaviour in School-Aged Children data found that adolescents in the United States and Finland have become more uniform in their drunkenness frequency, with overall alcohol consumption among adolescent age groups decreasing slightly [62], whereas a nationwide research on South Korean youths' health behavior recognized the increasing rate of alcohol use among the youth as a major issue [61].

In the United States and Finland, the social environment often encourages youths to participate in alcohol use and engaging in heavy forms of drinking usually takes place in social gatherings [63]. These youths might be socially satisfied, as the cognitive discrepancy loneliness theory implies. The findings of this study might additionally reveal that among American and Finnish youths, drinking alcohol is not only a characteristic behavior of the socially active but behavior that could be considered as indulgent; an allowed form of gratification, related to having fun and enjoyment [34].

Gambling, even though often practiced alone, does not seem to be a lonely endeavor for the American or Finnish youths. Loneliness was associated with higher problem gambling in all of our country samples before adding offline and online belonging, and psychological distress, into the models. After accounting for these factors, the association remained significant only in South Korea. In Finland and the United States, other psychological factors, such as belongingness to friends or psychological distress, may be stronger predictors of problem behavior. For some youths, living alone might function as a noteworthy risk factor in both, youth compulsive internet use and problem gambling, as associations between these variables were found in 2 of the samples: the United States and South Korea. It is also possible that these 2 activities are related; due to the various online gambling opportunities, gambling activities add to the overall time spent online, thus contributing to compulsive internet use. Moreover, comorbidity is a common feature of addiction and it should be acknowledged that the addictive behaviors investigated in this study might co-occur among young individuals [64,65].

South Korean culture is described as more long-term oriented than those of the United States or Finland [34]. From this cultural perspective, it is possible that lonely South Korean youths are more distressed about how their perceived loneliness might disrupt their long-term goals, which manifests in behaviors that are counterintuitive for future well-being. In

addition, loneliness may be a more serious issue in a collectivistic culture: those youths who feel loneliness may experience it much direr than their counterparts in less collectivistic countries.

Limitations

Notwithstanding the strengths of the study, some limitations must be acknowledged. First, the study utilized a cross-sectional design that does not allow for concluding that the examined associations have a directional causal relationship. Second, our results show some differences across the 3 countries but cannot pinpoint what makes the differences. Future research should explore various psychological and sociocultural factors that may contribute to the differences. Finally, the problem of self-reported survey data on substance use or illicit behavior must be acknowledged as a research limitation, as these questions can be sensitive and lead to social desirability bias.

Implications

Loneliness is an encompassing and harmful experience that can impact an individual on both physical and mental levels [27,28]. Although much research has been done on the effects of loneliness on adult populations, adolescents and emerging adults are also vulnerable populations to the harms of loneliness, as well as increasingly susceptible to destructive behaviors. Therefore, examining the relationship between these 2 variables is highly important. This study analyzed multicultural data on youths aged 15 to 25 years and found significant associations between perceived loneliness and addictive behaviors, thus adding to the existing literature. These results indicate that, across diverse cultures, youths who experience loneliness also report higher engagement in destructive behavior, especially that of compulsive internet use.

On the basis of these results, it is suggested that prevention methods for compulsive internet use be improved by educating youths about the harms of excessive online usage. An existing challenge is to reach young compulsive internet users. One promising direction of prevention is the development and building of internet-based, culturally informed behavioral intervention technologies that provide real-time support and personalized feedback, as well as assist with self-monitoring about the time elapsed online [66,67]. Furthermore, a need to develop youth prevention programs to lessen experienced loneliness is recognized. Youths should also be informed about how behaviors that may seem mundane and part of the everyday life can become excessive and disrupt healthy functioning. Focusing on strengthening youths' social relationships and educating them about the harms of loneliness are additional main implications suggested by this research.

Conclusions

Analyzing data from 3 countries, this research is able to add valuable and cross-culturally comparative insight into youth addictive behaviors. By applying social psychological theory on the phenomenon, this study extends the existing understanding on youth addiction. It can offer new information for policy makers and those working with young individuals on how to better address specific youth problem behaviors. Country and culture seem to have their share in influencing and shaping the underlining reasons, or ways, as to why the youth come to engage in certain behaviors. It is emphasized that youths coming from and living in different contexts might externalize their feelings of loneliness in different ways. Although the internet is used compulsively by youths in countries across the globe, South Korean youths also might externalize feelings of loneliness by engaging in excessive drinking and problem gambling. These youths might benefit from support and counseling that guides them toward other healthier activities.

This study expands youth addiction research beyond a national boundary. It offers additional insight into how perceived loneliness relates to 3 different types of youth addictive behaviors. Implications suggest improving prevention methods in compulsive internet use by educating youths about the harms of experienced loneliness and forms of excessive behaviors.

Acknowledgments

This work was supported by the Finnish Foundation for Alcohol Studies (Problem Gambling and Social Media Project, 2017–2019, PI: author AO).

Conflicts of Interest

None declared.

Multimedia Appendix 1

Complementary correlation and zero-inflated Poisson regression analyses.
[DOCX File , 18 KB-Multimedia Appendix 1]

Multimedia Appendix 2

Complementary logistic regression analysis.
[DOCX File , 14 KB-Multimedia Appendix 2]

References

1. Schulenberg J, Maggs J. A developmental perspective on alcohol use and heavy drinking during adolescence and the transition to young adulthood. J Stud Alcohol Suppl 2002 Mar(14):54-70. [doi: 10.15288/jsas.2002.s14.54] [Medline: 12022730]
2. Toumbourou J, Stockwell T, Neighbors C, Marlatt G, Sturge J, Rehm J. Interventions to reduce harm associated with adolescent substance use. Lancet 2007 Apr 21;369(9570):1391-1401. [doi: 10.1016/S0140-6736(07)60369-9] [Medline: 17448826]
3. Yao M, Zhong Z. Loneliness, social contacts and internet addiction: a cross-lagged panel study. Comput Human Behav 2014;30:164-170. [doi: 10.1016/j.chb.2013.08.007]
4. Canale N, Griffiths M, Vieno A, Siciliano V, Molinaro S. Impact of Internet gambling on problem gambling among adolescents in Italy: findings from a large-scale nationally representative survey. Comput Human Behav 2016;57:99-106. [doi: 10.1016/j.chb.2015.12.020]
5. Bonomo Y, Coffey C, Wolfe R, Lynskey M, Bowes G, Patton G. Adverse outcomes of alcohol use in adolescents. Addiction 2001 Oct;96(10):1485-1496. [doi: 10.1046/j.1360-0443.2001.9610148512.x] [Medline: 11571067]
6. Kann L, McManus T, Harris WA, Shanklin SL, Flint KH, Hawkins J, et al. Youth risk behavior surveillance - United States, 2015. MMWR Surveill Summ 2016 Jun 10;65(6):1-174. [doi: 10.15585/mmwr.ss6506a1] [Medline: 27280474]
7. West R. Definition, theory and observation. In: Theory of Addiction. Oxford: Blackwell Publishing; 2006:9-28.
8. Centers for Disease Control and Prevention. Fact Sheets - Underage Drinking URL: https://www.cdc.gov/alcohol/fact-sheets/underage-drinking.htm [accessed 2018-09-29]
9. Jernigan D, Noel J, Landon J, Thornton N, Lobstein T. Alcohol marketing and youth alcohol consumption: a systematic review of longitudinal studies published since 2008. Addiction 2017 Jan;112(Suppl 1):7-20. [doi: 10.1111/add.13591] [Medline: 27565582]
10. Raitasalo K, Huhtanen P, Miekkala M. Alcohol and Drug Use among Adolescents in Finland 1995–2015. ESPAD survey results. Helsinki: National Institute for Health and Welfare; 2015.
11. Orford J. Excessive Appetites: A Psychological View of Addictions. Chichester West Sussex: Wiley; 2010.
12. American Psychiatric Association. Diagnostic And Statistical Manual Of Mental Disorders. Fifth Edition. Washington D. C: American Psychiatric Publishing; 2013.
13. Orford J. An Unsafe Bet. The Dangerous Rise of Gambling and the Debate We Should Be Having. Chichester, UK: John Wiley & Sons Ltd; 2011.
14. Elton-Marshall T, Leatherdale S, Turner N. An examination of internet and land-based gambling among adolescents in three Canadian provinces: results from the youth gambling survey (YGS). BMC Public Health 2016 Mar 18;16:277 [FREE Full text] [doi: 10.1186/s12889-016-2933-0] [Medline: 26987439]
15. Salonen A, Raisamo S. Finnish Gambling 2015. Gambling, Gambling Problems, and Attitudes and Opinions on Gambling Among Finns Aged 15–74. Helsinki: National Institute for Health and Welfare; 2015.
16. Calado F, Alexandre J, Griffiths MD. Prevalence of adolescent problem gambling: a systematic review of recent research. J Gambl Stud 2017 Jun;33(2):397-424 [FREE Full text] [doi: 10.1007/s10899-016-9627-5] [Medline: 27372832]
17. Young K. The evolution of internet addiction disorder. In: Montag C, Reuter M, editors. Internet Addiction. Cham, Switzerland: Springer; 2015:3-17.
18. Yau Y, Potenza M, White M. Problematic internet use, mental health and impulse control in an online survey of adults. J Behav Addict 2013;2(2):72 [FREE Full text] [doi: 10.1556/JBA.1.2012.015] [Medline: 24294501]
19. Kuss D, Griffiths MD, Karila L, Billieux J. Internet addiction: a systematic review of epidemiological research for the last decade. Curr Pharm Des 2014;20(25):4026-4052. [doi: 10.2174/13816128113199990617] [Medline: 24001297]
20. Dhir A, Chen S, Nieminen M. Predicting adolescent Internet addiction: the roles of demographics, technology accessibility, unwillingness to communicate and sought Internet gratifications. Comput Human Behav 2015 Oct;51:24-33. [doi: 10.1016/j.chb.2015.04.056]
21. Durkee T, Carli V, Floderus B, Wasserman C, Sarchiapone M, Apter A, et al. Pathological internet use and risk-behaviors among European adolescents. Int J Environ Res Public Health 2016 Mar 8;13(3):pii: E294 [FREE Full text] [doi: 10.3390/ijerph13030294] [Medline: 27005644]
22. Kushlev K, Proulx J, Dunn E. Digitally connected, socially disconnected: the effects of relying on technology rather than other people. Comp Human Behav 2017;76:68-74. [doi: 10.1016/j.chb.2017.07.001]
23. Tsimtsiou Z, Haidich A, Drontsos A, Dantsi F, Sekeri Z, Drosos E, et al. Pathological internet use, cyberbullying and mobile phone use in adolescence: a school-based study in Greece. Int J Adolesc Med Health 2017 Apr 22;30(6). [doi: 10.1515/ijamh-2016-0115] [Medline: 28432846]
24. Brown BB, Larson J. Peer relationships in adolescence. In: Lerner RM, Steinberg L, editors. Handbook of Adolescent Psychology. Hoboken, NJ: John Wiley & Sons; 2009:74-103.
25. Soenens B, Berzonsky MD, Vansteenkiste M, Beyers W, Goossens L. Identity styles and causality orientations: in search of the motivational underpinnings of the identity exploration process. Eur J Pers 2005;19(5):427-442. [doi: 10.1002/per.551]
26. Holt-Lunstad J, Smith TB, Baker M, Harris T, Stephenson D. Loneliness and social isolation as risk factors for mortality: a meta-analytic review. Perspect Psychol Sci 2015 Mar;10(2):227-237. [doi: 10.1177/1745691614568352] [Medline: 25910392]

27. Perlman D, Peplau LA. Toward a social psychology of loneliness. In: Duak K, Gilmour R, editors. Personal Relationships. London: Academic Press; 1981:31-56.
28. Weiss RS. Loneliness: The Experience of Emotional and Social Isolation. Cambridge, MA: The MIT Press; 1973.
29. Stein JY, Tuval-Mashiach R. The social construction of loneliness: an integrative conceptualization. J Constr Psychol 2015 Jan 28;28(3):210-227. [doi: 10.1080/10720537.2014.911129]
30. de Jong-Gierveld J. Developing and testing a model of loneliness. J Pers Soc Psychol 1987 Jul;53(1):119-128. [doi: 10.1037//0022-3514.53.1.119] [Medline: 3612484]
31. Shankar A, McMunn A, Banks J, Steptoe A. Loneliness, social isolation, and behavioral and biological health indicators in older adults. Health Psychol 2011 Jul;30(4):377-385. [doi: 10.1037/a0022826] [Medline: 21534675]
32. Pressman SD, Cohen S, Miller GE, Barkin A, Rabin BS, Treanor JJ. Loneliness, social network size, and immune response to influenza vaccination in college freshmen. Health Psychol 2005 May;24(3):297-306. [doi: 10.1037/0278-6133.24.3.297] [Medline: 15898866]
33. Stickley A, Koyanagi A, Koposov R, Schwab-Stone M, Ruchkin V. Loneliness and health risk behaviours among Russian and US adolescents: a cross-sectional study. BMC Public Health 2014 Apr 16;14:366 [FREE Full text] [doi: 10.1186/1471-2458-14-366] [Medline: 24735570]
34. Hofstede G, Bond MH. Hofstede's culture dimensions: an independent validation using Rokeach's value survey. J Cross Cult Psychol 1984;15(4):417-433. [doi: 10.1177/0022002184015004003]
35. Proctor CL, Linley PA, Maltby J. Youth life satisfaction: a review of the literature. J Happiness Stud 2008;10(5):583-630. [doi: 10.1007/s10902-008-9110-9]
36. OECD. PISA 2015 Results (Volume III): Students' Well-Being. Paris: OECD Publishing; 2017.
37. World Health Organization. 2014. Global Status Report on Alcohol and Health 2014 URL: https://www.who.int/substance_abuse/publications/global_alcohol_report/msb_gsr_2014_1.pdf [accessed 2018-11-28]
38. Williams R, Volberg R, Stevens R. OPUS: Open Uleth Scholarship. 2012. The Population Prevalence of Problem Gambling: Methodological Influences, Standardized Rates, Jurisdictional Differences, and Worldwide Trends URL: https://opus.uleth.ca/handle/10133/3068 [accessed 2018-12-10]
39. Antunes B, Daveson B, Ramsenthaler C, Benalia H, Ferreira P, Bausewein C, et al. Palliative care Outcome Scale (POS). 2012. The Palliative Care Outcome Scale (POS) Manual for Cross-cultural Adaptation and Psychometric Validation URL: https://pos-pal.org/doct/Manual_for_crosscultural_adaptation_and_psychometric_validation_of_the_POS.pdf [accessed 2019-10-04]
40. Bush K, Kivlahan DR, McDonell MB, Fihn SD, Bradley KA. The AUDIT alcohol consumption questions (AUDIT-C): an effective brief screening test for problem drinking. Ambulatory Care Quality Improvement Project (ACQUIP). Alcohol Use Disorders Identification Test. Arch Intern Med 1998 Sep 14;158(16):1789-1795. [doi: 10.1001/archinte.158.16.1789] [Medline: 9738608]
41. Dawson DA, Grant BF, Stinson FS, Zhou Y. Effectiveness of the derived Alcohol Use Disorders Identification Test (AUDIT-C) in screening for alcohol use disorders and risk drinking in the US general population. Alcohol Clin Exp Res 2005 May;29(5):844-854. [doi: 10.1097/01.alc.0000164374.32229.a2] [Medline: 15897730]
42. Lesieur HR, Blume SB. The South Oaks Gambling Screen (SOGS): a new instrument for the identification of pathological gamblers. Am J Psychiatry 1987 Sep;144(9):1184-1188. [doi: 10.1176/ajp.144.9.1184] [Medline: 3631315]
43. Meerkerk G, Eijnden RJ, Vermulst AA, Garretsen HF. The Compulsive Internet Use Scale (CIUS): some psychometric properties. Cyberpsychol Behav 2009 Feb;12(1):1-6. [doi: 10.1089/cpb.2008.0181] [Medline: 19072079]
44. Russell D, Peplau LA, Cutrona CE. The revised UCLA Loneliness Scale: concurrent and discriminant validity evidence. J Pers Soc Psychol 1980 Sep;39(3):472-480. [doi: 10.1037//0022-3514.39.3.472] [Medline: 7431205]
45. Hughes ME, Waite LJ, Hawkley LC, Cacioppo JT. A short scale for measuring loneliness in large surveys: results from two population-based studies. Res Aging 2004;26(6):655-672 [FREE Full text] [doi: 10.1177/0164027504268574] [Medline: 18504506]
46. Cole DA, Nick EA, Zelkowitz RL, Roeder KM, Spinelli T. Online social support for young people: does it recapitulate in-person social support; can it help? Comput Human Behav 2017 Mar;68:456-464 [FREE Full text] [doi: 10.1016/j.chb.2016.11.058] [Medline: 28993715]
47. Jackson J, Cochran SD. Loneliness and psychological distress. J Psychol 1991 May;125(3):257-262. [doi: 10.1080/00223980.1991.10543289] [Medline: 1880752]
48. Huber P. The Behavior of Maximum Likelihood Estimates Under Non-Standard Conditions. In: Proceedings of the Fifth Berkeley Symposium on Mathematical Statistics and Probability. 1967 Presented at: BSMSP'67; December 27, 1965-January 7, 1966; Berkeley, California p. 221-233.
49. White H. Maximum likelihood estimation of misspecified models. Econometrica 1982;50(1):1-25. [doi: 10.2307/1912526]
50. O'brien RM. A caution regarding rules of thumb for variance inflation factors. Qual Quant 2007;41(5):673-690. [doi: 10.1007/s11135-006-9018-6]
51. Liao D, Valliant R. Variance inflation factors in the analysis of complex survey data. Surv Methodol 2012;38:53-62 [FREE Full text]

52. Meneses-Gaya CD, Zuardi AW, Loureiro SR, Crippa JAS. Alcohol Use Disorders Identification Test (AUDIT): an updated systematic review of psychometric properties. Psychol Neurosci 2009;2(1). [doi: 10.1590/s1983-32882009000100012]
53. Guertler D, Rumpf H, Bischof A, Kastirke N, Petersen KU, John U, et al. Assessment of problematic internet use by the Compulsive Internet Use Scale and the Internet Addiction Test: a sample of problematic and pathological gamblers. Eur Addict Res 2014;20(2):75-81 [FREE Full text] [doi: 10.1159/000355076] [Medline: 24080838]
54. Li W, O'Brien JE, Snyder SM, Howard MO. Diagnostic criteria for problematic internet use among US university students: a mixed-methods evaluation. PLoS One 2016;11(1):e0145981 [FREE Full text] [doi: 10.1371/journal.pone.0145981] [Medline: 26751569]
55. Tang CS, Wu AM, Tang JY, Yan EC. Reliability, validity, and cut scores of the south oaks gambling screen (SOGS) for Chinese. J Gambl Stud 2010;26(1):145-158 [FREE Full text] [doi: 10.1007/s10899-009-9147-7] [Medline: 19680794]
56. Goodie AS, MacKillop J, Miller JD, Fortune EE, Maples J, Lance CE, et al. Evaluating the South Oaks Gambling Screen with DSM-IV and DSM-5 criteria: results from a diverse community sample of gamblers. Assessment 2013 Oct;20(5):523-531 [FREE Full text] [doi: 10.1177/1073191113500522] [Medline: 23946283]
57. Baggio S, Iglesias K, Rousson V. Modeling count data in the addiction field: Some simple recommendations. Int J Methods Psychiatr Res 2018 Mar;27(1). [doi: 10.1002/mpr.1585] [Medline: 29027305]
58. Park A, Conway M. Longitudinal changes in psychological states in online health community members: understanding the long-term effects of participating in an online depression community. J Med Internet Res 2017 Mar 20;19(3):e71 [FREE Full text] [doi: 10.2196/jmir.6826] [Medline: 28320692]
59. Khalili-Mahani N, Smyrnova A, Kakinami L. To each stress its own screen: a cross-sectional survey of the patterns of stress and various screen uses in relation to self-admitted screen addiction. J Med Internet Res 2019 Apr 2;21(4):e11485 [FREE Full text] [doi: 10.2196/11485] [Medline: 30938685]
60. Apaolaza V, Hartmann P, Medina E, Barrutia JM, Echebarria C. The relationship between socializing on the Spanish online networking site Tuenti and teenagers' subjective wellbeing: The roles of self-esteem and loneliness. Comp Human Behav 2013;29(4):1282-1289. [doi: 10.1016/j.chb.2013.01.002]
61. Hong JS, Lee NY, Grogan-Kaylor A, Huang H. Alcohol and tobacco use among South Korean adolescents: an ecological review of the literature. Child Youth Serv Rev 2011;33(7):1120-1126. [doi: 10.1016/j.childyouth.2011.02.004]
62. Kuntsche E, Kuntsche S, Knibbe R, Simons-Morton B, Farhat T, Hublet A, et al. Cultural and gender convergence in adolescent drunkenness: evidence from 23 European and North American countries. Arch Pediatr Adolesc Med 2011 Feb;165(2):152-158 [FREE Full text] [doi: 10.1001/archpediatrics.2010.191] [Medline: 20921343]
63. Ahlström S, Österberg E. International perspectives on adolescent and young adult drinking. Alcohol Res Health 2004;28(4):258-268 [FREE Full text]
64. Cowlishaw S, Merkouris S, Chapman A, Radermacher H. Pathological and problem gambling in substance use treatment: a systematic review and meta-analysis. J Subst Abuse Treat 2014 Feb;46(2):98-105. [doi: 10.1016/j.jsat.2013.08.019] [Medline: 24074847]
65. De Leo JA, Wulfert E. Problematic internet use and other risky behaviors in college students: an application of problem-behavior theory. Psychol Addict Behav 2013 Mar;27(1):133-141. [doi: 10.1037/a0030823] [Medline: 23276311]
66. Alrobai A, Algashami A, Dogan H, Corner T, Phalp K, Ali R. COPE.er method: combating digital addiction via online peer support groups. Int J Environ Res Public Health 2019 Mar 31;16(7) [FREE Full text] [doi: 10.3390/ijerph16071162] [Medline: 30935151]
67. Burns MN, Montague E, Mohr DC. Initial design of culturally informed behavioral intervention technologies: developing an mHealth intervention for young sexual minority men with generalized anxiety disorder and major depression. J Med Internet Res 2013 Dec 5;15(12):e271 [FREE Full text] [doi: 10.2196/jmir.2826] [Medline: 24311444]

Abbreviations

AUDIT-C: Alcohol Use Disorders Identification Test-Consumption
CIUS: Compulsive Internet Use Scale
OLS: ordinary least squares
SOGS: South Oaks Gambling Screen

Edited by G Eysenbach; submitted 17.03.19; peer-reviewed by T Rashid Soron, N Khalili-Mahani; comments to author 12.07.19; revised version received 30.07.19; accepted 24.09.19; published 02.01.20

Please cite as:
Savolainen I, Oksanen A, Kaakinen M, Sirola A, Paek HJ
The Role of Perceived Loneliness in Youth Addictive Behaviors: Cross-National Survey Study
JMIR Ment Health 2020;7(1):e14035
URL: https://mental.jmir.org/2020/1/e14035
doi: 10.2196/14035
PMID: