

HELI HAGFORS

# Why Do We Gamble?

An integrative approach to  
gambling motives and problem gambling



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gambling motives and problem gambling

ACADEMIC DISSERTATION

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*Hilversum, Netherlands, August 2025*

# ABSTRACT

Gambling is a popular activity that serves various purposes for different people. Despite its popularity, gambling carries the potential to become excessive. The motives behind gambling only recently have started to generate more research interest. *Gambling motives* refer to the psychological reasons behind gambling, such as financial gain, excitement, socialising or escaping distressing thoughts and feelings. They are one of the key concepts in understanding gambling behaviour and problem gambling. The link between gambling motives and problem gambling has been established in extant studies, but longitudinal and population-level studies are scarce. Furthermore, social psychological mechanisms' role in the relationship between gambling motives and problem gambling is not fully understood. More research is needed to deepen the understanding of gambling motives and how they contribute to gambling participation and problem gambling.

This dissertation examines how gambling motives relate to gambling participation and problem gambling. First, this dissertation aims to produce general knowledge on Finns' gambling motives and their associations with sociodemographic and gambling participation-related factors, including offshore online gambling. Second, the dissertation aims to examine gambling motives' longitudinal effects on problem gambling, and to investigate psychological need frustration's role in this process. Theoretically, this dissertation integrates several different theoretical approaches from the fields of social psychology, gambling research and social scientific addiction research to provide a comprehensive framework for understanding the motivational processes behind gambling. This dissertation comprises four empirical research studies. Study 1 investigated the sociodemographic and gambling participation-related differences in gambling motives among past-year Finnish gamblers using cross-sectional ( $n = 4,684$ ) and longitudinal ( $n = 2,078$ ) data from the Gambling Harms Survey 2016–2017. Study 2 examined the differences between Finnish offshore and onshore online gamblers in terms of their general gambling motives, gambling participation and sociodemographic factors using data from the Finnish Gambling Survey 2019 ( $n = 1,422$ ). Study 3 investigated gambling motives' longitudinal effects on problem gambling and basic psychological need frustration's moderating role in this relationship using the first three time points ( $n = 1,022$ ) of the longitudinal Gambling in the Digital Age 2021–2024 survey. Study 4 utilised the data from the five time points in the same survey used in Study 3 and examined the

longitudinal dynamic effects between the escape motive, loneliness and problem gambling among regular Finnish gamblers ( $n = 612$ ).

Study 1's results revealed that the most common motives for gambling among Finns were winning money and positive feelings. Moreover, differences in motives were found based on sociodemographic and gambling participation-related factors. Furthermore, at-risk gambling was associated with the escape, money and positive-feelings motives, but problem gambling was associated only with the escape motive. According to Study 2, offshore online gamblers cited a wider variety of motives to gamble than onshore online gamblers, but they were less likely to gamble for money or support worthy causes. Study 3 found that the escape, money and competition motives predicted gambling problems over time. Furthermore, frustration of psychological needs moderated the association between the money motive and gambling problems. Finally, Study 4 indicated that the escape motive predicts subsequent gambling problems, while gambling problems predict subsequent loneliness.

This dissertation's results underscore gambling motives' role in understanding gambling behaviour and highlight basic psychological needs' role in the relationship between gambling motives and problem gambling. The results also offer support for extant findings that some of the motives, such as escape and money, may be more harmful than others in terms of gambling problems. Moreover, frustration of basic psychological needs may predispose individuals to gambling problems through gambling motives, but gambling problems also may lead to need frustration, such as through isolation. Recognising gambling's function for individuals can help mental health professionals and social workers design individually tailored treatment and interventions to reduce gambling problems.

Keywords: gambling motives; reasons for gambling; problem gambling; basic psychological needs; offshore gambling; loneliness; longitudinal design

# TIIVISTELMÄ

Rahapelaaminen on suosittu aktiviteetti, joka palvelee eri ihmisillä erilaisia tarpeita. Suosiostaan huolimatta rahapelaamiseen liittyy mahdollisuus sen muuttumisesta ongelmalliseksi. Rahapelaamisen taustalla oleviin motiiveihin on vasta vähän aikaa sitten alkanut kohdistua enemmän akateemista mielenkiintoa. Rahapelaamisen motiivit viittaavat pelaamisen taustalla oleviin psyykkisiin syihin, kuten rahallisen voiton tavoitteluun, jännitykseen, sosiaaliseen vuorovaikutukseen tai vaikeiden ajatusten ja tunteiden pakenemiseen. Ne ovat keskeisessä roolissa rahapelaamisen ja rahapeliongelman ymmärtämisessä. Aiemmat tutkimukset ovat osoittaneet, että rahapelaamisen motiivien ja rahapeliongelmien välillä vallitsee yhteys, mutta pitkittäis- ja väestötason tutkimuksia aiheesta on niukasti. Lisäksi sosiaalipsykologisten mekanismien roolia rahapelaamisen motiivien ja ongelmapelaamisen välisessä suhteessa ei vielä täysin ymmärretä. Ymmärryksen syventämiseksi tarvitaan lisää tutkimusta rahapelaamisen motiiveista ja niiden yhteyksistä rahapelaamiseen ja rahapeliongelmaan.

Tämä väitöskirja tarkastelee, miten rahapelaamisen motiivit liittyvät rahapelaamiseen ja rahapeliongelmaan. Väitöskirjan tavoitteena on tuottaa yleistietoa suomalaisten rahapelaamisen motiiveista ja niiden yhteyksistä sosiaaliryhmittäisiin ja rahapelaamiseen osallistumiseen liittyviin tekijöihin, mukaan lukien rahapelaaminen ulkomaisilla verkkosivustoilla. Toisena tavoitteena on tutkia rahapelaamisen motiivien pitkittäisvaikutuksia rahapeliongelmaan ja selvittää psykologisen perustarpeiden turhautumisen roolia tässä prosessissa. Teoreettisesti tämä väitöskirja yhdistelee useita erilaisia teoreettisia lähestymistapoja sosiaalipsykologian, rahapelitutkimuksen ja sosiaalitieellisen addiktio tutkimuksen aloilta tarjotakseen kattavan viitekehysten rahapelaamisen taustalla olevien motivaatioprosessien ymmärtämiselle. Tämä väitöskirja koostuu neljästä empiirisestä osajulkaisusta. Ensimmäinen osatutkimus selvitti rahapelaamisen motiiveihin liittyviä sosiaaliryhmittäisiä ja rahapelaamiseen osallistumiseen liittyviä eroja rahapelejä pelanneilla suomalaisilla hyödyntäen *Rahapelikysely 2016–2017* tutkimuksen poikkileikkaus- ( $n = 4\ 684$ ) ja pitkittäisaineistoa ( $n = 2\ 078$ ). Toinen osatutkimus tarkasteli, miten ulkomaisilla verkkosivuilla pelanneet vastaajat erosivat vain kotimaisilla verkkosivuilla pelanneista vastaajista rahapelaamisen motiivien, rahapelikäyttäytymisen ja sosiaaliryhmittäisten erojen suhteen hyödyntäen *Suomalaisten rahapelaaminen 2019* tutkimuksen aineistoa ( $n = 1\ 422$ ). Kolmas osatutkimus tutki rahapelaamisen motiivien pitkittäisvaikutuksia rahapeliongelmaan, sekä psykologisten perustarpeiden turhautumisen moderoivaa roolia tässä

suhteessa hyödyntäen *Rahapelit digiajassa 2021–2024* pitkittäistutkimuksen kolmea ensimmäistä aikapistettä ( $n = 1\ 022$ ). Neljäs osatutkimus hyödynsi saman kyselytutkimuksen aineistoa viiden aikapisteen osalta ja tarkasteli yksinäisyyden, ikävien tunteiden ja ajatusten pakenemisen ja rahapeliongelmiin välisiä dynaamisia vaikutuksia vähintään kerran kuukaudessa rahapelejä pelanneilla ( $n = 612$ ).

Ensimmäisen osatutkimuksen tulokset osoittivat, että suomalaisten yleisimmät rahapelaamisen motiivit olivat rahan voittaminen ja positiiviset tunteet. Lisäksi motiiveissa havaittiin eroja sosiaaliryhmittäisen ja rahapelaamiseen osallistumiseen liittyvien tekijöiden suhteen. Riskitason pelaaminen oli lisäksi yhteydessä ikävien tunteiden ja ajatusten pakenemiseen sekä rahan ja positiivisten tunteiden vuoksi pelaamiseen, mutta rahapeliongelmaan oli yhteydessä ainoastaan ikävien tunteiden ja ajatusten pakeneminen. Toisen osatutkimuksen mukaan ulkomaisilla verkkosivustoilla pelaavilla oli enemmän erilaisia rahapelaamisen motiiveja kuin pelkästään kotimaisilla verkkosivustoilla pelaavilla, mutta he pelasivat harvemmin rahan vuoksi tai tukeakseen hyvää tarkoitusta. Kolmannessa osatutkimuksessa havaittiin, että ikävien tunteiden ja ajatusten pakeneminen, raha ja kilpaileminen rahapelaamisen motiiveina ennustivat rahapeliongelmaa yli ajan. Lisäksi psykologisten tarpeiden turhautuminen moderoi rahan vuoksi pelaamisen ja rahapeliongelman välistä yhteyttä. Lopuksi neljäs osatutkimus osoitti, että ikävien tunteiden ja ajatusten pakeneminen ennustaa myöhempää rahapeliongelmaa, kun taas rahapeliongelma ennustaa myöhempää yksinäisyyttä.

Tämän väitöskirjan tulokset korostavat rahapelaamisen motiivien roolia rahapelikäyttäytymisen ymmärtämisessä ja psykologisten perustarpeiden roolia rahapelaamisen motiivien ja rahapeliongelman välisessä suhteessa. Tulokset vahvistavat myös, että jotkin motiivit, kuten ikävien tunteiden ja ajatusten pakeneminen sekä rahan voittaminen, ovat rahapeliongelmiin kannalta haitallisempia kuin toiset. Lisäksi psykologisten perustarpeiden turhautuminen voi alistaa rahapeliongelmiin rahapelaamisen motiivien kautta, mutta rahapeliongelma voi myös johtaa psykologisten perustarpeiden turhautumiseen esimerkiksi sosiaalisen eristäytymisen kautta. Ymmärrys siitä, mitä motiiveja ja syvempiä tarpeita rahapelaamisen taustalla vaikuttaa, voi auttaa mielenterveysalan ammattilaisia ja sosiaalityöntekijöitä suunnittelemaan yksilöllisesti räätälöityjä hoitoja ja interventioita rahapeliongelmiin vähentämiseksi.

Avainsanat: rahapelaamisen motiivit; syyt rahapelaamiseen; rahapeliongelma; psykologiset perustarpeet; yksinoikeusjärjestelmän ulkopuolinen pelaaminen; yksinäisyys; pitkittäistutkimus

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# ABBREVIATIONS

BPNT	Basic Psychological Needs Theory
BPNSFS	Basic Psychological Need Satisfaction and Frustration Scale
CFHG	The Conceptual Framework of Harmful Gambling
CFI	Comparative Fit Index
DSM-V	The Diagnostic and Statistical Manual of Mental Disorders, 5 <sup>th</sup> Edition
FIML	Full Information Maximum Likelihood Estimation
GSGB 2023	Gambling Survey for Great Britain 2023
ICD-11	International Classification of Diseases 11 <sup>th</sup> Revision
MHI-5	5-Item Mental Health Inventory
MLE	Maximum Likelihood Estimator
OR	Odds Ratio
PGSI	Problem Gambling Severity Index
PPGM	14-item Problem and Pathological Gambling Measure
RI-CLPM	Random Intercept Cross-Lagged Panel Model
RMSEA	Root Mean Square Error of Approximation
SDT	Self-Determination Theory
SE	Standard Error
SRMR	Standardized Root Mean Squared Residual

# ORIGINAL PUBLICATIONS

- Publication I Hagfors, H., Castrén, S., & Salonen, A. H. (2022). How gambling motives are associated with socio-demographics and gambling behavior - A Finnish population study. *Journal of Behavioral Addictions, 11*(1), 63–74. <https://doi.org/10.1556/2006.2022.00003>
- Publication II Hagfors, H., Oksanen, A., & Salonen, A. H. (2024). Gambling Motives and Offshore Gambling: A Finnish Population Study. *Journal of Gambling Studies, 40*(2), 825–840. <https://doi.org/10.1007/s10899-023-10253-8>
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- Publication IV Hagfors, H., Kaakinen, M., Savolainen, I., Vepsäläinen, J., & Oksanen, A. (2025). Lonely gamble - A longitudinal study of loneliness, gambling to escape and problem gambling. *Journal of Behavioral Addictions, 4*(2), 972–981. <https://doi.org/10.1556/2006.2025.00025>

# 1 INTRODUCTION

Gambling is a popular activity that touches most people in one way or another. In Finland, around 70% of the population has gambled in the previous 12 months (Grönroos et al., 2024). Despite its popularity, only recently has academia started to focus more on the motives behind gambling. By definition, gambling means risking something of value on an event with an uncertain outcome in the hopes of winning money or other material goods (Williams et al., 2017). For some people, gambling represents an exciting betting event with friends, whereas others are fascinated by the intellectual challenge of, for example, playing poker and the strong tension caused by high stakes. Gambling also may serve as a way to relax or escape distressing thoughts and emotions. However, at the heart of all gambling is the possibility of winning money. The psychological reasons behind gambling are called gambling motives. Despite the growing body of literature on gambling motives, the number of extant population-level and longitudinal studies is scarce. Moreover, the social psychological mechanisms behind gambling are not well-understood. This dissertation examines how gambling motives relate to gambling participation and problem gambling.

Gambling typically is viewed as a recreational activity, but it carries the potential to become excessive. Problem gambling refers to harmful gambling behaviour that can be characterised by a need to gamble with increasing amounts of money, an inability to stop gambling despite the negative consequences, a preoccupation with gambling and a loss of control (American Psychiatric Association, 2013). According to a recent meta-analysis, problem gambling touches around 1.41% of the adult population worldwide (Tran et al., 2024; see also Calado & Griffiths, 2016, and Gabellini et al., 2023). In Finland, problem gambling's prevalence was 1.3% in the latest Finnish Gambling 2023 survey (Grönroos et al., 2024). Problem gambling can cause severe harm to personal finances (e.g., debts, inability to meet household needs), emotional and psychological well-being (e.g., shame, anxiety, stigma), physical health (e.g., poor nutrition, increased alcohol consumption, chronic comorbid diseases), relationships (e.g., arguments, trust issues) and occupation (e.g., weakened job performance) (Langham et al., 2016; Marionneau et al., 2023).

However, the harm is not limited to the gambler, but also affects significant others, such as family members and partners, and society at large in the form of bankruptcy, criminal activity and increased costs for mental health services. It has been estimated that the social costs of gambling range between 6 million and 324,000 million international dollars<sup>1</sup> – an average of 3,980 international dollars per adult (Hautamäki et al., 2025).

With advancements in technology, online gambling's popularity is rising. This has caused new trends, such as gambling on unregulated gambling websites provided by offshore gambling operators, who, instead of holding valid licences to operate in particular countries, simply provide gambling games, in violation of local regulations (Gainsbury et al., 2018). The offshore operators may not follow consumer protection regulations and offer gambling services that are not available through licensed websites, thereby posing several risks. These services may be particularly motivating for those who seek sensations and novelty from gambling. In Finland, gambling services are provided by state-owned monopoly operator Veikkaus Oy. Other gambling operators are prohibited from marketing and providing gambling services (Lotteries Act, 1074/2001). Despite this, offshore gambling is on the rise in Finland (Grönroos et al., 2024), and more research is needed to understand what motivates people to gamble on unregulated offshore gambling websites. Also, differences in general gambling motives between those who gamble on offshore gambling websites vs. those who gamble only on licensed websites are not well understood. The increase in the popularity of offshore gambling has caused concern because extant studies have linked offshore gambling to gambling problems (Gainsbury et al., 2018; Oksanen et al., 2022a; 2022b). Finnish Gambling system will be reformed in 2026, and the current monopoly system will be partly opened for competition, which makes this topic especially relevant and timely.

Much academic research has been conducted on problem gambling and the risk factors and consequences of it, but to truly understand people's gambling behaviour, we must study the motives behind it. Extant literature has established a link between gambling motives and problem gambling, but the social psychological mechanisms behind this association are not fully understood. Moreover, a growing body of literature suggests that those with gambling problems are not one homogenous group, but rather differ in terms of their psychological, neurobiological, cognitive and ecological backgrounds, and what function gambling serves for them (Blaszczynski & Nower, 2002).

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<sup>1</sup> The international dollar is an artificial currency designed to eliminate the effects of differing purchasing power among nations (Hautamäki et al., 2025).

One possible framework for studying gambling's social psychological mechanisms is through self-determination theory, which posits that autonomy, competence and relatedness are basic psychological needs at the core of human motivation (Ryan & Deci, 2017). *Autonomy* refers to the need to decide on matters concerning oneself, while *competence* refers to the need to feel capable of accomplishing tasks that are important to oneself. *Relatedness* refers to the need for meaningful relationships and connection. Theoretically, we all have an innate drive to satisfy these basic psychological needs, as they are essential to our well-being and daily efficiency. Similarly, deficits in these basic psychological needs have been linked to ill-being, mental health issues and addictions (Vansteenkiste & Ryan, 2013). Recent extant studies have found a link between problem gambling and frustration of these basic psychological needs (e.g., Vuorinen et al., 2022) but gambling motives' role in this association remains largely unknown. Considering basic needs' role could help in understanding why individuals seek certain desires from gambling (such as money, excitement or escape) in the first place.

Drawing on theoretical approaches from social psychology and the gambling and social-scientific addiction literature, this dissertation offers a comprehensive framework for understanding motivational processes behind gambling. This dissertation's main objective is to examine how gambling motives relate to gambling participation and problem gambling. More specifically, the dissertation's aims are twofold: first, to produce general knowledge on gambling motives and how they relate to sociodemographic and gambling participation-related differences, including offshore gambling; and second, to investigate the longitudinal dynamics between gambling motives, problem gambling and frustration of the aforementioned basic psychological needs. To address these aims, four peer-reviewed empirical research studies were conducted. Study 1 investigated sociodemographic and gambling participation-related differences in gambling motives among Finnish past-year gamblers. Study 2 expanded on this by examining how gambling motives differ between Finnish offshore and onshore online gamblers. Study 3 examined gambling motives' longitudinal effects on problem gambling and whether frustration of the psychological needs moderates this association. Finally, Study 4 investigated the longitudinal dynamics among the escape motive, loneliness and problem gambling in the context of Finnish regular gamblers. Together, these empirical studies and the combined framework provide a comprehensive understanding of how gambling motives relate to gambling behaviour and basic psychological needs' role in the relationship between gambling motives and problems.

## 2 GAMBLING, GAMBLING MOTIVES AND PROBLEM GAMBLING

In the following chapters, I review the literature and theoretical considerations relevant for this dissertation. I then present this dissertation's general aims and the specific research questions and hypotheses guiding each research article. Next, I describe the data, measures and analytical methods utilised in the research articles. An overview of the main findings precedes the discussion, in which I address the main findings in relation to the dissertation's general aims, outline theoretical and practical implications, and evaluate the dissertation's strengths and limitations while discussing directions for future research.

### 2.1 Defining gambling, gambling motives and problem gambling

Gambling has been an ever-present aspect of human culture, manifesting in various forms and cultural contexts. As already mentioned in the Introduction, gambling generally is defined in the literature as risking something valuable on an event with an uncertain outcome in the hopes of winning money or other material goods (Williams et al., 2017). Gambling sometimes is associated with digital gaming, and there has been lively discourse on the convergence of gambling and gaming. However, in this dissertation, digital gaming is not viewed as gambling; thus, it lies outside this dissertation's scope. Gambling takes place in many different forms and contexts, so it is necessary to view gambling as an activity with little more detail.

Different forms of gambling identified in the gambling literature include commercial gambling, private gambling, unregulated gambling, illegal gambling, recreational gambling and harmful gambling (Abbott et al., 2018; Sulkunen et al., 2019). *Commercial gambling* refers to formal and regulated gambling, and includes several different game types, such as lotteries, bingo, electronic gambling machines, casino table games, sports betting and other betting games. Commercial gambling can be characterised by an unequal relationship between the gambling provider and the gambler because the games themselves are designed strategically with built-in

statistical advantages that favour the provider and ensure profits in the long run (Abbott et al., 2018). This dissertation focusses on commercial gambling.

*Private gambling* refers to gambling with friends, family or colleagues in an informal context, such as homes. It can include card games such as poker or betting on sports. In contrast to commercial gambling, in private betting, money is redistributed among participants and wins or losses are purely a matter of chance or skill. *Unregulated gambling* refers to gambling that is not legally controlled in the specific country or jurisdiction, whereas *illegal gambling* refers to gambling that is prohibited by law and, thus, operates outside the official and regulated gambling realm (Abbott et al., 2018; Sulkunen et al., 2019). Illegal gambling services include bookmaking on sports and horse races, and underground casinos. Illegal gambling providers do not adhere to laws or regulations, so they are not obligated to pay winners or use legitimate methods for debt collection, i.e., an unequal relationship exists between the provider and gambler. Finally, it is necessary to distinguish between *recreational gambling* and *harmful gambling* (Abbott et al., 2018). *Recreational gambling* refers to gambling as a leisure activity, in controlled and low-risk situations that make little or no impact on the gambler's well-being. The term *recreational gambling* implies that not all gambling is problematic or harmful. In contrast, *harmful gambling* refers to any kind of recurrent gambling that inflicts negative consequences on the gambling individual, their family, the community or society at large (Abbott et al., 2018). Gambling-related harm exists on a continuum, from minor and transient to severe and persistent, and the term *harmful gambling* captures this full range of harms.

People choose to gamble for various reasons. To get a better understanding of gambling, individuals' motives for gambling must be examined. Gambling motives are the psychological reasons behind gambling, and they reflect both what causes the behaviour and what purpose it serves (see Dweck et al., 2023). Early attempts to identify gambling motives were based on alcohol research and questionnaires on drinking motives (see Cooper et al., 1992). However, gambling motives differ from drinking motives in that gambling is built around money. With some variations, most academic literature these days recognises several different gambling motives: money; enhancement; socialising; escape; and challenge (Barrada et al., 2019; Binde 2013; Canale et al., 2015; Dechant 2014; Francis et al., 2015; Grönroos et al., 2024; Wardle et al., 2010, 2024). Gambling for money entails seeking financial gain or hitting the jackpot, whereas enhancement refers to excitement and sensation seeking. Socialising refers to social interaction with friends or family. Escaping includes the idea of regulating emotions, avoidance and coping with gambling.

Sometimes a distinction between enhancement motives and coping motives is made (Stewart & Zach, 2008), in which enhancement motives refer to fostering positive emotions – such as excitement, thrill, feeling good and socialising – while coping motives refer to alleviating unpleasant emotional states, such as anxiety, depression or boredom. A broader affection regulation factor, which encompasses both positive (i.e., ‘because it makes me feel good’) and negative (e.g., ‘to forget my worries’) emotion-related motives also has been suggested (Barrada et al., 2019). Other gambling motives also have been proposed, such as competing with others (Binde, 2013) and supporting worthy causes (implying that gambling profits are used to support public interests or charity; see Volberg et al., 2015, 2023).

Defining problem gambling is somewhat more challenging than defining gambling or gambling motives. Problem gambling has been described using various terms and definitions (i.e., compulsive gambling, pathological gambling, gambling disorder), each emphasising slightly different things. In this dissertation, I use the term *problem gambling* and adhere to Neal et al.’s (2005) definition: ‘Problem gambling is characterised by difficulties in limiting money and/or time spent on gambling, which leads to adverse consequences for the gambler, others or for the community’. This definition’s strength is that it distinguishes between the individual’s behaviour and the harm caused by it, which is particularly useful for understanding gambling motives’ role in problem gambling. This definition also aligns with the dual understanding of the problem gambling concept. On one hand, problem gambling refers to the most severe end of a continuum of gambling severity, progressing from nonproblem to low-risk, moderate-risk and, ultimately, problem gambling (as seen in measures such as the Problem Gambling Severity Index (PGSI; Ferris & Wynne, 2001). On the other hand, the term can be used to describe the entire spectrum of problematic gambling, covering all degrees of problems, from mild to severe.

Problem gambling also should be distinguished from the clinical diagnosis of gambling disorder. In the 11th revision of the *International Classification of Diseases* (ICD-11, 2022), gambling disorder is described as a pattern of persistent gambling behaviour characterised by impaired control over gambling, increasing importance placed on gambling at the expense of other life domains and continuing or escalating gambling despite the harmful consequences. The diagnostic requirements include six essential features (e.g., impaired control over gambling behaviour) that should be evident for at least 12 months to receive the diagnosis. According to Neal et al. (2005), problem gambling refers to an earlier stage or level of gambling severity that results in less-severe harm than experienced by those at the later stage or those clinically diagnosed with gambling disorder. However, the term *problem gambling* is

broad, encompassing individuals who experience difficulties with gambling, but do not meet the diagnostic criteria, as well as those who have received an official diagnosis of gambling disorder.

Notably, gambling disorder is the first officially recognised behavioural addiction (APA, 2013; ICD-11, 2022). A growing body of literature indicates that excessive, repetitive and problematic engagement in certain activities – such as gambling, video gaming and sex – can share similarities with substance use disorders (Gullo et al., 2022; Petry, 2016; Robbins & Clark, 2015). These similarities include features such as tolerance, withdrawal, preoccupation and negative consequences to the individual, close ones and community (APA, 2015). In this dissertation, I use the concept of problem gambling as a broad term that covers all levels of severity in problem gambling.

## 2.2 The Conceptual Framework of Harmful Gambling

A significant amount of research has sought to investigate factors associated with problem gambling. The Conceptual Framework of Harmful Gambling (CFHG; Abbott et al., 2018; Hilbrecht et al., 2020) provides an integrated summary of all factors that have been associated with harmful gambling at the individual, family and societal levels. The CFHG summarises some of the most current and robust findings in the various areas of gambling, demonstrating harmful gambling's multifaceted nature and, thus, providing a useful foundation for conceptual reflections. Conceptually, harmful gambling is very close to the concept of problem gambling, as they both view gambling harm and severity as existing on a continuum from mild to severe. The difference between these concepts is that harmful gambling is understood entirely through the harmful consequences of gambling, while the definition of problem gambling also includes the individual's own behaviour. Nevertheless, the CFHG provides a useful tool for reviewing the literature related to gambling, gambling motives, problem gambling and other associated factors.

The CFHG organises current knowledge into eight interconnected factors divided into two main themes: general factors and gambling-specific factors (Abbott et al., 2018; Hilbrecht et al., 2020). *General factors* include biological, cultural, social and psychological factors contributing to harmful gambling. Biological factors include genetic or biological predispositions to harmful gambling, whereas social factors refer to the social context that influences an individual's gambling behaviour, such as interpersonal relationships, norms and stigmatisation. Cultural factors impact values,

which can affect attitudes towards gambling. As cultural factors include elements such as ethnicity and tradition, religion and belief systems, gambling (sub)cultures, sociocultural attitudes and gender, it seems that social and cultural factors partly overlap. Psychological factors, in turn, include various factors ranging from emotion regulation and cognitive processes to mental health, subjective well-being and individual's self-perceptions. *Gambling-specific factors* contributing to harmful gambling include environment, exposure, gambling types and resources. *Gambling environment* refers to the economic and sociopolitical environment in different jurisdictions that can impact gambling through supply and government regulations. *Exposure* refers to how many gambling opportunities are available in society and how much an individual is exposed to them. *Gambling types* include the lottery, poker and electronic gambling machines, which have different potentials to cause harm. Gambling types also include motivational characteristics, as individuals are likely to choose different forms of gambling based on what they seek from gambling. Finally, *gambling resources* refer to factors that prevent or reduce gambling-related harm.

In this dissertation, I focus on two gambling-specific factors – motivational characteristics and environment – and two general-level factors: social and psychological. This framework's authors note that although gambling-specific and general factors likely are interconnected, the framework does not offer a detailed discussion of these relationships and interactions, leaving room for future studies to help investigate these dynamics (Abbott et al., 2018). While most extant research on problem gambling previously has been examined from the individual's perspective, a growing recognition of gambling's wider social costs has caused a shift in academic research towards a public health perspective. Although my focus primarily is on the individual level, I acknowledge the importance of investigating harmful gambling's effects on affected others, communities and society at large.

## 2.3 Gambling motives

In recent years, academic research has begun to focus more on why people gamble and how these gambling motives relate to gambling participation and problem gambling. The extant literature suggests that gambling motives differ across sociodemographic groups and gambling participation-related factors. For example, women tend to report more coping and socialising motives, whereas men more commonly gamble for money and enhancement (Francis et al., 2015; Lloyd et al., 2019; Stewart & Zach 2008; Wardle et al., 2011; Pallesen et al., 2020). In the

nationally representative Gambling Survey for Great Britain 2023, winning big money was the most common reason for gambling among both men and women (Wardle et al., 2024). Moreover, enhancement, coping, socialising and challenge motives are more common among younger age groups (Francis et al., 2015; Pallesen et al., 2020; Wardle et al., 2024), whereas recreation and supporting worthy causes are emphasised among older age groups (Wardle et al., 2011). Findings regarding the money motive and age are inconsistent, as in some studies, gambling for money is more common among older age groups (e.g., Wardle et al., 2011), whereas in other studies, it is more common among younger age groups (Volberg et al., 2015). The money motive is also more common among those with part-time employment, are looking for work (Francis et al., 2015) or have a long-term disability (Wardle et al., 2011). Coping motives are particularly pronounced among students, homemakers and those looking for work or unable to work (Francis et al., 2015; Mond et al., 2019). Similarly, the enhancement, socialising and challenge motives are more common among students and the unemployed (Francis et al., 2015; Mond et al., 2019; Wardle et al., 2011). Finally, while the money motive seems to be common across all income tertiles, the recreation and coping motives are particularly emphasised in the lowest income tertiles (Wardle et al., 2011). The differences in the results might be explained by sampling (e.g., Mond et al., 2019, was conducted among international students in Tasmania instead of the whole population) or cultural and societal differences between the countries where the studies were conducted. For example, the United States, Great Britain and Australia offer low levels of market regulation and social benefits, whereas in the Nordic countries, such as Norway and Finland, society strongly regulates markets and aims to offer its citizens a supporting network in the form of social benefits and welfare services (Chambers, 2011, pp. 22–23). If society does not provide sufficient support in a difficult financial situation caused by unemployment or disability, gambling may seem like an easy way to make money. Finally, only one study has investigated gambling motives' categorical stability with a community sample longitudinally across five years and found significant changes in each motive category, indicating that individuals' gambling motives are likely to change over time (McGrath & Konkoly-Thege, 2018).

Gambling motives have been found to vary also in terms of gambling participation, such as game types, gambling mode (offline, online or mixed-mode), gambling frequency and number of game types. For example, enhancement motives have been associated with betting and sports games, online bingo, national lotteries and scratch cards, while socialising has been associated positively with bingo and casino games, and negatively with online games (Gambling Commission, 2025).

Interestingly, it appears that money is not the main motivator for participating in most gambling activities in Great Britain, except for lotteries, scratch cards and instant online wins (Gambling Commission, 2025). Regarding gambling mode, the enhancement motive has been linked to both online and mixed-mode gambling (Canale et al., 2015; Dowling et al., 2015). Canale et al. (2015) also found a link between mixed-mode gambling and the money motive. However, the findings on the association between the escape motive and online gambling have been inconsistent: Some studies have found that escape and coping motives were associated with online gambling activities (Tipping & Wardle, 2025), whereas one study found that coping motives reduced the likelihood of migrating from land-based to online games (Allami et al., 2025b). Goldstein et al. (2016) found that online gambling more often was initiated for monetary reasons, boredom or to demonstrate skills, whereas land-based gambling was associated with social reasons and excitement. Moreover, enhancement and money motives have been associated with greater gambling frequency and gambling through multiple game types (Stewart & Zach, 2008; Volberg et al., 2015).

A significant portion of the literature on gambling motives has focussed on examining the link between motives and gambling problems. It seems that almost all gambling motives have been associated with gambling problems, but some motives appear to have a stronger association than others. Most consistent evidence concerns escape and coping motives, the money motive and enhancement motives. Systematic meta-analyses have focussed specifically on the escape and money motives. Regarding the escape motive, in their meta-analysis, Alaba-Ekbo et al. (2024) found small to moderate effect sizes for the association between the escape motive and problem gambling, while Tabri et al. (2022) found a positive association between the money motive and problem gambling with a moderate effect size. Moreover, another systematic review and meta-analysis investigated the associations between all gambling motives and problem gambling and found large effect sizes for coping motives and medium effect sizes for enhancement motives, while all the other motives exerted small or no effects (Allami et al., 2025b). The number of longitudinal studies is scarce, but two studies with five-year longitudinal data found that gambling to escape and to win money predicted both existing and future problem gambling (el-Guebaly et al., 2015; Williams et al., 2015). Furthermore, another longitudinal study found that the escape motive and positive gambling expectations predicted problem gambling over a six-month period (Grubbs & Rosansky, 2020).

The evidence concerning the other gambling motives and problem gambling is less consistent. Social motives usually are viewed as less harmful motives for gambling or even protection from gambling problems (Barrada et al., 2019; Francis et al., 2015; Lambe et al., 2015). Volberg et al. (2015, p. 61) found that while individuals with at-risk or problem gambling issues predominantly chose money as their main reason for gambling, recreational gamblers chose socialising with family or friends and supporting worthy causes as their main motive more often than those with at-risk or problem gambling issues. However, some studies have found social motives to be a risk factor for problem gambling (e.g., Floyd et al., 2025). Schellenberg et al. (2016) found that social motives predict gambling severity through gambling frequency. Moreover, Savolainen et al. (2022) found that social motives mediated the association between mental health problems and gambling problems during the COVID-19 pandemic. It seems that social motives' role in gambling problems depends on the context. Furthermore, some evidence has indicated that the challenge motive might exert an effect on problem gambling (Francis et al., 2015; Sundqvist et al., 2016).

In recent years, researchers have begun to examine in more detail *why* some gambling motives are associated with gambling problems by considering other relevant factors in this relationship. Emotion dysregulation's role in the relationship between gambling motives and problem gambling possibly has been studied the most (e.g., Barrault et al., 2019; Dias et al., 2025; Estévez et al., 2024; Marchica et al., 2020; Theodorou et al., 2025). For example, Dias et al. (2025) found that low distress tolerance (difficulty coping with distressing emotions), lack of emotional clarity and positive urgency (a tendency to act impulsively under positive emotions) interact with gambling motives. Furthermore, a few studies have investigated contextual factors' role. One study investigated social context's influence on gambling motives and problem gambling and found that loneliness and a lack of social connections moderate the relationship between social motives and problem gambling (Floyd et al., 2025). In another study, perceived relative deprivation interacted with money motive in predicting greater gambling problems (Floyd et al., 2024). A few studies also have investigated gambling motives' role in the relationship between gambling-related cognitive distortions, personality and problem gambling (MacLaren et al., 2015; Mathieu et al., 2018).

Taken together, gambling motives vary based on sociodemographic and gambling participation-related factors, but the number of representative population-based studies in the literature is scarce. Many extant studies have relied on convenience sampling or have focussed on some specific subpopulation, limiting the findings'

generalizability in broader populations. Moreover, extant literature has established a link between gambling motives and problem gambling, but the underlying contextual and psychosocial mechanisms are not fully understood. While deficits in emotion regulation, gambling-related cognitive distortions, personality and social context have been suggested as playing a role in this relationship, much still remains to discover. Finally, the literature on gambling motives primarily has been cross-sectional with a few exceptions, emphasising the critical need for more longitudinal studies.

## 2.4 Social and psychological factors associated with problem gambling

Extant research on gambling and problem gambling has identified multiple social and psychological factors associated with gambling and problem gambling. In the CFHG, social factors associated with problem gambling are divided into sociodemographics, peer and family gambling involvement, education system, neighbourhood, stigmatisation and deviation (Abbott et al., 2018). Regarding sociodemographic factors, a growing body of literature consistently has associated male gender, young age and low income as risk factors for problem gambling (Allami et al., 2021; Abbott et al., 2018; Dowling et al., 2017; Grönroos et al., 2024; Volberg et al., 2023; Wardle et al., 2024; Williams et al., 2021). Extant studies on gender differences have found that while men have a greater risk of problem gambling, men and women differ in their characteristics associated with problem gambling. For example, impulsivity and substance and alcohol abuse were associated consistently with problem gambling among men, whereas unemployment, psychological distress and childhood abuse were predictors of problem gambling among women (Merkouris et al., 2016). Moreover, women tend to prefer chance-based games more than men (McCarthy et al., 2018). Extant studies on adolescent gambling have found that gender differences start at a young age (Calado et al., 2017). This higher risk of problem gambling among young adults might be explained partly by conforming with group norms, peer pressure and having many friends and family members who gamble (Hoorn et al., 2017; Mazar et al., 2018; Savolainen et al., 2021).

Furthermore, it has been found that problem gambling, in terms of education level, is more common among students and others with less than a bachelor's degree (Ford & Håkansson, 2020; Volberg et al., 2023; Williams et al., 2021). Other social factors associated with problem gambling include interpersonal factors, such as loneliness, although the evidence concerning the relationship between loneliness and problem

gambling is inconsistent (Nordmyr & Frosman, 2020). Generally, understanding on the social factors contributing to problem gambling is lacking, and extant findings' consistency varies. The most robust findings concern sociodemographics and family and peer gambling involvement, but the evidence from other social factors is less consistent (Abbott et al., 2018). Thus, more research is needed to deepen understanding of social context in problem gambling.

Among all the factors associated with problem gambling, psychological factors are perhaps being studied the most (Abbott et al., 2018). Psychological factors identified in the CFHG include coping styles, personality and temperament, social learning, self-perceptions, comorbid disorders, subjective well-being, negative childhood experiences, judgement and decision making, and lifespan development. Strong evidence has indicated that difficulties in emotion regulation are central to problem gambling (e.g., Buen & Flack; 2022; Caudwell et al., 2024; Lee et al., 2025; Velotti et al., 2021; Williams et al., 2012). Problem gambling appears to be strongly associated particularly with avoidance-based coping strategies (Neophytou et al., 2023). Extant literature also consistently has found that gambling-related cognitive distortions, such as the illusion of control and the gambler's fallacy, predict gambling problems (Calado et al., 2017; Ciccarelli et al., 2017; Goodie et al., 2013). Certain personality features, such as impulsivity and novelty-seeking, also have been found to be robust predictors of problem gambling (Haw, 2017; Martinotti et al., 2006; Ioannidis et al., 2019). Other psychological risk factors for problem gambling include adverse or traumatic childhood experiences (Goodrich et al., 2023; Poole et al., 2017), as well as comorbid disorders, such as depression, anxiety, alexithymia, and alcohol and substance abuse disorders, (Bonnaire et al., 2017; Dowling et al., 2016). Recent extant studies also have found that a financially focussed self-concept (placing heavy emphasis on financial success as a basis of self-worth) can predispose individuals to gambling problems (Tabri et al., 2021, 2023; Tabri & Wohl, 2021). Finally, problem gambling has been associated with subjective well-being, such as psychological distress (Oksanen et al., 2018; Suomi et al., 2014) and low satisfaction with life (Oyanedel et al., 2024).

Taken together, extant research has established a link between problem gambling and several key social and psychological factors. The most consistent findings concern sociodemographic risk factors – such as male gender, young age and low income – alongside psychological risk factors, such as difficulties in emotion regulation, cognitive distortions and personality traits (i.e., impulsivity). While the role of family and peer gambling involvement has been recognised, problem gambling's broader social context remains unclear, with inconsistent findings concerning factors

such as loneliness. Thus, further research is needed to deepen understanding of the complex interplay between these factors.

## 2.5 Gambling environment and regulation in Finland

Gambling is regulated by laws and restrictions that impact the gambling environment, including what types of games are available and accessible, and how often an individual encounters gambling marketing in their environment. Countries and jurisdictions differ greatly in terms of their gambling environment, regulations and restrictions, and there are also international agreements concerning gambling regulation (Sulkunen et al., 2019). Gambling systems range from prohibition and (state-owned) public monopolies, to licensing systems and free markets. In most countries, governments aim to reduce unregulated gambling markets and favour regulated ones (Sulkunen et al., 2019). Acceptance of gambling as a leisure activity also greatly varies between countries (Abbott et al., 2018). Next, I describe Finland's gambling environment and regulation – this dissertation's context.

The legal age for all gambling in Finland is 18. Generally, gambling is accepted widely based on the aforementioned statistic that 70% of the population has gambled during the past 12 months (Grönroos et al., 2024). The prevalence of past-year gambling was higher in previous population surveys. In 2019, it was 78%, while in 2015, it was 80% (Salonen et al., 2020; Salonen & Raisamo, 2015). Gambling also is widely available, as electronic gambling machines are placed in kiosks and grocery stores, where one also can buy lottery tickets and scratch cards from cashiers. These offerings are complemented by a wide selection of online games, though the ability to gamble during evening hours has been restricted. The prevalence of online gambling has grown significantly, currently at around 44% in the latest population survey (Grönroos et al., 2024). The prevalence of problem gambling is 1.3%, while 4.2% gambled at least at a moderate-risk level. The prevalence of problem gambling is higher among men than women (2.0% vs. 0.5%). The most popular gambling games are lotteries, scratch cards and electronic gambling machines.

In Mainland Finland, the state-owned monopoly supplier Veikkaus Oy has an exclusive right to provide gambling services. Before 2017, three gambling operators – RAY, FinToto and Veikkaus – were licensed to provide gambling games in Finland, but in 2017, these operators were combined into one monopoly operator: Veikkaus Oy. The justification for this was that one monopoly operator would be better at preventing and reducing gambling harm than three competing companies (Salonen

et al., 2019). Another justification for a state-owned monopoly is that gambling profits will be used for public interests (Sulkunen et al., 2019). The Finnish gambling system is regulated through the Lotteries Act. According to the Lotteries Act 52§, gambling harm must be monitored and researched – a task assigned to the Ministry of Social Affairs and Health. Veikkaus Oy must compensate the state for the costs of this research work. Until 2024, the Finnish government earmarked gambling profits for sports, culture, youth work, scientific research, social services and nonprofit organisations, but now, all gambling revenues are transferred directly to the state budget without earmarking. In recent years, the Finnish gambling system has undergone many small changes. In 2019, Veikkaus Oy reduced the number of electronic gambling machines in the marketplace greatly, and since 2023, mandatory identification has been required for all gambling types. The mandatory identification likely explains gambling's reduced prevalence, as those who gamble only occasionally might not view gambling as important enough to trouble themselves with strong identification (Grönroos et al., 2024). According to the current government programme, a reform plan will partly open the Finnish gambling system to competition with a license model by 1 January 2026, at the latest (Finnish Government, 2023). This reform is targeting gambling outside the monopoly system, so-called offshore gambling, which has increased significantly and cannot be regulated (Grönroos et al., 2024). The reform aims to improve channelling into regulated gambling services (Ministry of the Interior, n.d.).

Offshore gambling refers to gambling with unregulated online websites provided by offshore gambling operators. The rise in online gambling causes concerns for several reasons. Offshore gambling operators do not have a valid license in a particular country or jurisdiction and, thus, are not bound by regulations and restrictions (Gainsbury et al., 2018). Therefore, the games they provide may be more addictive, their consumer protection tools inadequate and their marketing strategies more aggressive, thereby posing a risk for gambling problems. Moreover, there is no way to control how many player accounts a gambler can create at different gambling websites, which can blur the overall picture of how much money the person has spent on gambling. Indeed, extant studies have linked offshore gambling to increased gambling problems (Gainsbury et al., 2018; Oksanen et al., 2022a; 2022b). However, only a few studies have investigated the reasons why online gamblers choose offshore gambling websites (e.g., Gainsbury et al., 2019); therefore, more research is needed to understand offshore online gamblers' motives.

# 3 INTEGRATIVE APPROACH TO GAMBLING MOTIVES AND PROBLEM GAMBLING

In this chapter, I aim to provide an integrative framework for understanding how gambling motives influence problem gambling. I begin with a more general examination of the connection between addiction and motivation, recognising problem gambling as one form of addiction and motives as a specific expression of motivational drives. After this, I move on from a general level to examine specific motives for gambling and their role in gambling problems, as described in the Pathways Model. Following this, I present the theory of basic psychological needs and consider their role in human motivation, addiction and gambling. In the final sub-chapter, I synthesise these various theoretical approaches and argue that basic psychological needs behind gambling motives could complement the Pathways Model of problem gambling.

## 3.1 Motivation and addiction

Problem gambling is recognised widely as a form of addiction, belonging to a broader category of behavioural addictions (Orford, 2001; Petry et al., 2016). To fully understand gambling motives' role in problem gambling, the more general relationship between addiction and motivation must be considered. First, the meaning of the addiction concept should be examined. Defining *addiction* is challenging, with myriad approaches and perspectives that can be taken. Generally, the addiction research field is dominated by two different, widely supported frameworks: the brain disease model of addiction (BDMA) and the biopsychosocial model of addiction. According to the brain disease model, addiction is viewed as a chronic and relapsing brain disease with a genetic or biochemical cause (Gonzalez & Skeves, 2013; Kelly, 2019). The disease model has received much support from the medical and neuroscience fields (see, e.g., Berridge & Robinson, 2016; Nutt et al., 2015), but the model has been criticised for biomedical reductionism, in which complex clinical phenomena are viewed as being derived mainly from neurobiological factors (Gonzalez & Skewes, 2013; Fava & Sonino, 2017). The biopsychosocial addiction

model (Engel, 1977) attempts to provide a more holistic understanding of addiction's complex nature. According to this view, addiction is a chronic disease caused by the interplay between several biological, psychological and sociocultural factors (Borrell-Carrió et al., 2004; Griffiths, 2005). Both the biomedical and biopsychosocial addiction models are used widely today. Contemporary BDMA models also acknowledge addiction's psychological, social and behavioural aspects, even though they are not viewed as important (Conzalez & Skewes, 2013). While recognising addiction's multifaceted nature, my theoretical understanding of problem gambling is grounded in the biopsychosocial addiction model.

The addiction research field continues to evolve, as the understanding of addiction's intricate nature grows. In recent years, motivation's role in addiction has gained much attention. In many contemporary addiction theories, motivation plays a significant role. According to Dweck et al. (2023), motivation can be defined as a process that drives, selects and directs individuals' behaviours towards their goals. Motivation arises from basic needs, such as hunger and thirst, but also from psychological needs, such as the need for relationships. We are all built to fulfil these needs; thus, these basic needs form the basis of human motivation (Dweck et al., 2023). However, fulfilling needs requires specific goals, which are mental representations of desired states, as well as goal-oriented behaviours, to reach these goals. If we apply this idea to gambling motives, then motives can be thought of as goals in the motivational process, representing the underlying cause of behaviour, but also the means by which the goal is achieved – which, in this dissertation's context, is gambling.

Generally, addiction research is characterised by a vast number of different theories, yet most of these theories focus on explaining only a narrow aspect of addiction. However, a few theories examine addiction's mechanisms in a very comprehensive way, attempting to create a synthesis of extant findings. In Jim Orford's social-behavioural-cognitive-moral model, addictions are conceptualised as 'excessive appetites' (Orford, 2001). According to this model, addiction arises from several interacting factors, including personal features and psychological, ecological, socioeconomic and cultural factors, such as the activity's availability and norms associated with family and friends. The right circumstances predispose individuals to development of addiction. For example, high availability and incentives, combined with few restraints, predispose individuals to excessive behaviours. Learning plays a significant role in explaining how addiction develops: The combination of positive incentives (feelings of reward and satisfaction) and operant learning creates automatic cues for the activity. Over time, the activity generalises and begins to fulfil

even more diverse purposes, and the individual's life begins to revolve around the activity more and more. In the problem gambling context, this could mean that an individual begins to develop varying motives for gambling. However, strong attachment to an activity starts to create adverse consequences: loss of time and money; increasing debts; and conflicts in family and relationships. Orford describes this tension between the powerful desire for activity and the resulting negative consequences as motive conflicts. The motive conflict plays a key role in the model: There is no addiction without harmful consequences.

Similarly, West and Brown (2013) proposed that at the core of addiction is a failure of the motivational system, in which excessively high importance is placed on a specific activity. In the synthetic theory of addiction, motivation plays an even bigger role than in Orford's model. The PRIME human motivation model describes how the motivational system comprises five interacting and hierarchical subsystems: plans; responses; impulses; motives; and evaluations (PRIME). Addiction can occur with a malfunction in any of these subsystems. According to this model, motives comprise 'wants' and 'needs'. *Wants* are described as feelings of appeal that arise from the expectation of pleasure or satisfaction, while *needs* are feelings of appeal generated by the expectation of relief from mental or physical discomfort. This type of understanding of motives is quite close to certain gambling motives that are related, for example, to excitement and pleasure, or to escaping unpleasant emotions. According to West and Brown (2013), any highly rewarding activity has the potential to change motivational systems so that an individual's ability to resist the activity becomes challenged.

Another way to conceptualise motivation's role in addiction is to focus on motivation as goal-directed behaviour. According to Köpetz et al. (2013), motivated behaviour includes setting a goal (such as money or relaxation), identifying effective means (gambling) to achieve the goal, resisting distractions and resolving conflicts. When addiction starts to develop, goals get cognitively and emotionally associated with the means used to achieve them. In a process called emotional transference, the emotional experience related to the goal strengthens the link between behaviour and the goal. Finally, the behaviour itself gains a 'motivational pull' and becomes a desirable goal, which the individual compulsively chases despite the negative consequences.

Taken together, motivation's role in addiction has been considered in several different addiction models, most of which agree that in addiction, the motivational system functions abnormally to the extent that some of the models even see that addiction is a failure of the motivational system, or at least a special case of motivated

behaviour. As addiction develops, disproportionately high priority is given to a certain rewarding activity at the expense of other activities, and the addicted individual continues to pursue the activity despite the negative consequences. A certain activity can serve multiple functions even within the same individual. As the addiction deepens, the activity begins to serve an even wider range of functions. Increasing negative consequences and neglecting other important life domains create motive conflicts. Although the models presented above provide a good general understanding of motivation's role in addiction, it is necessary to examine a theoretical model that focusses specifically on the development of problem gambling and gambling motives' role in this process.

## 3.2 The Pathways Model of problem gambling

The Pathways Model of problem gambling (Blaszczynski & Nower, 2002) is a widely used etiological model that presents a complex interplay between psychological, cognitive, neurobiological and ecological factors that help develop problem gambling behaviours. Thus, the model is an example of a biopsychosocial view of addiction. The model's core assumption is that those with gambling problems are not one homogenous group, but rather the model proposes three distinctive subtypes that differ based on their etiological pathways and risk factors. Most of the risk factors also are recognised in the CFHG (Abbott et al., 2018) described in Section 2.2. According to the Pathways Model, some of these factors are common to all three pathways, such as ecological factors (i.e., availability and access to gambling), classical and operational conditioning (i.e., associating gambling stimuli and emotional or arousal response) and cognitive distortions (i.e., the erroneous belief that the gambling outcome can be controlled), but the model proposes that certain factors distinguish the three subtypes' pathways, including motives for gambling, premorbid mood and anxiety symptoms, personality and neurobiological features, predisposition towards antisocial behaviour and experiences of childhood maltreatment.

In the Pathways Model, the first pathway describes the gambler subtype termed 'behaviourally conditioned', which initiates gambling for social reasons or recreation and does not have any background of mood or anxiety symptoms, or other psychopathology. Due to the increase in gambling participation and intensity, this subtype develops behavioural conditioning and cognitive distortions related to gambling that help develop problem gambling behaviours. The second pathway describes the subtype termed 'emotionally vulnerable' individuals, which reveals

premorbid mood and anxiety symptoms, underlying emotional dysregulation, poor stress-coping skills, childhood maltreatment and gambling mainly to escape negative emotional states. The third pathway describes the subtype of 'antisocial-impulsivist' individuals who can be characterised by impulsive and antisocial personality traits, attention-deficit symptoms, risk taking, and substance abuse. They gamble mainly for excitement and enhancement motives. According to the original Pathways Model, Pathway 1's characteristics are included in Pathway 2, and Pathway 3 includes characteristics from both the first and second pathways. The first pathway indicated less-severe gambling problems and later onset than the second and third pathways, while the third pathway revealed the most severe gambling problems. The third pathway also was viewed as a subtype of the second pathway.

The original Pathways Model was revised and updated later using empirical evidence, as the original model was purely theoretical (Nower & Blaszczynski, 2017; Nower et al., 2022). In the revised Pathways Model, the third pathway (antisocial-impulsivist) is no longer viewed as a subgroup of the second pathway (emotionally vulnerable). Instead, this group is likely to be its own separate subtype. Moreover, attention-deficit problems and comorbid substance abuse were removed from the model, as they did not discriminate between the pathways. It also was found that the escape motive is common for both the second and third subtypes, as those in the 'antisocial-impulsivist' group also gamble to alleviate stress. This group also was found to gamble for purpose or meaning, which could reflect the high priority given to gambling in an individual's life. Gambling motives still are viewed as one of the key components in the development of gambling problems after the revision.

The existence of three distinctive pathways for problem gambling proposed in the model has gained further support from several empirical studies on both clinical and nonclinical gamblers (e.g., Bonnaire et al., 2022; Devos et al., 2020; Mader et al., 2019; Nower & Blaszczynski, 2017), adolescents and young adults (Allami et al., 2017; Gupta et al., 2013) and other community samples (e.g., Hum & Carr, 2018). Most of the studies have focussed on individuals with more or less severe gambling problems, but studies on the general population are scarce. The model's developers have asserted strongly that the model should be applied only to those with clinically relevant gambling behaviour (Nower et al., 2022). However, as gambling problems form a continuum from mild problems to severe disorders (Neal et al., 2005), understanding the etiological problem gambling process justifies also applying the model to the general population (Billieux et al., 2022).

While several empirical studies have attempted to validate the model, most have focussed on validating the three subtypes proposed in the model, instead of other

aspects of the model. Recently, the role of certain components of the model, such as gambling motives, has started to gain more research interest. The model proposes that subtypes differ according to the function that gambling serves for them, and this is important in the development of problem gambling. Empirical studies have gained support for the proposed associations between gambling motives and problem gambling. The most consistent evidence concerns escape, enhancement and money motives (Alaba-Ekbo et al., 2024; Allami et al., 2025a; Tabri et al., 2022), as I described in Section 2.3. Furthermore, a few studies have found support for the other proposed associations in the model. For example, it has been found that difficulties in emotion regulation interact with gambling motives, thereby predicting problem gambling severity (Dias et al., 2025; Marchica, 2020), as described in the emotionally vulnerable pathway. Furthermore, coping motives appear to mediate the relationship between negative and positive urgency (the tendency to act impulsively under negative or positive emotions) and problem gambling (Kim et al., 2019), as in the third pathway (antisocial-impulsivist). However, most of these studies are limited to cross-sectional designs; therefore, more longitudinal research is needed.

The Pathways Model suggests that individuals have a tendency towards certain gambling motives because of their poor stress-coping strategies or individual differences in neurobiological or personality features. While being a comprehensive etiological model of problem gambling, the model does not consider the motivational behaviour arising from inherent basic needs, as noted by Dweck et al. (2023). The unmet psychological needs could explain why an individual seeks escape, money or enhancement from gambling. In the next section, I describe the theory of basic psychological needs and explain why considering their role behind gambling motives can provide more in-depth understanding of the relationship between gambling motives and problem gambling.

### 3.3 Basic psychological needs approach to problem gambling

Self-determination theory (SDT; Deci & Ryan, 2000; Ryan & Deci, 2017, 2000) is a social psychological macro theory of human motivation that provides a framework for understanding how social-contextual factors can foster psychological growth, well-being and motivation by supporting or thwarting the satisfaction of basic psychological needs. In the theory, an individual is viewed as an active agent who directs their own behaviour but needs support from the social environment to fulfil psychological needs and remain intrinsically motivated. The SDT includes six mini-

theories: cognitive evaluation theory; organismic integration theory; causality orientations theory; goal contents theory; relationship motivation theory; and basic psychological needs theory (BPNT; Ryan & Deci, 2017). I focus specifically on the BPNT.

According to BPNT, all humans have innate basic psychological needs for autonomy, relatedness and competence (Ryan & Deci, 2017). The need for autonomy refers to an individual's need to make their own life choices and decide on matters concerning themselves: They are allowed to build a life that resembles themselves. Competence refers to an individual's need to feel effective in one's own environment, capable of accomplishing tasks that are important to themselves and developing skills. Finally, relatedness refers to the need to create meaningful interpersonal relationships and experience care and belonging with others. The theory proposes that fulfilment of these basic needs is essential for healthy psychological growth, well-being and the ability to thrive. Conversely, frustration of any of these needs produces psychological discomfort and diminished well-being (Vansteenkiste & Ryan, 2013). Need frustration can arise in a situation when the social environment prevents needs from being met. For example, a highly controlling environment can produce autonomy frustration, while an environment that is highly critical or prevents individuals from developing skills, expertise or deeper understanding leads to competence frustration. Social rejection, exclusion and lack of meaningful connections produce relatedness frustration. The theory has inspired researchers from several different fields, including addiction research. Most studies in the addiction field have investigated need satisfaction and frustration in relation to digital gaming (e.g., Allen & Anderson, 2018; Park & Yap, 2025; Remedios et al., 2024), but a few studies also have applied BPNT in the field of gambling research. For example, it has been found that need frustration predicts gambling and gaming problems (Vuorinen et al., 2022). Moreover, it has been found that need frustration mediates the association between general motivations (autonomous and controlled motivation, amotivation) and problem gambling (Mills et al., 2021).

Need frustration is psychologically burdening. In a shorter time frame, need frustration elicits many kinds of ill-being, but within a longer time frame, when needs are chronically frustrated, people develop coping strategies to withstand distressing situations (Vansteenkiste & Ryan, 2013). According to the theory, people may try to cope with chronic need frustration in myriad ways, such as need substitutes and compensatory behaviours. Need substitutes are often extrinsic goals that people seek to compensate for the feeling of need frustration – such as popularity, physical attractiveness, money or other status symbols – to gain admiration and respect.

However, these substitutes never can fully satisfy basic needs, but rather can cause even more harm, as they often sustain need frustration and can lead to a negative cycle of self-harming behaviour. Then again, compensatory behaviours may involve releasing self-control (e.g., alcohol abuse, binge eating), strict behavioural patterns (e.g., setting extremely high standards to oneself) or oppositional defiance, such as rebellion towards authorities. Need substitutes and compensatory behaviours could explain why need frustration has been associated with addictive behaviours, such as problem gambling. For example, as gambling is essentially built around winning money, it may seem like an easy way to make money for an individual who tries to gain approval and appreciation through wealth.

To date, only a few studies have considered both basic psychological needs and gambling motives simultaneously. For example, Jouhki et al. (2024) investigated the role of escapism and need frustration in gambling and gaming problems, finding that competence frustration moderated the association between escapism and problem gambling. Another recent study investigated the moderative roles of relatedness frustration and loneliness in the relationship between social gambling motives and problem gambling (Floyd et al., 2025). The finding suggests that loneliness could motivate people to find social connections and friends through gambling, but it ultimately leads to gambling problems. As loneliness is a painful experience that results from a lack of meaningful relationships (Cacioppo & Patrick, 2008), it is also possible that the hurtful experience of loneliness leads an individual to seek relief and distraction from gambling (escape motive), but this option has not been examined yet. As the evidence concerning the relationship between loneliness and problem gambling is inconsistent (Nordmyr & Forsman, 2020), more research is needed.

In summary, while both need frustration and gambling motives appear to play a role in problem gambling, only a few extant studies have considered both of these factors simultaneously. Gambling may serve as a need substitute or a compensatory mechanism for individuals who experience need frustration, as it can be viewed as a way to gain money or appreciation, particularly for those individuals who are driven by extrinsic goals. Alternatively, it is possible that people turn to gambling to seek relief and distraction from the distressing feelings associated with unmet psychological needs. Understanding the dynamic relations between need frustration, gambling motives and problem gambling is crucial, as relying on need substitutes or compensatory behaviours can accelerate a self-harming cycle. Therefore, further research is needed to deepen the understanding of these dynamics, particularly through longitudinal designs that can capture these processes over time.

### 3.4 Integrative approach to gambling motives and problem gambling

Considering the discussion above, it can be said that motivation is central to understanding both gambling participation and problem gambling. Motivation is the driving force of behaviour that is influenced by basic psychological needs for autonomy, relatedness and competence (Dweck et al., 2023; Ryan & Deci, 2017). Satisfaction of basic psychological needs is crucial for an individual's well-being, while frustration of basic needs elicits discomfort and ill-being, such as addictive behaviours. Despite this, the gambling motives among Finnish residents have not been investigated in detail. This literature gap is particularly significant, as the Finnish gambling system soon will undergo a reformation, in which the current monopoly system will be partly opened to international competition. This reform aims to improve the channelling rate, as gambling on unregulated offshore gambling websites is rising, and the current monopoly system is unable to prevent it (Grönroos et al., 2024). Therefore, representative population-based studies are needed to understand how gambling motives vary across different sociodemographic groups and gambling participation in Finland.

The CFHG (Abbott et al., 2018; Hibrecht et al., 2020) is a summary of all the factors contributing to problem gambling, drawing from numerous previous theoretical approaches, including the Pathways Model (Blaszczynski & Nower, 2002) and other biopsychosocial addiction models, to gather all existing knowledge of the factors associated with problem gambling. Thus, the framework provides a useful basis for recognising problem gambling's multifaceted nature. However, the framework does not explain in detail how these varying factors interact with each other. Therefore, it is necessary to consider other theoretical models of addiction, problem gambling and motivation to gain a holistic understanding of motivational processes' role in problem gambling.

Addiction can be viewed as a dysfunction of a motivational system, in which an individual places excessively high importance on a certain activity regardless of the harmful consequences (e.g., Orford, 2001; West & Brown, 2013). Furthermore, motives are goals that the individual seeks through addictive behaviours, such as gambling (Köpetz et al., 2013). However, problem gambling notably does not manifest in the same way for everyone. According to the Pathways Model, there are three distinctive subtypes, or etiological pathways, for problem gambling (Blaszczynski & Nower, 2002). Each subtype shares a unique combination of psychological, cognitive, neurobiological and ecological risk factors. Some risk

factors are common for all three subtypes, while others, such as certain motives, are associated mainly with a specific subtype. Thus, gambling motives play a central role in explaining the development of problem gambling. However, the Pathways Model does not discuss in detail why individuals are motivated to seek certain things through gambling. Considering the role of basic psychological needs in gambling motives could help gain a deeper understanding of the link between gambling motives and problem gambling. If basic needs are not sufficiently fulfilled in an individual's life, the individual may turn to gambling, either to find a substitute for the unsatisfied need or to try to relieve the discomfort caused by the frustration of a basic need. This could help explain why certain social contexts or experiences, such as loneliness and lack of important relationships, have been linked to problem gambling (Edgren et al., 2016; McQuade & Gill, 2012; Sirola et al., 2019). While frustration of basic psychological needs has been associated with problem gambling (e.g., Floyd et al., 2025; Jouhki et al., 2024; Mills et al., 2021; Vuorinen et al., 2022), only a few studies have considered basic psychological needs and gambling motives concurrently in gambling problems.

This dissertation aims to apply different theoretical approaches from the fields of social psychology, gambling research and social scientific addiction research to investigate motives' role in gambling participation and problem gambling. Combining multiple approaches can provide a holistic understanding of the complex social psychological and motivational processes behind problem gambling.

## 4 STUDY AIMS, RESEARCH QUESTIONS AND HYPOTHESES

This dissertation's main objective was to investigate how gambling motives relate to gambling participation and problem gambling – more specifically, to produce general knowledge on gambling motives and how they relate to sociodemographic and gambling participation-related differences, including offshore gambling. The second aim was to investigate the longitudinal dynamics between gambling motives, problem gambling and frustration of basic psychological needs. To address these general aims, four studies were conducted. In addition to this dissertation's general aims, each study has its own research questions and hypotheses. Next, I discuss the four articles' topics in more detail and describe their exact research questions and hypotheses.

### 4.1 How are gambling motives associated with sociodemographic differences and gambling participation?

**Article I** aimed to produce general knowledge on Finnish residents' gambling motives and the sociodemographic and gambling participation-related differences associated with them. Although gambling in Finland is common, and around 70% of the population has gambled in the past 12 months, relatively little is known about the reasons why Finns gamble. Finns' gambling motives have been described briefly in the national statistical reports (e.g., Salonen et al., 2019, 2020), but no more in-depth research has been published. More specifically, the aim was to investigate the prevalence of different gambling motives and their associations with age, gender, monthly income, employment status, gambling frequency, number of game types, gambling mode and severity of problem gambling. Furthermore, change within the gambling motive categories and in the number of motives was investigated across one year. The study aimed to answer the following research questions:

**RQ1:** What is the prevalence of primary and additional gambling motives among Finnish residents?

**RQ2:** How are gambling motives associated with sociodemographic differences and gambling participation?

**RQ3:** How do gambling motives change across one year?

## 4.2 How do gambling motives relate to offshore online gambling?

**Article II** focussed on offshore and onshore online gambling in Finland. Offshore gambling's popularity is rising (Grönroos et al., 2024), which poses challenges to gambling regulation both in Finland and globally. Moreover, offshore gambling has been linked to problematic gambling behaviour (Gainsbury et al., 2019; Oksanen et al., 2022). Offshore gambling operators provide gambling opportunities in their online casinos without an official license in a given jurisdiction, thereby evading gambling regulations and taxes (Gainsbury et al., 2018). The Finnish gambling system will be partially opened to competition in the near future so that offshore gambling could be better channelled towards becoming officially licensed and regulated. Thus, it is important to understand the gambling motives of those who choose to gamble with offshore online casinos compared with those who gamble with onshore websites only. The study aimed to answer the following research questions:

**RQ4:** How do gambling motives differ between offshore and onshore online gamblers?

**RQ5:** What are the specific reasons for offshore gambling?

## 4.3 Does the frustration of basic psychological needs moderate the association between gambling motives and problem gambling?

Extant literature has established the link between gambling motives and problem gambling (e.g., Allami et al., 2025a). Furthermore, the literature suggests that frustration of basic psychological needs predicts problem gambling (e.g., Vuorinen et al., 2022; Mills et al., 2021). However, the psychological need frustration behind gambling motives has not been studied much, and the longitudinal evidence on the matter is scarce. Thus, **Article III** investigated whether gambling motives predict problem gambling over time, and whether frustration of basic psychological needs

moderates associations between gambling motives and problem gambling using a longitudinal design with three time points. The study aimed to answer the following research questions:

**RQ6:** Do gambling motives predict gambling problems over time?

**RQ7:** Does frustration of basic psychological needs moderate the association between gambling motives and problem gambling?

Based on the extant literature, it was hypothesised that the escape and money motives would predict gambling problems over time, and that this association would be stronger if basic psychological needs are frustrated.

**H1:** Gambling to escape and win money predict gambling problems over time.

**H2:** Frustration of basic psychological needs moderates the association between gambling motives and gambling problems.

#### 4.4 How do the escape motive, loneliness and gambling problems relate to each other?

The evidence concerning the association between loneliness and problem gambling is inconsistent (Fordmyr & Håkansson, 2020), which is why the topic must be studied further. Considering the escape motive's role could shed light on this relationship. Loneliness is a painful experience that causes frustration of the basic psychological need for relatedness (Ryan & Deci, 2017). The distress caused by loneliness can elicit the need to avoid and escape the distressing feelings. As some people use gambling to escape negative thoughts and emotions (e.g., Francis et al., 2015), loneliness could lead to seeking escape and relief from gambling. Gambling to escape, in turn, has been associated consistently with problem gambling (Alaba-Ekbo et al., 2024). However, it is equally possible that those with gambling problems want to hide their problems and, thus, isolate themselves from other people (Hing et al., 2016), thereby causing loneliness (Dabrowska & Wieczorek, 2020). **Article IV** aimed to investigate the longitudinal dynamics between the escape motive, loneliness and gambling problems across five time points. The within-person and between-person levels were separated in the analysis. The study aimed to answer the following research questions:

**RQ8:** How do the escape motive, loneliness and gambling problems relate to each other on within-person and between-person levels?

Based on the extant literature, we stated the following hypotheses on the within-person level:

**H3:** Loneliness predicts future gambling to escape.

**H4:** Loneliness predicts future gambling problems.

**H5:** Gambling problems predict future loneliness.

**H6:** Gambling problems predict future gambling to escape.

**H7:** Gambling to escape predicts future gambling problems.

**H8:** Gambling to escape predicts future loneliness.

On the between-person level, we hypothesised that the escape motive, loneliness and problem gambling correlate positively (**H9**).

## 5 DATA AND METHODS

In this chapter, I describe the data, measures and statistical techniques used to provide answers to the research questions. At the end of this chapter, I also present ethical considerations related to the studies.

### 5.1 Data

#### 5.1.1 Gambling Harms Survey 2016–2017

**Article I** utilised data from the longitudinal Gambling Harms Survey 2016–2017 (PI: Anne H. Salonen), which was launched to investigate gambling participation and gambling-related harm and opinions on gambling marketing during and after the reform of the Finnish gambling monopoly, when three gambling operators were combined into one monopoly operator, Veikkaus Oy. Statistics Finland collected the Wave I data through a postal and Internet survey between 9 January and 27 May 2017, and it assessed the situation in 2016 retrospectively right before the reform (Salonen et al., 2017). The data for Wave II was collected between January and April 2018, in which gambling and gambling harm were assessed in a similar manner retrospectively for 2017. The study's population included Finnish residents from Uusimaa, Pirkanmaa and Kymenlaakso regions who were 18 or older and whose first language was Finnish or Swedish. The participants were selected randomly from the population register ( $N = 20,000$ ), and 7,186 acceptable responses were received (response rate: 36.1%).

The nonresponse analysis of the Finnish Gambling Harms 2016–2017 (Kontto et al., 2025) survey indicated that some subpopulations were more difficult to reach, such as men, those ages 18–54, those with primary or secondary education, the unemployed and those with a mother tongue other than Finnish or Swedish. In contrast, women, those ages 55–84, those with tertiary education, white-collars, retired and those living in a household with only adults registered a higher response rate. However, analytical weights were used to correct this bias. The weights were

calibrated using the distributions of the selected variables (age, gender, education level, region) estimated from the research data which were forced to correspond to the population distributions (Salonen et al., 2019).

Article I included only participants with past-year gambling and information on gambling motives ( $n = 5,684$ ; female 49.9%;  $M_{\text{age}} = 17.7$  years). Participants who did not have any information on gambling motives were excluded from the study ( $n = 121$ ). The data were weighted by gender, age, education and area of residence to ensure representativeness. The weighting was calibrated so that the sample's distributions for these variables matched those of the Finnish population. The Wave II data were collected between 15 January and 30 April in 2018, after the gambling system reform, from participants who provided their consent for the invitation to Wave II (Salonen et al., 2019). Altogether, 2,684 participants (57% from Wave I) participated in both waves. Of these, 2,078 (49.4% women) were past-year gamblers and were included in the longitudinal analysis of Article I.

### 5.1.2 Finnish Gambling Survey 2019

**Article II** utilised data from the Finnish Gambling Survey 2019 (PI: Anne H. Salonen). The Finnish Ministry of Social Affairs and Health assigned the Finnish Institute of Health and Welfare to monitor and investigate Finns' gambling behaviour, problems, attitudes and opinions towards gambling according to Section 52 of the Lotteries Act. The survey is administered every four years. The target population of the 2019 survey was Finnish residents ages 15–74 living in Mainland Finland ( $N = 7,800$ ). Statistics Finland collected the data using computer-assisted phone interviews (CATI) between 2 September and 13 December using random sampling. Overall, 3,994 (50.7% women,  $M_{\text{age}} = 45.0$  years) participants completed the survey, and the response rate was 51.9%. Only participants who were 18 or older and had gambled online during the previous 12 months were included in the study ( $n = 1,422$ , 36.9% women, 63.1%  $M_{\text{age}} = 44.5$  years).

The nonresponse analysis revealed that younger age groups and those living in cities were more reluctant to participate in the survey than older age groups and those living in the countryside. Furthermore, the response rate among men was slightly higher than women in the same way as in the previous Finnish Gambling Surveys (Kontto et al., 2020; Salonen et al., 2020). It is possible that gambling, as a topic of the survey, motivates more men than women to participate in the survey. The nonresponse analyses from Finnish Gambling Survey 2015 indicated that a lower

response rate was associated with lower socioeconomic status, which includes low income and education levels (Kontto et al., 2020). This also might be the case with the Finnish Gambling 2019 survey, although a detailed nonresponse analysis has not yet been published. However, analytical weights based on gender, age and region of residence were used to address the bias (Salonen et al., 2020).

### 5.1.3 Gambling in the Digital Age 2021–2024 survey

**Articles III** and **IV** utilised data from the longitudinal Gambling in the Digital Age survey collected during the Gambling in the Digital Age Project (Tampere University, 2021–2024, PI: Atte Oksanen). The Finnish Foundation of Alcohol Studies funded the project. The survey aimed to examine emerging types of gambling among Finnish individuals, with a particular emphasis on the Internet’s influence on gambling and potential risks associated with these new gambling forms. The participants were recruited from an online panel of the European data collection company Norstat, which collects participants’ data for a specific survey by drawing from its existing, pre-recruited online panels. Panel members then are filtered and selected based on their demographic and profile information to match the criteria for a specific target group. Invitations then are sent to this target group via email or their online platform. This survey targeted Mainland Finland residents 18–75 years old and was restricted to those who spoke Finnish. The participants were surveyed at six-month intervals starting in April 2021 (T1). The response rate in T1 was 34.60% ( $N = 1,530$ ). The participants evenly represented all the regions of Mainland Finland: the Helsinki-Uusimaa capital area (36.30%); Southern Finland (20.25%); Western Finland (24.27%); and Northern and Eastern Finland (19.18%).

**Article III** utilised data from the first three time points of the survey. T2 was surveyed between October and November 2021 ( $n = 1,198$ ), and T3 was surveyed between April and May 2022 ( $n = 1,100$ ). Of the participants, 1,022 participated at all three time points, which was 66.80% of the initial T1 (51.27% male, 48.43% female; 0.03% other gender,  $M_{age} = 49.50$  years), and were included in Article III’s final sample. The nonresponse analysis of the sample did not reveal any major biases, and the sample corresponded with the general Finnish population relatively well (Hagfors et al., 2023; Oksanen et al., 2022a). **Article IV** utilised data from five time points (T1–T5). T4 was collected in October–November 2022 ( $n = 1,008$ ), and T5 was collected in April–May 2023 ( $n = 934$ ). Only those who participated at all five time points ( $n = 812$ ) and gambled at least monthly with at least one game type during the

2.5 years of data collection were included in the final sample ( $n = 612$ , 40.00% of the original T1 sample, 54.58% men, 45.42% women, 0.16% other gender). The nonresponse analysis revealed that those who participated at all five time points and had gambled at least monthly were slightly older than the original T1 participants (the mean age at T1 was 46.67 vs. a mean age of 51.84 at T5). Moreover, the final sample contained slightly fewer at-risk gamblers than the initial T1 sample (scoring 5 or higher on the PGSI, 9.48% at T1 vs. 8.99% at T5). Other than that, the sample did not contain any major biases compared with the general Finnish population.

## 5.2 Measures

### 5.2.1 Dependent variables

In **Article I**, gambling motives were the dependent variables and were measured using a two-part question to distinguish between primary and additional motives. First, the primary motive for gambling was asked using a single, categorical question: 'What would you say is the main reason why you gamble?' The participants were instructed first to choose one main motive (primary motive). After that, additional motives were asked about with this question: 'What other reasons do you have for your gambling?'. After the participants selected all the other reasons for their gambling, they were coded into separate dummy variables. The response options included the following: 'For excitement, entertainment or fun'; 'Because it makes you feel good about yourself'; 'To win money'; 'To escape or distract yourself'; 'To socialise with family or friends'; 'To support worthy causes'; 'Other reason'; and 'Do not know'. The responses then were recoded into six motive categories in line with the Massachusetts Baseline Population Survey (Volberg et al., 2015). The options 'For excitement, entertainment or fun' and 'Because it makes you feel good about yourself' were combined into a positive feeling category. The options 'Other reason' and 'Do not know' also were combined. The final six motive categories were positive feelings, money, escape, socialising, supporting worthy causes and other/do not know. For the logistic regression analysis, primary and additional motives were combined into a single binary variable for each motive type (1 = yes, 0 = no). For example, the money motive was recoded as 1 if the participant selected it either as their primary motive or as one of their additional motives.

In **Article II**, the dependent variable was offshore gambling, which was defined by participating in 18 predefined game types provided by different operators. Games provided by Finnish monopoly operator Veikkaus Oy were viewed as onshore gambling. Games provided by Paf or some other offshore gambling operators were viewed as offshore gambling. Those who gambled only through online games provided by Veikkaus were assigned to onshore gamblers, and those who gambled through online games on offshore gambling websites in addition to Veikkaus' games were viewed as offshore gamblers. Based on this, a dichotomous variable was created in which 0 = onshore gambler and 1 = offshore gambler.

In **Article III**, the dependent variable was gambling problems, which were measured using the PGSI (Ferris & Wynne, 2001; Currie et al., 2010). The nine-item PGSI was found to be reliable in measuring gambling severity in population surveys (Currie et al., 2013). The original PGSI scale evaluates gambling behaviour and problems during the past 12 months, but in this study, the scale was modified to measure gambling problems during the past six months. The scale comprises nine items, and each item is assessed within a four-point scale. We measured the scale's internal consistency using McDonald's omega ( $\omega$ ) coefficient (Dunn et al., 2014). McDonald's omega indicated high internal consistency at all three time points (T1:  $\omega = 0.94$ ; T2:  $\omega = 0.93$ ; T3:  $\omega = 0.94$ ).

In **Article IV**, three variables (the escape motive, loneliness and gambling problems) were used, and due to the analytical method's nature, each variable served as a predictor/independent variable and as an outcome/dependent variable. Loneliness was measured through the widely used UCLA Three-Item Loneliness Scale (Hughes et al., 2004). The items measure experiences of loneliness, social isolation and being left out. All the items were assessed using a three-point scale (0 = *Hardly ever*, 1 = *Occasionally*, 2 = *Often*), and the scale's values ranged from 0 to 6. Higher values indicate a greater experience of loneliness. Based on McDonald's omega, the scale registered good internal consistency (T1:  $\omega = 0.84$ ; T2:  $\omega = 0.83$ ; T3:  $\omega = 0.85$ ; T4:  $\omega = 0.84$ ; T5:  $\omega = 0.84$ ).

The escape motive was measured using three items from the Motivations to Play Inventory (Hagström & Kaldö, 2014; Jouhki et al., 2022; Yee, 2006), measuring how negative escapism impacts gambling behaviour. Using the anchor 'How often in the last six months have you...' the participants were asked '...gambled to avoid thinking about some of your real-life problems or worries?', '...gambled to avoid real-life social encounters or situations?' and '...continued to gamble to avoid having to deal with everyday problems and conflicts?'. The items were assessed using a five-point scale (0 = *Never*, 1 = *Rarely*, 2 = *Sometimes*, 3 = *Often*, 4 = *Always*). The scale's values

ranged from 0 to 12, with higher values indicating a greater prevalence of escapist motive to gamble. The scale's internal consistency was good: T1:  $\omega = 0.86$ ; T2:  $\omega = 0.86$ ; T3:  $\omega = 0.87$ ; T4:  $\omega = 0.84$ ; T5:  $\omega = 0.87$ .

Finally, gambling problems were measured using the PGSI mentioned earlier in this section. McDonald's omega coefficients indicated high internal consistency at all five time points: (T1:  $\omega = 0.94$ ; T2:  $\omega = 0.94$ ; T3:  $\omega = 0.94$ ; T4:  $\omega = 0.94$ ; T5:  $\omega = 0.94$ ).

## 5.2.2 Independent variables and controls

In **Article I**, the following independent variables were used: gender; age; monthly income; employment status; number of game types; gambling frequency; gambling mode; and the gambling problem's severity. Gender and age were derived from register, and age was recoded into six age groups (18–24, 25–34, 35–44, 45–54, 55–64 and  $\geq 65$ ). Monthly income and employment status were requested directly from the participants. Income was recoded into four categories based on quartiles. The number of game types and gambling frequency were calculated based on 18 game types. Gambling frequency was determined by the game type, with participants reporting gambling most often. The gambling mode was assessed using a categorical question with three response options (land-based, mixed-mode, online only), which then were recoded into two categories: land-based gambling and online or mixed-mode gambling.

Problem gambling severity was measured using the validated 14-item Problem and Pathological Gambling Measure (PPGM; Williams & Volberg, 2010, 2014). The PPGM measure comprises three subscales that measure gambling-related harm (Harm scale), difficulties in controlling gambling (Impaired Control scale) and preoccupation, tolerance and withdrawal (Other Issues scale) (Gooding et al., 2024). The total score ranges between 0–14, and the measure classifies individuals into five categories: no gambling; recreational gambling; at-risk gambling; problem gambling; and pathological gambling. The categories were recoded as follows: recreational gambling; at-risk gambling; and problem or pathological gambling. No non-gamblers were included, as the data encompassed only past-year gamblers. The measure has been found to be reliable and accurate in classifying different levels of gambling problem severity in general population and clinical samples (Molander & Wennberg, 2022; Williams & Volberg, 2010, 2014). The measure's Cronbach's alpha was 0.91, indicating excellent internal consistency.

In **Article II**, the independent variables comprised gambling motives, number of different motives, gambling frequency, gambling expenditures, gambling problems, age and gender. Gambling motives were assessed by asking the participant for their main reason for gambling (see Williams et al., 2017). The question included 10 predefined answer options that were recoded into seven motive categories – 1) Positive feelings, 2) Money, 3) Socialising, 4) Supporting worthy causes, 5) Escape, 6) Challenge and 7) Other – in line with Volberg et al. (2015) (see a more detailed description of the coding in Hagfors et al., 2024). First, the participants were instructed to choose only one primary motive and then asked what their additional motives for gambling were. In the analysis, primary and additional motives were combined, and a dummy variable was created for each motive in a similar manner as in Article I (see Section 5.2.1. The challenge motive was not included in the analysis, as very few participants chose it. The number of motives was calculated based on these motives and ranged between 0 and 6.

Severity of problem gambling in the past 12 months was assessed using the PGSI (Ferris & Wynne, 2001). PGSI items use a four-point scale: 0 = *never*; 1 = *sometimes*; 2 = *most of the time*; and 3 = *almost always*. Total scores range from 0 to 27, and higher scores indicate a more severe gambling problem. The scale demonstrated excellent reliability, with McDonald's omega at 0.89. Gambling frequency was determined based on the game type the participants reported using most often. Participants also were asked about their gambling expenditures, which they could report within one week, month or year. These answers then were used to calculate weekly gambling expenditures. Participants also were asked for their age and gender.

In **Article III**, gambling motives and psychological need frustration were the main independent variables. Psychological distress, offshore and onshore gambling, age, gender, education, employment status and income were used as controls. Gambling motives were measured using eight individual questions, with each question focussing on a specific motive. The escape motive was measured with three questions from the Motivation to Play Inventory (Hagström & Kaldo, 2014) regarding negative escapism. The other motives were gambling for money, competition, excitement, social interaction and competence. All motives were assessed using a five-point scale, with higher numbers indicating higher endorsement of the motive. The scale measuring gambling to escape indicated good internal consistency at all three time points (T1:  $\omega = 0.84$ ; T2:  $\omega = 0.87$ ; T3:  $\omega = 0.88$ ).

Frustration of basic psychological needs was measured using the Basic Psychological Need Satisfaction and Frustration Scale (BPNSFS; Chen et al., 2015).

The 24-item scale measures the satisfaction and frustration of three basic psychological needs: autonomy; competence; and relatedness. Of these questions, 12 measure satisfaction, and 12 measure frustration of these needs. For this study's purposes, we selected only the 12 frustration-related items: Four measure autonomy frustration; four measure relatedness frustration; and four measure competence frustration. All the items were assessed using a seven-point scale ranging from 1 (*not at all true*) to 7 (*totally true*). These three frustration subscales were combined to measure psychological need frustration in general. The scale was included only at the first time point but registered high internal consistency ( $\omega = 0.92$ ).

We measured psychological distress using the five-item Mental Health Inventory (MHI-5; Berwick et al., 1991), which assesses general mental health and distress using five items (see Hagfors et al., 2023). All the items were assessed using a six-point scale (1 = *none of the time* ... 6 = *all of the time*), in which higher points indicate more psychological distress. The scale's internal consistency was high at all three time points (T1:  $\omega = 0.89$ ; T2:  $\omega = 0.88$ ; T3:  $\omega = 0.87$ ). Questions about offshore and onshore gambling were asked, with individual questions concerning gambling on the websites provided by Paf or other offshore gambling websites. The participants were categorised as offshore gamblers if they gambled on websites provided by Paf and/or any other offshore gambling website. Participants were categorised as onshore gamblers if they had not gambled on any offshore gambling websites. Based on the answer, two dichotomous variables were created: offshore gambling and onshore gambling. Finally, the participants were asked for their age, gender, income, employment status and education.

## 5.3 Statistical techniques

### 5.3.1 Descriptive statistics

Descriptive statistics were used in all the studies. In **Article I**, the prevalence of primary and additional gambling motives was described using frequencies and percentages. In **Article II**, Pearson's chi-square ( $\chi^2$ ) test was used to compare differences between offshore and onshore online gamblers. In **Articles III** and **IV**, frequencies ( $n$ ), percentages, means and standard deviations were used to describe the main variables and the sample's characteristics. The pairwise correlations between the variables also were assessed using Pearson's correlation coefficient in

**Article IV.** The descriptive analyses were computed using IBM SPSS Version 27.0 statistical software (IBM Corp. 2020), Stata 17.0 (StataCorp, 2021) software and Stata 18.0 (StataCorp, 2023) software.

### 5.3.2 McNemar's test

McNemar's test was used in **Article I's** sub-study to investigate changes in gambling motives in one year. McNemar's typically is used with dichotomous variables in pretest-posttest study designs (Bokhove, 2018). The test compares whether the proportion of the participants who switched their category in one direction is significantly different from the proportion of those who switched in the other direction (Smith & Ruxton, 2020). This method allowed us to investigate whether or not the participants in our study chose the same motive category after a year, and whether changes occurred in the number of motives the participants had chosen. Furthermore, *p*-values were used to assess statistical significance, and the tests were conducted using IBM SPSS 27.0 statistical software.

### 5.3.3 Logistic regression

In **Articles I and II**, multivariate logistic regression was used as the main analytical method. Logistic regression analysis can be used to examine the associations of binary dependent variables with binary, ordinary or continuous independent variables (Osborne, 2015; Tabachnick & Fidell, 2014). The logistic regression model predicts probability of a binary outcome, and the strength of the association between dependent and independent variables can be estimated using odds ratios (*ORs*). *ORs* indicate the change in the likelihood of the outcome to occur for each one-unit increase in the independent variable.

In **Article I**, associations between gambling motives and sociodemographic and gambling behaviour-related variables were examined using five logistic regression models. Gambling motives were treated as dependent variables, while sociodemographic variables (gender, age, income, employment status) and gambling behaviour-related variables (gambling frequency, number of game types, gambling mode, gambling severity) were treated as independent variables. For the models, primary and additional motives were combined to represent gambling motives more broadly. We reported regression coefficients (*B*) with their standard errors (*SEs*),

ORs,  $p$ -values and 95% confidence intervals. All the analyses were conducted using IBM SPSS 27.0 statistical software.

In **Article II**, logistic regression was used to predict offshore online gambling. Gambling motives, number of motives, sociodemographic variables (age and gender) and gambling participation-related variables (frequency, expenditure, gambling severity) were used as independent variables. The independent variables' effects are expressed as regression coefficients ( $B$ ) with their SEs, ORs, and 95% confidence intervals. Wald  $\chi^2$ -coefficients and  $p$ -values also were reported to determine statistical significance. The analysis was conducted using IBM SPSS 27.0 statistical software.

### 5.3.4 Multilevel linear mixed-effects and fixed-effects regression

**Article III** used multilevel linear mixed-effects regression to predict gambling problems over time. Multilevel linear mixed-effects regression allows for estimating both within-person and between-person differences in gambling problems. Time-varying within-person predictors were gambling motives, need frustration, psychological distress, offshore and onshore gambling, occupational status and income. Age, gender and education were added as between-person predictors, as they were measured only at T1.

In Model 0, each gambling motive is added to the model separately, without any other variables. In Model 1, all the variables – including gambling motives, need frustration, psychological distress, offshore/onshore gambling and control variables – were added simultaneously. Model 2 builds on Model 1 by adding interaction terms between each gambling motive and need frustration. We reported the unstandardised regression coefficients ( $B$ ), their standard errors ( $SE B$ ) and the estimates' statistical significance ( $p$ ) for the fixed part of the models. Random intercepts and random slopes for time with an unstructured covariance structure are included in the models. For the random parts of the models, regression coefficients ( $B$ ), their standard errors ( $SE B$ ) and 95% confidence intervals were reported.

We also checked the findings' robustness using multilevel fixed effects regression analysis. Fixed effects regression is particularly useful in causal inference, as it focusses solely individual variation over time and excludes all the between-person person variance, including unobserved confounders (Brüderl & Ludwig, 2015). Both multilevel mixed effects and fixed effects regression analyses were conducted using Stata 17.0 software (StataCorp, 2021).

### 5.3.5 Random intercept cross-lagged panel model

In **Article IV**, we employed a random-intercept cross-lagged panel model (RI-CLPM) to examine how the escape motive, loneliness and gambling problems relate to each other over five time points. The RI-CLPM is based on structural equation modelling (SEM), and it decomposes the observed variance into time-varying within-person changes and time-invariant between-person differences (Mulder & Hamaker, 2021; Hamaker et al., 2015). A maximum likelihood estimator (MLE) with robust standard errors was used, and we also conducted square root transformations for the variables to adjust for multivariate nonnormality. In Model 1, we did not set any constraints for the parameters. In Model 2, we constrained all the path coefficients and covariances of the error terms to be equal over time. We reported the chi-square test statistics, comparative fit index (CFI), root mean square error of approximation (RMSEA) and standardised root mean squared residual (SRMR) to estimate model fit. The model fit statistics on Models 1 and 2 were compared to determine whether the constrained model (Model 2) registered a significantly worse fit than the unconstrained model (Model 1). A change of less than  $-0.01$  in CFI was viewed as evidence that the constrained model did not have a significantly worse fit than the unconstrained model. (Putnick & Bornstein, 2016). The analysis was conducted using the lavaan package for R Version 0.6-17 (Rosseel, 2012).

## 5.4 Data-driven content analysis

In **Article II**, data-driven content analysis was used to analyse the open-ended questions considering the specific reasons to gamble on offshore gambling websites. For the analysis, two authors independently developed the coding structure, i.e., without knowledge of each other's work. After establishing the coding structure, both authors conducted an independent review of the data. Finally, a third author conducted a statistical interrater reliability analysis. Cohen's kappa values ranged between  $\kappa = 0.86-1.00$  ( $p < .00-.001$ ), indicating high interrater reliability.

**Table 1.** Overview of each study's research questions (RQ), hypotheses (H), data and methods.

	<b>Article I</b>	<b>Article II</b>	<b>Article III</b>	<b>Article IV</b>
RQs and Hs	RQs 1–3	RQs 4–5	RQs 6–7 H1–H2	RQ8 H3–H9
Data and target population	Gambling Harms Survey 2016–2017 (2 waves)  Finnish residents 18–75 years old living in the Uusimaa, Pirkanmaa and Kymenlaakso regions	Finnish Gambling 2019 survey  Finnish residents 18–75 years old	Gambling in the Digital Age 2021–2024 (3 time points)  Finnish residents 18–75 years old	Gambling in the Digital Age 2021–2024 (5 time points)  Finnish residents 18–75 years old
Participants	Wave I: $n = 5,685$ Wave II: $n = 2,078$  Finnish past-year gamblers 18–75 years old	$n = 1,422$  Finnish past-year online gamblers 18–74 years old	$n = 1,022$  Finnish residents 18–75 years old	$n = 612$  Finnish regular gamblers 18–75-years old
Methods	Logistic regression McNemar's test	Logistic regression Data-driven qualitative analysis	Multilevel linear mixed-effects regression	Random intercept cross-lagged panel modelling
Dependent variable/s	Gambling motives	Offshore/onshore online gambling	Gambling problems (PGSI)	Loneliness (UCLA Loneliness Scale), Gambling to escape (MPI), Gambling problems (PGSI)
Independent variables	Age, gender, income, employment status, gambling frequency, number of game types, gambling mode, gambling problems (PPGM)	Gambling motives, number of different gambling motives, age, gender, gambling frequency, gambling expenditure, gambling problems (PGSI)	Gambling motives, need frustration (BPNSFS), psychological distress (MHI-5), offshore and onshore online gambling, sociodemographics	

## 5.5 Ethical considerations

I strived to adhere to high ethical standards throughout this research project. As problem gambling is a sensitive topic, it is of the utmost importance to maintain confidentiality and care to protect the research participants. Therefore, several ethical considerations were addressed. Informed consent was required from participants from all the research projects to ensure that participants understood the topic's sensitive nature, that participation was completely voluntary and that they had the right to withdraw at any point during the study. The participants' anonymity was ensured in all the research projects, as only anonymised data were provided to the researchers. Research groups conducted quality and integrity checks of the data, which were restored and handled according to official data protection guidelines. Furthermore, it was ensured that all the results were reported so that it was impossible to identify participants even indirectly.

The research proposals for these three research projects went through an official ethical review before the studies were implemented. The Ethics Committee of the National Institute for Health and Welfare (THL) reviewed the Gambling Harms 2016–2017 survey proposal and stated that there are no ethical concerns (THL/1390/6.02.01/2016). Furthermore, the ethical board of Statistics Finland provided an additional review for combining register data with survey data for subsequent research. Similarly, the Ethics Committee of THL reviewed and supported the Finnish Gambling 2019 survey proposal (THL/774/6.02.01/2019). The ethical board of Statistics Finland reviewed the combination of register-based data with survey data and found no ethical issues. Finally, the Ethical Committee of Tampere Region reviewed the research proposal for the Gambling in the Digital Age survey 2021–2024 and found no ethical issues (Statement 24/2021). Furthermore, all the surveys complied with the research guidelines of the Finnish National Board on Research Integrity (TENK).

## 6 OVERVIEW OF THE MAIN FINDINGS

In this section, I describe the main findings of the articles in light of the dissertation's general research questions.

### 6.1 Article I: Gambling motives, sociodemographics, and gambling participation

**Article I** examined the prevalence of Finnish residents' gambling motives and their associations with sociodemographic and gambling participation-related factors. Furthermore, gambling motives' stability across one year also was assessed. According to the results, the most common motives for gambling among Finns were winning money and positive feelings. Of the participants, 52.2% chose money as their primary motive for gambling and 24.0% as an additional motive, while 32.6% selected positive feelings as their primary motive and 29.4% as an additional motive. These were also more likely to be chosen as primary motives than additional motives. However, socialising (2.7% primary motive, 7.2% additional motive), supporting worthy causes (2.9% primary motive, 17.7% additional motive) and escape (0.5% primary motive, 3.0% additional motive) were selected as additional motives more often than primary motives. Escape was the rarest gambling motive.

The results from the logistic regression models revealed notable differences in gambling motives in terms of their associations with sociodemographic and gambling behaviour-related factors. Regarding sociodemographic factors, it was found that men had lower odds of gambling for money than women ( $OR = 0.73$ , 95% CI 0.63–0.83). Older age groups had lower odds of gambling for positive feelings ( $ORs = 0.33$ – $0.69$ , 95% CI 0.20–0.94) and socialising ( $ORs = 0.38$ – $0.49$ , 95% CI 0.24–0.80) than 18–24-year-olds and, whereas supporting worthy causes was the most common among those who were 55 or older compared with the youngest age group ( $ORs = 1.46$ – $2.12$ , 95% CI 1.04–3.28). Being in the highest income quartile increased the odds of gambling for positive feelings compared with the lowest income quartile ( $OR = 1.42$ , 95% CI 1.14–1.76). Being a homemaker increased the odds of gambling to escape ( $OR = 2.69$ , 95% CI 1.31–5.53) but decreased the odds of gambling to

support worthy causes ( $OR = 0.44$ , 95% CI 0.24–0.80) compared with those who were employed.

Regarding gambling participation, it was found that more frequent gambling increased the odds of gambling for positive feelings, money and supporting worthy causes, but decreased the odds of gambling for socialising. Gambling with multiple game types increased the odds of gambling for positive feelings ( $ORs = 1.59$ – $4.09$ , 95% CI 1.35–4.87) and socialising ( $ORs = 1.37$ – $2.31$ , 95% CI 1.03–3.04). Online or mixed-mode gambling increased the odds of gambling for money ( $OR = 1.64$ , 95% CI 1.41–1.91), while it decreased the odds of gambling for socialising ( $OR = 0.66$ , 95% CI 0.54–0.81) or worthy causes ( $OR = 0.76$ , 95% CI 0.66–0.88) compared with land-based gambling. Finally, at-risk gambling increased the odds of gambling for positive feelings ( $OR = 1.63$ , 95% CI 1.30–2.03) or money ( $OR = 1.55$ , 95% CI 1.19–2.02), but both at-risk and problem/pathological gambling increased the odds of gambling to escape, compared with recreational gambling ( $ORs = 2.97$ – $10.80$ , 95% CI 1.95–17.47).

Furthermore, the results from the McNemar's tests indicated minor changes in the motive categories and the number of motives within one year. A small decrease was found in the proportion of those supporting worthy causes and a small increase in the proportion of the category 'Other/Do not know'. Furthermore, a small decrease was found in the proportion of socialising as a primary motive. The proportion of those who selected positive feelings, money or supporting worthy causes as additional motives decreased within one year, whereas the proportion of those selecting 'Other/Do not know' increased. Finally, the proportion of those who selected one gambling motive or three gambling motives decreased, whereas the proportion of those who selected two motives increased. Generally, gambling motives remained relatively stable between 2016 and 2017.

## 6.2 Article II: Gambling motives and offshore gambling

**Article II** focussed on offshore gambling in Finland, and it sought to examine how offshore and onshore online gamblers differ in terms of their gambling motives. Differences in sociodemographic factors (age and gender) and gambling participation (frequency, expenditures and gambling severity) also were assessed. Furthermore, offshore gamblers were asked, through an open-ended question, what their specific reasons were for gambling through offshore sites.

According to the descriptive analysis, the proportion of men was higher than women both among onshore online gamblers (59.1% vs. 40.9%) and offshore online gamblers (83.3% vs. 16.7%), although the difference between genders was much greater among offshore gamblers. Most of the offshore gamblers were ages 18–29 (47.9%), whereas most of the onshore online gamblers were 40 or older (65.7%). The most common motive for gambling among onshore online gamblers was money (78.7%), while offshore gamblers gambled most often for positive feelings (73.2%). Offshore gamblers also cited socialising (13.8% vs. 7.9%) and the escape motive (11.3% vs. 3.3%) more often than onshore gamblers, while onshore gamblers chose supporting worthy causes more often than offshore gamblers (12.2% vs. 4.6%). The majority of both onshore (56.2%) and offshore (58.6%) gamblers cited two different motives for gambling, but a higher proportion of offshore gamblers than onshore gamblers cited three or more motives for gambling (18.0% vs. 6.7%). Finally, more than half of the offshore gamblers gambled at least once a week (52.3%), whereas the corresponding number of onshore gamblers was 44.1%.

According to the logistic regression model, men had higher odds of offshore gambling than women ( $OR = 2.49$ , 95% CI 1.65–3.76). Furthermore, younger age groups had higher odds of offshore gambling ( $OR = 17.33$ , 95% CI 8.97–33.48) than those who were 55 or older. The money motive ( $OR = 0.54$ , 95% CI 0.34–0.87) and supporting worthy causes motive ( $OR = 0.24$ , 95% CI 0.10–0.55) decreased the odds of offshore gambling. Although positive feelings and escape were more common among offshore gamblers than onshore gamblers, based on the chi-square results, they were no longer statistically significantly when associated with offshore gambling in the logistic regression model. However, having three or more gambling motives increased the odds of offshore gambling ( $OR = 6.35$ , 95% CI 2.39–16.87). Moreover, higher gambling frequency ( $ORs = 2.48$ – $2.93$ , 95% CI 1.53–4.82) and more severe gambling problems measured with the PGSI ( $OR = 1.46$ , 95% CI 1.28–1.66) increased the odds of offshore gambling.

Finally, the results from the data-driven qualitative analysis indicated six different categories for reasons to gamble through offshore sites. In the largest category, *larger game supply and game features*, 76.3% of the offshore gamblers cited reasons that fell into this category, which included reasons such as interesting and larger game supply, plus mentions of 'bigger payouts' and 'faster-paced games'. In the second-largest category – *benefits, bonuses and the usability of the website* – 33.5% of the offshore gamblers cited reasons that fell into this category, which included responses concerning ease of getting started, customer benefits and that winnings were paid out quickly. In the third-largest category, *inner motivation* (18.6%),

responses often concerned curiosity and passing time. The other three reason categories were *social reasons* (9.8%, i.e. friend recommended), *responsibility* (7.4%, i.e. responsible gambling procedures) and *marketing* (4.7%, i.e. advertisements). Participants could mention multiple different reasons for offshore gambling.

### 6.3 Article III: Gambling motives, need frustration and problem gambling

**Article III** investigated whether gambling motives predict the severity of problem gambling over time and whether the frustration of basic psychological needs moderates this association. According to the descriptive results, slightly more than half the participants were men (51.27% vs. 48.43% women). The participants' mean age was 49.50 ( $SD = 15.86$ ). Moreover, 51.57% were employed, and as for education, 39.53% held a bachelor's degree or higher. The mean score for gambling problems measured with the PGSI in T1 was 1.15 ( $SD = 3.02$ , range 0–27). Furthermore, the mean score for need frustration measured with the BPNSFS in T1 was 32.46 ( $SD = 13.40$ , range 12–74), and the mean score for psychological distress measured with the MHI-5 in T1 was 12.24 ( $SD = 4.67$ , range 5–30). The mean scores for each gambling motive in T1 varied between 0.43–0.99 ( $SDs = 0.89$ – $1.72$ , ranges 0–4, except for the escape motive, 0–10), and the money, escape and excitement motives registered the highest mean scores. Very small changes were found in the mean scores and proportions of all the variables between T1 and T3, which are reported in Tab 1 of Article III (Hagfors et al., 2023).

The results from the multilevel, mixed-effect regression analysis indicated that all the gambling motives individually predicted gambling problems on the within-person level over time (Models 0,  $\beta = 0.29$ – $0.85$ ,  $p < 0.001$ ), with the escape motive having the highest beta coefficient ( $\beta = 0.85$ ,  $p < 0.001$ ). In Model 1, which included all the gambling motives and other independent variables, the escape motive ( $\beta = 0.71$ ,  $p < 0.001$ ), money motive ( $\beta = 0.32$ ,  $p < 0.001$ ) and competing motive ( $\beta = 0.17$ ,  $p = 0.002$ ) exerted positive within-person effects on gambling problems, thereby supporting H1. Of these, the escape motive exerted the strongest within-person effect on gambling problems. Moreover, need frustration ( $\beta = 0.23$ ,  $p = 0.004$ ) and offshore gambling ( $\beta = 0.55$ ,  $p < 0.001$ ) exerted a positive within-person effect on gambling problems. Higher education exerted a negative between-person effect on gambling problems ( $\beta = -0.35$ ,  $p = 0.011$ ). Model 2 included interaction terms between

gambling motives and need frustration. Need frustration moderated the association between money motive and gambling problems ( $\beta = 0.29, p < 0.001$ ), partially supporting H2.

We checked the findings' robustness using linear multilevel fixed-effects regression, which supported these findings. The escape motive ( $\beta = 0.66, p < 0.001$ ), money motive ( $\beta = 0.30, p < 0.001$ ), competition motive ( $\beta = 0.30, p < 0.001$ ), excitement motive ( $\beta = 0.21, p < 0.001$ ), social motive ( $\beta = 0.21, p < 0.001$ ) and competence motive ( $\beta = 0.14, p = 0.002$ ) all exerted statistically significant and positive within-person effects on gambling problems.

## 6.4 Article IV: Loneliness, gambling to escape and problem gambling

**Article IV** investigated the longitudinal dynamic effects relationships between the escape motive, loneliness and gambling problems over 2.5 years (five time points). Participants were monthly gamblers who participated at all five time points ( $n = 612$ ). Of the participants, 54.58% were men, and 45.42% were women or other genders, and the mean age was 51.85 ( $SD = 13.97$ , range 18–75). The mean score for loneliness measured with the UCLA 3-Item Loneliness Scale at T1 was 1.59 ( $SD = 1.66$ , range 0–6), with slight increases in T2–T4. The mean score for the escape motive measured with the Motivations to Play Inventory at T1 was 0.81 ( $SD = 1.69$ , range 0–12), with a slight increase in T2–T5. The mean score for gambling problems measured with the PGSI at T1 was 1.39 ( $SD = 3.35$ , range 0–25), increasing slightly at T2 (1.42) and T3 (1.42), but then decreasing at T4 (1.34) and T5 (1.25) (see Table 1; Hagfors et al., 2025). The strongest correlations were found between the same variables measured at different time points, indicating that participants' loneliness, escape motive and gambling problem scores were relatively stable over time. The correlation between the escape motive and loneliness was relatively low ( $r = 0.27$ – $0.34, p < 0.001$ ). The relationship between the escape motive and gambling problems was stronger, ranging from low to moderate ( $r = 0.39$ – $0.53, p < 0.001$ ), while the correlations between loneliness and gambling problems were consistently low ( $r = 0.18$ – $0.27, p < 0.001$ ).

We investigated the dynamic longitudinal effects among the escape motive, loneliness and gambling problems using a random-intercept, cross-lagged modelling approach. Two models were tested: an unconstrained model (Model 1) and a constrained model (Model 2), which imposed equality constraints on all

autoregressive and cross-lagged paths across time. The fit indices for Model 1 were very good ( $\chi^2 [48] = 63.675, p = 0.064$ ; CFI = 0.998; RMSEA = 0.023; and SRMR = 0.025). Similarly, the fit indices for Model 2 also indicated a very good fit ( $\chi^2 [84] = 145.195, p < 0.001$ ; CFI = 0.992; RMSEA = 0.035; SRMR = 0.020), with the statistically significant chi-square value likely a result of the large sample size. The change in CFI between the models was negligible (less than 0.01), suggesting that the more parsimonious constrained model (Model 2) did not fit the data significantly worse than the unconstrained model. Thus, we present the results based on the constrained model (Model 2) (see Figure 1; Hagfors et al., 2025).

On the within-person level, it was found that gambling to escape predicted subsequent gambling problems ( $\beta = 0.077, p = 0.047$ ), and gambling problems predicted subsequent loneliness ( $\beta = 0.069, p = 0.007$ ), supporting H5 and H7, but the effects were relatively low. Loneliness did not predict subsequent escape motive or gambling problems ( $\beta = 0.001, p = 0.971$ ). This suggests that loneliness does not drive escapist gambling behaviour, but that existing gambling problems may predispose individuals to loneliness. Furthermore, the autoregressive paths for loneliness ( $\beta = 0.083, p = 0.024$ ) and gambling to escape ( $\beta = 0.124, p = 0.005$ ) were statistically significant and positive, indicating that participants' temporal deviations in loneliness and the escape motive tend to persist from one time point to the next. The autoregressive path for gambling problems was not statistically significant. On a between-person level, it was found that the escape motive, loneliness and problem gambling correlated positively, supporting H9.

An additional sensitivity analysis was conducted using the full information MLE and the same constraints. The results remained relatively similar except for the autoregressive path for gambling problems, which was statistically significant ( $\beta = 0.12, p = 0.028$ ), and the cross-lagged path from escape to loneliness, which was statistically significant, but negative ( $\beta = -0.05, p = 0.018$ ).

**Table 1.** Summary of the main findings from all four articles.

Article RQs/Hs	Main findings	Additional findings
<p><b>Article I</b></p> <p>RQs 1–3</p>	<p>The most common motives for gambling were money and positive feelings. Gambling for money was more common among women than men. Younger age was associated with socialising, positive feelings and the escape motive, while older age was associated with supporting worthy causes. Higher income was associated with positive feelings. Gambling intensity (frequency and number of game types) was associated with positive feelings and money motive. Mixed-mode gambling was associated with money motive. At-risk gambling was associated with positive feelings, money motive and the escape motive, but problem gambling was associated only with the escape motive.</p>	<p>Gambling motives remained relatively stable over one year.</p>
<p><b>Article II</b></p> <p>RQs 4–5</p>	<p>Offshore online gamblers were less likely to gamble for money or to support worthy causes than onshore online gamblers. Offshore gamblers cited more differing motives to gamble than onshore gamblers.</p>	<p>Offshore gambling was associated with male gender, younger age, higher gambling frequency and severity of gambling problems.</p>
<p><b>Article III</b></p> <p>RQs 6–7</p> <p>H1 supported H2 partly supported</p>	<p>The escape motive, money motive and competing motive predicted gambling problems on within-person level over time. Psychological need frustration moderates the association between money motive and gambling problems: The money motive combined with need frustration predicted more severe gambling problems.</p>	<p>Psychological need frustration and offshore gambling predicted gambling problems on the within-person level over time.</p>
<p><b>Article IV</b></p> <p>RQ8</p> <p>H3 not supported H4 not supported H5 supported H6 not supported H7 supported H8 not supported H9 supported</p>	<p>On the within-person level, the escape motive predicted subsequent gambling problems (H7), and gambling problems predicted subsequent loneliness (H5), but the effects were relatively low. The results suggest that loneliness does not drive escapist gambling behaviour, but existing gambling problems may predispose gamblers to loneliness.</p> <p>On the between-person level, loneliness, escape motive and problem gambling correlated positively (H9).</p>	<p>The autoregressive paths for loneliness and the escape motive were positive.</p>

## 7 DISCUSSION

This dissertation's main objective was to investigate how gambling motives relate to gambling participation and problem gambling. The dissertation's aims were twofold: first, to produce general knowledge on gambling motives and their relations to sociodemographic differences and gambling participation, including offshore gambling; and second, to investigate longitudinal relationships between gambling motives, need frustration and problem gambling. These aims were addressed through four empirical studies, each approaching these issues from distinct, but interrelated, perspectives. Article I investigated the sociodemographic and gambling participation-related correlates for gambling motives, while Article II extended the perspective to offshore gambling. Article III examined the longitudinal relationships between gambling motives and problem gambling, alongside the moderating effect of basic psychological need frustration. Finally, Article IV focussed on the longitudinal dynamic effects between the escape motive, loneliness and problem gambling.

### 1. Gambling motives, sociodemographic differences and gambling participation

Article I's findings revealed that the most common motives for gambling among Finns were money and positive feelings. Gambling to escape and to support worthy causes were the rarest motives for gambling. Moreover, most participants chose money and positive feelings motives as their primary reasons for gambling, while supporting worthy causes, socialising and escape motives were selected more often as additional motives, rather than primary ones, for gambling. This result reflects the fundamental nature of gambling, which is built around the possibility of winning money, thrills and excitement. These are perhaps the initial and widely accepted reasons for gambling. The finding that supporting worthy causes was more often an additional motive than a primary one for gambling might indicate its status as a socially acceptable reason for gambling. For example, in the Finnish monopoly system, gambling profits previously were earmarked for public good – such as nonprofit organisations, youth work, sports, culture and academic research – thus, gambling helped finance these. However, socialising might be a byproduct of gambling for many, such as a poker night with friends or sports betting with

colleagues, instead of the initial reason for participating in gambling. Finally, the observation that the escape motive is more frequently an additional, rather than a primary, reason for gambling suggests that it might develop later in the gambling trajectory, along with other signs of emerging problem gambling. While initial reasons for gambling may be money or positive feelings, gambling begins to serve a wider range of functions beyond those reasons, including a coping strategy for distressing emotions. This aligns with the idea that as an addiction deepens, the activity generalises to serve many different needs, gradually occupying an increasingly central role in an individual's life (Orford 2001).

Regarding sociodemographic differences, it was found that women gambled for money more than men, contradicting some extant population-based studies (e.g., Francis et al., 2015; Pallesen et al., 2020; Volberg et al., 2015). Several explanations are possible, such as cultural, social and gambling-specific factors in Finland, as presented in the CFHG (Abbott et al., 2018). According to the latest Finnish Gambling 2023 survey (Grönroos et al., 2024), men gambled more than women across most game types, but scratch cards were notably more popular among women. Other popular game types among women were daily and weekly lotteries and EGMs. This aligns with Great Britain's Gambling Commission report (2025), which identified money as the main motivator for national lotteries, scratch cards and online instant wins. Although the association between gambling motives and game types has not been studied yet in Finland, these gender-specific game preferences could explain our findings. Nevertheless, more research is needed to clarify the relationships between gambling motives, game types and gender differences. Among youths, gambling for positive feelings, socialising and escape was emphasised, which may indicate that gambling is an increasingly normalised and socially accepted pastime activity – not just a harmless and light pastime for all youths. Indeed, the prevalence of problem gambling is the highest among young adults (Grönroos et al., 2024). In contrast, supporting worthy causes was the most common among the oldest age groups.

Furthermore, the escape motive was associated consistently with gambling intensity and severity, suggesting its role in emotion regulation, particularly among young adults and vulnerable groups, such as homemakers. Gambling for money and positive feelings also was associated with higher gambling intensity in terms of gambling frequency, number of game types and at-risk gambling. Furthermore, consistent with previous findings, the money motive was associated with online gambling (Canale et al., 2015; Goldstein et al., 2016). Through the Internet, offshore

gambling websites in particular provide increasing access to a wider selection of games and possibly better payout rates (Gainsbury et al., 2018).

However, regarding gambling motives and offshore gambling, Article II results indicated only small differences between onshore and offshore online gamblers. Compared with onshore gamblers, offshore gamblers were less likely to report money or support worthy causes as their motivation for gambling. This finding was somewhat surprising because in the second part of the study, higher payout rates were mentioned as one of the specific reasons to use offshore gambling websites (under the category of *larger game supply and game features*). Given that online gambling has been associated with the money motive, it is possible that those who gambled only at domestic websites already endorsed the money motive at such a high level that offshore online gamblers appeared to gamble less often for money by comparison. The finding that offshore gamblers cited the motive of supporting worthy causes less often is understandable, as offshore gambling operators do not pay taxes or otherwise contribute to public-good interests in Finland. However, offshore gamblers tend to have more varying motives for gambling than onshore gamblers, which might reflect the generalisation process in the addiction progression mentioned above, in which gambling begins to serve a wider range of functions over time (Orford, 2001). Indeed, we found that offshore gambling also was linked with higher gambling intensity in terms of frequency and expenditures, and higher gambling severity, in line with extant studies (Gainsbury et al., 2018; Oksanen et al., 2022). It is also possible that the extensive game variety available on offshore gambling websites allows these gamblers to serve a wider spectrum of motives.

## 2. Longitudinal dynamics between gambling motives, need frustration and problem gambling

Article III's results indicated that each gambling motive (escape, money, excitement, competition, socialising and competence) independently predicted future problem gambling. However, when considered within the full model, only gambling for escape, money and competition remained significant within-person predictors of problem gambling over time. While the escape motive exerted the strongest within-person effect on problem gambling, the results highlighted that other motives, such as money and competition, can be harmful, too. These results support extant literature (e.g., Alaba-Ekbo et al., 2024; Allami et al., 2025a; Floyd et al., 2025; Tabri et al., 2022). The findings also support the Pathways Model propositions (Blaszczynski & Nower, 2002), in which the money, escape, enhancement and socialising motives play a

central role in the development of problem gambling. The three subtypes differ based on their etiological pathways and gambling motives. The first subtype gambles mainly for money and socialising, while the second subtype gambles mainly to regulate internal states and escape distressing emotions. The third subtype gambles mainly for enhancement, but also to alleviate stress (escape motive) (Nower et al., 2022).

Moreover, a moderation effect was found between money motive and need frustration, i.e., need frustration combined with money motive predicts an even higher level of problem gambling. This finding is in line with the BPNT and supports the idea that an underlying frustration of basic psychological needs may explain why people pursue certain goals, such as money, through gambling. This finding also could be used to explain the association between financially focussed self-concept and problem gambling (Tabri et al., 2021, 2023; Tabri & Wohl, 2021). People with financially focussed self-concept tend to assign disproportionately high value to monetary wealth and base their self-worth on financial success. This may be a sign of underlying need frustration and maladaptive attempts to fulfil unmet needs with substitutes, which in this context is money (Vansteenkiste & Ryan, 2013). Given that gambling inherently revolves around monetary wins, it can appear to be an easy way to earn money. However, extrinsic goals, such as wealth or physical attractiveness, cannot truly fulfil unmet basic needs, as they offer only a fleeting sense of admiration and appreciation. Furthermore, gambling operators are designed to make profit, i.e., gamblers ultimately will lose money in the long run, which may predispose them to chasing losses and problem gambling (Auer & Griffiths, 2023).

Given that extant literature has reported an interaction effect between escapism and competence frustration, predicting more severe problem gambling (Jouhki et al., 2022), it was somewhat surprising that we did not find an interaction effect between need frustration and the escape motive. This finding suggests that while need frustration and the escape motive both predict gambling problems, they represent distinct pathways. While need frustration produces psychological discomfort, it may not universally lead to a conscious motive to escape distressing feelings through gambling, as one can cope with need frustration in several ways. It is also possible that the connection only applies to some specific psychological needs or only occurs under certain circumstances. Thus, more research is needed to clarify which specific needs are connected to each gambling motive and under what circumstances the connection emerges.

Nevertheless, our results suggest that the escape motive is inherently harmful, though it is not a very common gambling motive. Strong evidence has indicated that using gambling to regulate internal states and avoidance-based coping strategies are

at the core of problem gambling (e.g., Buen & Flack; 2022; Caudwell et al., 2024; Lee et al., 2025; Neophytou et al., 2023; Velotti et al., 2021; Williams et al., 2012). Gambling as a response to negative emotional states has been recognised as a diagnostic feature of gambling disorder in both DSM-5 (APA, 2013) and ICD-11 (2022). This raises the question of whether the escape motive is already an early sign of problem gambling – a signal that should be taken seriously in health care and social work contexts. In contrast, while the money motive is a very common gambling motive, it does not inherently signify problem gambling. While extant literature has found strong support for an association between the money motive and problem gambling (Tabri et al., 2022), it appears that the effect is not as strong as for the escape motive (Allami et al., 2021). This may suggest that the money motive is harmful, particularly if combined with certain sociocontextual or psychological factors, such as basic need frustration or financially focussed self-concept (Tabri et al., 2023; Vansteenkiste et al., 2013).

Article IV's results further supported the findings that gambling to escape predicts subsequent problem gambling. However, our results did not support the hypothesis that loneliness, a hurtful experience and a sign of relatedness frustration, would make people gamble to alleviate distressing feelings produced by it, thereby leading to problem gambling. It might be that earlier findings on the link between loneliness and problem gambling could be explained by how lonely individuals are more motivated to gamble for socialisation than to escape distressing feelings elicited by a lack of social contacts, leading to gambling problems (Floyd et al., 2025). Although we could not confirm the assumption that loneliness leads to gambling as an escape and, thus, gambling problems, our results suggest that problem gambling itself may predispose individuals to loneliness and relatedness frustration. Possible explanations for this could be that individuals experiencing gambling problems may isolate themselves due to shame and fear of other people's negative reactions. Indeed, problem gambling is highly stigmatising, and the prevailing view that individuals are solely responsible for their difficulties only exacerbates the issue (Hing et al., 2016). Extensive research has demonstrated that gambling problems are linked to suicide through shame and over-indebtedness (Marionneau & Nikkinen, 2022). Alternatively, it is also possible that problem gambling causes a self-harming cycle, as when the addiction deepens, individuals assign increasing importance to the activity at the expense of all other life domains, which then begins to harm close relationships and create conflicting motives (Orford, 2001). Damaged relationships, in addition to emotional harms, are some of the most common harmful effects of problematic

gambling (Lind et al., 2022; Spence et al., 2025). In the next section, I provide a unified account of these empirical findings' theoretical and practical implications.

## 7.1 Theoretical and practical implications

Together, these four studies' findings contribute to extant literature on problem gambling summarised in the CFHG (Abbott et al., 2018). While the CFHG is highly valuable for identifying diverse factors associated with problematic gambling and highlighting knowledge gaps, it does not provide a detailed description of the interconnection between these factors. This dissertation addresses this need by investigating the relationships between general-level (social and psychological) factors and gambling-specific factors (gambling environment, motivational characteristics), with a particular emphasis on gambling motives. The findings suggest that Finns' gambling motives differ in terms of sociodemographic groups (age, gender, income, employment status) and gambling participation (frequency, number of game types, mode, severity). Gambling motives also were found to differ slightly between offshore and onshore online gamblers, as offshore gamblers were less likely to gamble for money or support worthy causes, but more likely to have many different motives for gambling than onshore gamblers. In line with extant research, offshore gambling also was linked to problem gambling (Gainsbury et al., 2018; Oksanen et al., 2022).

Moreover, this dissertation's cross-sectional and longitudinal findings support the propositions of the Pathways Model of problem gambling (Blaszczynski & Nower, 2002) and expand it by considering basic psychological needs' role in autonomy, competence and relatedness (Ryan & Deci, 2017). According to the findings, escape, money and competing motives predict gambling problems individually over time, giving longitudinal support to the Pathways Model's notions. However, while the Pathways Model highlights gambling motives' centrality in the development of gambling problems, it does not fully explain *why* individuals pursue certain goals through gambling. This dissertation's findings address this gap by proposing that the underlying cause of these motives, particularly the money motive, may be frustration of basic psychological needs (Ryan & Deci, 2017). Gambling may become a means to obtain money, which serves as a substitute for a frustrated need, eventually leading to problem gambling (Vansteenkiste & Ryan, 2013).

The results suggest further that need frustration and gambling to escape both play a distinct and independent role in predicting gambling problems over time. The

findings did not support the hypothesis that the distress caused by need frustration directly leads to escapist gambling, which predicts gambling problems. Instead, the escape motive appears to represent a separate, dysfunctional way of regulating difficult emotions and may even be an early sign of emerging problem gambling. However, need frustration's predictive role appears to be explained by using gambling as a means to pursue need substitutes or other ways to fulfil unmet needs, rather than as a means to escape the distress caused by need frustration. Furthermore, the findings suggest that problem gambling itself may expose individuals to relatedness frustration and loneliness. This could be due to social isolation stemming from experienced stigma and shame associated with gambling problems.

Finally, this dissertation advances the theoretical understanding of gambling motives by examining them in relation to more general addiction theories. The findings support theories that propose that motivation plays a major role in the development of addiction (Orford, 2001; Köpetz et al., 2013; West & Brown, 2013). Addiction itself is conceptualised here as a dysfunction of the motivational system, in which an individual places excessively great importance on a particular activity, leading to harmful consequences. Within this framework, motives are the specific goals that an individual seeks through addictive behaviours such as gambling (Köpetz et al., 2013). Together, these findings contribute to the broader addiction and gambling research fields by highlighting the complex interplay between individual motives, basic psychological needs and gambling behaviours.

Beyond its theoretical implications, this dissertation provides several practical implications. First, this dissertation's findings can be used to inform developing practical tools, such as screening questions or checklists, to help healthcare professionals, counsellors and social workers better identify individuals at risk of, or currently experiencing, problem gambling. Furthermore, a deeper understanding of the underlying motives, especially those related to psychological needs and coping, can foster a less-stigmatising and more-empathetic approach to individuals with gambling problems. This can promote open discussion and lower barriers to seeking help. Policymakers should carefully consider how gambling motives drive engagement with both land-based and online gambling. As the Finnish gambling system is to be opened up to competition, it will be necessary to regulate gambling marketing strictly and ensure that vulnerable populations, such as adolescents, are not exposed to advertising that overemphasises monetary gains and excitement in gambling. Finally, the results can be used to develop more effective, tailored interventions and treatments for individuals with gambling problems. For example,

support services, self-help materials and therapeutic treatment could be customised to address each person's underlying individual needs and motives. Indeed, supporting fulfilment of an individual's basic psychological needs for autonomy, competence and relatedness, while simultaneously removing factors that prevent need satisfaction, could promote long-term recovery significantly.

## 7.2 Strengths, limitations and future directions

In addition to theoretical and practical implications, this dissertation has several strengths, having utilised three distinctive, nationally representative and high-quality datasets. It applied many different analytical methods to produce both cross-sectional and longitudinal knowledge on gambling motives, need frustration and problem gambling. The statistical methods used in the longitudinal designs allowed for the modelling of complex interplay between variables, effectively separating within-person and between-person variance to draw more robust conclusions.

However, certain limitations need to be acknowledged. First, we did not use a validated measure for gambling motives, such as the Gambling Motives Questionnaire-Financial (Dechant 2014; Schellenberg et al., 2016) or Reasons for Gambling Questionnaire (Wardle et al., 2011). Although using a validated measure would have been justified, it was not possible, as motives were only one part of the larger research projects. The questionnaires used with these research projects already were comprehensive and long, so it was not possible to include a complete validated measure of motives alone. However, we selected questions that measured motives carefully so that they corresponded as closely as possible to the motives identified in extant population-based studies (see Volberg et al., 2015; Williams et al., 2017). In Articles I and II, motives were assessed using a single question. In Articles III and IV, each motive was its own question, measured with a five-point Likert scale. Furthermore, the escape motive was measured with three questions regarding negative escapism from the validated Intention to Play Inventory (Hagström & Kaldø, 2014), which initially was intended to measure motivations in the digital gaming context.

Furthermore, while we utilised a validated measure for frustration of basic psychological needs for autonomy, competence and relatedness in Article III, we opted to combine their subscales into a single, general 'need frustration' scale. This practical decision was made to manage the complexity of our analysis, as examining the interaction effect between each of the seven individual motives and three basic

needs would have led to a very large number of interaction terms. Although this approach prevented a more detailed analysis of the relationships between individual needs and gambling motives, it allowed us to maintain coherence in our final models.

Moreover, it should be reiterated that gambling is a sensitive topic that carries a stigma, so certain population segments might be more difficult to reach. Moreover, these studies relied on self-reports, which are known to be sensitive to social desirability biases, particularly with stigmatised topics such as problem gambling, which may lead to underreporting gambling involvement to hide problematic gambling (Goldstein et al., 2017). There is also a risk that individuals will not recall their gambling behaviour accurately when retrospective self-reporting is used (Dussault et al., 2019; van der Maas et al., 2021), and those with gambling problems also have been known to overestimate their wins and underestimate their losses either because of a cognitive distortion (Braverman et al., 2014) or a desire to represent oneself as a winner (Goldstein et al., 2017). Thus, future studies should use, for example, prospective diaries or real-time player account data to overcome this problem.

Furthermore, the sampling methods notably varied among the studies, presenting both challenges and benefits. Articles I and II used random sampling with phone interviews, which usually is viewed as a reliable and valid method. However, like all traditional surveys, it suffers from declining response rates, thereby limiting the findings' generalizability (Jabkowski & Cichocki, 2025). The response rates in Articles I and II were somewhat low (36.1% and 51.9%), but still acceptable and within the typical range for gambling population studies (Williams, Volberg et al., 2012). Phone interviews also may be more prone to social desirability bias than online surveys, as participants might be reluctant to disclose sensitive topics, such as gambling problems, during a phone interview (Lee et al., 2015). In Articles III and IV, the data were collected from an online panel – a cost-effective alternative to traditional surveys, which suffer from declining response rates. While these panels' memberships are structured to match the general population's demographics, they have been found to demonstrate a higher prevalence in reported gambling problems (Lee et al., 2015). This could be due to a genuinely higher prevalence of problem gambling in these panels or because the online panel surveys offer more anonymity than phone surveys, thereby reducing social desirability bias. Furthermore, the data used in this dissertation notably were not collected specifically for these studies. Instead, participants were drawn from larger, preexisting research projects. Therefore, the sample sizes were determined by the scope of those larger projects, rather than this dissertation's specific hypotheses. Consequently, we did not conduct

power analyses during these studies, but were able to use large, population-based samples to enhance the findings' validity and generalizability.

Moreover, Articles I and II used a cross-sectional design, which does not allow for conclusions about cause-and-effect relationships between variables. In contrast, Articles III and IV used a longitudinal panel design in which the same participants were followed across multiple time points. This approach provided a stronger basis for causal inference by establishing temporal precedence, although causality notably cannot be proven definitely through an observational study (VanderWeele 2021). We also conducted a robustness check with fixed-effects linear regression in Article III to exclude any unobserved confounders. However, longitudinal studies are subject to data attrition, as some participants drop out during the study. This was also the case in our study, as participants were somewhat older than the general Finnish population, but no other major biases were found in the samples (Hagfors et al., 2023, 2025). We used analytical weights based on age and gender to correct this bias, and in Article IV, we conducted an additional sensitivity analysis using a full information maximum likelihood (FIML) estimator to confirm our results, as it is useful for handling missing data.

Finally, this dissertation's results are specific to Finland's cultural context; therefore, it is unclear how these connections manifest in different cultural contexts. In Finland, gambling is a widely available and socially accepted pastime activity regulated by a state-owned monopoly company. Gambling takes place in kiosks, grocery stores and gas stations, in addition to online gambling, i.e., solitary forms of gambling, such as lotteries and electronic gambling machines, are emphasised, while there is only one casino. As casinos emphasise entertainment, glamour and socialising, other gambling motives and needs may manifest in countries with a lively casino culture. Furthermore, there may be differences between collectivist and individualistic cultures. In collectivist societies, group harmony and social bonds are highly valued; thus, gambling might be driven more by socialising and a need for relatedness. In contrast, in individualistic societies that emphasise independence and personal achievements, motives for competition and the desire for financial independence might be more prevalent. Finally, the results regarding offshore gambling might differ from jurisdictions with licensing systems. Thus, more cross-cultural studies are needed to confirm the findings.

Some key areas were left for future researchers to investigate. First, future studies must determine how gambling motives are related to individual game types. Despite the CFHG having placed motivational characteristics under the gambling-types factor, suggesting that different game types are developed to meet different needs

(Abbott et al., 2018), very few extant studies have investigated this relationship (e.g., Gambling Commission, 2025). Game types differ significantly in terms of their logic, how much skill is involved and what kind of emotional reactions they elicit (e.g., excitement vs. relaxation). Also, gambling preferences might explain our results concerning the association between gambling motives and gender. In addition to game types, future studies should examine associations between gambling motives and individual psychological needs because frustration of certain basic needs might be associated more strongly with specific gambling motives than others. Future studies also should investigate social-contextual factors that influence basic needs and gambling motives concurrently, as these factors ultimately may help develop problem gambling patterns. Finally, a promising area for future research is exploring how fostering basic psychological need fulfilment could help in coping with and recovering from problem gambling. Some evidence already has indicated that need satisfaction could protect individuals from problem gambling (e.g., Dennis et al., 2017), but more research is needed from this field.

### 7.3 Conclusions

This dissertation aimed to investigate how gambling motives relate to gambling participation and problem gambling among Finns. Based on the results, the most common motives among Finns were money and positive feeling. There were sociodemographic differences in gambling motives based on gender, age, income and occupational status. In addition, gambling motives differed in terms of gambling frequency, number of game types, gambling mode and gambling severity. Regarding offshore gambling, it was found that offshore online gamblers reported less the money motive and gambling to support worthy causes than onshore-only online gamblers. However, offshore gamblers had more different motives for gambling in general compared to onshore gamblers. Furthermore, it was found that gambling to escape, money and competition had positive within-person effects on problem gambling over time. In addition, frustration of the basic psychological needs moderated the association between money motive and problem gambling. Finally, gambling to escape predicted subsequent problem gambling, and problem gambling predicted subsequent loneliness on a within-person level over time. The findings highlight the role of motives and basic psychological needs in understanding problem gambling.

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# PUBLICATION

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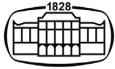
## **How gambling motives are associated with socio-demographics and gambling behavior - A Finnish population study**

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AKADÉMIAI KIADÓ

# How gambling motives are associated with socio-demographics and gambling behavior - A Finnish population study

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## FULL-LENGTH REPORT

### ABSTRACT

*Background and aims:* The aims were to examine how socio-demographics and gambling behavior relate to both primary and additional gambling motives, and whether the gambling motives change during a one-year-period. *Methods:* The Finnish Gambling Harms Survey data was used. Gambling motives were measured with a categorical question. Gambling severity was measured using the Problem and Pathological Gambling Measure (PPGM). Using the first-wave data including only past-year gamblers ( $n = 5,684$ ), five logistic regression models were utilized to explore the associations of gambling motives with socio-demographics and gambling behavior. The stability of gambling motives was assessed with McNemar's test using longitudinal data ( $n = 2,078$ ). *Results:* Gambling for positive feeling was associated with younger age, high income, high gambling involvement and at-risk gambling. Monetary motive was associated with female gender, high gambling involvement, online or mixed-mode and at-risk gambling. Supporting worthy causes was associated with older age, monthly and weekly gambling, and land-based gambling. Socializing was associated with younger age and gambling occasionally on land-based venues with multiple game types. Finally, the motive to escape was intensified among 25–34-year-olds, homemakers, and those with high gambling involvement and at-risk or problem gambling. Gambling motives remained relatively stable for one year. *Discussion and conclusions:* Gender and age profiles varied in different motives. Positive feeling, socializing and escape motive was heightened among younger respondents while supporting worthy causes was heightened among the oldest. Women gambled for money more often than men. Escape motive was associated with problem gambling. Longer follow-up is needed to confirm the longitudinal results.

### KEYWORDS

at-risk gambling, gambling motives, gambling behavior, longitudinal study, problem gambling, population study

## INTRODUCTION

Gambling is a very popular activity in Finland. Around 80% of the Finnish population are past-year gamblers (Salonen, Hagfors, Lind, & Kontto, 2020; Salonen, Latvala, Castrén, Selin, & Hellman, 2017). While the majority of the population have no identified problems, 3.0% of Finns are estimated to have past-year gambling problems (South Oaks Gambling Screen, SOGS 3+) and 10.7% gamble at an at-risk level (SOGS 1–2; Salonen, Hagfors, et al., 2020). Gambling motives shape gambling behavior and are important factors in the development of gambling problems (Blaszczynski & Nower, 2002; Francis, Dowling, Jackson, Christensen, &

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Wardle, 2015; Sundqvist, Jonsson, & Wennberg, 2016). Nevertheless, studies on this topic among Finns are scarce (Salonen, Hellman, Latvala, & Castrén, 2018; Salonen et al., 2017; Salonen, Lind, Hagfors, Castrén, & Kontto, 2020).

Three to five different gambling motives have been identified in the previous literature: monetary, social, enhancement, challenge and escape (Binde, 2013; Dechant, 2014; Francis et al., 2015; Stewart & Zack, 2008; Wardle et al., 2011). Monetary motive refers to gambling to make or win money. Social motive denotes using gambling to socialize with friends and family, whereas enhancement motive means excitement, competing with others and reinforcing positive emotions. The challenge motive encapsulates the idea of developing skills and challenging oneself intellectually, while escape motive includes tension relief and reducing or avoiding negative emotions with gambling as a coping style (Barrada et al., 2019; Binde, 2013; Dechant, 2014; Wardle et al., 2011.) In such countries, Finland among them, where gambling profits are used to fund public interests, gambling to support worthy causes has also been recognized as a motive to gamble (McGrath, Stewart, Klein, & Barrett, 2010). According to previous studies, gambling for enhancement or entertainment and to win money are usually the most common motives for gambling, whereas gambling to escape is one of the least endorsed motives (Francis et al., 2015; Pallesen et al., 2020; Volberg et al., 2015; Wardle et al., 2011).

Gambling can serve many different purposes; hence gamblers may have several motives. Based on our knowledge, no previous study has examined the difference between the primary gambling motive and additional motives. Only one longitudinal study has explored the stability of gambling motives. A five-year follow-up study explored the categorical stability of gambling motives and the results suggest that gambling motives are relatively unstable: the proportion of respondents who remained in their primary motive category for five years was only 22%. Enhancement and financial motives were the most stable (43.9% and 31.6% of respondents remained in the same category) while socializing (11.6%) and escape (5.7%) motives were the least stable. Migrating in motive categories occurred in all five time points indicating high fluidity (McGrath & Konkoly Thege, 2018).

### Socio-demographic differences in gambling motives

Following socio-demographic differences have been reported on gambling motives: gambling for money and enhancement is more common among men, whereas socializing and supporting worthy causes are usual motives for women (Francis et al., 2015; Pallesen et al., 2020; Volberg et al., 2015). Recent prevalence studies, however, show that gender roles are becoming less clear, i.e. women's problem gambling rates are increasing and motives to gamble start resemble to those with men (McCarthy et al., 2018; McCarthy, Thomas, Bellringer, & Cassidy, 2019; Wardle et al., 2011). Gambling for socializing, enhancement, challenge and escape reasons are more common among younger

gamblers (Francis et al., 2015; Pallesen et al., 2020; Wardle et al., 2011), whereas monetary motives and supporting worthy causes tend to be more common among older gamblers (McGrath et al., 2010; Pallesen et al., 2020; Volberg et al., 2015; Wardle et al., 2011). The following differences are reported concerning income and employment groups: enhancement, recreational and escape motives are common motives in the low-income group, while the monetary motive is mutual for all income groups (Wardle et al., 2011). Enhancement, recreational and escape motives are common among unemployed and students, although students gamble for social reasons, as well. Those with long-term disability or retired often gamble for recreational reasons, whereas homemakers report gambling for escape. Money motive is common in all employment groups, but particularly commonly it is reported among those with long-term disability.

### Gambling motives and gambling behavior

The associations between gambling motives and gambling behavior (e.g. gambling frequency, number of game types and gambling mode) have been explored, as well. Greater gambling frequency is associated with escape, enhancement and money motives (Stewart & Zack, 2008; Volberg et al., 2015), whereas gambling with multiple game types is associated with escape, enhancement and socializing motives (Francis et al., 2015; Stewart & Zack, 2008; Wardle et al., 2011). Gambling can take place on land-based platforms, online portals or both (mixed-mode) (Canale, Santinello, & Griffiths, 2015). According to previous studies, gambling on land-based venues relate to enhancement and socializing, while online gambling is associated with escape and monetary motives (Goldstein, Vilhena-Churchill, Stewart, Hoaken, & Flett, 2016).

Furthermore, escape, enhancement and money motives have consistently been associated with problem gambling (Abbott et al., 2018; Barrada et al., 2019; Francis et al., 2015; Hearn, Ireland, Eslea, & Fisk, 2021; Pallesen et al., 2020; Volberg et al., 2015; Wardle et al., 2011). Among younger gamblers and women with a problem gambling background, the escape motive is particularly common, whereas the enhancement motive is common among problem gambling men (Lloyd et al., 2010; Sundqvist et al., 2016). In contrast, the evidence between social motive and problem gambling is somewhat inconsistent as socializing has been associated with both problem gambling (Pallesen et al., 2020) and non-problem gambling (Barrada et al., 2019; Hearn et al., 2021; Volberg et al., 2015; Wardle et al., 2011). Some studies suggest that the connection between motives and problem gambling may be indirect, suggesting that motives act as mediators between problem gambling and various factors (Blaszczynski & Nower, 2002; Hearn et al., 2021).

All of the above-mentioned factors are also mentioned in the Conceptual Framework of Harmful Gambling (Abbott et al., 2018; Hilbrecht et al., 2020) which summarizes and synthesizes various factors impacting on harmful gambling. The framework also emphasizes how economic and political



environment, as well as cultural factors can impact the nature and frequency of gambling behavior. Thus, there are many different factors which are likely to impact the results in different countries.

### Aims of the current study

Better understanding of the complex role of motives in gambling behavior and related harm, as well as the stability or changes in motives, is important in preventing harms and developing support and treatment for those in need. The objectives of this study include: (1) to describe gambling motives: primary motive and additional motives, (2) to explore how gambling motives are associated with socio-demographic factors (gender, age, income and employment status) and gambling behavior (gambling frequency, number of game types, gambling mode and gambling severity), and (3) to explore whether and how gambling motives change over a one-year period.

## METHOD

### Participants and procedure

This study is based on a population-based longitudinal Finnish Gambling Harms survey which was launched to explore gambling, gambling-related harm and opinions on gambling marketing during the reform of the Finnish gambling monopoly. In the reform, three gambling operators were merged into one monopoly supplier, Veikkaus Oy. The rationale behind the reform was that one monopoly supplier would be better at preventing gambling harms than three operators who compete with each other (Salonen et al., 2017, 2019). The wave I data evaluating the situation in 2016 (before the reform) was collected between January 9th and

May 26th in 2017 by Statistics Finland and the potential participants ( $N = 20,000$ ) were randomly selected from the population register. The participants were Finnish adults who lived in three different regions; Uusimaa, Pirkanmaa and Kymenlaakso. The inclusion criteria were  $\geq 18$  years old and fluency in Finnish or Swedish. The age group of 18–24-year-olds was oversampled: 15% of this group was sampled for the survey while they represent 10% of the population. The response rate of wave I was 36% ( $n = 7,186$ ). The mean age of the participants was 48.5 years ( $SD = 17.7$ ) and 49.9% were women. A total of 82% of the participants ( $n = 5,805$ ) from the wave I had gambled in 2016. Participants without any information on gambling motives ( $n = 121$ ) were excluded from the analysis leaving a total of 5,684 participants in the final sample. Wave II data evaluating the situation in 2017 (after the reform) was collected between January 15th and April 30th in 2018. Eventually, 2,624 respondents participated in both waves, which represent 57% of those who participated in wave I and gave their consent for the wave II invitation. Finally, 2,078 past-year gamblers (49.4% women) were included for the longitudinal analysis.

### Measures

**Gambling motives.** Gambling motives were assessed with a categorical question: “What would you say is the main reason that you gamble?” (Williams, Volberg, Stevens, Williams, & Arthur, 2017). First, the participants were asked to choose only one primary reason for their gambling (primary motive). Then, the participants were instructed to choose what other possible reasons they had for their gambling (additional motives). The responses for both questions were recoded into six categories based on the Massachusetts Baseline Population Survey (SEIGMA,

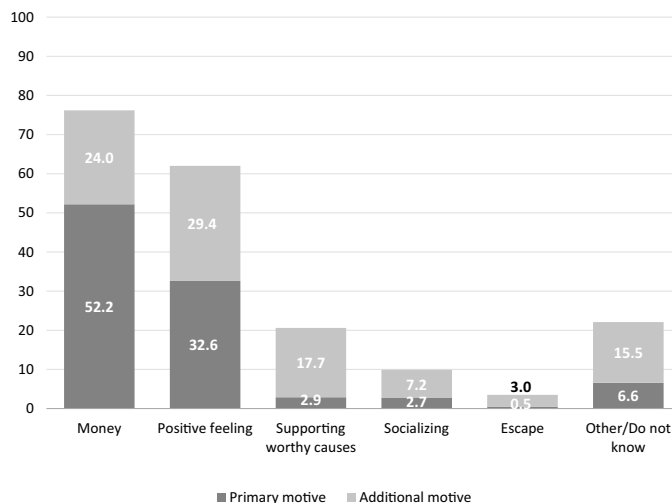


Fig. 1. Frequencies of the primary gambling motives and additional gambling motives in 2016. First-wave data including past-year gamblers (82.0%, non-weighted  $n = 5,684$ )

Volberg et al., 2015). The answer options and their recoding are presented in Table 1. As the group sizes for some primary motives were small, primary and additional motives were combined for the regression models to reflect gambling motives more broadly. Therefore, the simple term ‘motive’ is used when a primary motive and an additional motive for gambling are considered together further in the text.

**Demographics.** Register-based gender and age were used while income and employment status were requested from the participants.

**Past-year gambling participation.** The focus of the surveys was on past-year gambling participation (i.e., in 2016 and 2017). Gambling participation and frequency was inquired for 18 pre-defined game types. The participant’s gambling frequency was calculated based on the game type which the participant gambled the most often. Then, the number of game types was calculated using these game types (see Tables 2 and 3). 41 missing values were recoded as ‘1 game type’ as these participants indicated using money for gambling during 2016. The gambling mode was measured with a categorical question with three different options: land-based, online or mixed-mode. The variable was dichotomized so that ‘0’ = land-based gambling and ‘1’ = online or mixed-mode gambling. Those who had given no answer to this question but indicated gambling some game type provided online only ( $n = 61$ ) were recoded into online or mixed-mode gambling. Similarly, those who had not given answer to this question but indicated gambling game types provided in land-based venues only ( $n = 320$ ) were recoded into land-based gambling.

**Problem gambling severity.** Problem gambling severity was assessed with a 14-item Problem and Pathological Gambling Measure (PPGM; Williams & Volberg, 2010, 2014). The PPGM covers three categories: Problems (7 questions), Impaired Control (4 questions), and Other Issues (3 questions).

Table 1. Options for the reasons to gamble and how they were recoded

Option	Recoding
For excitement, entertainment or fun	Positive feeling
Because it makes you feel good about yourself <sup>a</sup>	Positive feeling
To win money	Money
To escape or distract yourself	Escape
To socialize with family or friends	Socializing
To support worthy causes	Supporting worthy causes
Other reason <sup>b</sup>	Other reason/Do not know
Do not know	Other reason/Do not know

Note. <sup>a</sup> Preliminary crosstabulations revealed that the distribution of the item ‘Because it makes you feel good about yourself’ was much closer to the distribution of ‘excitement, entertainment or fun’ than the distribution of the item ‘to escape or to distract yourself’; <sup>b</sup> Other reasons included, i.e., receiving a scratch card as a gift or wanting to get rid of loose coins.

Problem gambling severity was categorized into recreational gambling, at-risk gambling, problem gambling and pathological gambling (Williams & Volberg, 2010, pp. 85–87). 14 missing values and those who gambled less than once per month were defined as recreational gamblers. Problem and pathological gambling were combined into a single category. The PPGM has proven to be a sensitive and accurate instrument for identifying problem gambling (Williams & Volberg, 2014). Herein, Cronbach’s Alpha was 0.91.

## Statistical analysis

First, the frequencies of main gambling motive and additional motives were estimated with the first wave data to describe their prevalence. Second, five separate binary logistic regression analyses were conducted to explore the relationship of each gambling motive (including both main and additional motives) to different sociodemographic and gambling behavior-related factors. Third, the categorical stability of gambling motives and changes in the amount of motives after one year was assessed using a longitudinal design with McNemar’s test (McNemar, 1947). McNemar’s test is typically used in a pretest posttest study designs with categorical variables (Bokhove, 2018). The test compares the proportion of respondents who changed in one direction to the proportion of respondents who changed in the opposite direction. All analyses were performed with IBM SPSS 27.0 statistical software (SPSS, Chicago, IL, USA).

## Ethics

Participation in the study was voluntary and informed consent was obtained. All the answers were treated confidentially, and the study results will be reported as statistics and tables so that participants are impossible to identify. The Ethics Committee of the Finnish Institute for Health and Welfare approved the research protocol (THL/1390/6.02.01/2016).

## RESULTS

### Main motive and additional motives

Winning money was the most common motive for gambling; 52.2% chose it as their primary motive and 24.0% as an additional motive (Fig. 1). Positive feeling was the second most common motive; 32.6% of the participants selected positive feeling for their primary motive and 29.4% for an additional motive. Supporting worthy causes, socializing and escape were more common as additional motives than as primary motives. Overall, escape was the least common gambling motive, and few chose it as an additional motive.

### Gambling motives and the correlates

The results of the logistic regression models focusing on the five motives (positive feeling, money, supporting worthy causes, socializing and escape) are presented in Tables 2 and 3.



Table 2. Sociodemographic and gambling participation-related factors associated with gambling for positive feeling, money and supporting worthy causes in 2016

	Positive Feeling		Money		Worthy Causes	
	OR	95% CI	OR	95% CI	OR	95% CI
Gender						
Women	1	1	1	1	1	1
Men	0.97	0.86–1.10	0.73***	0.63–0.83	0.89	0.78–1.02
Age in years						
18–24	1	1	1	1	1	1
25–34	0.69*	0.51–0.94	1.42*	1.07–1.88	1.31	0.96–1.80
35–44	0.43***	0.31–0.58	1.39*	1.04–1.86	1.37	0.99–1.90
45–54	0.27***	0.20–0.36	1.47*	1.09–1.98	1.21	0.87–1.69
55–64	0.28***	0.20–0.38	1.37*	1.01–1.87	1.46*	1.04–2.05
≥65	0.33***	0.22–0.49	1.12	0.74–1.68	2.12**	1.37–3.28
Income <sup>a</sup> (per month)						
≤ 1300 EUR (Q <sub>1</sub> )	1	1	1	1	1	1
1301–1900 EUR (Q <sub>2</sub> )	1.20	0.99–1.46	1.04	0.84–1.29	0.99	0.80–1.22
1901–2500 EUR (Q <sub>3</sub> )	1.15	0.94–1.41	0.98	0.78–1.22	0.95	0.76–1.19
≥2501 EUR (Q <sub>4</sub> )	1.42**	1.14–1.76	1.07	0.84–1.37	1.09	0.85–1.38
No answer <sup>b</sup>	0.88	0.69–1.13	0.81	0.62–1.04	0.79	0.59–1.05
Employment status <sup>a</sup>						
Employed	1	1	1	1	1	1
Student	1.14	0.84–1.56	1.02	0.76–1.40	1.06	0.76–1.48
Unemployed or laid off	0.90	0.68–1.18	1.19	0.86–1.64	0.93	0.68–1.27
Retired	0.95	0.71–1.27	0.75	0.54–1.04	0.84	0.60–1.17
Disabled	1.36	0.97–1.91	0.92	0.63–1.36	1.13	0.79–1.62
Homemakers	0.87	0.57–1.31	1.31	0.79–2.16	0.44**	0.24–0.80
Other <sup>c</sup>	0.88	0.65–1.20	0.83	0.60–1.14	0.58**	0.39–0.86
Gambling Frequency <sup>a</sup>						
Less than monthly <sup>b</sup>	1	1	1	1	1	1
1–3/month	1.11	0.94–1.31	1.68***	1.40–2.00	1.46***	1.22–1.76
Once/week	0.90	0.76–1.06	2.30***	1.91–2.78	1.52***	1.27–1.84
Several times/week or daily	1.29*	1.00–1.66	2.00***	1.52–2.65	1.09	0.83–1.43
Number of game types <sup>a</sup>						
1 game type <sup>b</sup>	1	1	1	1	1	1
2 game types	1.59***	1.35–1.88	1.27*	1.06–1.53	1.05	0.87–1.29
3 game types	2.59***	2.15–3.12	1.27*	1.03–1.67	1.21	0.98–1.50
≥4 game types	4.09***	3.43–4.87	1.12	0.92–1.35	1.21	0.99–1.48
Gambling mode <sup>a</sup>						
Land-based <sup>b</sup>	1	1	1	1	1	1
Online or mixed-mode	1.11	0.98–1.27	1.64***	1.41–1.91	0.76***	0.66–0.88
Gambling severity <sup>a,c</sup>						
Recreational gambling <sup>b,e</sup>	1	1	1	1	1	1
At-risk gambling	1.63***	1.30–2.03	1.55**	1.19–2.02	0.94	0.75–1.16
Problem/pathological gambling	1.21	0.79–1.83	0.87	0.57–1.33	0.89	0.58–1.37
Nagelkerge R <sup>2</sup>	0.19		0.09		0.03	

First-wave data including past-year gamblers (non-weighted  $n = 5,684$ ); for the logistic regression models, the main motive and additional motives were combined to reflect gambling motives more broadly.

<sup>a</sup>in 2016; <sup>b</sup>Includes the missing values; <sup>c</sup>Includes those in military or civil service; <sup>d</sup>PPGM; the Problem and Pathological Gambling Measure, <sup>e</sup>Includes those who gambled less than once a month. \* $P < 0.05$ , \*\* $P < 0.01$ , \*\*\* $P < 0.001$ .

Sociodemographic and gambling behavior-related variables were correlates in the models.

Older age groups had lower likelihood (OR = 0.27–0.69) to gamble for positive feeling than 18–24-year-olds. The odds were also higher among those with more intense gambling in terms of frequency (OR = 1.29) and number of game types (OR = 1.59–4.09). Compared to those who

gambled at recreational level, those who gambled at at-risk level had higher odds to gamble for positive feeling (OR = 1.63). The association was non-significant among those with problem gambling, however.

Men had a lower probability than women to gamble for money (OR = 0.73). The odds were also higher for respondents over 24 years (OR 1.37–1.47) than 18–24-year-olds.



Table 3. Sociodemographic and gambling participation-related factors associated with gambling for socializing and escape

	Socializing		Escape	
	OR	95% CI	OR	95% CI
Gender				
Women	1	1	1	1
Men	1.13	0.94–1.37	1.13	0.81–1.58
Age				
18–24	1	1	1	1
25–34	0.74	0.54–1.02	1.97*	1.15–3.37
35–44	0.49***	0.35–0.71	1.12	0.61–2.06
45–54	0.38***	0.26–0.56	0.91	0.49–1.70
55–64	0.46***	0.31–0.69	0.48*	0.23–1.00
≥65	0.44***	0.24–0.80	0.86	0.29–2.54
Income (per month) <sup>a</sup>				
≤ 1,300 EUR (Q <sub>1</sub> )	1	1	1	1
1,301–1,900 EUR (Q <sub>2</sub> )	0.76	0.56–1.03	1.02	0.64–1.64
1,901–2,500 EUR (Q <sub>3</sub> )	1.00	0.74–1.37	0.88	0.53–1.48
≥2,501 EUR (Q <sub>4</sub> )	1.06	0.76–1.47	0.71	0.39–1.28
No answer <sup>b</sup>	0.57*	0.37–0.88	1.24	0.66–2.36
Employment status <sup>a</sup>				
Employed	1	1	1	1
Student	1.04	0.72–1.51	1.22	0.65–2.30
Unemployed or laid off	0.93	0.62–1.40	1.34	0.73–2.43
Retired	1.00	0.59–1.71	0.74	0.27–1.993
Disabled	0.58	0.30–1.12	1.22	0.58–2.57
Homemaker	0.50	0.25–1.01	2.69**	1.31–5.53
Other <sup>c</sup>	0.76	0.46–1.27	1.24	0.61–2.54
Gambling frequency <sup>a</sup>				
Less than monthly <sup>b</sup>	1	1	1	1
1–3/month	0.53***	0.42–0.68	1.52	0.94–2.45
Once/week	0.46***	0.35–0.60	0.96	0.56–1.65
Several times/week or daily	0.40***	0.27–0.58	1.70	0.95–3.05
Number of game types <sup>a</sup>				
1 game type <sup>b</sup>	1	1	1	1
2 game types	1.37*	1.03–1.81	1.73	0.90–3.32
3 game types	1.39*	1.02–1.89	1.61	0.82–3.18
≥4 game types	2.31***	1.75–3.04	2.31**	1.25–4.24
Gambling mode <sup>a</sup>				
Land-based <sup>b</sup>	1	1	1	1
Online or mixed mode	0.66***	0.54–0.81	1.04	0.74–1.47
Gambling severity <sup>a,c</sup>				
Recreational gambling <sup>b,d</sup>	1	1	1	1
At-risk gambling	1.25	0.92–1.69	2.87***	1.95–4.23
Problem/pathological gambling	0.92	0.50–1.71	10.80***	6.68–17.47
Nagelkerge R <sup>2</sup>	0.07		0.18	

First-wave data including past-year gamblers (non-weighted  $n = 5,684$ ); for the logistic regression models, the main motive and additional motives were combined to reflect gambling motives more broadly.

<sup>a</sup>in 2016; <sup>b</sup>Includes the missing values; <sup>c</sup>Includes those in military or civil service; <sup>d</sup>PPGM; the Problem and Pathological Gambling Measure, <sup>e</sup>Includes those who gambled less than once a month. \* $P < 0.05$ , \*\* $P < 0.01$ , \*\*\* $P < 0.001$ .

Compared to those who gambled less than monthly, those with more frequent gambling had higher odds to gamble for money (OR = 1.68–2.30). Moreover, the odds were higher among those who gambled with two or three game types (OR = 1.27), online or mixed mode (OR = 1.64) or at at-risk level (OR = 1.55) than among those who gambled using only one game type, land-based or at recreational level.

The odds of supporting worthy causes were higher among the oldest age groups (OR = 1.46–2.12) compared

to 18–24-year-olds. The odds were lower among homemakers (OR = 0.44) and those in the category of ‘other’ (OR = 0.58) than among employed. Those who gambled 1–4 times in a month had higher odds to support worthy causes (OR = 1.46–1.52) than those who gambled less than monthly. In contrast, the odds of supporting worthy causes were lower among those who gambled online or in mixed-mode (OR = 0.76) than among land-based gamblers.



The odds of socializing were lower among the respondents over 35 years (OR = 0.38–0.49) and those with more frequent gambling (OR = 0.40–0.53) compared to 18–24-year-olds and those with less than monthly gambling. On the contrary, those who gambled using multiple game types had higher odds to gamble for socializing (OR = 1.37–2.31) than those who gambled using only one game type. Compared to those who gambled land-based, those who gambled online or in mixed-mode were less likely to gamble for socializing (OR = 0.66).

Finally, compared to 18–24-year-olds, the odds of gambling to escape was higher among 25–34-year-olds (OR = 1.97) and lower among 55–64-year-olds (OR = 0.48). The odds were also higher among homemakers (OR = 2.69) than among employed. Moreover, the odds of gambling to escape were higher among those who gambled using four or more game types (OR = 2.31), at-risk (OR = 2.87) or problem level (OR = 10.80) than those who gambled using just one game type or at recreational level.

### Gambling motives between time

Overall, a small decrease in supporting worthy causes and a small increase in the category ‘Other/Do not know’ were detected (Table 4). A small decrease was detected in socializing as a primary motive. Gambling for positive feeling, money and supporting worthy causes as additional motives decreased between 2016 and 2017 while ‘Other/Do not know’ increased. The proportion of those who had one gambling motive or three gambling motives decreased while the number of those who had two gambling motives increased between 2016 and 2017 (Table 5).

## DISCUSSION

### Gambling for money and positive feeling were the most common motives

In line with previous studies, winning money and positive feeling were the most common motives for gambling. This

Table 4. The categorical stability of gambling motives from 2016 to 2017

Gambling motives (primary + additional)	Endorsed in 2016		Endorsed in 2017		Endorsed in 2016, not in 2017		Endorsed in 2017, not in 2016		McNemar's test P
	%	(n)	%	(n)	%	(n)	%	(n)	
	Money	79.2	(1,641)	78.9	(1,629)	9.5	(199)	9.2	
Positive feeling	66.7	(1,356)	66.7	(1,351)	12.0	(255)	12.0	(260)	1.000
Worthy causes	26.3	(559)	21.0	(460)	8.1	(179)	13.4	(278)	<0.001
Socializing	10.5	(214)	10.5	(211)	6.1	(121)	6.2	(124)	0.951
Escape	3.3	(56)	2.8	(50)	2.0	(36)	2.5	(42)	0.358
Other <sup>1</sup>	18.9	(416)	22.8	(487)	13.5	(284)	9.6	(213)	<0.001

Primary gambling motives	Endorsed in 2016		Endorsed in 2017		Endorsed in 2016, not in 2017		Endorsed in 2017, not in 2016		McNemar's test P
	%	(n)	%	(n)	%	(n)	%	(n)	
	Money	52.8	(1,112)	53.4	(1,119)	13.0	(266)	12.4	
Positive feeling	35.1	(707)	33.8	(684)	12.2	(256)	13.5	(279)	0.264
Worthy causes	3.0	(72)	3.2	(73)	1.9	(45)	1.8	(44)	0.734
Socializing	2.7	(57)	1.8	(40)	1.0	(26)	2.0	(43)	0.017
Escape	0.5	(8)	0.2	(5)	0.2	(<5)	0.4	(7)	†
Other <sup>1</sup>	4.7	(102)	5.8	(120)	4.3	(92)	3.3	(74)	0.099
Missing	1.2	(20)	1.8	(37)	1.7	(35)	1.0	(18)	0.111

Additional gambling motives	Endorsed in 2016		Endorsed in 2017		Endorsed in 2016, not in 2017		Endorsed in 2017, not in 2016		McNemar's test P
	%	(n)	%	(n)	%	(n)	%	(n)	
	Money	40.0	(815)	28.8	(581)	12.7	(264)	24.3	
Positive feeling	47.0	(952)	42.4	(859)	15.7	(332)	20.3	(425)	<0.001
Worthy causes	24.3	(507)	18.3	(397)	8.2	(179)	14.1	(289)	<0.001
Socializing	8.4	(168)	8.9	(177)	6.2	(120)	5.7	(111)	0.569
Escape	2.9	(49)	2.6	(45)	1.9	(34)	2.2	(38)	0.520
Other <sup>1</sup>	17.3	(383)	20.5	(440)	12.7	(269)	9.5	(212)	0.003

Note. n = 2,078 in both waves; Percentages are calculated from the weighted data, frequencies from the non-weighted data; <sup>1</sup>Other/Do not know; † Data too uncertain for presentation.



Table 5. Changes in the amount of motives in 2016 and 2017

	2016 ( <i>n</i> = 2,078 <sup>1</sup> ) % ( <i>n</i> )	2017 ( <i>n</i> = 2,078 <sup>1</sup> ) % ( <i>n</i> )	McNemar's test <i>P</i>
0 motives	1.1 (18)	1.6 (34)	0.212
1 motive	17.6 (379)	11.4 (250)	<0.001
2 motives	59.5 (1,236)	71.7 (1,485)	<0.001
3 motives	19.1 (393)	13.1 (270)	<0.001
≥4 motives	2.7 (52)	2.1 (39)	0.230

<sup>1</sup>Longitudinal non-weighted data including past-year gamblers in 2016 and 2017.

reflects the central features of gambling – the possibility of winning money and reward uncertainty – which are linked to dopamine release and pleasure (Anselme & Robinson, 2013; Binde, 2013; Dechant, 2014). Positive feeling and money motives were also associated with at-risk gambling, while the escape motive was associated with both at-risk and problem gambling, which may manifest the trajectory of problem gambling (i.e., motives change over time). The development of gambling disorder is known to start from pleasure and end at preoccupation, mood regulation, loss of control and change in tolerance (APA, 2013; Blaszczynski, Walker, Sharpe, & Nower, 2008).

Supporting worthy causes, socializing and escape were more often additional motives and multiple times more common than as primary motives. It could be that different motives are entangled and feed one another, thus additional motives support the main gambling motive (Binde, 2013). It is possible that if the individual does not find the possibility of winning pleasurable in the first place, socializing, supporting worthy causes or escape motives alone would not stand as sufficiently strong motives to gamble.

### Women gambled for money more than men

In contrast to previous population studies (Francis et al., 2015; Pallesen et al., 2020; Volberg et al., 2015), women gambled for money more than men. There may be various explanations for this. According to the Conceptual Framework of Harmful Gambling (Abbott et al., 2018), gambling takes many forms and occurs in various settings in different environments, while significant differences may also occur in gambling exposure, game types and gambling resources. Furthermore, several cultural, biological, social and psychological factors may also have an impact on gambling which should be considered when comparing the results from different countries and contexts. Women often prefer chance-based games (McCarthy et al., 2018). In Finland, there is high availability and easy accessibility to various game types, and especially chance-based EGMs which are among top three game types among Finns (Raisamo, Toikka, Selin, & Heiskanen, 2019; Salonen, Hagfors et al., 2020). Moreover, some recent prevalence studies have found that gender differences are becoming less clear as women's gambling participation is increasing, and women's gambling behavior and motives to gamble start to resemble those with men (McCarthy et al., 2019; Wardle et al., 2011). This may

reflect the 'feminization' of gambling as some forms of gambling have become more socially acceptable, safe and less stigmatizing for women (Abbott et al., 2018; McCarthy et al., 2019). However, more research on how motivational characteristics interact with gender and gambling types is needed.

### Online gambling was associated with monetary motive

In our study, the monetary motive was also associated with online gambling. For online gamblers, the monetary motive may be enhanced by a larger variation of games available and the possibility to gamble on multiple offshore and unregulated gambling sites with fast payout rates, free credits and bonuses (Gainsbury, Russell, Hing, & Blaszczynski, 2018). Online gambling paired with the monetary motive may form an additional risk since many gambling sites offer a variety of fast-phased games with easy access 24/7. However, further research is needed on motivational factors and pathways to offshore gambling. Finnish gambling provider Veikkaus Oy have various responsible gambling tools to be used online, but the efficacy linked with their usage (i.e. money setting limit, self-exclusion, panic button) has not been investigated yet. Therefore, research on account-based player data is needed in order to build up effective harm reduction initiatives.

### Gambling motives may reflect the normalization of gambling as leisure activity among youth

Both gambling for positive feeling and socializing were associated with younger age, as was found in previous research (Francis et al., 2015; Pallesen et al., 2020) and may reflect the normalization and social acceptance of gambling as a leisure activity among youth. Besides, positive feeling was linked with relatively high income, and high gambling intensity and versatility in terms of gambling frequency, game types and multiple modes. High income can buffer negative outcomes of excessive gambling to some extent, as people with high income gamble with a smaller proportion of their income than people with lower income (Castrén, Kontto, Alho, & Salonen, 2018). On the other hand, gambling for socializing was associated with infrequent gambling on land-based venues, but with multiple game types. Gambling can evoke powerful emotions, such as excitement and pleasure, and when it is linked to socializing with peers, with time it can turn into a way to cope (Jauregui & Estevez, 2020). This may explain our result regarding the escape motive being the most common among 25–34-year-olds. Youth and young adulthood are periods when socializing with peers is important, yet risk-taking is relatively common, and through social norms, peers and online peer groups can encourage risky behavior (Savolainen, Sirola, Kaakinen, & Oksanen, 2019). Due to the high prevalence of gambling among youth (Salonen, Lind, et al., 2020; Salonen & Raisamo, 2015), a plan to incorporate these findings into a preventive programs targeting public, educating professionals, and planning secondary and tertiary prevention in Finland has to be put in action.



### Supporting worthy causes was common among older adults

Older adults were found to gamble with the motive of supporting worthy causes. Again, this is in line with previous research (McGrath et al., 2010; Pallesen et al., 2020; Volberg et al., 2015). This may also reflect the culture-specific environment. There has been a state monopoly for gambling in Finland for more than 70 years and the gambling profits are used to support public interest activities, such as sports, science, art and youth work. For decades, gambling has been marketed for Finns as a support for worthy causes (Örnberg & Tammi, 2011), however, recently, gambling marketing has been changed towards more responsible marketing (Forström & Cisneros Örnberg, 2019; Nikkinen, 2019). It may be that the older generation may perceive gambling more often as a form of charity in a Finnish cultural context. Overall, a low rate of problem gambling was a distinctive feature of this age group, which may be related to less risky game types preferred by older adults, such as weekly national lottery and scratch cards (Salonen, Lind, et al., 2020).

### Escape motive was consistently associated with gambling severity and intensity

Along with young age, gambling to escape was associated with being a homemaker as well as both at-risk and problem gambling. This is largely consistent with previous findings (Binde, Romild, & Volberg, 2017; Francis et al., 2015; Mazar, Zorn, Becker, & Volber, 2020; Pallesen et al., 2020; Wardle et al., 2011; Yakovenko et al., 2016). Individuals who engage in problem gambling often use gambling to regulate emotions (Wood & Griffiths, 2007). Taking care of a relative can be an emotionally burdensome situation sometimes involving frustration and loneliness. For some homemakers, gambling may offer an escape from daily stresses, relieve tension and work as a coping strategy (Lloyd, Nicklin, Rhodes, & Hurst, 2021; Wardle et al., 2011). Some gamblers with the escape motive describe gambling as a dissociative state (Wood & Griffiths, 2007), which can intensify gambling. Thus, problem gambling often manifests in high gambling intensity and versatility, which likely explains our results (Mazar, Zorn, Becker, & Volberg, 2020).

Based on the Conceptual Framework of Harmful Gambling, gambling motives are classified as significant factors contributing to gambling-related harm (Abbott et al., 2018; Hilbrecht et al., 2020). Furthermore, gambling motives have been found to mediate the relationship between problem gambling and impulsivity traits (Canale, Viena, Griffiths, Rubaltelli, & Santinello, 2015; Kim, Poole, Hodgins, McGrath, & Dobson, 2019), cognitive distortions (Mathieu, Barrault, Brunault, & Varescon, 2018, 2020) and affective states (Hearn et al., 2021). However, further studies on this topic are needed.

### Gambling motives remained relatively stable

The primary motives to gamble remained relatively stable for one year, which contrasts with the previous findings

(McGrath & Konkoly Thege, 2018). In turn, additional gambling motives were less stable as the proportion of positive feeling, money and supporting worthy causes decreased. The small decrease in the supporting worthy causes may be explained with the reform of the Finnish gambling market in 2017. The reform drew public attention and stirred up discussion about the role of gambling operators, as three gambling operators merged into one monopoly supplier, Veikkaus Oy. It also raised critique against the Finnish gambling system where gambling profits are used to fund public interests, as studies revealed that 50% of the gambling profits comes from 2.5% to 5% gamblers and largely from at-risk and problem gambling (Castrén et al., 2018; Grönroos, Kouvonon, Konnto, & Salonen, 2021; Salonen, Lind, et al., 2020). This may have affected public opinion; thus, it may be showing in the results. However, longer follow-up time and longitudinal research from the stability and changes of gambling motives are needed in the future.

### Limitations

This study is the first to explore Finns' gambling motives and their associations with socio-demographics and gambling behavior. Notwithstanding, this study has limitations. Gambling motives were assessed with a single question, and the challenge motive identified in some previous studies (e.g. Binde, 2013) was not included in this. This single-question solution might explain the low prevalence rate of escape motive as gamblers who would indeed score higher on a continuous escape scale might be inadequately identified when a single item is used for assessing gambling motivation (see McGrath & Konkoly Thege, 2018). Moreover, some respondents might have found the labeling of escape motive as stigmatizing and thus choose some other more socially desirable motive. Future research would benefit from using a validated measure for gambling motives. According to previous studies (e.g. Abbott et al., 2018), game types are possible factor that impacts on gambling motives. Due to small group sizes in some motives, however, the association between game types and motives was impossible to explore in this study, but future studies should try to fill this gap. It is also noteworthy that the gambling frequency may be an underestimation if it is calculated based on the game type which the participant gambles most often. For example, if a person gambles lottery once a week and EGM in some other day of the same week, her gambling frequency would still be calculated as once a week.

Lastly, socio-demographic register-based data from Statistics Finland was linked to a study sample to obtain information from respondents and non-respondents (Salonen et al., 2017). It revealed that women and older participants participated more eagerly than men and younger participants. The most active respondents included 65–74-year-olds and the least active were 18–24-year-olds. Those who were married and with higher education were more eager to participate than single, divorced or those with lower education.

## CONCLUSIONS

Gender and age profiles varied in different motives. Women gambled more often to win money than men. Young age was associated with gambling for positive feeling, socializing and escape motives although their socioeconomic and gambler profiles differed. Older adults preferred supporting worthy causes. The escape motive was the most clearly linked with problem gambling. Gambling to win money and getting a positive feeling were most often primary motives whereas socializing, supporting worthy causes and escape motives were more common as additional motives. Overall, gambling motives remained quite constant over the course of a one-year-period although longer period of time would be needed to confirm the results. Specific gambling motives that may pose a risk or harm should be noted. Policy implications would be to increase public awareness, stakeholders in promoting less harmful gambling (i.e. recognizing one's own motives and being aware of expenditure of gambling).

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# PUBLICATION II

## **Gambling Motives and Offshore Gambling: A Finnish Population Study**

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# Gambling Motives and Offshore Gambling: A Finnish Population Study

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## Abstract

The rise of online gambling has drawn attention towards offshore gambling. Currently there is lack of evidence on reasons and motivations to gamble on offshore gambling sites. This study investigated the general gambling motives of onshore and offshore gamblers, and the reasons to gamble on offshore gambling sites. The study used binary logistic regression model to analyze the data from Finnish Gambling 2019 population survey including adult past-year online gamblers ( $n=1,422$ ). The validated measure for problem gambling severity (PGSI, Problem Gambling Severity Index) was used. Furthermore, data-driven qualitative analysis was used to form categories for the reasons to gamble on offshore gambling sites. Offshore gambling was more common among men and younger age groups than among women or older age groups. Offshore gamblers gambled less often for money or worthy causes than onshore gamblers. Furthermore, offshore gamblers had more different types of motives to gamble, they gambled more frequently and had higher problem gambling severity scores (PGSI) than onshore gamblers. Finally, the most common reasons to gamble offshore were: (1) larger game supply and game features, (2) benefits, bonuses, and the usability of the website, and (3) inner motivation. Offshore gambling is characterized with intensity and diversity of gambling behavior and motives, and it poses a risk especially for young men.

**Keywords** Offshore gambling · Domestic gambling · Population study · Problem gambling · Monopoly · Gambling motives · Online gambling

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## Introduction

Many countries regulate gambling services to prevent gambling harms, crime, and other negative social outcomes (Banks, 2017; Sulkunen et al., 2019). There are great differences between countries how the regulation is arranged from licensing systems to monopoly suppliers. Rapid rise on the popularity of online gambling has drawn the attention to offshore gambling operators which accept online gamblers in contravention to local regulations even though they do not have local licenses (Gainsbury et al., 2018; Hing et al., 2021; Lind et al., 2021). The popularity of offshore gambling raises some concerns as the offshore operators may offer access to products that do not meet local restrictions for gambling or do not follow consumer protection requirements (Forsström & Cisneros Örnberg, 2019; Hing et al., 2021; Podesta & Thomas, 2017). For example, unregulated gambling operators have been associated with difficulties or inability of withdrawing winnings, and frauds, such as identity thefts (Banks, 2012; Griffiths, 2010; Gainsbury et al., 2018; Hing et al., 2021). Moreover, offshore gambling may predispose to exacerbation of gambling problems as offshore sites are accessible 24 h a day with large game variety (Silvennoinen & Vuorento, 2022). Having multiple player accounts makes it more difficult to follow how much has been spent to gambling overall. For those who have voluntarily self-excluded from gambling through licensed operators, offshore gambling sites may pose a risk to breach one's own self-exclusion (Häkansson & Åkesson, 2022). Offshore gambling has also been linked to trading with high-risk cryptocurrencies (Oksanen et al., 2022).

The reasons for gambling, called gambling motives, are key concept in understanding gambling behavior and potential gambling harm, such as problem gambling. To our knowledge, only a few studies have investigated the reasons to gamble on offshore gambling sites, and no prior study has compared the general gambling motives between online gamblers who use only onshore gambling sites as opposed to gamblers who also use offshore gambling sites. This study aimed to fill this gap with an analysis of offshore and onshore gamblers in Finland.

## Offshore and Onshore Gambling

In this paper, we use the term offshore gambling for those operators which do not hold a valid operating license in a particular jurisdictional area but provide gambling services for online gamblers from that area (Gainsbury et al., 2019; Hing et al., 2021; Podesta & Thomas, 2017). Gambling operators which hold a license for a given jurisdictional area are referred as onshore gambling operators (Podesta & Thomas, 2017). Onshore gambling operators must follow the governmental regulations for marketing and promotion, offer adequate consumer protection tools, and pay taxes for the given jurisdictional area (Gainsbury et al., 2019; Marionneau & Järvinen-Tassopoulos, 2017). Offshore gambling operators compete with onshore operators in the same markets with similar products and services, or with the kind of products and services that regulated sites are unable to offer, but do not pay taxes or follow the local restrictions (Gainsbury et al., 2019). By competing with onshore gambling sites, offshore gambling operators undermine the value of licenses while having an unfair competing advantage. For these reasons, many governments try to channel gambling for their licensed gambling operators.

For some gamblers, offshore gambling sites might seem tempting as they may provide greater variance of different products, payouts, and gambling experiences. Moreover, the restrictions the onshore sites must use might be frustrating for some compared to offshore sites (Costes et al., 2016; Gainsbury et al., 2018). It is also noteworthy, however, that gamblers may not always be aware of the unlicensed status of the gambling site (Hing et al., 2021), as the gambling websites can mimic or copy the design of a licensed gambling website (Griffiths, 2010). Based on our knowledge, only a few studies have examined the characteristics of those who use offshore gambling sites and their reasons for site selection. Previous studies have associated offshore gambling with younger age (Costes et al., 2016; Gainsbury et al., 2018, 2019) but the associations with gender are somewhat mixed. One study found that offshore gamblers were more often men (Gainsbury et al., 2018) while two studies found offshore gambling to be more common among women (Costes et al., 2016; Gainsbury et al., 2019).

The proportion of problem gambling is higher among offshore than onshore gamblers (Hing et al., 2021), and offshore gambling is also associated with more intense gambling patterns (Costes et al., 2016) and greater variance of game types (Gainsbury et al., 2019). The most common reasons for offshore gambling are greater variance in gambling options, higher payout rates and better prices (Gainsbury et al., 2018; Hing et al., 2021). The ability to pay in local currency and the usability of the website were also listed as reasons for choosing one site over another (Gainsbury et al., 2019). Furthermore, some gamblers might be encouraged to use offshore gambling sites due to betting restrictions that onshore gambling operators place to their gambling accounts if they gamble too successfully (Podesta & Thomas, 2017).

## Motivation, Addiction, and Gambling Motives

The role of motivation has been recognized as an important factor in gambling behavior and addictions (Baumeister, 2016; Binde, 2013; Köpetz et al., 2013). Motivation can be defined as any sort of desire to do something (Baumeister & Vohs, 2007). Baumeister and Vohs (2007) distinguish two forms of motivations; drives and impulses. Drive is a more long-term desire or a recurrent pattern of behavior that heads toward some goal that may not be present at the current situation. Impulse, or a state, is a situational and contextual desire to perform a particular act in a particular occasion. Drive can be seen as trait of a person which is independent of the situations whereas impulse is a product of the interaction between person and a situation. Some situational cue can activate an impulse.

Self-regulation is a concept closely connected to motivation and addiction, which includes setting a goal, finding appropriate means to achieve the goal, rejecting distractions, and managing conflicts (Köpetz et al., 2013). Goals have motivational properties as they represent a desirable end-state which can be achieved through certain action. At the beginning of an addiction, means (such as gambling) are just different pathways to the desirable end-state (e.g., enhancement or relaxation). As time passes, the means are cognitively and emotionally associated with the goal through a process called emotional transfer, and the mean becomes the goal in itself that the individual compulsively chases.

Previous research has associated difficulties in impulse control with addictive behaviors (Ioannidis et al., 2019). Impulsivity is a multifaceted concept which consist of impulsive choice, impulsive action and impulsive personality traits (negative and positive urgency,

lack of persistence, lack of planning and sensation seeking) (MacKillop et al., 2016; Whiteside et al., 2005). The tendency to act rash without thinking, difficulty to tolerate negative emotions, and the preference of small immediate rewards rather than large but delayed rewards (delay discounting) are typical characters of impulsive behavior, and may maintain the addiction despite the negative consequences (Amlung et al., 2017; MacKillop et al., 2016).

In order to understand gambling behavior more in depth, researchers have identified psychological reasons for gambling, in other words gambling motives (e.g. Binde, 2013; Stewart & Zack, 2008). Although the possibility to win money is the fundamental motive to gamble, many other reasons to gamble have been recognized (Binde, 2013). Previous studies have identified five motives in addition to monetary motive: enhancement, socializing, challenge, escape and supporting worthy causes (Binde, 2013; Dechant, 2014; Francis et al., 2015; Wardle et al., 2011). According to different population studies (Francis et al., 2015; Pallesen et al., 2020; Volberg et al., 2015; Wardle et al., 2011), gambling for money and enhancement are usually the most common motives whereas the escape motive is one of the least endorsed motives, but there are some differences between countries.

Gambling motives have been shown to vary between socio-demographic and gambling behavior related factors (Francis et al., 2015; Hagfors et al., 2022; Pallesen et al., 2020; Volberg et al., 2015; Wardle et al., 2011). For example, gambling for money and enhancement is usually more common among men, whereas gambling for escape is more common among women (Francis et al., 2015; Pallesen et al., 2020; Wardle et al., 2011). Furthermore, gambling for socializing, enhancement and escape is more common among younger gamblers, while supporting worthy causes is more common among older gamblers (Francis et al., 2015; Pallesen et al., 2020; Volberg et al., 2015; Wardle et al., 2011). Some of the motives (e.g. escape, money, enhancement) have been associated with problem gambling more strongly than others (Abbott et al., 2018; Francis et al., 2015, 2015; Pallesen et al., 2020; Volberg et al., 2015).

Online gambling is currently changing gambling globally (Håkansson, 2020; King et al., 2020; Oksanen et al., 2021; Sirola et al., 2021). This emerging and transforming context of gambling involves also potentially different motives for gambling than traditional forms of offline gambling. Online gambling has been associated with escape motives and negative affect, and it is more often initiated to make money, to demonstrate skills or because of boredom than offline gambling (Goldstein et al., 2016). Although online gambling has been associated with problem gambling, the likely reason behind it could be that online gamblers often engage in multiple gambling forms, which is a strong predictor of problem gambling in itself (Abbott et al., 2018).

## Present Study

This study focused on the offshore and onshore online gamblers in Finland. Currently, a state-owned monopoly supplier Veikkaus Oy has exclusive right to provide gambling services in Mainland Finland. In 2017, three gambling operators (RAY, Fintoto and Veikkaus) were merged in order to prevent competition between the monopoly operators, and it was thought that monopoly supplier could be better at preventing and reducing gambling-related harms than licensed operators who compete with each other (Salonen et al., 2019). The Sect. 52 of the Lotteries Act regulates gambling in Mainland Finland. The Ministry of Inte-

rior governs gambling with a decree which regulates specific details in gambling provision, e.g., the wins paid to players and the maximum number of slot machines. The National Police Board monitors the provision of gambling services. The Lotteries Act has assigned the Ministry of Health and Social Affairs to monitor and research gambling harms which allocated this mission to the Finnish Institute of Health and Welfare. Veikkaus Oy must compensate the state for the costs incurred by monitoring, research, and development. Gambling profits are used to support public interest activities from health, culture, research, and sports fields. (The Sect. 52 of the Lotteries Act.)

To gamble onshore games provided by Veikkaus Oy, the customer is obligated to create a player account and verify their identity and age. Each customer can have only one account and must set limits to daily and monthly money transfer in order to gamble. Despite the monopoly, participating in offshore gambling, that is, games offered by Paf (Ålands Penningautomatförening) and/or foreign gambling operators, is not prohibited under Finnish legislation. Monopoly operator Paf operates in the Åland Islands by offering online games and games on ships sailing between Finland and Sweden or Estonia. Overall, the proportion of offshore gamblers has increased in Finland from 5.1 to 6.2% between 2015 and 2019 (Salonen et al., 2020). The most popular offshore game types in Finland were EGMs, online betting, and poker.

This study examines both gambling motives in general and the specific reasons for offshore gambling in Finland. Our research questions were:

- 1) How do gambling motives differ between offshore and onshore online gamblers?
- 2) What are the specific reasons for offshore gambling?

## Method

### Participants

The data from the Finnish Gambling 2019 population study was used for the present study (Salonen et al., 2020). The survey was assigned to the Finnish Institute of Health and Welfare and funded by the Finnish Ministry of Social Affairs and Health according to the Sect. 52 of the Lotteries Act. The purpose of the study is to monitor and explore Finn's gambling, problem gambling, and attitudes and opinions towards gambling. The target population of the survey was 15–74 aged Finnish people living in Mainland ( $N=7,800$ ). Statistics Finland collected the data using computer-assisted telephone interviews. 3,994 Finns participated in the survey in 2019 (50.7% women, response rate 52%). Mean age of the participants was 45.0 years ( $SD=17.1$  years). Only those participants, who had gambled online during previous 12 months, were selected to this study. Underage participants (15–17 years old) were excluded from the analysis as they gamble mostly land-based games and particularly scratch cards and electronic gaming machines (Salonen et al., 2020). Five participants were excluded from the analysis due to missing information leaving a total of 1,422 participants to the final sample.

## Measures

Our study was focused on offshore gambling. The survey included questions on participating in 18 different game types provided by Veikkaus Oy, Paf or other offshore gambling operators and based on these we created a dichotomous variable indicating onshore and offshore gamblers (0=*onshore gambler* and 1=*offshore gambler*). Those participants who had gambled only games provided by Veikkaus Oy were categorized as onshore gamblers, and those participants who had gambled online games provided by offshore gambling operators, in addition to games provided by Veikkaus Oy, were categorized as offshore gamblers. Only a very few participants ( $n < 5$ ) gambled on offshore gambling sites only, so they could not be analyzed separately. Online games provided by Paf were also categorized as offshore gambling since Paf is not a part of gambling monopoly system in Mainland Finland.

Gambling motives were asked with a categorical question: “What would you say is the main reason that you gamble?” (Williams et al., 2017). The answer options included: (1) for excitement, entertainment or fun, (2) to win money, (3) to improve your skills, (4) to compete with others or to challenge yourself, (5) to socialize, (6) to support worthy causes, (7) to escape, relax or to relieve stress, (8) because it makes you feel good about yourself, (9) other reason, and (10) do not know. At first, the participants were asked to choose only one primary motive for their gambling (main motive). Then, the participants were instructed to choose what secondary reasons they had for their gambling (additional motives).

The responses for both questions were recoded into seven categories based on Massachusetts Baseline Population Survey (SEIGMA, Volberg et al., 2015; see also Hagfors et al., 2022). The categories were: 1) Positive feeling, 2) Money, 3) Socializing, 4) Supporting worthy causes, 5) Escape, 6) Challenge, and 7) Other. The category ‘Positive feeling’ were combined from the options “For excitement, entertainment or fun” and “Because it made you feel good about yourself”. The options “to improve your skills” and “to compete with others or to challenge yourself” were combined to form category ‘Challenge’, and the options “other” and “do not know” were combined, as well. Those participants who had indicated gambling on offshore gambling sites were also asked with an open-ended question what their reasons were to gamble on offshore sites (“What were your main reasons for gambling on sites other than Veikkaus Oy?”). All offshore gamblers answered to this question.

For the logistic regression models, the main motive and additional motives were combined to reflect gambling motives more broadly. Therefore, a simple term ‘motive’ is used when main motive and additional motive for gambling are considered together further in the text. Each motive was used as a dummy variable in the model. Challenge motive was not included in the models due to too small frequency. The amount of gambling motives was calculated from the previously mentioned motive categories and ranged between 0 and 6. We recoded the variable into three categories: ‘0–1 motive’, ‘2 motives’ and ‘ $\geq 3$  motives’.

Problem gambling severity was measured with the Problem Gambling Severity Index (PGSI, Ferris & Wynne, 2001). PGSI is a self-report instrument including nine items which has been widely used for assessing problem gambling population surveys (Currie et al., 2013; Holtgraves, 2008). The PGSI items have four-point scale where 0=*never*, 1=*sometimes*, 2=*most of the time*, 3=*almost always*. The total scores range between 0 and 27 scores and it is treated as a continuous variable in the analysis. McDonald’s omega for the scale was excellent ( $\omega = 0.89$ ). One missing value was recoded as 0 after checking the weekly

gambling expenditure (2.50 €), gambling frequency (1–3 times in a month) and the number of game types gambled (1).

Gambling frequency was inquired for 18 pre-defined game types. The response options were ‘daily or several times per week’, ‘once a week’, ‘1–3 three times per month’ and ‘less than monthly’. The overall gambling frequency was calculated based on the game type the respondent gambled most often. Furthermore, respondents were inquired how much money they used for gambling weekly, monthly or yearly. Weekly gambling expenditure was calculated based on these answers. Finally, age and gender were inquired from all respondents. The participants were divided into four age groups: 18–29, 30–39, 40–54 and 55 years or older. As offshore gambling was much rarer among the oldest participants, we decided to put all the participants 55 or over into the same age group.

## Methods

We used binary logistic regression to analyze the associations between offshore gambling (dependent variable), gambling motives and gambling behavior related variables. The effects of the independent variables are presented as regression coefficients (B) and their standard errors (SE), odds ratios (OR) and their 95% confidence intervals. We also report Wald  $\chi^2$ -coefficients and  $p$ -values for statistical significance based on the test. Data-driven qualitative content analysis was used to analyze the reasons why participants chose to gamble on offshore gambling websites. Coding structure was conducted by two authors independently without knowing each other. After the coding structure was set, both authors read the data independently. Third author then conducted the statistical inter-rater reliability analysis. Cohen’s kappa values varied from  $\kappa=0.86$ ,  $p<.001$  [Benefits, bonuses, and the usability of the website] to  $\kappa=1.00$ ,  $p<.001$  [Responsibility and Social reasons] indicating high inter-rater reliability.

## Results

### Statistical Results

Almost 85% of the sample were onshore gamblers while 15% gambled also on offshore gambling sites. Larger proportion of men than women gambled online, but the distinction was even sharper among offshore gamblers than among onshore gamblers (Table 1). Offshore gamblers also tended to be younger than those who gambled onshore only. What comes to gambling motives, gambling for positive feeling, socializing and escape were more common among offshore gamblers, whereas gambling for money or supporting worthy causes were more common among onshore gamblers. In addition, offshore gamblers tended to have more different motives and gamble more frequently than onshore gamblers. Finally, the average PGSI score was higher for offshore gamblers than onshore gamblers (1.88 vs. 0.24,  $t = -8.00$ ,  $p < .001$ ) and the same was true with the average weekly gambling expenditure (58.4€ vs. 8.41€,  $t = -3.25$ ,  $p < .001$ ).

According to the logistic regression model (Table 2), men had higher odds to gamble on offshore sites than women confirming the descriptive results in the Table 1. Nagelkerke pseudo  $R^2$  for the model was 0.39. Younger age groups had multiple times higher odds

**Table 1** Descriptive statistics and the comparison of onshore and offshore online gamblers (n=1,422)

	Onshore gamblers <sup>a</sup> (n=1,208)	Offshore gamblers <sup>b</sup> (n=214)	Pearson $\chi^2$	All (n=1,422)
	% (n)	% (n)	p	% (n)
<i>Gender</i>				
			<0.001	
Men	59.1 (723)	83.3 (179)		63.1 (902)
Women	40.9 (485)	16.7 (35)		36.9 (520)
<i>Age (range 18–74)</i>				
			<0.001	
18–29 years	14.7 (146)	47.9 (94)		20.2 (240)
30–39 years	19.7 (217)	27.5 (60)		21.0 (277)
40–54 years	33.6 (403)	18.3 (43)		31.0 (446)
≥55 years	32.1 (442)	6.3 (17)		27.8 (459)
<i>Gambling motives</i>				
Positive feeling	53.8 (640)	73.2 (156)	<0.001	57.0 (796)
Money	78.7 (955)	69.2 (149)	<0.001	77.2 (1104)
Socializing	7.9 (89)	13.8 (28)	0.003	8.8 (117)
Worthy causes	12.2 (151)	4.6 (10)	<0.001	10.9 (161)
Escape	3.3 (40)	11.3 (23)	<0.001	4.6 (63)
<i>Amount of motives</i>				
			<0.001	
0–1 motive(s)	37.1 (455)	23.4 (51)		34.9 (506)
2 motives	56.2 (673)	58.6 (125)		56.6 (798)
≥3 motives	6.7 (80)	18.0 (38)		8.6 (118)
<i>Gambling Frequency</i>				
			<0.001	
Less than monthly	27.6 (319)	14.2 (29)		25.4 (348)
1–3 times/month	28.3 (332)	33.5 (70)		29.1 (402)
At least once/week	44.1 (557)	52.3 (115)		45.4 (672)

Note. <sup>a</sup>Gambled only game types provided by Veikkaus Oy. <sup>b</sup>Gambled both game types provided by Veikkaus Oy and/or offshore gambling operators

to gamble on offshore sites than the participants over 55 years. What comes to gambling motives, offshore gamblers were less likely to gamble for money or to support worthy causes but had multiple reasons to gamble, when compared to onshore gamblers. Furthermore, offshore gambling was more common for those who gambled regularly than for those who gambled less often than once a month. Lastly, having gambling problems was more likely for offshore gamblers than for those who gambled onshore only. Although the average weekly gambling expenditure was significantly higher for offshore than onshore gamblers in the descriptive results, it was non-significant in the model.

## Qualitative Results

Offshore gamblers (n=214) were asked with an open-ended question what their reasons were to gamble on offshore gambling sites. Six different categories were formed based on these answers (Table 3). The largest category was named ‘Larger game supply and game features’. This category included responses such as interesting and larger game supply, bigger payouts, and faster-paced games. The second largest category was named ‘Benefits, bonuses, and the usability of the website’ and included responses such as “easy to start

**Table 2** Predictors of offshore gambling among past-year online gamblers (n=1,422)

	<i>B</i>	<i>SE (B)</i>	<i>Wald</i>	<i>OR</i>	<i>95% CI</i>
<i>Gender</i> (Ref. women)	0.91	0.21	18.64	2.49***	1.65–3.76
<i>Age</i> (Ref. ≥ 55 years)					
18–29 years	2.85	0.33	72.02	17.33***	8.97–33.48
30–39 years	1.95	0.34	33.87	7.02***	3.64–13.53
40–54 years	1.09	0.36	10.60	2.99***	1.55–5.77
<i>Positive Feeling</i>	-0.09	0.25	0.13	0.91	0.56–1.50
<i>Money</i>	-0.61	0.24	6.37	0.54*	0.34–0.87
<i>Socializing</i>	-0.62	0.34	3.35	0.54	0.28–1.03
<i>Worthy Causes</i>	-1.44	0.43	11.47	0.24**	0.10–0.55
<i>Escape</i>	-0.43	0.40	1.11	0.65	0.29–1.45
<i>Number of motives</i> (Ref. 0–1 motive)					
2 motives	0.48	0.28	3.03	1.62	0.94–2.79
≥3 motives	1.85	0.50	13.74	6.35***	2.39–16.87
<i>Gambling frequency</i> (Ref. less than once/month)					
1–3 times/month	0.91	0.25	13.67	2.48***	1.53–4.01
At least once/week	1.08	0.25	17.94	2.93***	1.78–4.82
<i>Gambling expenditure</i>	0.01	0.00	2.32	1.01	1.00–1.01
<i>Problem Gambling<sup>a</sup></i>	0.38	0.07	32.88	1.46***	1.28–1.66

Note. *OR*=odds ratio; *CI*=confidence interval. <sup>a</sup>Problem Gambling Severity Index, PGSI

\* $p < .05$ , \*\* $p < .01$ , \*\*\* $p < .001$

**Table 3** Reasons to gamble on offshore gambling websites (n=214)

Category	<i>n</i>	<i>%</i>
Larger game supply and game features	164	76.3
Benefits, bonuses, and the usability of the website	72	33.5
Inner motivation	40	18.6
Social reasons	21	9.8
Responsibility	16	7.4
Marketing	10	4.7

gambling”, customer benefits and “the winnings were paid fast”. The third largest category was named ‘Inner motivation’ and included responses such as curiosity and time passing. ‘Social reasons’ included responses such as a friend recommended or pastime with friends. The category ‘Responsibility’ refers to the responsible gambling procedures the gambling sites use, such as offering consumer protection tools. Some of the respondents indicated that they gambled on offshore gambling sites because the onshore sites used these consumer protection tools. A few respondents indicated that they did not want to support the monopoly status of Veikkaus Oy and therefore used the offshore gambling websites. Finally, the last category was ‘Marketing’ which included advertising, for example. Four answers were excluded as their meaning was not clear or they did not fall into any category (the respondent had invested to the gambling operator, for example).

## Discussion

This study investigated the general gambling motives of onshore and offshore online gamblers, and the specific reasons to gamble on offshore gambling sites. According to our results, offshore gamblers gambled rarely for money or worthy causes but had more different motives to gamble than onshore gamblers. Offshore gamblers tended to gamble more frequently and had higher weekly gambling expenditure than onshore gamblers, although the difference in the gambling expenditure was no longer significant in the logistic regression model.

### Gender and age Differences

As expected, offshore gambling was more common among men. This finding is in line with Gainsbury and her colleagues (2018): offshore gambling is more common among men than women. This finding might be explained by the fact that men gamble more often than women overall. Furthermore, the most game types that women often prefer (e.g., EGMs and lotteries) are already offered on the onshore gambling sites (Salonen et al., 2020). Women also gamble online less than men in general (McCormack et al., 2014; Salonen et al., 2020). Moreover, offshore gamblers had significantly higher PGSI scores than onshore gamblers. Problem gambling is known to be the most prevalent among young men (Salonen et al., 2020). According to the annual report of national helpline Peluuri, young adult males were the largest group to contact helpline and chat services, and the role of offshore gambling in gambling problems has continued to grow (Silvennoinen & Vuorento, 2021). The high gambling expenditure combined with low income associated with studying or early career stage may pose young men at heightened risk for gambling problems as the buffer against financial problems is weaker (Castrén et al., 2018).

The finding that offshore gambling was more common among younger gamblers confirms the previous findings (Costes et al., 2016; Gainsbury et al. 2018; 2019), as well. Younger generation has grown up surrounded by internet in their daily life and easily adopt new technologies (Ahn, 2011). They probably feel more confident exploring new gambling forms on offshore gambling websites than older generation who might feel less confident in online environment, and worry about becoming a victim of fraud (Burton et al., 2022). Furthermore, youth is a period when seeking novel experiences and risk taking is common (Oksanen et al., 2017, 2018; Sussman & Arnett, 2014). Those youths who already hold positive attitudes towards gambling may find new gambling content encountered on social media especially appealing (Kaakinen et al., 2020). Gambling marketing has increased, and people can be exposed to gambling advertising even without searching any related information (Guillou-Landreat et al., 2021). Large amount of the gambling marketing is connected to sports and is designed to strengthen the mental association of sports and gambling, sometimes referred as sportification of gambling. This type of advertising is targeted especially to young men, and depicts gambling as exciting, fun, and effortless lifestyle.

### Motive Types and Multiple Motives

The result that gambling for money was less common for offshore gamblers than onshore gamblers was surprising given that online gambling is often initiated to make money (Gold-

stein et al., 2016). Offshore gamblers might be more motivated by the mood-altering effects of games or social reasons, as was shown in the descriptive results although the difference was no longer statistically significant in the model. Offshore gambling sites may provide opportunities to gamble with higher risk which in turn increases the thrill and excitement (Baudinet & Blaszczynski, 2013; Rockloff et al., 2007). Young people with sensation seeking and impulsive behavior may find high risk games especially appealing which places them at higher risk for developing gambling problems as a result. However, the result that supporting worthy causes was less common for offshore gamblers was expected since the offshore gambling operators rarely use their profits to common-good purposes.

The results also revealed that offshore gamblers had more different motives, gambled more often, spent more money on gambling, and had higher PGSI scores than onshore gamblers. It is likely that all these factors represent the intensity of gambling which is inherently related to problem gambling (Abbott et al., 2018; Binde et al., 2017; Ferris & Wynne, 2001). This is in accordance with previous studies which found out that offshore gambling is associated with more intense gambling patterns and problem gambling (Costes et al., 2016; Gainsbury et al., 2018; Hing et al., 2021). If gambling has a big role in one's life, its meaning may also be manyfold so that it can fulfill several different needs. It is likely that those who already have gambling problems seek new and more thrilling gambling experiences from offshore gambling sites, but also using offshore gambling sites can facilitate more intensive gambling and accelerate the development of problem gambling. The motives for gambling may also differ in the different phases of the addiction: pleasure is important at the onset of the addiction but eventually mood regulation, loss of control and changes in tolerance become central (APA, 2013; Blaszczynski et al., 2008).

### **Reasons for Choosing Offshore Gambling Sites**

The results from the qualitative analysis revealed that offshore gamblers have multiple different reasons for choosing offshore gambling sites. The most important reasons were larger game supply and game features which corresponds the previous findings (Gainsbury et al., 2018, 2019). This finding suggests that some gamblers are not satisfied with the onshore game supply and gambling experiences, which may push them to search new gambling experiences elsewhere. Offshore gambling sites can provide larger variation of game features, as they do not follow the same restrictions and consumer protection requirements as onshore sites. The second most common reasons to gamble on offshore gambling sites were benefits, bonuses, and the usability of the website, which are designed to appeal new customers and to commit the existing ones. This finding is also in accordance with the study by Gainsbury et al. (2019).

### **Implications for Policy and Practice**

The Lotteries Act that regulates gambling in Finland will be reformed (Ministry of Social Affairs and Health, 2022). The reform focuses on preventing harm caused by gambling, combating illegal marketing, and directing the demand for gambling towards activities that are covered by the Lotteries Act. Lotteries Act will include, for example, a new instrument which enables to block payment transactions to offshore gambling operators that direct their marketing to mainland Finland (Rydman & Tukka, 2019). This study provides important

new knowledge that supports restricting offshore gambling. Offshore gambling poses a threat to public health and especially for young people with impulsive and risky behavior. This group should be targeted in preventive programs.

## Limitations

This study has some limitations that should be considered. First, the study is limited to Mainland Finland only excluding the immigrants, institutionalized person or those speaking other language than Finnish or Swedish. Second, the monopoly system in Finnish gambling regulation is somewhat uncommon compared to many other countries, which may weaken the generalizability of the study results into countries with different licensing systems. Third, the study design was cross-sectional denoting that no causal conclusions can be made. Future studies would benefit from using longitudinal study design. Finally, the study utilized self-reported data which enables possible social desirability bias where participants tend to answer in socially acceptable ways which does not wholly reflect their genuine reality (Krumpal, 2013). The participants may, for example, underreport some sensitive information, such as gambling severity or gambling expenditure.

## Conclusions

Offshore online gambling was more common among men and younger age groups than among women or older age groups. Offshore gamblers gambled rarely for money or supporting worthy causes, but they had multiple gambling motives, more intense gambling behavior, and more severe problem gambling than onshore gamblers. Offshore gambling poses a heightened risk for problem gambling especially for young men with impulsive and risky behavior. The most common reasons for choosing offshore gambling sites were larger game supply and game features implicating that some gamblers are not satisfied with the onshore game supply.

**Authors' Contribution** Heli Hagfors: Conceptualization, Methodology, Formal Analysis, Writing – Original draft.

Atte Oksanen: Conceptualization, Writing – Review & Editing, Supervision.

Anne H. Salonen: Conceptualization, Resources, Writing – Review & Editing, Supervision.

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**Data & Materials** The survey data without any register-based information is publicly accessible for research purposes from the Finnish Society Science Data Archive (FSD) with the name of Gambling Survey 2019 (ID: FSD3522; Persistent identifier: urn:nbn:fi:fsd:T-FSD3522).

## Declarations

**Ethics Approval** The Ethics Committee of the Finnish Institute for Health and Welfare has approved the research protocol (THL/774/6.02.01/2019). Participation in the study was voluntary and informed consent

was obtained. All the answers were treated confidentially, and the study results will be reported as statistics and tables so that participants cannot be identified.

The research protocol was approved by the Ethics Committee of the Finnish Institute for Health and Welfare (Statement THL/774/6.02.01/2019). Written information about the study in form of invitation letter and the brochure, also including contact information, a link to the study homepage and to the privacy notice for scientific research ([www.thl.fi/rahapelitutkimus](http://www.thl.fi/rahapelitutkimus)), were sent to the participants. Furthermore, the principles of voluntary participation were offered to potential participants. According to the General Data Protection Regulation, potential participants were informed that participating in the study included links to the register-based data. The study was conducted in accordance with the ethical standards of the Declaration of Helsinki.

**Competing Interests** The authors have no competing interests to declare that are relevant to the content of this article.

**Consent** Before the computer-assisted interview, informed consent was obtained from all subjects involved in the study.

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**A longitudinal study of gambling motives, problem gambling and need  
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# A longitudinal study of gambling motives, problem gambling and need frustration

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## ABSTRACT

Gambling motives are an important element in understanding the development of problem gambling, yet most of the recent studies investigating their role in problem gambling have been cross-sectional. This study analyzed the links between gambling motives and problem gambling using a longitudinal study design. The moderating effect of the frustration of basic psychological needs was also assessed. The study sample with 1,022 participants (48.43% female,  $M_{age} = 49.50$  years) was surveyed at three timepoints (T1–T3) in 6-month intervals. The Problem Gambling Severity Index (PGSI) was used to measure problem gambling and need frustration was assessed with The Basic Psychological Need Satisfaction and Frustration Scale (BPNSFS). The data were analyzed using a multilevel mixed-effects regression model where PGSI was the outcome variable. Gambling motives and need frustration were the predictors while psychological distress (measured with the 5-Item Mental Health Inventory, MHI-5), offshore/onshore online gambling, and socio-demographic factors were used as control variables. All the motives predicted problem gambling individually over time. In contrast, motives to escape, to win money, and to compete along with need frustration predicted problem gambling over time in the full model. In addition, money motive and need frustration had an interaction effect so that higher need frustration combined with money motive predicted more severe gambling problems. The results of this study provide a valuable longitudinal perspective on gambling motives, frustration of basic psychological needs, and gambling problems which can be used to develop and improve treatment efforts and programs of problem gambling.

## 1. Introduction

What motivates behavior is one of the most frequently asked questions among people, especially when it comes to potentially harmful behaviors like gambling. In recent years, gambling motives have started to gain more research interest as their role in gambling behavior and problem gambling have been recognized (Francis et al., 2015; Stewart & Zack, 2008; Sundqvist et al., 2016; Tabri, Xuereb, et al., 2022). Although several studies have analyzed the links between gambling motives and problem gambling, a majority of the studies have been cross-sectional (i. e., Francis et al., 2015; Hagfors et al., 2022; Mulkeen et al., 2017; Sundqvist et al., 2016; Tabri, Xuereb, et al., 2022). This kind of research can be used to identify potential correlates of problem gambling, but it cannot be used to deduce the temporal sequence of the variables (Busk, 2005; Landreat et al., 2020). Moreover, gambling motives may change during the progress of gambling problem severity: the initial reasons to gamble are likely to be different than the reasons that maintain the habit

(Blażczynski et al., 2008; Grubbs & Rosansky, 2020). Therefore, it is important to investigate the longitudinal patterns of gambling motives and their role in gambling problems over time. This study aims to fill this gap by analyzing the associations of gambling motives and problem gambling using a longitudinal study design.

Previous research has identified various motives for why people gamble. Winning money is the most fundamental motive for gambling as it is in the core of the activity (Binde, 2013). The temptation to gamble may also be fueled with other well-known motives such as enhancement, socializing, and escaping or distracting oneself from negative thoughts and emotions (Barrada et al., 2019; Francis et al., 2015; Stewart & Zack, 2008; Volberg et al., 2017; Wardle et al., 2011). Competition and developing skills have also been recognized as motives for gambling (e. g. Binde, 2013). However, only a few studies have used longitudinal designs to analyze the links between gambling motives and problem gambling. Two Canadian 5-year longitudinal studies found that gambling to escape and to win money predicted not only current

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problem gambling but also future problem gambling onset (el-Guebaly et al., 2015; Williams et al., 2015). Additionally, a recent study found that gambling to escape and positive gambling expectations predicted problem gambling six months after the initial assessment (Grubbs & Rosansky, 2020). A study by McGrath and Konkoly Thege (2018) investigated the stability versus change of gambling motives over five years. They concluded that notable changes were found in each motive category, although problem gambling was not a significant predictor for stability or change.

The pathways model of problem and pathological gambling (Blaszczynski & Nower, 2002; Nower et al., 2022) proposes that there are different pathways to problem gambling where individual's biopsychological disposition, past experiences, ecological factors, and current behavior – including gambling motives – all contribute to the development of problem gambling. According to the model, these factors make individuals vulnerable to problem gambling. For instance, cognitive processes taking place while gambling, previous mental health problems, poor coping skills, and having a troubled family history correlate with gambling problems (Blaszczynski & Nower, 2002). Moreover, certain characteristics of the environment, such as easy availability and accessibility of gambling activities, can promote heavy gambling involvement (Abbott et al., 2018; Blaszczynski & Nower, 2002; el-Guebaly et al., 2015).

The rapid rise of online gambling with easy access any time of the day poses a new kind of risk for developing gambling problems (Hing et al., 2017). Especially offshore websites form a worrisome new mode of online gambling (Gainsbury et al., 2018, 2019). Offshore gambling refers to gambling on websites that provide gambling services in a certain jurisdictional area without a valid license and against local restrictions. These websites are often heavily marketed with high payout rates, benefits and bonuses, and the ability to use local currency, but at the same time they ignore local safety standards. In previous studies, offshore gambling has been associated with more severe gambling problems than gambling on licensed onshore sites (Gainsbury et al., 2018, 2019; Hing et al., 2021; Oksanen, Hagfors et al., 2022), making it a form of activity that requires special attention.

An additional factor making individuals vulnerable to gambling problems could be the frustration of psychological needs. Basic psychological needs theory (BPNT) is a mini theory that was developed within the self-determination theory (SDT; Ryan & Deci, 2000; 2017). According to the BPNT, satisfaction of basic psychological needs for autonomy (feeling of choice and volition), competence (being confident about one's own abilities), and relatedness (being meaningfully connected to others) promotes well-being, flourishing, and personal growth (Church et al., 2013). In contrast, frustration of these needs has been associated with increased psychological distress and ill-being (Bartholomew et al., 2011; Chen et al., 2015; Vasteenkiste & Ryan, 2013). Need frustration includes experiences of rejection and loneliness (relatedness frustration), feelings of failure and doubts about one's abilities (competence frustration), and feelings of being controlled and pressured (autonomy frustration) (Chen et al., 2015). Conceptually, need frustration has been suggested to be distinguished from low levels of need satisfaction, as it is, for example, different to feel low relatedness to colleagues than to be actively rejected by them (Bartholomew et al., 2011; Vasteenkiste & Ryan, 2013).

According to the BPNT, when the psychological needs are chronically thwarted, people are likely to develop various coping strategies, including need substitutes and maladaptive compensatory behaviors (Vasteenkiste & Ryan, 2013). Previous literature has associated need frustration with problematic gambling (Mills et al., 2021; Vuorinen et al., 2022), but it is still unclear how need frustration affects gambling behavior. It is feasible that need frustration works in conjunction with certain gambling motives and accelerates the development of problem gambling. Thus, thwarted intrinsic needs may drive toward more extrinsic rewards and motivate gambling behavior as a means of compensation.

Building on previous findings on gambling motives, basic psychological needs, and problem gambling, this study aims to investigate whether gambling motives predict gambling problems over time and to further explore if need frustration moderates this association. Referring to the previous longitudinal studies, we hypothesize that gambling to escape or to win money predict gambling problems over time. Moreover, we hypothesize that need frustration moderates these associations so that the associations would be stronger when need frustration is present.

## 2. Materials and methods

### 2.1. Participants and procedure

A nation-wide sample included Finnish participants from mainland Finland, aged 18–75 years ( $N = 1,022$ ; 51.27 % male, 48.43 % female, and 0.03 % other gender). The data were collected from a panel administered by a European data collection company Norstat. Response rate in the first time point of the study (T1) was 34.60 and the sample matches the Finnish population aged 18–75 (Oksanen, Mantere, et al., 2022). Data collection was conducted in three timepoints every 6-months, starting in April 2021 (T1). The first follow-up survey was conducted in October–November 2021 (T2) and the second follow-up in April–May 2022 (T3). Of the initial T1 participants, 66.80 % participated also in T2 and T3.

Nonresponse analysis showed that those who participated in all three timepoints ( $N = 1,022$ ) were somewhat older (49.59 years vs. 46.67 years) than those in the original T1 ( $N = 1,530$ ). There was no other major dropout based on gender, income, education, geographical area, or occupational or marital status. However, the mean rate of gambling problems measured with the Problem Gambling Severity Index (PGSI) was lower in the final sample compared to T1 (1.11 vs. 1.15) which indicates that the final sample is closer to the general population estimates (e.g., Salonen et al., 2020). Overall, the final sample corresponds with the general population parameters relatively well based on the demographic data by Statistics Finland (Official Statistics of Finland, 2022).

The participants were informed about the purpose and use of the survey, and they gave their consent for participation by completing the full survey. Individual participants could not be identified from the data, as Norstat provided only anonymized data to the researchers. The study was reviewed and approved by The Academic Ethics Committee of the Tampere region before the first data collection. In each timepoint, the researchers conducted data quality checks to remove obviously biased response patterns from the final data.

#### 2.1.1. Measures

The Problem Gambling Severity Index (PGSI; Ferris & Wynne, 2001; Currie, Casey, & Hodgins, 2010) was used to assess the severity of gambling problems in the sample. The scale is widely used in assessing problem gambling in general populations, including national studies in Finland (e.g., Salonen et al., 2020; Volberg et al., 2017; Wardle et al., 2011). The scale consists of nine items, each assessing different negative consequences of gambling, such as a range of problems and harms. The original PGSI (Ferris & Wynne, 2001) evaluates gambling behaviors and harms experienced in the last 12 months, but due to the longitudinal approach of our study, we assessed gambling problems as experienced in the last six months (e.g., “Thinking about the last six months, have you bet more than you could really afford to lose?”). Each item of the scale is assessed on a four-point scale (0 = *never*, 1 = *sometimes*, 2 = *most of the time*, and 3 = *almost always*), higher points indicating a higher likelihood of gambling problems. The internal consistency of the scale measured with McDonald's omega was excellent in all three timepoints (T1:  $\omega = 0.94$ , T2:  $\omega = 0.93$ , T3:  $\omega = 0.94$ ).

Gambling motives were assessed with eight individual questions, each addressing a different gambling motive. The items asked about frequency with the anchor: “How often during the last six months...”.

The escape motive was measured with the three escapism items from the Motivations to Play Inventory (Hagström & Kaldo, 2014), for example "...have you gambled in order to avoid real-life social encounters or situations?". Other gambling motives were chosen based on previous literature on gambling motives (Williams et al., 2017; Volberg et al., 2015). The chosen items have been widely used in Finland as well (e.g., Salonen et al., 2020; Hagfors et al., 2022). These involved motives for money ("...have you gambled to win money?"), competition ("...have you gambled to compete with others?"), excitement ("...have you gambled for excitement?"), social interaction ("...have you gambled to socialize with others?"), and competence ("...have you gambled because it makes you feel skilled?"). All motives were assessed on a five-point scale (0 = *never*, 1 = *rarely*, 2 = *sometimes*, 3 = *often*, and 4 = *always*) where higher points indicated higher endorsement of the motive. Escape motive scale had a good internal consistency in all three timepoints (T1:  $\omega = 0.84$ , T2:  $\omega = 0.87$ , T3:  $\omega = 0.88$ ).

To measure the frustration of basic psychological needs we combined the frustration subscales of The Basic Psychological Need Satisfaction and Frustration Scale (BPNSFS; Chen et al., 2015). The scale included half of the 24 items of the full scale, with 4 items measuring autonomy frustration (e.g., "I feel forced to do many things I wouldn't choose to do"), 4 items measuring relatedness frustration (e.g., "I feel excluded from the group I want to belong to") and 4 items measuring competence frustration (e.g., "I feel disappointment with my performances") on a 7-point Likert scale (1 = *not at all true* ... 7 = *totally true*). The scale was included only at T1, but it had excellent internal consistency ( $\omega = 0.92$ ). The satisfaction subscales were left out in order to focus exclusively on need frustration.

Psychological distress was measured using the 5-Item Mental Health Inventory (MHI-5; Berwick et al., 1991). The measure includes five items that assess emotional health status. It is a short version of the original 38-item version and commonly used in surveys to efficiently screen for general mental health and wellbeing (e.g., Elovainio et al., 2020). Items of the MHI-5 inquire, for example, how much of the time during the last 30 days the individual has felt downhearted or blue, or felt calm and peaceful. Answer options range on a scale from 1 (*none of the time*) to 6 (*all of the time*). Internal consistency of the inventory was high in all measurement points (T1:  $\omega = 0.89$ , T2:  $\omega = 0.88$ , T3:  $\omega = 0.87$ ).

In Finland, gambling is provided by a state-owned monopoly supplier, Veikkaus Oy. Offshore and onshore gambling were inquired with two different questions: "Have you gambled on any offshore gambling websites (other than websites provided by Veikkaus or Paf)?" and "Have you gambled on gambling websites provided by Paf?". Paf (Ålands Penningautomatförening) is the Åland Islands' own monopoly operator that provides online games and gambling opportunities on ships sailing between Finland and Sweden or Estonia. Despite the state-owned monopoly in Finland, participating in offshore gambling, that is, foreign gambling operators or games offered by Paf, is not prohibited under Finnish legislation. Answering 'yes' to either or both questions was categorized as offshore gambling, whereas answering 'no' to both questions was categorized as onshore gambling. Finally, several socio-demographics such as age, gender, income, education, and occupational status were inquired from the participants.

## 2.2. Statistical techniques

We conducted the analyses using Stata 17 software. Main analyses were conducted using multilevel linear mixed-effects regression. These models analyze the within-person changes and between-person differences in gambling problems over time. Within-person predictors are time-varying and include gambling motives, need frustration, onshore/offshore gambling, psychological distress, occupational status, and income. Age, gender, and education are added as between-person predictors measured at T1.

Models 0 include only gambling motives added separately without any other variables. Model 1 includes all gambling motives and other

variables in the same model. Model 2 adds to Model 1 by including interactions between different gambling motives and need frustration.

For the fixed parts of our models, we report unstandardized regression coefficients (B) and their standard errors (SE B) and the statistical significance of the estimates (p). Our models included random intercepts and random slopes for time with an unstructured covariance structure. For the random parts of our models, we report regression coefficients (B) and their standard errors (SE B), and 95 % confidence intervals. Statistically significant interactions are plotted in the figure.

Additional robustness checks of the analyses were conducted using multilevel fixed effects regression. Fixed effects regression is especially powerful when focusing only on individual variation over time as they exclude between-person variation. Hence, they give also better ground for causal inference as they are more efficient in controlling unobserved confounders (Brüderl & Ludwig, 2015). These analyses focused only on gambling motives, and they are comparable to models 0. Predictors were standardized. These analyses are only reported in the text.

## 3. Results

Descriptive statistics of the study sample are presented in Table 1. At T1, around 40 % of the participants had a bachelor's degree or higher and more than half were employed. The mean score for gambling problems measured with the PGSI was a bit higher at T2 (2.98) than in the original sample at T1 (1.15) or at T3 (1.11). Gambling for money, to escape, and for excitement had the highest mean scores of the motives, respectively. The majority of the participants had gambled on onshore websites, while a fifth had also gambled on offshore gambling sites.

Table 2 presents the results from the multilevel mixed-effects regression analysis predicting gambling problems. In Model 0, within-person changes in each gambling motive predicted gambling problems over time. Escape motive had the strongest within-person effect on gambling problems ( $B = 0.85$ ,  $p < .001$ ) when compared to the other motives. Model 1 included all the gambling motives as independent variables. Need frustration, onshore/offshore gambling, psychological distress, age, gender, income, education, and occupational status were treated as control variables. The results show that escape, money, and competition motives had statistically significant within-person effects on gambling problems. Need frustration and offshore gambling also had significant within-person effects on gambling problems. Higher education, in turn, had a statistically significant between-person effect predicting fewer gambling problems over time.

The full model (Model 2) includes all independent variables, control variables, and the interaction terms with motives and need frustration. All the significant predictors from Model 1 remained statistically significant also in Model 2. Moreover, the results show that need frustration moderated the association between money motive and gambling problems ( $B = 0.29$ ,  $p < .001$ ) so that gambling for money combined with higher need frustration predicted more severe gambling problems (Fig. 1). None of the other interaction terms were statistically significant.

Additional robustness checks confirmed the role of gambling motives in gambling problems. Within person effects based on fixed effects regression models were all statistically significant. Escapism had the strongest effect ( $B = 0.66$ ,  $p < .001$ ), followed by money motive ( $B = 0.30$ ,  $p < .001$ ), competition motive ( $B = 0.30$ ,  $p < .001$ ), excitement motive ( $B = 0.21$ ,  $p < .001$ ), social motive ( $B = 0.21$ ,  $p < .001$ ), and competence motive ( $B = 0.14$ ,  $p = .002$ ).

## 4. Discussion

This longitudinal study investigated gambling motives and their association with gambling problems among Finnish adults. The moderating role of basic psychological need frustration was also examined. We expected that gambling to escape and to win money would predict gambling over time, and that need frustration would moderate the

**Table 1**  
Descriptive statistics of the main study variables (n = 1,022).

Continuous variables	Range	T1		T2		T3	
		M	SD	M	SD	M	SD
Gambling problems <sup>a</sup>	0–27	1.15	3.02	1.12	2.98	1.11	3.04
Motive: Escape	0–10	0.83	1.72	0.82	1.74	0.80	1.75
Motive: Money	0–4	0.99	1.37	1.05	1.36	0.99	1.36
Motive: Competition	0–4	0.48	0.89	0.51	0.94	0.49	0.90
Motive: Excitement	0–4	0.86	1.15	0.86	1.14	0.82	1.07
Motive: Socializing	0–4	0.43	0.89	0.42	0.86	0.42	0.85
Motive: Competence	0–4	0.49	0.89	0.50	0.89	0.49	0.88
Need frustration <sup>b</sup>	12–74	32.46	13.40	32.46	13.40	32.46	13.40
Psychological distress <sup>c</sup>	5–30	12.24	4.67	12.20	4.58	12.28	4.43
Income	1–8	3.16	1.59	3.18	1.60	3.25	1.60
Age	18–75	49.50	15.86	–	–	–	–
<i>Categorical variables</i>		<i>n</i>	<i>% yes (=1)</i>	<i>n</i>	<i>% yes (=1)</i>	<i>n</i>	<i>% yes (=1)</i>
Onshore online gambling	0/1	649	63.50	634	62.04	633	61.94
Offshore online gambling	0/1	199	19.47	207	20.25	192	18.79
Working	0/1	527	51.57	562	54.99	580	56.75
Male	0/1	524	51.27	–	–	–	–
BA degree or higher	0/1	404	39.53	–	–	–	–

Note.

- <sup>a</sup> Problem Gambling Severity Index (PGSI).
- <sup>b</sup> Basic Psychological Needs Satisfaction and Frustration Scale (BPNSFS).
- <sup>c</sup> 5-Item Mental Health Inventory (MHI-5).

**Table 2**  
Multilevel mixed-effects regression models predicting gambling problems<sup>a</sup> (n = 1,022).

Fixed part	Models 0			Model 1			Model 2		
	B	SE (B)	p	B	SE (B)	p	B	SE (B)	p
Constant				1.26	0.29	<0.001	1.26	0.29	<0.001
<i>Within-person variables</i>									
Motive: escape	<b>0.85</b>	<b>0.11</b>	<b>&lt;0.001</b>	<b>0.71</b>	<b>0.11</b>	<b>&lt;0.001</b>	<b>0.73</b>	<b>0.11</b>	<b>&lt;0.001</b>
Motive: money	<b>0.44</b>	<b>0.06</b>	<b>&lt;0.001</b>	<b>0.32</b>	<b>0.05</b>	<b>&lt;0.001</b>	<b>0.35</b>	<b>0.05</b>	<b>&lt;0.001</b>
Motive: competition	<b>0.44</b>	<b>0.06</b>	<b>&lt;0.001</b>	<b>0.17</b>	<b>0.05</b>	<b>0.002</b>	<b>0.15</b>	<b>0.05</b>	<b>0.004</b>
Motive: excitement	<b>0.41</b>	<b>0.06</b>	<b>&lt;0.001</b>	0.01	0.06	0.820	0.01	0.06	0.855
Motive: social	<b>0.29</b>	<b>0.06</b>	<b>&lt;0.001</b>	0.02	0.05	0.702	0.02	0.04	0.708
Motive: competence	<b>0.29</b>	<b>0.05</b>	<b>&lt;0.001</b>	–0.05	0.06	0.405	–0.05	0.05	0.335
Need frustration <sup>b</sup>	–	–	–	<b>0.23</b>	<b>0.08</b>	<b>0.004</b>	<b>0.24</b>	<b>0.08</b>	<b>0.003</b>
Onshore online gambling	–	–	–	0.07	0.04	0.057	0.07	0.04	0.052
Offshore online gambling	–	–	–	<b>0.55</b>	<b>0.07</b>	<b>&lt;0.001</b>	<b>0.55</b>	<b>0.07</b>	<b>&lt;0.001</b>
Psychological distress <sup>c</sup>	–	–	–	0.06	0.05	0.235	0.07	0.05	0.150
Working	–	–	–	0.02	0.07	0.806	0.02	0.07	0.728
Income	–	–	–	0.04	0.05	0.449	0.03	0.05	0.492
<i>Between-person variables</i>									
Age	–	–	–	0.00	0.01	0.958	0.00	0.00	0.871
Male	–	–	–	0.04	0.14	0.772	0.07	0.14	0.636
BA degree or higher	–	–	–	<b>–0.35</b>	<b>0.14</b>	<b>0.011</b>	<b>–0.33</b>	<b>0.13</b>	<b>0.014</b>
Motive: escape × frustration	–	–	–	–	–	–	–0.05	0.09	0.607
Motive: money × frustration	–	–	–	–	–	–	<b>0.29</b>	<b>0.06</b>	<b>&lt;0.001</b>
Motive: competition × frustration	–	–	–	–	–	–	0.08	0.06	0.167
Motive: excitement × frustration	–	–	–	–	–	–	–0.03	0.05	0.586
Motive: social × frustration	–	–	–	–	–	–	0.01	0.05	0.815
Motive: competence × frustration	–	–	–	–	–	–	0.01	0.06	0.908
<i>Random part</i>				<i>B</i>	<i>SE (B)</i>	<i>95% CI</i>	<i>B</i>	<i>SE (B)</i>	<i>95% CI</i>
Variance (time)	–	–	–	0.17	0.09	0.06–0.49	0.15	0.09	0.05–0.47
Variance (constant)	–	–	–	5.51	1.06	3.79–8.03	4.97	1.00	3.36–7.37

Note.

- <sup>a</sup> Problem Gambling Severity Index (PGSI).
- <sup>b</sup> Basic Psychological Needs Satisfaction and Frustration Scale (BPNSFS).
- <sup>c</sup> 5-Item Mental Health Inventory (MHI-5).

association between gambling motives and gambling problems. The results largely supported our hypotheses. According to our results, all the measured motives predicted gambling problems individually over time. In the full model, however, only escape, money, and competition motives predicted gambling problems over time. Need frustration, offshore gambling, and having a lower education (less than a bachelor's degree) also predicted gambling problems. In terms of the interaction analysis, we found that need frustration moderated the association

between money motive and gambling problems so that gambling for money predicted more severe gambling problems especially when need frustration was present.

The results of this study support the previous research which has shown that varying motives for gambling, such as winning money, excitement, socializing, and escaping negative emotions are critical factors in gambling engagement (Barrada et al., 2019; Binde, 2013; Francis et al., 2015; Stewart & Zack, 2008; Volberg et al., 2017; Wardle

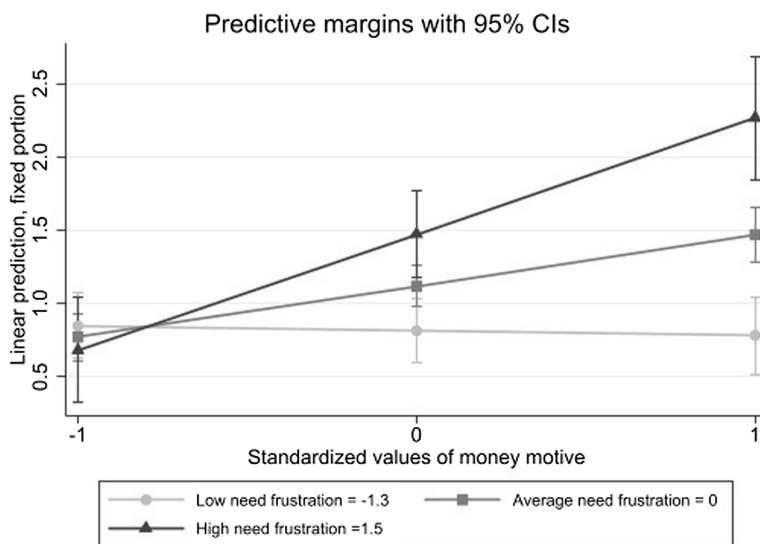


Fig. 1. Higher need frustration combined with money motive predicts more severe gambling problems.

et al., 2011). Our results suggest that especially the motives to escape, to win money, or to compete predict gambling problems over time. This is in line with the Pathways model, which suggests that those with mood disorders and other emotional vulnerabilities may use gambling to narrow their focus of attention to alleviate the symptoms of anxiety and depression (Baudinet & Blaszczynski, 2013; Blaszczynski & Nower, 2002; Wood & Griffiths, 2007). The money motive is also plausible, especially if the individual views money as a measure of success and extension of self-worth (Tabri, Xuereb, et al., 2022). In addition, gambling venues and sites offer competitive environments, which may appeal to some gamblers' need to assert oneself and thus contribute to continuation of gambling and gambling problems (Harris et al., 2015; Weiss & Schiele, 2013; Young & Stevens, 2009). Understanding the impact of these motives is crucial in understanding how some gamblers develop problems and which kinds of rewarding mechanisms lure individuals to gamble.

Our findings regarding the interaction between need frustration and money motive is also largely consistent with the BPNT. When people chronically feel that their needs are not being met, they develop strategies to cope with this situation, such as compensatory behavior and need substitutes (Vasteenkiste & Ryan, 2013; Verstuyf et al., 2012). People may use gambling to cope with the negative emotions produced by need thwarting, and this may be especially true if the individual is motivated to gamble for money. According to the BPNT, need substitutes are divided into extrinsic goals, such as popularity, physical attractiveness or financial success, and intrinsic goals, such as personal growth or contributing to the community (Vasteenkiste & Ryan, 2013). Money can be an appealing goal for those experiencing deficits in their self-worth and yearning social approval, as it represents power, prestige, and status (Blaszczynski & Nower, 2010), and for many, gambling may seem like an easy way to make money (Binde, 2013; Tabri et al., 2022). Previous research has indeed found that those with problem gambling often have a financially focused self-concept and it may be a factor that maintains problematic gambling (Blaszczynski & Nower, 2010; Tabri, Salmon, et al., 2022; Tabri & Wohl, 2021). This is very much in line with the BPNT and implies that we must not only focus on the individual-level of gambling problems, but also strive to study and change the need thwarting environments that people might be exposed to.

Finally, our results join a small but growing body of evidence which links offshore gambling to gambling problems (Gainsbury et al., 2018,

2019; Hing et al., 2021; Oksanen, Hagfors et al., 2022). This may be due to both individual and website-related characteristics. Offshore gambling sites try to appeal to customers by offering them more diverse choices, products, and experiences than many onshore alternatives. They also include attractive payouts that often come with higher risks (Gainsbury et al., 2018). As gambling problems are characterized by high gambling involvement in general, those with gambling problems may be motivated to gamble on offshore websites as well (Binde et al., 2017).

The results of this study can be used to develop and advance the treatment of problem gambling. It would be beneficial to encourage those with gambling problems to reflect on their motives to gamble and how these motives may maintain the problem. Moreover, our findings highlight the requirement to address individual's psychological needs as a part of wholesome problem gambling intervention. It would be important to recognize and discuss unmet basic psychological needs and how their satisfaction or frustration may impact behavior. Teaching alternative and more adaptive coping behaviors as well as helping individuals find ways to satisfy these needs in a healthy way might be fruitful in efforts to change the thoughts and behaviors of those experiencing gambling problems.

The current study has some limitations. First, our study is limited to Finland. Future cross-national studies should investigate these associations in different cultural settings and gambling jurisdictions. Second, although our gambling motive items were based on validated scales, there are other gambling motive scales that we could have utilized, such as the 16-item Gambling Motives Questionnaire-Financial (GMQ-F) that includes financial, coping, enhancement and social motives (Schellenberg et al., 2016). Notably, our study found that escapism and competition motives are important in gambling behavior. Hence future studies could also investigate the possibility of combining sub-scales from different scales to screen for gambling motives more broadly. Third, the measures are based on self-reports which can be sensitive to bias, especially when concerning potentially undesirable behaviors, such as problematic gambling. Finally, we measured basic psychological need satisfaction and frustration only in T1, assuming there would not be much fluctuation during the next year. One must be cautious with making statements about whether this is the case. Future studies should continue investigations of gambling motives with both longitudinal and experimental designs. We also recommend future studies to continue

investigating the role of basic psychological needs in gambling problems, as the environment may increasingly threaten the satisfaction of these basic needs, for example, due to increased demands in different areas of life, including learning, working life, and the digitalization of social connectedness which may ultimately interact with gambling motives.

## 5. Conclusions

This study investigated the association between gambling motives and gambling using a three-wave longitudinal study-design. The results showed that gambling for money, to escape, and for competition predicted gambling problems over time. It was also found that the frustration of basic psychological needs moderated the association between money motive and gambling problems. The results highlight that gamblers' psychological needs should be better acknowledged and addressed in prevention and intervention work, as they are likely attempted to be satisfied by gambling, especially if motivated by money.

## Author agreement statement

We the undersigned declare that this manuscript is original, has not been published before and is not currently being considered for publication elsewhere. We confirm that the manuscript has been read and approved by all named authors and that there are no other persons who satisfied the criteria for authorship but are not listed. We further confirm that the order of authors listed in the manuscript has been approved by all of us. We understand that the Corresponding Author is the sole contact for the Editorial process. She is responsible for communicating with the other authors about progress, submissions of revisions and final approval of proofs.

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## CRedit authorship contribution statement

**Heli Hagfors:** Conceptualization, Formal analysis, Methodology, Visualization, Writing – original draft, Writing – review & editing. **Ilkka Vuorinen:** Data curation, Funding acquisition, Writing – original draft, Writing – review & editing. **Iina Savolainen:** Data curation, Funding acquisition, Writing – original draft, Writing – review & editing. **Atte Oksanen:** Conceptualization, Data curation, Formal analysis, Funding acquisition, Methodology, Supervision, Visualization, Writing – original draft, Writing – review & editing.

## Declaration of Competing Interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

## Data availability

Data is available from the authors with a reasonable request.

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# PUBLICATION IV

## **Lonely gamble – A longitudinal study of loneliness, gambling to escape and problem gambling**






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# Lonely gamble – A longitudinal study of loneliness, gambling to escape and problem gambling

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## ABSTRACT

*Background and Aims:* The evidence concerning the relationships between loneliness, gambling to escape, and problem gambling is mixed. This study aimed to investigate how loneliness relates to gambling to escape and gambling problems using a longitudinal approach. *Method:* This population-based, longitudinal study included five time points, with data having been collected between April 2021 (T1) and April–May 2023 (T5). Participants were 18–75-year-old Finnish residents. Only those who had taken part in the study at each time point (T1–T5) and had gambled at least once a month at some point in the follow-up period were included in the study ( $n = 612$ ; 54.58% male;  $M_{\text{age}} = 51.85$  years). Loneliness was measured with the UCLA 3-Item Loneliness Scale, and gambling to escape was measured with three questions concerning negative escapism taken from the Motivations to Play Inventory. Problem gambling was measured using the Problem Gambling Severity Index (PGSI). Random intercept cross-lagged panel modeling was used to analyze the relationships. *Results:* Gambling problems predicted future loneliness on a within-person level, but loneliness did not predict future gambling problems. Also, gambling to escape predicted future gambling problems on a within-person level. On a between-person level, loneliness, gambling to escape and gambling problems were positively correlated. *Discussion and Conclusion:* Gambling problems may predispose individuals to future loneliness. However, the relatively small effects observed indicate that individual differences play a significant role in this regard.

## KEYWORDS

loneliness, problem gambling, gambling to escape, coping motive, longitudinal design, follow-up study

## INTRODUCTION

The global expansion of the gambling industry and the possibilities of online gambling have made gambling widely accessible and popular (Allami et al., 2021; Sulkuinen et al., 2021). For most people, gambling is harmless recreation, but for some, gambling develops into a problem, with various associated social, financial, and psychological harms (Hilbrecht et al., 2020). Extensive research has found that psychosocial problems, such as loneliness, often co-occur with addictive behaviors (Savolainen, Oksanen, Kaakinen, Sirola, & Paek, 2020; van der Maas, 2016; Zilberman, Yadid, Efrati, & Rassovsky, 2020). Similarly, gambling problems have been found to be associated with loneliness (Sirola, Kaakinen, Savolainen, & Oksanen, 2019; Sirola, Nyrhinen, & Wilska, 2023; Vuorinen et al., 2021). However, the evidence concerning the association between loneliness and gambling problems is mixed (Nordmyr & Forsman, 2020). This study's purpose is to develop a nuanced understanding of the role of loneliness in gambling problems by investigating the relationships between loneliness, gambling to escape and problem gambling, using a longitudinal study design.

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Loneliness is a subjective emotional state characterized by feelings of isolation and a lack of meaningful connections (Perlman & Peplau, 1982). It is often described as a perceived discrepancy between the desired and actual levels of social interaction (Cacioppo & Cacioppo, 2012). As the need to belong is a fundamental human motivation (Baumeister & Leary, 1995), it is no wonder that loneliness has been associated with several negative outcomes, such as depression and other mental health problems, chronic illnesses, and addictive behaviors, including gambling problems (Mushtaq, Shoib, Shah, & Mushtaq, 2014; Park et al., 2020; Theeke, 2010). Some studies indicate that loneliness predicts gambling problems (Castrén et al., 2013; Edgren, Castren, Jokela, & Salonen, 2016; McQuade & Gill, 2012), whereas other studies suggest that gambling problems can cause loneliness when people with gambling problems attempt to hide their problematic behavior and thus avoid social stigma or negative reactions from loved ones (Dabrowska & Wiczorek, 2020). As the direction of causality is unclear, more longitudinal research is needed.

Gambling to escape is one of the basic gambling motives that has been recognized in several studies (Binde, 2013; Dechant, 2014; Francis, Dowling, Jackson, Christensen, & Wardle, 2015; Wardle et al., 2011), and it refers to distracting oneself from daily stresses, negative emotions and thoughts. In the previous literature, gambling to escape has been consistently associated with gambling problems (Alaba-Ekpo, 2024; Neophytou, Theodorou, Artemi, Theodorou, & Panayiotou, 2023). The escape motive plays an important role in the Pathways Model developed by Blaszczynski and Nower (2002). According to the model, those with gambling problems are not a homogenous group: instead, they can be divided into three subgroups (Kurilla, 2021; Nower, Blaszczynski, & Anthony, 2022). One of these subtypes, emotionally vulnerable gamblers, is characterized by a history of mood and anxiety disorders, hurtful past experiences, substance abuse, and the use of gambling as a coping mechanism to deal with negative emotions, which ultimately leads to gambling problems. The hypothesis linking dysfunctional emotion regulation and coping strategies to gambling problems has received further support (Bonnaire et al., 2022; Marchica, Keough, Montreuil, & Derevensky, 2020; Rogier & Velotti, 2018). Given the model described above, it is possible that loneliness drives some individuals to use gambling to alleviate the hurtful experience of loneliness, which can evolve into gambling problems. For example, Sirola et al. (2019) found that loneliness moderated the effect between gambling problems and online gambling community participation. Moreover, Holdsworth, Hing, and Breen (2012) found that women were more likely than men to use gambling to avoid feelings of loneliness. Escaping from feelings of loneliness, social isolation, and loss seems to be an important motivator for gambling among elderly as well (Botterill, Gill, McLaren, & Gomez, 2016; Martin, Lichtenberg, & Templin, 2011). There is also some evidence that the stresses associated with the COVID-19 pandemic, such as social isolation and mental health issues, contributed to people's gambling problems (Masaeli &

Farhadi, 2021). To our knowledge, only one prior study has investigated whether coping strategies moderate the relationship between loneliness and problem gambling among students (Hum & Carr, 2018), but that study failed to find support for the hypothesis. However, that study was not nationally representative, as it used a convenience sample of students, and the study design was cross-sectional. Thus, more longitudinal research is needed.

Gambling problems may also predispose individuals to loneliness and social isolation, as gambling problems often cause shame, guilt, and depression (Hing, Nuske, Gainsbury, & Russell, 2016; Pchajek, Edgerton, Sanscartier, & Keough, 2023). Hiding a gambling problem may further distance oneself from other people (Dabrowska & Wiczorek, 2020). Gambling is also increasingly shifting to online platforms, and these modern forms of gambling may contribute to loneliness given that online gambling is typically an individual activity (Sirola et al., 2023). Moreover, individuals with gambling problems commonly suffer from additional addictive behaviors and psychosocial comorbidities, such as depression and anxiety, which can exacerbate their social isolation (Macía, Jauregui, & Estevez, 2023; Walther and Alhughe, 2012).

Given that gambling problems are often associated with financial and relationship difficulties, as well as feelings of guilt and shame (de Ridder & Deighton, 2022; Marko, Thomas, Pitt, & Daube, 2023), individuals with problematic gambling may turn to gambling to alleviate the stress and difficult emotions arising from these situations. This, in turn, may create a vicious cycle in which gambling itself causes distress and acts as a distraction from negative feelings. Some gamblers with escapist motives even report seeking a dissociative state of mind, or “dark flow” (Kruger et al., 2020; Wood & Griffiths, 2007). Choosing this kind of activity as a way to cope with distress may isolate individuals and potentially contribute to loneliness.

## The present study

The aim of this longitudinal study is to investigate the dynamic relationships between loneliness, the escape motive, and gambling problems. As loneliness is a painful experience, it may lead some people to engage in gambling to cope with the distressing feelings that arise due to social isolation (Edgren et al., 2016; Holdsworth et al., 2012; Sirola et al., 2019). With time, this can lead to gambling problems. However, it is also common that individuals with gambling problems attempt to conceal their situation and thus avoid social stigma and negative reactions (Dabrowska & Wiczorek, 2020), which may isolate them from other people and cause loneliness. Several studies have also found strong evidence that using gambling as a coping mechanism can offer temporary relief from distressing feelings and thoughts. However, in the long term, this leads to gambling problems (Alaba-Ekpo, 2024; Neophytou et al., 2023). Finally, escapist gambling behavior may isolate individuals from social connections especially if they use gambling to enter a dissociative state of mind (Kruger et al., 2020; Wood &

Griffiths, 2007). In addition to these dynamic associations, it is possible that the connections between loneliness, gambling to escape, and gambling problems reflect more stable individual differences, such as differences in personality (see e.g. Blaszczynski & Nower, 2002).

In this study, we examine cross-lagged paths to clarify the causal relationships between loneliness and problem gambling, as well as how the escapist motivation to gamble contributes to this. To obtain more accurate results, we separate the time-varying within-person variance from the stable, trait-like between-person variance. Within-person variance represents changes in an individual's measurement scores over time relative to their own mean level and captures state-like dynamic changes that occur within an individual from one time point to another. This variance is crucial for understanding how deviations from an individual's average levels over time might predict subsequent changes in another variable. Between-person variance, on the other hand, captures the extent to which individuals differ from one another in their average levels of the variables measured. This variance is more stable over time and reflects trait-like characteristics (Berry & Willoughby, 2017).

Based on the previous literature, we present the following hypotheses on the within-person level:

- H1: Loneliness predicts future gambling to escape.
- H2: Loneliness predicts future gambling problems.
- H3: Gambling problems predict future loneliness.
- H4: Gambling problems predict future gambling to escape.
- H5: Gambling to escape predicts future gambling problems.
- H6: Gambling to escape predicts future loneliness.

On the between-person level, we hypothesize that loneliness, gambling to escape, and gambling problems are positively correlated (H7).

## METHOD

### Participants and procedure

A nationwide sample of Finnish residents aged 18–75 years ( $N = 1,530$ , 51.27% male, 48.43% female, 0.29% other gender) was recruited from Mainland Finland. The data were collected through a panel administered by the European data collection company Norstat. The data collection was conducted at five timepoints, which occurred every 6 months, beginning in April 2021 (T1, response rate 34.60%). The first follow-up survey took place in October–November 2021 (T2,  $n = 1,198$ , response rate 78.30%), followed by the second in April–May 2022 (T3,  $n = 1,100$ , response rate 91.40%). The third follow-up survey was collected in October–November 2022 (T4,  $n = 1,008$ , response rate 91.60%) and the fourth was collected in April–May 2023 (T5,  $n = 934$ , response rate 93.02%). At each timepoint, researchers performed data quality checks to eliminate overtly biased response patterns from the final dataset. Only participants who took part at all timepoints

( $n = 812$ ) and had gambled using at least one game type at least once a month during the 2.5 years of data collection were included in the final sample ( $n = 612$ , 40.00% of the original T1 sample, 54.58% male, 45.42% female, 0.16% other gender). The use of five time points allows for the examination of dynamics in gambling problems and other variables both in the short term and over the longer term. Spanning 2.5 years, the data allows us to observe meaningful changes and patterns across time.

According to the non-response analysis, those who took part at all five time points and had gambled at least once per month were older than the original T1 participants (mean age at T1 46.67 years vs. 51.85 years at T5). No major effects on drop out were found based on gender, geographical area, education, income, marital status or occupational status (see Oksanen, Mantere, Vuorinen, & Savolainen, 2022), although there were slightly fewer at-risk gamblers in the final sample compared to the original T1 sample (score of 5 or higher on the Problem Gambling Severity Index, T1 = 9.48% vs. T5 = 8.99%). Compared to the general Finnish population, this sample does not contain any major biases, except for the abovementioned drop-out among younger participants (Grönroos, Salonen, Latvala, Kontto, & Hagfors, 2024; Oksanen, et al., 2022), though analytical weights were used to correct for this bias.

### Measures

**Gambling problems.** The Problem Gambling Severity Index (PGSI) was used to measure gambling problems (Currie, Casey, & Hodgins, 2010; Ferris & Wynne, 2001). The PGSI is widely regarded as a reliable measure of gambling problems (Miller, Currie, Hodgins, & Casey, 2013; Orford, Wardle, Griffiths, Sproston, & Erens, 2010). It consists of nine items measuring various dimensions of gambling problems over the past six months (e.g., “Have you felt that you might have a problem with gambling?”). Respondents assessed each item on a four-point scale (0 = never, 1 = sometimes, 2 = most of the time, 3 = almost always). Scores range from 0 to 27, with higher scores indicating more severe gambling problems. McDonald's omega coefficients showed excellent internal consistency for the scale (T1:  $\omega = 0.94$ , T2:  $\omega = 0.94$ , T3:  $\omega = 0.94$ , T4:  $\omega = 0.94$ , T5:  $\omega = 0.94$ ).

**Loneliness.** Loneliness was measured with the UCLA Three-Item Loneliness Scale (Hughes, Waite, Hawkey, & Cacioppo, 2004). These questions asked respondents to rate how often they experienced different forms of loneliness or social isolation (“How often do you feel isolated from other people?”, “How often do you feel lonely?”, and “How often do you feel left out?”). Items were assessed using a three-point scale (0 = Hardly ever, 1 = Occasionally, 2 = Often). Potential values for the loneliness variable ranged from 0 to 6, with higher values indicating a greater experience of loneliness. McDonald's omega indicated good internal consistency for the scale (T1:  $\omega = 0.84$ , T2:  $\omega = 0.83$ , T3:  $\omega = 0.85$ , T4:  $\omega = 0.84$ , T5:  $\omega = 0.84$ ).

**Gambling to escape.** Gambling to escape was measured using three questions concerning negative escapism derived from the Motivations to Play Inventory (Hagström & Kaldo, 2014; Jouhki & Oksanen, 2022; Yee, 2006). The items focus on the impact of various escape motives on gambling in the past six months (“How often in the last 6 months have you gambled to avoid thinking about some of your real-life problems or worries?”; “How often in the last 6 months have you gambled to avoid real-life social encounters or situations?”; and “How often in the last six months have you continued to gamble to avoid having to deal with everyday problems and conflicts?”). Responses were given on a five-point scale (0 = Never, 1 = Rarely, 2 = Sometimes, 3 = Often, 4 = Always). Potential values on the escape motive scale ranged from 0 to 12, with higher values indicating a higher prevalence of escape motives to gamble. The McDonald’s omegas for the scale were as follows: T1:  $\omega = 0.86$ , T2:  $\omega = 0.86$ , T3:  $\omega = 0.87$ , T4:  $\omega = 0.84$ , T5:  $\omega = 0.87$ .

### Statistical analysis

We used the random-intercept cross-lagged panel model (RI-CLPM) to analyze the relationships between loneliness, gambling to escape and gambling problems at five time points. The RI-CLPM is an extension to the traditional cross-lagged panel model, which has been criticized for its inability to differentiate between the within-person and between-person changes in longitudinal panel studies which may lead to spurious conclusions (Lucas, 2023). The RI-CLPM has been designed to address this problem by adding a random intercept into the model (Hamaker, Kuiper, & Grasman, 2015; Mulder & Hamaker, 2021). The RI-CLPM decomposes the observed variance into stable, time-invariant between-person differences, as well as time-varying within-person differences. The between-person component reflects variance due to differences that exist between persons (e.g., people differ in terms of their average level of gambling problems), while the within-person component reflects variance due to changes which vary within individuals over time (e.g., an individual’s deviations from their personal average level of gambling problems).

The descriptive analyses were performed with Stata software 18.0 (StataCorp, 2023), and RI-CLPM was performed with the lavaan package for R version 0.6–17

(Rosseel, 2012). We used a maximum likelihood estimator (MLE) with robust standard errors. We also performed square root transformations for loneliness, escape motive, and PGSI score to adjust for multivariate nonnormality. We built two models: in the first model (Model 1), no parameter constraints were set, whereas in the second model (Model 2), all the path coefficients and covariances of the error terms were constrained to be equal over time. To estimate the model fit, we report several fit indices: the Chi-squared test statistic, comparative fit index (CFI), root mean square error of approximation (RMSEA), and standardized root mean squared residual (SRMR). The following cutoff criteria for good fit were used as suggested by Hu and Bentler (1999): above 0.90/0.95 for CFI, below 0.08 for SRMR, and below 0.06 for RMSEA. A change of less than  $-0.01$  in the comparative fit index (CFI) was taken as evidence that the constrained model did not have a significantly worse fit than the unconstrained model (Putnick and Bornstein, 2016). If the constrained model had a significantly worse fit than the unconstrained model, this would imply that the time constraints are untenable and some kind of developmental process was taking place during the study (Mulder & Hamaker, 2021).

### Ethics

The study underwent a review by The Academic Ethics Committee of the Tampere region and was approved before the initial data collection. The participants were provided with information about the survey’s purpose and use, and their consent to participate was obtained via the completion of the entire survey. The identity of individual participants could not be discerned from the data, as the data collection company Norstat supplied only anonymized data to the researchers.

## RESULTS

### Descriptive analyses

The descriptive statistics are reported in Table 1. Of the participants, 45.42% were female or other gender and 54.58% were male. Mean age was 51.85 years ( $SD = 13.97$

Table 1. Descriptive statistics of the variables ( $n = 612$ )

	Range	T1, M (SD)	T2, M (SD)	T3, M (SD)	T4, M (SD)	T5, M (SD)
Loneliness <sup>a</sup>	0–6	1.59 (1.66)	1.69 (1.65)	1.69 (1.65)	1.66 (1.65)	1.54 (1.63)
Escape <sup>b</sup>	0–12	0.81 (1.69)	0.85 (1.78)	0.86 (1.83)	0.92 (1.81)	0.89 (1.86)
PGSI <sup>c</sup>	0–25	1.39 (3.35)	1.42 (3.32)	1.42 (3.39)	1.34 (3.26)	1.25 (3.00)
Age	18–75	51.85 (13.97)	–	–	–	–
Gender	%	<i>n</i>				
Men	54.58	334				
Women or other gender <sup>d</sup>	45.42	278				

<sup>a</sup>The UCLA 3-Item Loneliness Scale.

<sup>b</sup>The Motivations to Play Inventory – Negative escapism.

<sup>c</sup>Problem Gambling Severity Index (PGSI).

<sup>d</sup>Other gender  $n = 1$ .

years). The mean score for loneliness was 1.59 at T1, peaked at T3 (1.69) and was slightly lower at T5 (1.54). The mean score for the escape motive increased slightly from T1 (0.81) to T5 (0.89). The mean PGSI score decreased from T1 (1.39) to T5 (1.25).

The pairwise correlations between the main variables are presented in Table 2. The strongest correlations were between the same variables measured in different time, points indicating that the participants' scores for loneliness, escape motive, and gambling problems at preceding timepoints remained relatively stable at the followings time point. The correlations between the escape motive and loneliness were relatively low ( $r = 0.27-0.34, p < 0.001$ ) while the correlations between the escape motive and gambling problems ranged from low to moderate ( $r = 0.39-0.53, p < 0.001$ ) at various time points. The correlations between loneliness and PGSI ranged from 0.18 to 0.27 ( $p < 0.001$ ).

**The random-intercept cross-lagged panel models**

Model 1 did not impose any constraints on the parameters, whereas in Model 2, all the autoregressive and cross-lagged paths and the covariances of the error terms were constrained to be equal over time. According to the fit statistics (Table 3), both Model 1 ( $\chi^2(48) = 63.675, p = 0.064$ ; CFI = 0.998; RMSEA = 0.023; SRMR = 0.025) and Model 2 ( $\chi^2(84) = 145.195, p < 0.001$ ; CFI = 0.992; RMSEA = 0.035; SRMR = 0.020) had excellent fits for the data, except for the Chi-squared test, which was statistically significant for Model 2. However, the Chi-squared test is known for being overly sensitive with large sample sizes and almost always rejects the model (Shi, Lee, & Maydeu-Olivares, 2019). The decrease in CFI was less than -0.01, indicating that the constrained model (Model 2) did not have a significantly worse fit than the unconstrained model (Model 1). Therefore, we present the results derived from Model 2 in Fig. 1.

According to the results, gambling problems predicted future loneliness ( $\beta = 0.069, p = 0.007$ ) and gambling to

Table 3. The fit indices for model comparison

Model fit indices	Model 1	Model 2
Chi-square	$\chi^2(48) = 63.68,$ $p = 0.064$	$\chi^2(84) = 145.20,$ $p < 0.001$
CFI	0.998	0.992
RMSEA	0.023	0.035
SMSR	0.025	0.020
CFI difference	-0.006	

Note. CFI = comparative fit index, RMSEA = Root Mean-Square Error of Approximation, SMSR = Standardized Root Mean Square Residual.

escape predicted future gambling problems ( $\beta = 0.077, p = 0.047$ ) at the within-person level, providing support for H3 and H5. However, the effects were relatively small, indicating that most of the variance was at the between-person level. Loneliness did not predict future gambling to escape or gambling problems ( $\beta = 0.001, p = 0.971$ ). However, the autoregressive paths (i.e., variable predicting itself at the subsequent time points) for loneliness ( $\beta = 0.083, p = 0.024$ ) and gambling to escape ( $\beta = 0.124, p = 0.005$ ) were statistically significant. This means that both loneliness and gambling to escape are relatively persistent over time and their previous levels are good predictors of their future levels. The autoregressive path for gambling problems was not statistically significant, indicating that the variance was on the between-person level. On the between-person level, loneliness, gambling to escape, and gambling problems correlated positively with one another, lending support to H7. This means that on average, those with gambling problems tend to be lonely and gamble to escape. In addition, lonely individuals are more likely to gamble to escape.

We performed an additional sensitivity analysis using the full information maximum likelihood estimation and the same constraints. The results remained the same, except for autoregressive path for gambling problems, which was

Table 2. Pairwise correlations of the variables in five time points ( $n = 612$ )

	1	2	3	4	5	6	7	8	9	10	11	12	13	14
1. Loneliness T1	1													
2. Loneliness T2	0.73	1												
3. Loneliness T3	0.73	0.75	1											
4. Loneliness T4	0.73	0.75	0.76	1										
5. Loneliness T5	0.73	0.73	0.75	0.80	1									
6. Escape T1	0.32	0.27	0.28	0.30	0.29	1								
7. Escape T2	0.30	0.32	0.31	0.31	0.32	0.68	1							
8. Escape T3	0.32	0.29	0.31	0.28	0.29	0.65	0.66	1						
9. Escape T4	0.29	0.34	0.33	0.34	0.32	0.63	0.64	0.67	1					
10. Escape T5	0.30	0.29	0.26	0.31	0.30	0.63	0.63	0.59	0.70	1				
11. PGSI T1	0.27	0.26	0.24	0.23	0.25	0.48	0.47	0.43	0.46	0.41	1			
12. PGSI T2	0.24	0.25	0.24	0.22	0.25	0.43	0.48	0.41	0.45	0.39	0.84	1		
13. PGSI T3	0.21	0.22	0.21	0.21	0.21	0.39	0.40	0.47	0.43	0.36	0.76	0.76	1	
14. PGSI T4	0.23	0.23	0.21	0.22	0.24	0.41	0.44	0.46	0.53	0.46	0.78	0.81	0.78	1
15. PGSI T5	0.24	0.22	0.18	0.20	0.22	0.40	0.39	0.40	0.47	0.48	0.72	0.76	0.73	0.76

Note. Loneliness = The UCLA 3-Item Loneliness Scale. Escape = The Motivations to Play Inventory - Negative escapism. PGSI = Problem Gambling Severity Index (PGSI). All the correlations were statistically significant at  $p < 0.001$ .

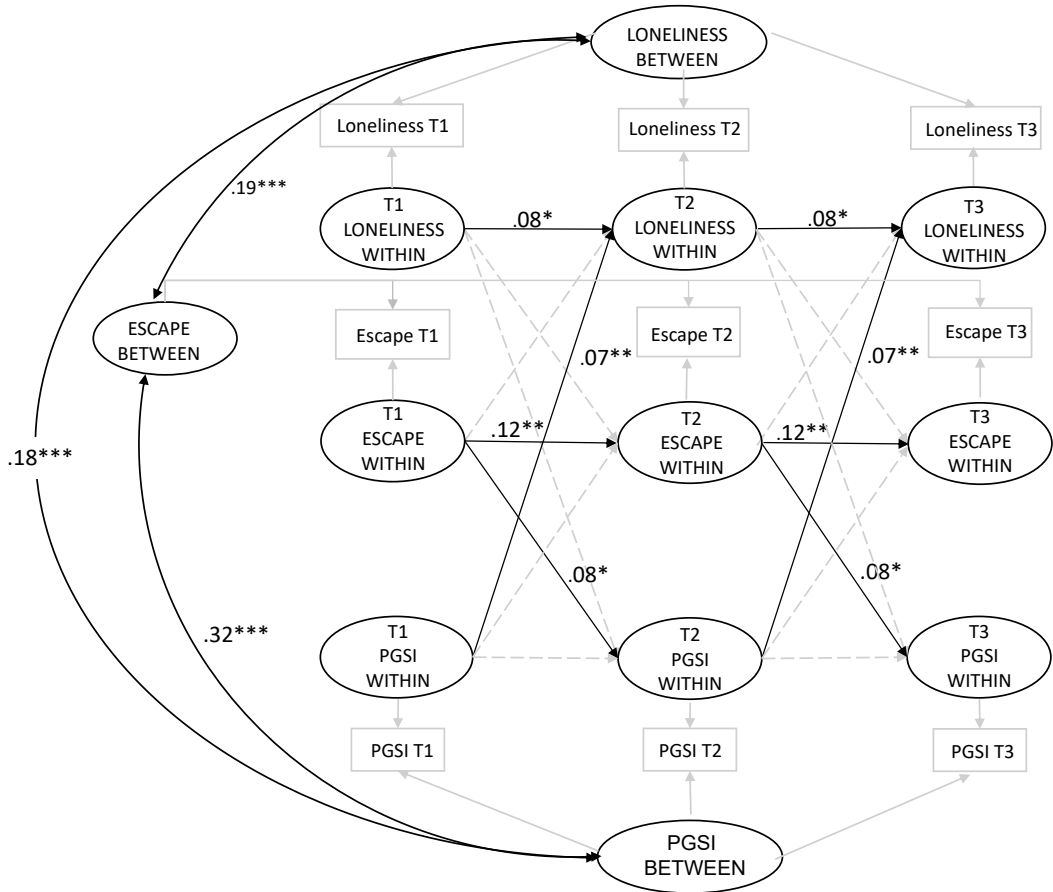


Fig. 1. Random-intercept cross-lagged panel model (RI-CLPM) for loneliness (Loneliness), gambling to escape (Escape), and gambling problems (PGSI). The RI-CLPM decomposes the observed variance (rectangles) into latent between-person and within-person variables (ovals). A single-headed arrow indicates a causal relationship between two variables and a double-headed curved arrow represents a covariation between two variables. The numbers next to the arrows are path coefficients, which represent the strength and direction of the relationship. All the autoregressive and cross-lagged path coefficients were constrained to be equal over time. Note. \* $p < 0.05$ , \*\* $p < 0.01$ , \*\*\* $p < 0.001$ . Only three time points depicted for simplicity. The within-person correlations among latent variables in T1 and the covariance of the error terms are modeled in the analysis but not depicted in the figure for clarity.

statistically significant ( $\beta = 0.12, p = 0.028$ ), and the cross-lagged path from escape to loneliness, which was statistically significant but negative ( $\beta = -0.05, p = 0.018$ ).

## DISCUSSION

This study investigated the dynamic relationships between loneliness, escapist gambling, and gambling problems using a longitudinal approach. Its analyses were based on a representative sample of Finnish adults. According to the results, gambling problems predict future loneliness on a within-person level. While the effect sizes were modest, these results suggest that gambling problems lead to loneliness, rather than *vice versa*. Additionally, gambling to escape predicted future

gambling problems on a within-person level. On a between-person level, loneliness, gambling to escape, and gambling problems were positively correlated with one another, which indicates that on average, those who have gambling problems tend to be lonely and gamble to escape.

These results extend the large body of research indicating that gambling to escape plays a crucial role in gambling problems (Alaba-Ekpo, 2024; Neophytou et al., 2023). Our study provides support for the Pathways Model of problem gambling, which proposes that relying on gambling as a coping mechanism plays an essential role in the development of gambling problems (Blaszczynski & Nower, 2002; Nower et al., 2022). However, we could not confirm the hypothesis that loneliness leads directly to gambling to escape, which ultimately leads to gambling problems. One potential reason

for this could be that our sample was demographically balanced and the levels of gambling to escape and gambling problems were relatively low, which is typical in addiction research. For example, a recent meta-analysis estimated that 8.7% of adults engaged in risky gambling, while only 1.41% of adults engaged in problematic gambling (Tran et al., 2024). The results might have been different if we had investigated a clinical sample. Individuals with strong problem gambling tendencies may be more likely to turn to escapist gambling when feeling lonely. However, it seems that loneliness, although it is a painful experience, does not universally drive gambling behavior.

On the other hand, our results provide support for the idea that gambling problems predict future loneliness. One potential explanation for this is that individuals with gambling problems often face shame and stigma, which may lead to secrecy, withdrawal from social activities, and distancing themselves from friends and family (Dabrowska & Wiczorek, 2020). Stigma and shame can prevent seeking help, and a delay in treatment may lead to the exacerbation of gambling problems (Suurvali, Cordingley, Hodgins, & Cunningham, 2009; Tavares, Martins, Zilberman, & el-Guebaly, 2002). Health-care professionals play a vital role in identifying and addressing gambling problems. By asking patients about gambling directly, they can initiate a conversation, provide support, and guide individuals toward the right services (Blank, Baxter, Woods, & Goyder, 2021). It is also important to take stigma and shame into account when developing treatments. For example, web-based counseling is becoming a prominent way to address stigma because of its ability to ensure confidentiality and anonymity (Rodda et al., 2013).

These results underscore the need for effective prevention and intervention strategies that promote healthy coping mechanisms and reduce gambling-related issues. Escape motives, gambling problems, and loneliness appear to be intertwined. For example, fostering productive, action-based coping skills could prevent future gambling problems. It is also important to note that loneliness, gambling to escape, and gambling problems were interrelated on a between-person level. This suggests that the connections between these phenomena are also explained by more stable traits, such as differences in personality (Blaszczynski and Nower, 2002). From the perspective of gambling problem interventions, this means that while the same individuals typically experience loneliness, gambling to escape, and gambling problems, effective treatment will need to be comprehensive and address not only these, but other factors as well.

As a starting point, efforts to address these issues should include evidence-based approaches, such as clinical interventions, therapy, and increased funding for mental health services that focus on gambling as a coping mechanism. As gambling increasingly moves to online environments, it is important to focus on technological solutions that can leverage these insights and the capability of the available technology. Such tools could utilize mobile apps offering real-time support or self-monitoring of gambling behaviors. These interventions could include features designed to help individuals recognize when their gambling

behavior is driven by escapist motives, enabling them to observe and identify contextual factors more effectively. Mobile apps should offer users alternative coping strategies or immediate connection to support networks. Access to virtual peer support groups or opportunities for offline social interactions with such groups could be potential features of the app targeted to foster a sense of community and belonging. Collaboration between clinicians and technology developers is crucial in an effort to create tools that are evidence-informed and efficient in addressing both gambling and social challenges of those vulnerable to gambling problems. Overall, various treatment-focused applications and digital tools will benefit from the growing knowledge base on problem gambling.

Our study has multiple strengths, but certain limitations must be noted. First, the study was limited to Finland, representing a unique context in terms of gambling and social culture, and it is important to replicate the results in various cultural contexts. In addition, we relied on self-reported information which may introduce biases, such as recall bias or social desirability bias, especially when investigating topics that can be considered sensitive. While the current study involves a large sample and follows the same respondents for 2.5 years, it is based on the general population and not those with gambling problems *per se*, a study of whom might have yielded different types of relationships. These associations should also be investigated using clinical samples to provide further support and enable comparisons.

Additionally, our study did not consider different gambling types, underscoring the need to examine these phenomena across diverse gambling contexts. While evidence suggests that different gambling motives drive various forms of gambling types (e.g. Sundqvist, Jonsson, & Wennberg, 2016), those with problem gambling typically engage in a broad range of gambling activities rather than specializing in particular types (Downling et al., 2017; Leslie & McGrath, 2024). Future studies should also investigate the role of gender differences, as previous literature has indicated differences in gambling behavior and escapist motives between men and women (e.g., Jouhki, Savolainen, Hagfors, Vuorinen, & Oksanen 2024; Wenzel & Dahl, 2009). However, our robust methods and high-quality data suggest that among the general population, gambling problems are likely to lead to increased loneliness and that gambling motivated by the need to escape predicts future gambling problems.

## CONCLUSION

This study showed that gambling problems predict future loneliness and gambling to escape predicts future gambling problems. The results were based on robust 5-time point data, and the study provided a much-needed longitudinal perspective on the topic. We believe that connections between loneliness, escapism, and gambling problems should be acknowledged by health professionals, counselors and legislators. Our results suggest that individuals who are lonely and gamble to escape are more likely to have gambling problems compared to others. Further research is

needed to identify effective intervention methods. In addition, future studies on the topic should continue building longitudinal designs.

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