Maastricht University

Arcade, more than a game?

Motives, attitudes and well-being of arcade visitors

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Materials are available at: https://osf.io/96mk8/

Contents

Summary

This report describes the results of research on the motives, attitudes, and well-being of arcade visitors. The motivation for this study stems from developments in the gaming and gambling industry in recent years, combined with the lack of scientific research on arcades. Therefore, this study focuses on arcade visitors and the effect of arcade visits on their well-being.

A qualitative study (interviews) and a quantitative study (questionnaire) were conducted. In this case, 38 interviews were conducted with 11 staff members and 37 visitors in arcades, and an online questionnaire was completed by Dutch individuals aged 18 to 35 (N=727).

The key questions addressed in this report are: How can the audience of arcades be characterized? How are arcade visits integrated into visitors' lifestyles? Do arcade visitors play for fun, or can dependency develop? To what extent do arcade visitors differ from gamblers?

Casinos and arcades appear to attract different types of audiences who play for different reasons. Arcades are often visited occasionally and usually in the company of a partner and friends. The audience is diverse in terms of age, gender, and income, and they typically stay for about an hour. Visitors generally spend the amount of money they had planned in advance, which keeps their gaming behavior under control. In contrast, casino visitors tend to spend more money per visit than they had intended.

Furthermore, arcade visitors have a less positive attitude toward gambling than gamblers, and this attitude is associated with a lower dependency on gambling. Arcade visitors scored significantly higher than gamblers on fun as a motive and indicated a preference for skill-based games rather than games of chance. For gamblers, financial and coping motives were positively correlated with gambling dependency, and they scored higher on these variables than arcade visitors.

Finally, a latent class analysis divided the data into five different patterns/groups of gaming and gambling: arcade players, sports betting players, “low-risk gamblers,” “moderate-risk gamblers,” and “high-risk gamblers.” Arcade players showed significantly lower on gambling dependency compared to sports betters, the moderate-risk group, and the

high-risk group. They also differed in terms of age and underlying motives from these other groups.

In summary, this study shows that arcade visitors primarily see their visits as a form of leisure, and there is no indication of risky gaming or gambling behavior within this group. In contrast, for gamblers, the risk of gambling dependency is clearly evident.

1. Introduction

Family Entertainment Centers are amusement venues and arcades that gaming machines, and both interactive and traditional arcade games. These centres came over from the United States during the 1980s and the first Family Entertainment Centers opened in the Netherlands (*www.fec-nederland.nl*). In the 1990s, partly due to the rise of home gaming consoles, the number of arcades declined, however in recent years, indoor entertainment venues have seen a significant resurgence in popularity (NOS [The Dutch Broadcasting Foundation], 2017). Today, arcades can be found in nearly every major city across the Netherlands (De Limburger newspaper, 2024).

In addition to an increase in the number of locations, the variety of games offered in arcades has also evolved. Over the past few decades, amusement venues have transformed from featuring a handful of pinball machines in an indoor entertainment venue to sophisticated arcades that increasingly offer 'immersive' experiences, sports-themed games like basketball, and other tie-ins to popular media franchises - ranging from cartoon characters like 'SpongeBob' to 'Mario Kart', or even oversized versions of mobile games, such as 'Flappy Bird'. While classic machines such as coin pushers or claw machines can be found, winning on these machines now relies entirely on skill, unlike traditional fairground machines, and they are not pre-programmed. Gambling is prohibited in all arcades *(www.fec-nederland.nl*).

From gaming to gambling?

While the distinction between gaming machines (such as pinball or Pacman) and gambling machines (such as roulette or slot machines) was once clear,

today's machines in arcades and casinos are increasingly similar in both design and gameplay features. This phenomenon is known as gaming-gambling convergence (Gainsbury, 2019). Research into the harmful effects of gambling on individuals, their social circles and society has increased in recent years (Kristensen *et al.*, 2024). There are growing concerns about the similarities between different types of games, such as the parallels between online gaming and social casino games (Gainsbury *et al.*, 2015; Wohl *et al.*, 2017), as well as the risks associated with gambling elements in online games, such as loot boxes (Brooks & Clark, 2023).

However, scientific research consistently shows that only a small percentage of individuals are problem gamblers. A recent study (Tran *et al.*, 2024) which summarised research from 68 countries, found that approximately 8.7% of gamblers are classified as at-risk, with just 1.4% identified as problem gamblers. Notably, this issue is most prevalent among online gambling and slot machines. Similarly, extensive research has been conducted into online gaming and the risk of gaming addiction, with the findings showing that the percentage of addicted players is also relatively low (ranging from 2.1%–8.8%; Limone *et al.*, 2023). In the Netherlands, 65% of the population participated in gambling in 2024 (Ipsos I&O, 2024): Lotteries and scratch cards were by far the most popular, followed by bingo, slot machines and casino games. The study found that the vast majority of Dutch people (95%) were classified as non-problem gamblers, 3% as moderate-risk gamblers and 2% as high-risk gamblers.

In addition to the similarities in gameplay features, it is often noted that these machines also share similar designs. Both skill-based games and gambling machines are equipped with brightly coloured lights and include sound effects to enhance the player's experience. The question raised, particularly by the Netherlands Gambling Authority (KSA) and municipalities, is whether visitors can distinguish between gaming machines and skill-based

gambling machines. The Netherlands Gambling Authority (KSA) has previously conducted research on arcades (KSA, 2018, 2020) and found that some arcades featured machines that combined elements of both gambling and skill-based gameplay. While the KSA acknowledged that the potential consequences for gambling addiction are not fully clear, it concluded that the current risk of gambling addiction associated with the current arcade offerings remains low (KSA, 2018, 2020). Nevertheless, in consultation with the Gambling Authority, FEC Netherlands has announced improvement measures and decided to remove a small number of slot machines from their locations.

Outstanding questions

While considerable research has been conducted into (online) gaming and (online) gambling, there have been few, if any, scientific studies focusing on arcades, their visitors and the impact of arcade gaming on visitors' well-being. For example, little to no research has explored the experiences of arcade visitors, or how they perceive the connection between arcade games and gambling. The research presented in this report aims to fill these gaps in knowledge concerning arcades.

The key questions in this study were developed in collaboration with FEC Netherlands and are as follows:

- What sociodemographic factors influence the decision to visit arcades?
- What motivates people to visit arcades, and how does this relate to their well-being?
- How do attitudes towards gambling differ between arcade visitors and casino visitors?
- Do visitors play for fun, or is there a potential for dependency?

- Do visitors recognise the difference between skill-based games and games of chance?
- What are the similarities and differences between arcade visitors and casino visitors?

The University of Maastricht conducted research from 01-11-2023 to 01-10-2024 on behalf of the Trade Association Family Entertainment Centers in the Netherlands (FEC Netherlands) to address these questions. The study employed a mixed-methods approach, combining interviews and questionnaires.

The first part of this report examines how arcade visits fit into individuals' lifestyles, focusing on public perceptions and motives. The second part explores the similarities and differences between arcade visitors and gamblers. Finally, the report offers recommendations for policy development and suggestions for further research.

2. Study design

This research combines two studies: an interview study (qualitative data) and an online questionnaire (quantitative data). The interviews provide in-depth insights from a smaller group of individuals, while the questionnaire allows for the examination of these patterns within a larger group, enabling a comparison between arcade visitors and gamblers. Conversely, the interviews offer contextual explanations for the findings from the questionnaire. The content, materials and procedures for both studies were pre-approved by the Ethics Committee of Psychology at Maastricht University (#OZL_262_08_01_2023_S24 and #OZL_262_08_01_2023_S46).

All materials (interview protocol, online questionnaire, information letter, etc.) can be found at: https://osf.io/96mk8/.

2.1 Interview component of the study

Recruitment & procedure

For the qualitative study, interviews were conducted at various arcades across the Netherlands. The arcades were contacted in advance, to schedule visits and arrange the interviews. A total of 11 arcades, located in different cities across the Netherlands - Kerkrade, Maastricht, Eindhoven, Utrecht, Amsterdam, Groningen, Almere, The Hague, Scheveningen and Waalwijk – were selected. These locations were chosen based on their type and geographical location, ensuring a broad representation of different environments (i.e. city centre, suburbs and industrial zones). The selection process also ensured that all six FEC organisations were represented, offering

a comprehensive overview of the Dutch Arcade Sector. The visits and interviews took place in November 2023, with consideration given to varying days and times to capture a representative sample of the public. A total of 48 interviews were conducted, including 37 with visitors and 11 with staff members.

At each location, random visitors were approached and invited to participate in the study. Participation was voluntary, and as a token of appreciation, interviewees received a gift card from FEC Netherlands. Only Dutch-speaking participants were included in this study, with a primary focus on young adults aged 18 to 35. However, younger participants were also allowed to participate, provided they were accompanied by a supervising adult family member if under 16 years of age. On average, each interview lasted for 30 minutes.

The researcher visited each location once only, meaning the observations and interviews provided a snapshot in time. To complement the visitors' perspectives, staff members were also invited to participate in the study. As staff members are more familiar with an arcade's audience, they were able to provide valuable insights into the demographic composition of visitors, peak times, the most popular games and prizes, and any (problematic) behaviours exhibited by visitors. In total, 11 staff members were interviewed.

Prior to the interview, all interviewees were informed that audio recordings would be made, and were told that they could withdraw from the study at any time, without needing to provide a reason. Each interviewee also received an information letter and signed a consent form before the interview began. During the interviews, measures were taken to ensure that the audio recordings did not contain any personal information (such as names, addresses or email addresses, etc.), to prevent the identification of respondents and to guarantee their anonymity.

The interviews were semi-structured, following a set of core pre-defined questions, while allowing ample space for respondents to deviate from the questions as needed. The interview guide was based on existing literature on the motives and behaviours related to gaming and gambling. Audio recordings of all interviews were transcribed, and the recordings were subsequently destroyed in accordance with the General Data Protection Regulation (GDPR).

2.2 Questionnaire component of the study

Data for the quantitative study were collected from 1 to 14 May 2024 using an online self-reporting questionnaire. This study had two primary objectives: (1) to generalise the findings from the interview study to a larger group of residents, and (2) to explore the similarities and differences in behavioural patterns between arcade visitors and gamblers.

Recruitment & procedure

The questionnaire was designed based on the findings from the interviews, supplemented with insights from the scientific literature. It focussed on describing gaming behaviours (including duration, frequency and money spent), as well as positive and negative attitudes, motives for playing or gambling, problematic (gambling) behaviour and mental well-being. All questions were framed to cover both arcade and gambling activities. The questionnaire was created using Qualtrics®, a software tool used for surveys and other data collection projects (Qualtrics, 2024), which complies with the European GDPR guidelines.

For an overview of the key constructs in the questionnaire, see Table 1. To keep the questionnaire concise, several validated measurement tools were shortened:

- The Gambling Motives Questionnaire (GMQ-F, Dechant (2014) includes four constructs in sixteen questions: enhancement, coping, social and financial motives. For this study, eight questions were selected, with two questions for each construct. The internal reliability, measured with Cronbach's alpha, ideally ranges from .65 to .99 and in this case, it was .77.
- The Gambling Fallacies Measure (GF; Williams (2003)) was also shortened from ten to five items, with a Cronbach's alpha = .70. This scale measures the extent to which individuals hold misconceptions about their chances and control over gambling outcomes.
- Additionally, the Attitude Towards Gambling Scale (ATGS, Wardle (2007)) was used, consisting of 4 questions for a positive attitude (alpha = .74) and 4 questions for a negative attitude (alpha = .69) towards gambling.

The questionnaire was distributed through posters displayed in arcades, each featuring a QR code that directed interested individuals to the online questionnaire. The same poster with QR code/link was also shared digitally by email by all FEC members to their customer base. To ensure data collection from gamblers and to increase the overall response rate, the Motivaction research panel was engaged (Motivaction Stempunt). Motivaction has a StemPunt online research panel with over 70,000 active Dutch members, from which a representative sample was drawn based on factors such as gender, age, level of education, region and participation in gambling activities. All participants received the same questionnaire, although the sequence of questions varied depending on their earlier responses. It took respondents 5 to 10 minutes to complete the questionnaire.

Table 1: List of psychological constructs measured in the questionnaire.

Construct	Reference	Sample item	Scale	Alpha
Attitude towards gambling	Attitude towards Gambling Scale	"Most people who gamble do so responsibly"	1 – 5	.65
Motives for arcade and casino visits	Gambling Motives Questionnaire	"When I go gambling, it's because I enjoy doing it with friends"	1 – 4	.77
Gambling dependency	Brief Problem Gambling Scale	"In the past 6 months, have you often gambled longer, with more money or more frequently than you intended to?"	1 - 5	.89
Gambling fallacies	Gambling Fallacies Measure	"There are 10 names in a hat, including yours. What is the chance that your name will be drawn?"	1 – 5	.70
Mental well-being	Mental Health Index	"How often have you felt down or depressed in the past 4 weeks?"	1 - 6	.78
Satisfaction with life	Satisfaction with Life Scale	"So far, I have done the important things I want to do in my life"	1 – 5	.65

2.3 Data analysis

The interview transcripts were entered into Atlas.ti software, and analysed using content analysis. This process starts with bottom-up coding of the text, followed by grouping these codes into categories, which are then organised into themes. In other words, respondents' answers were categorised based on key terms, and the final report of the interviews focuses on common themes that emerged in (almost) all interviews. To illustrate these themes, relevant quotes are included.

The questionnaire data were analysed using IBM SPSS 28.0. The first step involved describing the study population by calculating the frequencies and averages of sociodemographic characteristics (e.g. age, gender, level of education). Next, the frequencies and averages for the constructs in the questionnaire were calculated. Differences between groups were assessed for significance using the 'Independent Sample T test' and 'Paired Sample T test'. Additionally, Pearson correlations were calculated to evaluate the degree of association between variables.

Next, the population was divided into subgroups using latent class analysis. Latent class analysis is a technique used to identify data groups of individuals based on their responses or reported behaviours. These subgroups are often referred to as 'clusters' or 'classes'. After identifying these groups, differences in scores across classes are compared, taking into account both personal characteristics and psychological constructs using multinomial regression. The outcomes from the latent class analysis were incorporated into the model as the dependent variable, with the first class serving as the reference category.

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3. Results

The results are presented in line with the research questions, drawing from both the interviews and questionnaire findings.

3.1 Description: sampling, visitors and behaviour

3.1.1 Sampling

Interviews. A total of 37 interviews were conducted with visitors. Of these, 51% identified as male and 49% as female. The average age was 26 years, with the youngest participant being 12 years old and the oldest 64 years at the time of the interview. The age distributions were as follows: 12-18 years (32.4%) 18-21 years (32.4%), 21-25 years (16.2%), 25-40 years (27.0%), 40+ years (10.8%).

Questionnaire. The online questionnaire was completed by 867 individuals. Of these, 28 participants did not agree to the consent form, and 87 individuals were excluded from the analysis due to incomplete responses. Of the 753 individuals who completed the questionnaire, 24 did not meet the age requirement and one individual was excluded for duplicate participation. After excluding these 140 individuals (16.1%), a total of N = 727 respondents remained for analysis. The majority of respondents were recruited through Motivaction (n=609, 83.8%).

Half of the respondents identified as female (51.3%), 43.6% as male, and a small percentage (4.3%) identified as 'other', or preferred not to disclose their gender (0.8%). The average age was 24.7 years, with the following age distribution: 18 – 21 years (22.7%), 21 to 25 years (33.6%), 25 – 30 years (39.8%) and 30 – 35 years (4.0%). For a detailed overview of these and

other demographic characteristics of the study population that responded to the questionnaire, see Table 2.

Table 2: Overview of demographic characteristics of the population that responded to the questionnaire study *(n=727).*

Variable	Category	Number/Average	%
Gender	Male	317	43.6%
	Female	373	51.3%
	Other	31	4.3%
	Prefer not to say	6	0.8%
Age (in years)		M=24.7 (SD 3.86)	
Highest level of education completed	Low (primary school, lower secondary vocational education *(LBO))*, junior general secondary education *(MAVO)*	66	9.1%
	Medium (Senior general secondary education *(HAVO)*, pre-university education *(VWO)*, vocationally oriented education *(MBO)*)	337	46.9%
	High (Higher professional education *(HBO)*, undergraduate degree *(WO)*, Masters, PhD))	306	42.6%
	Prefer not to say	9	1.3%
Annual gross income (individual)	< 30,000 €	325	52.4%
	30,000 – 50,000 €	192	31.0%
	50,000 – 200,000 €	103	14.2%
	Prefer not to say	103	14.2%
Employment status	Full time (>34 hours/week)	313	43.1%
	Part time (<34 hours/week)	154	21.1%
	Student/school	116	16.0%
	Self-employed	63	8.7%
	Unemployed	64	8.9%
	Prefer not to say	16	2.2%
Arcade experience	Yes	332	45.7%
	No	395	54.3%
Gambling experience (including lotteries, bingo, sports betting, etc.)	Yes	621	85.4%
	No	106	14.6%
Casino experience	Yes	248	34.1%
	No	479	65.9%

3.1.2 Arcade visitors

The results from the questionnaire revealed that fewer than half of the study population had experience with arcades (45.7% compared to 85.4% who had experience with gambling). Of the 332 individuals who reported having visited an arcade in the past, the gender distribution was nearly equal, with 47.3% males and 46.1% females. The average age of arcade visitors was 24 years (*SD*=3.96), with the following age distribution: 18 – 21 years (29.4%), 21-25 years (34.6%), 25 – 30 years (31.9%), and 30 – 35 years (3.9%). Most arcade visitors had an average level of education (47.0%), followed by those with a high level of education (40.5%). The smallest group consisted of individuals with a low level of education (10.4%).

3.2 Arcades

The interviews revealed significant variation in the **frequency** of arcade visits. For one in five (21.6%) interviewees, it was their first visit to an arcade, while one-third (32.4%) reported it was only their second or third visit. Additionally, some respondents reported visiting the arcade occasionally (16.2%), regularly (21.6%) or frequently (8.1%). The interviews revealed that individuals typically visit arcades with their partners or friends, although a few mentioned visiting with family or in some cases prefer visiting alone, to focus on a specific game.

The questionnaire results further revealed that one in five respondents (19%) had not visited an arcade in over 6 months. Among the remaining 81%, the percentage of respondents decreased as the frequency of visits declined from weekly to once every six months (Figure 1). Specifically, 7.1% reported visiting an arcade weekly or more often, 9.3% visited every 2 weeks and

18.2% said they visited monthly. However, the largest group reported visiting the arcade every 2 months (32%) or once every six months (33.5%). The questionnaire responses regarding who individuals typically visit the arcade with were consistent with the interview findings. Most visitors went with friends (47%) or a partner (34%), while 13% preferred to visit alone. A smaller percentage reported typically visiting with family (3.6%), or with varying company each visit (2.4%).

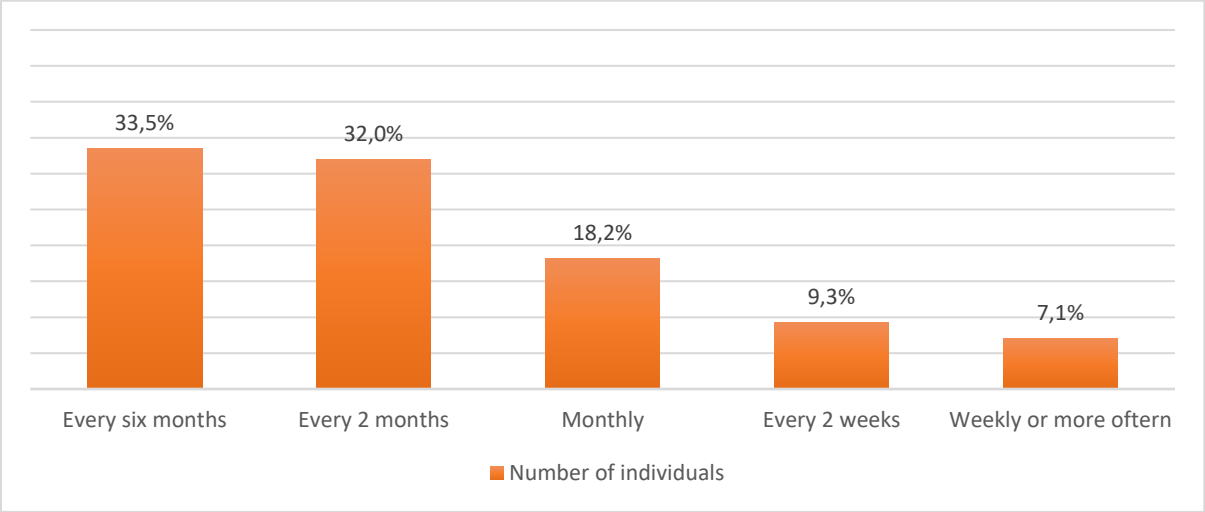

Figure 1. Overview of the percentage of respondents by frequency of arcade visits in the past 6 months *(n=269: number of respondents who reported visiting an arcade in the past 6 months)*

The average **duration** of an arcade visit ranged from 1 to 1.5 hours (SD=.75). A significant portion (39.8%) of respondents reported spending between 30 and 60 minutes in an arcade per visit, while an even larger group spent 1 to 2 hours per arcade visit (44.6%). A smaller percentage spent less than half an hour (10.2%), and a small number of respondents (5.4%) reported spending more than 2 hours in an arcade.

The **spending pattern** of arcade visitors averages between €20 and €40 per visit. One in three respondents (31.9%) spends less than €20 per visit, while just over one third (38%) spends between €20 and €40, 22.6% of the

population spends between €40 and €60 per visit, and 7.5% spends €60 or more per arcade visit. A comparison of planned spending versus actual spending per arcade visit revealed no statistically significant difference, indicating that most individuals tend to stick to their budget when visiting an arcade.

This was also reflected in the participant interviews. For instance, some mentioned taking advantage of promotions offering extra credits, allowing them to extend their gameplay. One participant explained: "*I didn't stop last time until my credits ran out. I stopped when I felt I was done*." (D10, V, 17; participant, gender, age). However, for others, stopping wasn't always that easy. One participant shared: "*We load up 50 Euros once, or something like that. And then you're almost about to hit the jackpot, or you're close to winning. So, yeah, you end up loading more*." (D47, M, 20).

Additionally, some participants took advantage of a "playtime" package, where they could pay a fixed price for unlimited gameplay within a set time frame. Depending on the arcade, players either received no tickets, a fixed number of tickets, or unlimited tickets. Participants especially enjoyed this option, as it allowed them to play freely without worrying about how many credits each game would cost.

The questionnaire also revealed that visitors do not typically plan which games they will play in advance (response scale 1-5, M=2.40, SD=1.30), instead they make their selection once they are actually in the arcade (M=3.89, SD=1.14). During the interviews, participants mentioned that if their preferred game was in use, they would choose a different game. Additionally, many reported that they often find games more enjoyable when the gameplay matched their skill level (e.g. Basketball).

To assess the factors influencing game choice in the questionnaire using statements, respondents were asked to rate various statements on a scale from 1 ('strongly disagree') to 5 ('strongly agree'). The key factors influencing game choice included the busyness of the arcade (*M*=3.72, *SD*=1.07), the number of credits required to play (*M*=3.68, *SD*=1.19) and the player's skill level (*M*=3.53, *SD*=1.07). The potential number of tickets to be won was also a factor in game selection (*M*=3.26, *SD*=1.22), though it was considered less important than the other three. For an overview of how these factors influence game choice, see Figure 2 which shows the average scores for each factor.

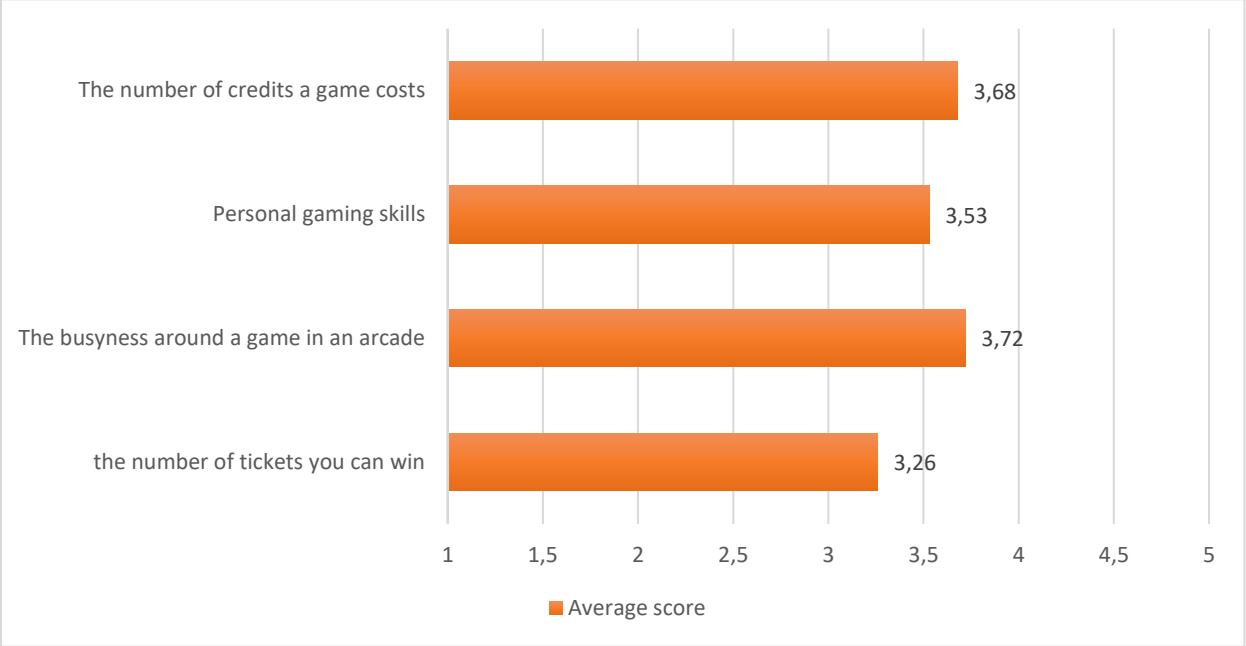

***Figure 2. Overview of how factors influence game choice, showing the average scores for each factor (n=269)**. Score at a scale of 1 = strongly disagree to 5 = strongly agree.*

The interviews strongly indicated that participants place significant value on the overall experience of visiting arcades, with their primary motivation being fun. One participant expressed: "*It's fun to get those tickets, and it's fun to win the games. And yes, sometimes we turn it into a competition, but we're*

really there for enjoyment." (D47, M, 20). For most participants, **the social aspect, enjoyment and companionship were the key reasons for visiting**. Additionally, participants highlighted the importance of the games themselves, with one participant saying: "*I don't really like the games that are purely about earning tickets. There needs to be a real gameplay element, so not just hitting something once.. "*(D23, M, 50). However, they acknowledged that tickets and prizes were part of that experience. Another participant said "*I come for the game and the tickets are just a nice bonus*" (D12, M, 14). Some participants emphasised a combination of all three factors: the social aspect, the games and the tickets. One participant added: *"A combination of all three, but definitely the first two the most" (D32, V, 26)*. Two other factors that emerged from the interviews were the competitive element and specifically the desire to win against others.

These five factors were also included in the questionnaire. The average scores of arcade visitors are displayed in Figure 3. Respondents were asked to rate the importance of these factors on a scale from 'very unimportant' (score 1) to 'very important' (score 5) during an arcade visit. All five factors scored above 3 ('neutral'), indicating they are considered important. **Social interaction** (*M*=3.97, *SD*=1.24) and the **games themselves** (*M*=3.77, *SD*=1.06) were rated as the most important factors, which is consistent with the interview findings. The influence of tickets and prizes followed (*M*=3.60, *SD*=1.13). While competition (*M*=3.21, *SD*=1.16) and winning against others (*M*=3.16, *SD*=1.17) scored lower, they were still seen as important.

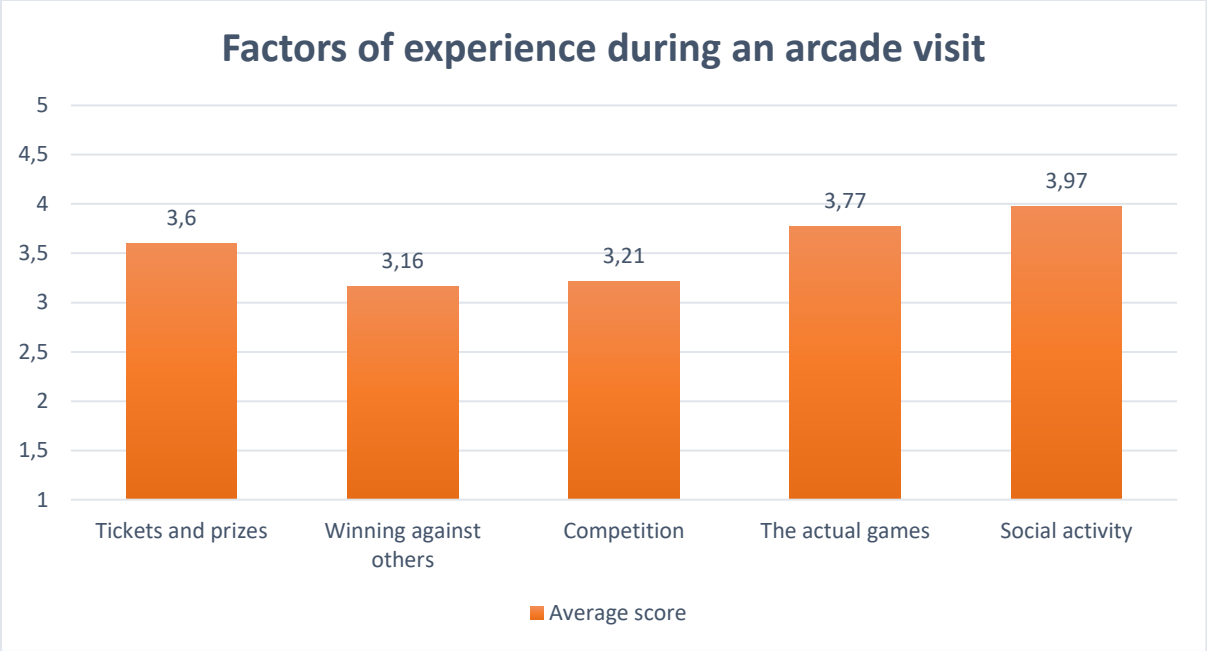

Figure 3. Overview of average scores for factors of experience during an arcade visit *(n=269). Scores between 1=very unimportant and 5=very important.*

3.3 Games of chance

Only a few participants in the interviews had experience with gambling, and those who had visited a casino had typically done so only once. One participant mentioned occasionally visiting a casino, with a preference for table gaming.

In contrast, the questionnaire revealed a much larger proportion of respondents with gambling experience (85.4%). However, this encompassed *all* types of gambling, including lotteries, scratch cards, sports betting, TOTO *(the Dutch state-owned betting company)*, bingo, electronic slot machines, table gaming and online gambling. Participation in lotteries (55.3%) and scratch cards (53.8%) was by far the most popular among respondents. This was followed by TOTO (32.9%), casino table gaming (27%), bingo in amusement arcades (25.2%), electronic gambling machines (25%), sports betting (21.6%) and online table gaming (19.3%). A relatively large

percentage of respondents had only participated in lotteries. The focus of our study is to compare participation in gambling at physical casinos. According to the questionnaire, 34.1% of participants reported having experience with gambling in physical casinos.

Among these casino visitors, a higher percentage were men (56.5%) compared to women (38.7%), which contrasts with the more balanced gender ratio observed among arcade visitors. The average age of casino visitors was 24.7 (*SD*=3.78) years. The majority of casino visitors were employed, with 56.5% working full-time and 19% working part-time. Additionally, 12.1% of casino visitors were students, while 6.8% were not working.

The **frequency** of casino visits in the past six months showed a trend where the proportion of respondents decreased as the frequency of visits increased. Over half (59.7%) reported having visited a casino once in the past six months. About a quarter (24%) had visited a casino 2 or 3 times, and 10.6% had visited a casino monthly in the past six months. A smaller percentage visited a casino every two weeks (3.7%) or weekly (2%).

Respondents who visited a casino most often did so in the company of friends (43.4%). About one in five went with their partner (19.1%) or alone (17.7%), while a small portion visited with family (7.1%). Additionally, 12.6% of respondents reported that the composition of their group could vary from visit to visit.

On average, individuals spend more time in the casino than in an arcade typically between 1 to 2 hours. Additionally, more money is spent in casinos compared to arcades, with individuals reporting an expenditure of €60 to €100 per person per visit. A notable finding was that the planned expenditure in a casino (ranging from €40 to €60) differed from the actual amount spent, with this difference being statistically significant ($p < .01$). Unlike arcade visitors,

casino visitors **tend to spend more money at a casino than they had intended.**

3.4 Comparison between arcade players and gamblers

The scores of arcade players and gamblers were compared on psychological variables. Respondents who had *not* visited an arcade or casino, or both, in the past six months were excluded from these analyses. Additionally, gamblers were selected based on their participation in bingo, electronic slot machines, and table gaming at *physical* gambling locations (such as Fair Play, Queens Casino, Holland Casino, etc.). This approach allowed for a more accurate comparison between arcade players and gamblers.

The average scores on key psychological variables were statistically compared between these two groups (Table 3). The analysis revealed no statistically significant differences in terms of negative attitude, mental health and gambling fallacies between the two groups. However, gamblers reported higher satisfaction with life than arcade visitors ($p < .01$).

One important finding is that gamblers scored significantly higher on **gambling dependence** than arcade players ($p < .01$). However, it is important to note that the scores were generally low (around the midpoint or lower on a 5-point scale), indicating that neither group exhibited problematic behaviour or a significant decline in well-being due to gambling.

Furthermore, notable differences emerged in the **motives** for visiting between gamblers and arcade players. Gamblers scored higher on all four motives compared to arcade visitors, as measured by the GMQ. Differences in the fun, coping (i.e. escaping from the daily grind and worries) and financial motives were significant ($p<.01$), while the social motive did not show any significant difference. For both arcade visitors and gamblers, **fun was the most important motive.**

Table 3: Differences between arcade visitors (who do not participate in gambling; n=150) and gamblers (who do not go to arcades; n=129) on key psychological variables

Variable	Group	Average	SD
Gambling dependence	Arcade	2.28	1.08
	Gambling	2.72*	1.01
Positive attitude towards gambling	Arcade	2.82	.76
	Gambling	3.08*	.67
Negative attitude towards gambling	Arcade	3.37	.75
	Gambling	3.44	.67
Mental health	Arcade	3.26	.76
	Gambling	3.33	.71
Satisfaction with life	Arcade	3.20	.81
	Gambling	3.47*	.75
Gambling fallacies	Arcade	1.33	.74
	Gambling	1.33	.70
Fun motive	Arcade	2.44	.81
	Gambling	2.77*	.61
Social motive	Arcade	2.21	.94
	Gambling	2.53	.78
Coping motive	Arcade	1.53	.86
	Gambling	2.19*	.77
Financial motive	Arcade	1.98	.89
	Gambling	2.48*	.85

Note: Scores on a scale of 1 to 5. *Significantly different p<.01.

In addition to the measured gambling/play dependence from the questionnaire, respondents were also asked about their **perceived control** over the games they play. Arcade players felt they had more control over the games they played compared to casino visitors. On a scale of 1 (‘strongly disagree’) to 5 (‘strongly agree’), with 3 being neutral, arcade visitors scored 3.52 (*SD*= .04), while casino visitors scored 2.91 (*SD*=.09). This difference is statistically significant (*p<.001*). These findings align with the responses to

statements about the influence of **luck or skill** on game outcomes. Both arcade and casino players agreed that luck affects the outcome of games, but casino players rated this influence significantly higher ($p<.001$). Conversely, casino players did not believe their knowledge and skills influenced the game results, while arcade players felt their skills played a role in arcade games. This difference was also statistically significant ($p=.01$). The results are illustrated in Figure 4.

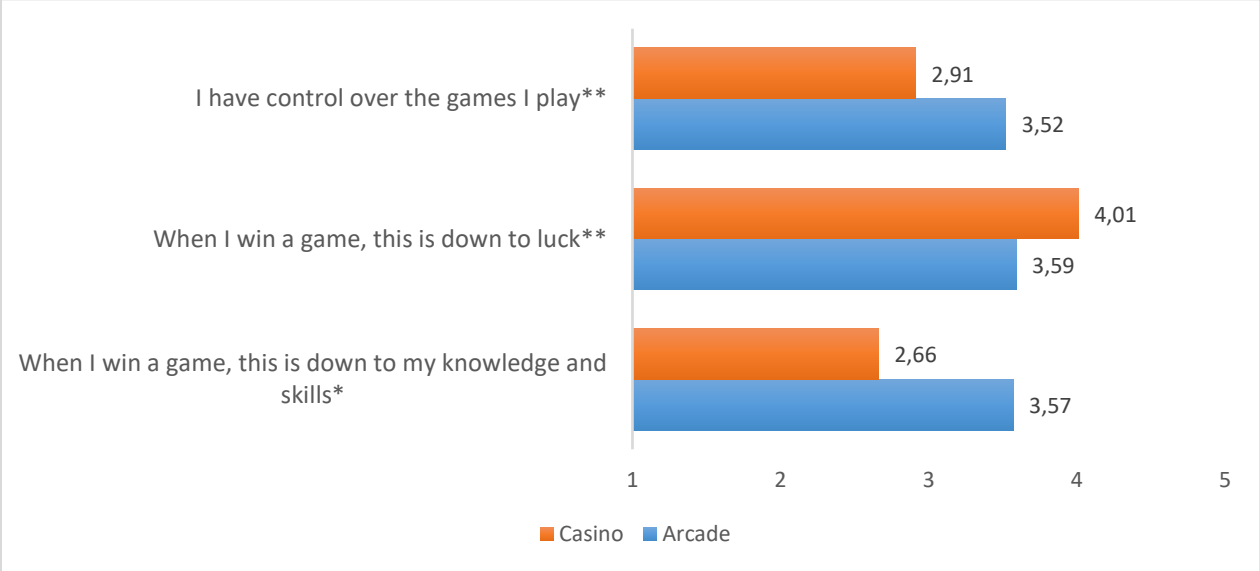

Figure 4. Differences in perceived control between arcade and casino visitors. *Scores range from 1 to 5. **significant difference between the groups, p<.001*

During the interviews, participants had varied opinions and experiences on the roles of luck and skill in gameplay. One participant commented: "*We just played that basketball game and it was against the computer, so you kind of know you're going to lose*" (D42, M, 17). However, others interpreted the question differently, suggesting that in games like basketball, luck plays a role in how the ball bounces and whether it goes in the right direction.

Additionally, gamblers exhibit a more positive attitude towards gambling than arcade visitors (p <.001). With a score of 2.82, arcade visitors are at the lower

end of the positive attitude scale. Conversely, arcade visitors tend to have a more negative attitude towards gambling (*M*=3.37, *SD*=.75; although the difference compared to gamblers was not statistically significant).

The quantitative comparison between arcade (games) and casino (games) is further illustrated by insights from the **interviews**. Overall, participants expressed a negative perception of gambling. One participant put it bluntly: "*I consider a casino a no-go*." (D35, V, 33). A common sentiment expressed was: "*The house always wins*" (D46, M, 22). Notably, participants did not associate these feelings with arcades: "*I believe a casino is designed to make you lose, but I don't get that feeling here [arcade]*" (D27, V, 27).

When participants were asked to elaborate on their responses, several similarities and differences between casinos and arcades emerged. The most significant difference identified by participants was the ability to win money at a casino. One participant said: "*There [at the casino] you can actually win money, and it's physically more thrilling*" (D26, M, 23). Another frequently mentioned difference was the type of games found in arcades versus casinos. Participants generally expressed a preference for skill-based games, where they are mentally engaged and have the opportunity to improve. One participant said: "*I didn't really like those [games of chance]; I prefer to play the 'real' games, I find them much more fun*" (D07, V, 41). The social aspect was also cited as a positive feature of arcades: "[...] *it's more inviting*" (D44, M, 28). However, some criticisms of arcades were also voiced. One participant pointed out: "*You can win the jackpot, just like in a casino. That's misleading*." (D31, V, 23). The credit system in arcades also came under scrutiny: "[...] *with credits it's less clear how much money you're spending*." (D03, V, 63).

Discussions about design and atmosphere highlighted differences between casinos and arcades. "*It's kind of the same atmosphere with the lights and sounds*" (D14, M, 29). However, another participant disagreed, saying: "*The*

atmosphere is very different. In a casino, I feel really poor. Here, you have fixed prices for each game." (32, V, 26). Differences in motives for visiting were also mentioned during the interviews. One participant explained: "*You go to a casino for the experience, or with the goal of leaving with more money than you came in with. I don't have that here [arcade]. Here, I feel like I come to play some games and have fun*" (D10, V, 17). Another remarked: "*I've been to a casino once and you definitely go there to try and win money. You probably won't win anything, but that's what you go for – it's not really about the fun.*" (D42, V, 17). One participant remarked: "*That [casino] attracts a completely different audience, with a different goal, something we [arcade] don't really relate to.*" (D39, V, 28).

3.5 Correlation between variables and gambling dependency

Correlation analysis was conducted to examine the relationships between different variables in the questionnaire. A correlation measures both the strength and direction of the relationship between two variables, with -1 indicating a strong negative correlation, 0 indicating no correlation, and +1 indicating a strong positive correlation. The correlations were analysed across gambling dependence, attitudes, perceptions, well-being and motives, while also including personal characteristics, such as age, gender and education level (see Table 4).

As shown in the table, problematic gambling is associated with a positive attitude towards gambling in both groups. However, for gamblers, it is also associated with a (lower) negative attitude towards gambling. This positive attitude correlates with fun, social and financial motives among gamblers. In both groups, a positive attitude towards gambling is associated with the coping motive. Interestingly, for arcade visitors, better mental health correlates with a more negative attitude towards gambling. In both groups, the numbers of errors in gambling fallacies (GF) are negatively correlated with gambling dependence. This could imply that a stronger belief in illusions of control over gambling are linked with higher levels of gambling dependence. Lastly, satisfaction with life is negatively associated with gambling dependence in both groups. However, for gamblers, satisfaction with life is significantly correlated with stronger social, coping and financial motives in contrast to arcade visitors.

Table 4. Overview of correlation values for variables and gambling dependence, divided into arcade and casino groups. *The values in bold indicate differences between the two groups; *p < .05; **p <.01. GF = Gambling fallacies. MHI = Mental Health Inventory. SWLS = Satisfaction with life scale. Gender coded as 1 = male, 2 = female.*

	Gambling Dependence	Positive Attitude	Negative attitude	GF	MHI	SWLS	Fun motive	Social motive	Coping motive	Financial motive	Gender	Age
Arcade												
Positive attitude	.52**											
Negative attitude	**.09**	-.10										
GF	-.49**	-.19*	.07									
MHI	**.32****	.44**	**.41****	**-.17***								
SWLS	.45**	.46**	.40**	**-.08**	.33**							
Fun motive	.34*	**.22**	-.05	-.24	.29	.17						
Social motive	.23	**.18**	.12	-.26	.15	**.12**	.55**					
Coping motive	.48**	**.47****	.10	-.28	.37*	**.30**	.47**	.46**				
Financial motief	.58**	**.31**	.02	-.42*	.22	**.38***	.38*	.24	.44**			
Gender	-.07	.08	.03	-.20*	.20*	-.16	.19	.27	.05	-.09		
Age	-.04	.01	.09	.01	-.03	.05	-.11	-.17	.05	**.28**	.08	
Education	-.003	-.04 *	.09	.08	.06	.17*	.02	-.15	-.1	-.10	-.16	.24**
Gambling												
Positive attitude	.40**											
Negative attitude	**.28****	.02										
GF	-.45**	-.21*	.05									
MHI	**.02**	.29**	**.16**	**-.05**								
SWLS	.48**	.38**	.35*	**-.23****	.21*							
Fun motive	.18*	**.24****	-.04	.04	.12	.06						
Social motive	.12	**.18***	.10	-.05	.14	**.22****	.33**					
Coping motive	.52**	**.36***	.17	-.29**	.06	**.29****	.33**	.21*				
Financial motive	.40**	**.25***	.17	-.09	.02	**.26****	.39**	.31**	.40**			
Gender	-.06	-.02	-.10	-.13	-.03	-.06	.00	-.03	.16	-.12		
Age	.05	.08	.01	.07	.11	-.02	.03	-.19*	-.03	**.18***	-.06	
Education	-.11	-.27**	-.02	.09	.11	-.05	.02	-.03	-.05	-.17	-.20*	.15

3.6 Identification of gambling profiles

3.6.1 Patterns in gaming and gambling

The next step involved identifying participation patterns in arcade and gambling activities, using data from the questionnaire (*N*=350). This was achieved through Latent Class Analysis (Vermunt & Magidson, 2004), a method that identifies **subgroups** within a dataset based on distinct patterns. In this study, the model includes patterns of participation in arcades and all types of gambling activities listed in the questionnaire, including lotteries, scratch cards, sports betting, TOTO, bingo, EGMs and table gaming. This approach allows us to identify distinct subtypes of gamblers/players based on their gaming and gambling patterns, and then examine how these subtypes score on motives, attitude and well-being.

To decide on the model, 'model fit' statistics were compared across models with 2 to 6 classes, and the model that best represented the data was selected. According to the model fit statistics (lowest BIC, AIC value and class size - Nylund *et al.*, 2007), a model with **5 classes** provided the best fit for the data.

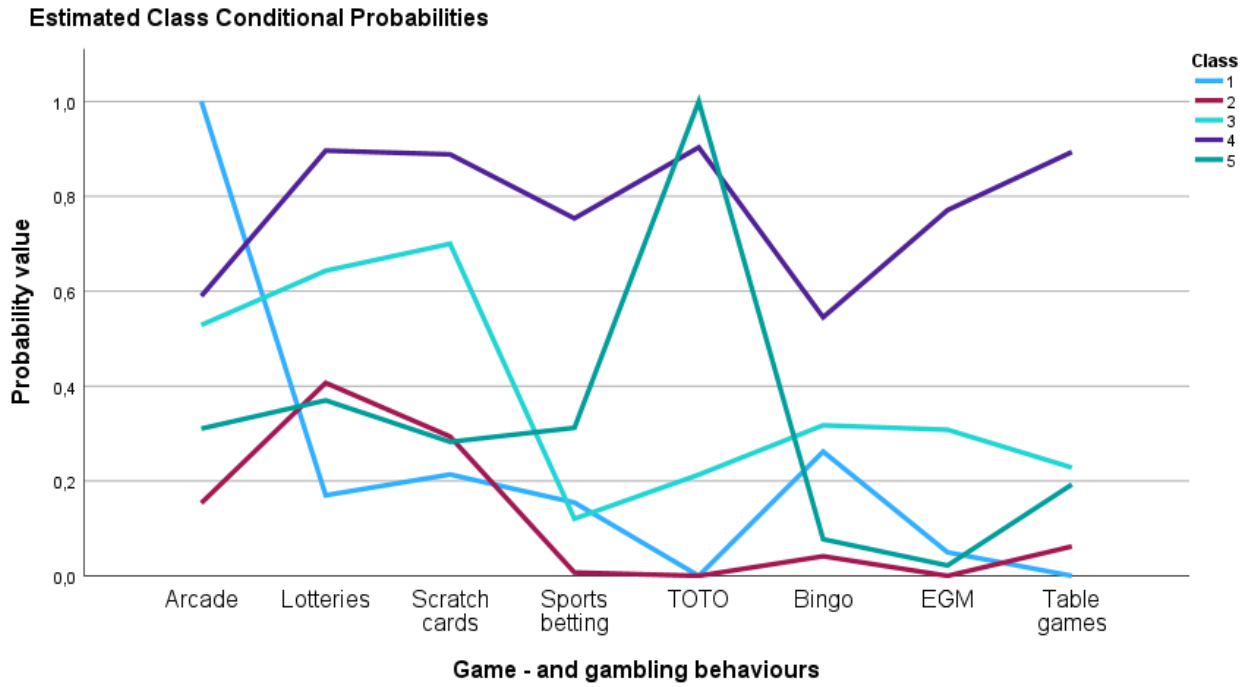

Figure 5: Graphical representation of the five identified gaming and gambling patterns in the population. *EGM = electronic gambling machines.*

The optimal model is presented in Figure 5, with the corresponding values shown in Table 5. For instance, a probability of 1.00 indicates a 100% likelihood that an arcade participant belongs to Class 1. The 5 classes are as follows:

- Class 1: Arcade players
- Class 2: Low-risk players
- Class 3: Moderate-risk gamblers
- Class 4: High-risk gamblers
- Class 5: Sports gamblers

The **arcade players** group (Class 1) makes up 8.7% of the population and is characterised by participation in arcade games (100%). Their scores on EGM (electronic gambling machine - 5%) and table gaming (0%) are exceptionally low. Class 2 comprises the low-risk players (27%). They exhibit the lowest

scores in participating in both gambling and arcade activities. However, they demonstrate higher participation in lotteries (40.7%) and scratch cards (29.4%). Class 3, with the moderate-risk players, is the largest group (38%). The pattern of this class is higher than class 2, but lower than class 4. The high-risk group, class 4, shows a high score for many different types of gambling, such as lotteries (89.6%), scratch cards (88.8%), sports betting (75.4%), TOTO (90.3%), EGM (77.1%), table gaming (89.3%). Notably their participation in arcade games (59%) and bingo (54.5%) is lower in this group. This class comprises 16.5% of the respondents. Class 5, the sports gamblers, is primarily defined by their participation in TOTO (100%). This class is small, making up 9.9% of the participants.

Table 5. Composition of the model with patterns of gaming and gambling behaviour with values of the probability that a variable belongs to the class*. Values in bold are characteristic values for this class. EGM = electronic gambling machines.*

Class	Label	% population	Arcade	Lotteries	Scratch cards	Sports betting	TOTO	bingo	EGM	Table gaming
1	Arcade	8.7%	**1.000**	.170	.214	.155	.000	.262	.050	.000
2	Low-risk	27%	.154	**.407**	**.294**	.007	.000	.041	.000	.062
3	Moderate-risk	38%	.529	.643	.700	.120	.213	.317	.308	.228
4	High-risk	16.5%	.590	**.896**	**.888**	**.754**	**.903**	.545	**.771**	**.893**
5	Sports	9.9%	.310	.370	.282	.312	**1.000**	.077	.022	.193

3.6.2 Differences between classes

The five subgroups of players were compared based on the constructs in the questionnaire and their sociodemographic characteristics. Given the focus of this study on comparing arcade players and gamblers, class 1 was used as the reference group. This allowed for a statistical comparison of the average scores between the arcade player group and the other four classes.

Firstly, it is clear that the sports, high-risk and moderate-risk classes show higher gambling dependence compared to the arcade class. However, there are no significant differences between the arcade class and **low-risk** class, except for age (players in the low-risk class are generally older on average than those in the arcade group, $p = 0.03$). The arcade group consists of the youngest participants across all classes. The **moderate-risk** group scores higher than the arcade class in mental health, fun motives and financial motives. In addition to demonstrating greater gambling dependence than arcade players, the **sports player** class show a more positive attitude towards gambling, fewer gambling fallacies (GF) and a higher satisfaction with life. The **high-risk** class, in contrast to the arcade class, exhibits greater gambling dependence, better mental health and higher scores across all four motives. Additionally, the high-risk group contains a significantly higher proportion of men ($p < .001$). These findings are summarised in Table 6.

***Table 6. Comparison of values and characteristics between the classes**. Scale 1-5. * p < .05; ** p <.01. Arcade serves as the reference category against which the other 4 classes are compared*

	Arcade	**Low-risk**	**Sports**	**High-risk**	**Moderate risk**
Gambling dependency	2.35	2.01	2.75**	2.91**	2.44*
Positive attitude	2.83	2.67	3.17*	3.18*	3.03
Negative attitude	3.43	3.59	3.34	3.58	3.43
Gambling fallacies	1.54	1.45	1.17*	1.30*	1.47
Mental health	3.20	3.25	3.38	3.31	3.41*
Satisfaction with life	3.24	3.16	3.54*	3.52*	3.40
Fun motive	2.27	2.38	2.94**	2.90**	2.67*
Social motive	2.00	2.52	2.24	2.56**	2.41
Coping motive	1.68	1.80	2.41**	2.30**	1.95
Financial motive	1.92	1.77	2.53*	2.67**	2.47*
Gender (male)	30.6%	41.5%	72.8%	57.7%	40.7%
Age	23.09	24.86*	24.55	25.06*	25.13*

4 Conclusion and reflection

4.1 Conclusion: Answers to the research questions

The primary objectives of this research were (1) to gain an insight into the audience of arcades, including their opinions, motives and well-being, and (2) to compare these insights with those of gamblers. One key motivation for this study was the lack of research specifically focusing on arcades. In total, 48 interviews were conducted, and over 700 Dutch individuals, aged between 18 and 35 years completed an online questionnaire. Based on the research questions, the following conclusions can be drawn.

- *What sociodemographic factors play a role in the decision to visit arcades? How does this differ from gambling?*

Although some literature and a few respondents suggest that gaming and gambling share certain similarities, our findings highlight that this is not the case when comparing arcades and casinos. Arcades are particularly popular among younger audiences, with an equal gender distribution. In contrast, casino visitors tend to be predominantly male and older on average. The results from the latent class analysis further emphasise the differences in characteristics between arcade visitors and gamblers. One class, for instance, was characterised by arcade game participation, with little to no involvement in gambling activities. Sociodemographic variables, such as gender, age and education, revealed a distinct pattern of correlations with the psychological variables for the two groups (except for a more positive attitude correlating with lower education levels in both groups - see Table 4). In conclusion, there is little to no overlap between arcade visitors and casino visitors, which is further confirmed by the interview findings.

- *Do visitors play in arcades for fun, or is there a potential for addiction? How does this differ from gambling?*

Visitors to arcades typically spend less time and money than those visiting casinos. Arcade visitors tend to have better control over their spending, not exceeding the amount they intended or planned to spend. This is in contrast to casino visitors who spend more money than they initially intended per person per visit. Both groups show correlations between problematic behaviour scores and factors such as positive attitude, gambling fallacies, satisfaction with life and motives. However, casino players tend to have a more positive attitude towards gambling, higher satisfaction with life and stronger motives than arcade visitors, all of which increase their risk of gambling dependence. Despite these differences, both groups seem to display minimal signs of problematic behaviour or significant declines in well-being.

- *What motivates people to visit arcades, and how does this relate to the well-being of visitors? How does this differ with gamblers?*

The motives of enjoyment, coping (‘escaping from the daily grind and worries’) and financial gain (‘wanting to win money’) are all positively correlated with gambling dependence, suggesting that the stronger these motives are, the higher the likelihood of developing dependence over time. Notably, enjoyment was the main motive in both groups. For arcade visitors, social interaction with friends during visits also plays a significant role in their motivation to visit. When comparing the two groups, casino players score significantly higher than arcade players in terms of enjoyment, coping and financial motives, indicating that casino players are at a higher risk of gambling dependence than arcade players.

- *Do visitors recognise the difference between skill-based games and games of chance?*

Arcade visitors recognise that their skills influence game outcomes, scoring higher in this regard compared to casino visitors. However, they also recognise that chance/luck plays a role in their perception, such as whether a ball will bounce in the wrong direction. In contrast, casino visitors are more likely to believe that their chances of winning are determined by luck rather than skill. Overall, it appears that the audience is well aware of the principle that in casinos "the house always wins", while in arcades the games are skill-based, where 'luck' is also largely dependent on one's own abilities.

- *How do attitudes towards gambling differ between arcade visitors and casino visitors?*

The average score for arcade players fell in the lower half of the scale, meaning they do *not* have a positive attitude towards gambling. In contrast, casino players scored in the upper half of the scale, with a significant difference between the arcade and casino players. Among arcade visitors, a more positive attitude was associated with a stronger coping motive, however the average coping motive score for arcade visitors is low. For casino players, a more positive attitude is linked to stronger motives relating to enjoyment, coping and financial motives. Since casino players scored higher on all three of these motives than arcade visitors, and given that motives are closely tied to gambling dependency, it can be concluded that casino players, driven by their more positive attitude, are at a higher risk of developing gambling dependency.

4.2 Reflection

In this section, we critically reflect on our findings, in light of potential limitations and insights from other sources. A key limitation of this study is that it represents one of the first studies on arcades, and our conclusions are based on cross-sectional data that provide only a snapshot of a specific subpopulation within the Dutch population. As such, there is some uncertainty about the generalisability of these results and/or potential long-term effects. Additionally, a limitation of this study is that the findings are based on self-reported past behaviour, which introduces the possibility of social desirability bias, which could have influenced the participants' responses in the questionnaires. These two factors may lead to a distorted interpretation of reality in the results.

However, the sample selection was highly representative of the target group of 18 – 25-year-olds. The selection process accounted for gender, education level, age, region and participation in gambling. For example, the education levels closely aligned with the statistics for 15- to 25-year-olds and 25- to 35-year-olds reported by Statistics Netherlands (2024). Furthermore, the likelihood of social desirability bias was relatively low, as the questionnaires contained few 'sensitive' questions, aside from those related to mental well-being. Our findings also align with previously reported data. For instance, research by Ipsos I&O (2024) shows that participation in lotteries and scratch cards is the highest among the Dutch population, which was also reflected in our results. Interestingly, participation in TOTO was notably high in our study, which may be attributed to the timing of data collection – in the weeks leading up to the European Football Championships in 2024. This timing likely

influenced our results from the latent class analysis, potentially explaining the group of sports gamblers.

Additionally, the latent class analysis (LCA) carries other factors of uncertainty. Firstly, the population was selected based on participation in gambling to create groups that are as similar as possible. In turn, this selection influenced the distribution of gender and age across the groups. Furthermore, the sample size for the LCA was limited to participants who had engaged in arcade and gambling activities within the past six months (n=350). For estimating relatively simple latent class models, a sample size of 300 to 500 individuals is generally recommended as a minimum. However, for more complex model structures with four or more classes, larger sample sizes are advised (Vermunt & Magidson, 2004). Ideally, these analyses should be repeated with a larger, unfiltered sample that is more representative of the broader (in this case Dutch) population.

The patterns identified in our data are consistent with findings from previous studies. For example, Macey *et al.* (2024) report that younger men with a more positive attitude towards gambling are at a higher risk of developing gambling dependence. Additionally, these authors identified four patterns, with lotteries and scratch cards being the most common forms of gambling. Another study also identified four classes of gamblers, but differentiated between those who preferred skill-based games (such as poker) and those who preferred games of chance (Sanscartier *et al.*, 2018). The group of intensive gamblers, who tended to favour games of chance over skill-based games, scored higher on dependence, as well as on enjoyment, coping and social motives. Our high-risk group largely mirrors the high-risk group identified in the research performed by Sanscartier and colleagues (2018).

Our **key conclusion** from the studies presented is that, based on the findings of this research, there is **no evidence of concerns in relation to gaming or gambling dependence among arcade visitors**. Arcade visits are typically infrequent, and players maintain control over both their time and spending. Both the interviews and the questionnaire data highlight distinct differences between arcade and casino visitors in terms of personal characteristics, attitudes and motives, ultimately leading to varying levels of risk for developing problematic gaming or gambling behaviour in the two groups.

5 Recommendations

Based on the findings from interviews with visitors and staff, the questionnaire data, and discussions with members of the FEC, we offer the following recommendations:

- Visitors to arcades view their experience purely as a form of leisure, focused on enjoyment and social interaction. It is essential to maintain and further cultivate this atmosphere.
- Arcade visitors prefer skill-based games over games of chance. The selection of games offered in arcades should reflect this preference.
- There is a clear distinction between arcade visitors and gamblers. This distinction should be preserved to maintain the positive differences and they should be made more visible to the public:
    - There is awareness of the difference between skill and chance in arcades versus casinos.
    - This study found no evidence of high-risk gaming or gambling behaviour among arcade visitors, as evidenced by their low dependency scores and a negative attitude towards gambling.
    - Arcade visitors are a distinct subgroup to gamblers in their everyday lives.
- As the risk of dependence can never be fully ruled out, it is recommended that arcade staff are trained to recognise and interpret signs of problematic gaming behaviour.
- In our studies, we did not make any comparisons with the group of individuals who have never visited an arcade or casino. Additionally, we excluded young people who engage in online gaming. Future research would benefit from including these groups – non-participants,

arcade visitors and gamblers – to gain a more comprehensive understanding of the differences in behaviours and attitudes.

- Since this study does not establish causal relationships, we recommend conducting (a) experimental and (b) longitudinal research (with multiple measurement points over an extended period of time) to explore whether arcade visitors are more likely to transition to gambling as adults, and whether distinct patterns can be seen between the groups. One potential avenue could be to set up a Virtual Reality experiment, where different environments are created to measure risk perceptions. However, funding would be required for further research in this area.

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