



Not Gamers, Just Women Who Play Video Games: A Survey of Women's Attitudes to Mobile Games in the UK

Stephanie Rennick¹ · Seán G. Roberts²

Received: 7 January 2025 / Accepted: 5 August 2025

© The Author(s), under exclusive licence to Springer Science+Business Media, LLC, part of Springer Nature 2025

Abstract

This study investigates the barriers to playing video games that women face. Despite gaming being a traditionally male-dominated pastime, 51% of women now game in some capacity compared to 53% of men. However, women are still less likely to play some genres and often face discrimination. A survey of 1000 people in the UK who identify as women and who play mobile games revealed that they experience negative emotions around playing video games: A third experienced guilt about taking time to play games and 1 in 6 kept gaming a secret for fear of judgement. There were also unexpected associations in the data: Women who look forward to playing are *more* likely to feel guilty than those who do not, and women who feel proud of their gaming achievements were *more* likely to keep it a secret than those who do not. We relate these patterns to theories of gendered attitudes toward leisure time and argue they are rooted in women feeling excluded from gaming culture. We suggest the implications for game makers and game scholars, including the potential benefits of broadening the perception of who plays video games, who games are for, and what types of games are available.

Keywords Gender roles · Gender role attitudes · Computer games · Mobile games · Gaming · Guilt · Leisure time · Gender inequality · Smartphones · Telephone surveys · Mobile phones

The games industry in the United Kingdom was valued at almost £8B in the latest market valuation report (Purdie, 2024), with over £1.5B in mobile game sales in 2023. A 2024 survey of over 3600 UK participants aged 16+ found that 36% of female respondents (and 34% of respondents overall) had played mobile games, up from 20% in 2019 (Clement, 2025). Although the number of women playing video games continues to increase, their representation varies between different genres, platforms, and gaming activities (e.g., Le Ngoc, 2024). Previous research, as outlined below, has suggested multiple barriers to women's play and participation in video game culture. However, there are few studies that provide evidence for these barriers in a broad sample of UK women who play mobile games.

A brief note on terminology: in relation to our study, we use “women” to mean people who identify as women. When discussing other authors' work, we use “men,” “women,” and “people of other genders” to refer to those people who were designated that way in the context of their studies; similarly, we use “female” and “male” in accordance with how they are used by those other authors. Not all studies offer definitions of the terms used and may use them differently from each other.

Barriers to Play

Casual Vs. Core Games

One reason that women might be reluctant to consider themselves ‘gamers’ and fully participate in the gaming community is that the sorts of games that they are assumed to play, and that are marketed towards them, are viewed as less central, less serious, and less important than those chosen by and designed for men. There is a commonly drawn distinction within the gaming community between ‘casual games’ and ‘core games’ (or ‘games’ *simpliciter*) (Chess & Paul,

✉ Stephanie Rennick
steph.rennick@stir.ac.uk

¹ Communications, Media and Culture, University of Stirling, Stirling, UK

² School of English, Communication, and Philosophy, Cardiff University, Cardiff, UK

2019; Paaßen et al., 2017), along with a “subtle devaluation and blatant feminization (Vanderhoef, 2013, p. 4) of the former. Industry efforts to separate the two markets “have worked their way into the gaming subculture, furthering the stratification of gamers by gamers” (Hanford, 2018). The Global Gamer Study of 2023 found that women players are more likely to identify as casual gamers than men (44% vs. 28%, Le Ngoc, 2024, see e.g., Shaw, 2011), though there are some casual genres that seem to be played equally by men and women, such as puzzle games (Eklund, 2016).

How best to cash out the distinction is contested, but casual games are often free or cheaper than their ‘core’ counterparts, can be played in shorter bursts, are thought to be easier to learn, and can be (and often are designed for) lower-powered hardware such as mobile phones (Juul, 2012; Ramirez, 2015). It is commonly assumed that women play casual games rather than core games (Chess, 2016; Eklund, 2016; Juul, 2012; Paaßen et al., 2017), and the “perception of femininity in the casual games market guides the design of casual games” (Chess, 2016, p. 108). Those video games marketed towards women often involve pragmatic play (Chess, 2009) or emotional labour, constructing women “as being social- or care-centric players” (Chess, 2017, p. 96). Yet, these games are often devalued by the wider video game industry and gaming community. For instance, Chess (2017) notes of *FarmVille*, a popular casual game with social mechanics, that it:

[W]on “Game of the Year” in 2010 at the Game Developers Association Conference, yet the video game industry has been primarily indifferent or outright insulting regarding this feat... It would seem that just as affective [labour] is devalued in the real world, so is it devalued in the gaming world and as a form of play. (p. 118)

Attitudes: Violence, Invisibility and Hostility

As suggested above, women’s attitudes to gaming derive in part from their relation to their perception of games through advertising. Women are often an “invisible audience” for video games and not considered the primary market for core games. This invisibility affects how they view video games: women cite not knowing what games to try and feeling that “games are too violent” as explanations for why they do not play more games (Blackburn & Scharrer, 2019; Chess, 2020). Although most published games contain some kind of violence (APA Task Force on Violent Media, 2015), there are now a wide range of games and genres, and the discourse of games as primarily violent is slowly disappearing (Heritage & Humphreys, 2024). Chess (2017) suggests

that women may not be aware of the range of games that are available: another impact of marketing strategy.

At the same time, decades of assumptions about gender and gaming (Eklund, 2016) have fed into additional barriers to women in the form of hostility from the gaming community. This includes the sexualisation of female video game characters to serve the presumed straight male gamer, limited representation of women in games and gaming culture, and harassment and sexist abuse (e.g., Bustos-Ortega et al., 2024; Fox & Tang, 2017; Nakandala et al., 2017). Vulnerability to this harassment may increase for women when moving from casual to core gaming spaces (Chess, 2020), creating an atmosphere that might make women feel like games are not “for them.”

Time and Leisure Equality

Another potential barrier to women playing video games is lack of time. Across various studies, women have been found to have less leisure time than men (e.g., Noonan & Glass, 2012; Yerkes et al., 2020a; Kan et al., 2021) and women’s leisure time is more likely to be interrupted (Craig & Mullan, 2013). A study of UK respondents from 2015 found that women have an average of 40 min less leisure time per day than men (Payne, 2017). Further, Yerkes et al. (2020b) found that women respondents felt more rushed than men and were less likely to use their free time to relax and recover.

These differences in leisure time have an impact on opportunities to game. In a study of the social networking game *YoWorld*, “not having enough time” was the main reason cited for women stopping playing the game (Bergstrom, 2019a). Work commitments and “life getting in the way” were the next most frequent responses, while cost, boredom and bullying were relatively rare reasons. In a study of American video game players, women had less free time, and played for shorter time periods than men (Winn & Heeter, 2009). Accordingly, lack of time may also act as a barrier to identifying as “gamers.” As Hanford (2018) writes:

The “gamer” identity is strongly wrapped up in the amount of work and investment one puts into gaming. The effort that gamers put into their play becomes a badge of commitment and their abilities merit their use of the term. This cycle of legitimacy and work has a multitude of effects, from the shaming of women at gaming conventions to the common critique of Anita Sarkeesian not playing enough games to critique them. (p. 150)

Of course, gender is not the only relevant factor in how we spend our leisure time; age plays an intersecting role. A Spanish study (Garrido et al., 2022) found that as people age, they spend less time in cultural leisure activities (film, theatre, reading books, and most games) and social leisure activities (talking on the phone, religious practices), and more time on passive leisure activities (watching TV or listening to the radio, napping, resting). However, in older adults, women were even less likely to participate in cultural leisure activities than men.

Chess (2017, 2020) argues that playing video games is an important issue for leisure equality:

Video games create an opportunity to enact leisure equality. It's a space that has been largely dominated by masculinity until this point and it is a space where femininity gets largely ignored, harassed or mocked. A renewed focus on video games creates a new set of opportunities for thinking about leisure equality. (Chess, 2021)

Indeed, a study of 800 US and UK gamers found that 67% of women players felt that gaming was “a vital means to escape the daily grind,” though 42% felt guilty about taking time to play games (GameHouse, 2023). Surveys on this topic may be subject to reporting biases precisely because of the emotions involved. For example, underreporting of time spent playing the online multiplayer game *Everquest II* is higher for women compared to men, and for older players compared to younger, and this is attributed to differing social desirability of gaming (Kahn et al., 2014; Williams et al., 2009). Women were also more likely than men to report anticipating guilt about playing a violent video game (Hartmann et al., 2014, though this relates to guilt about the moral content of the video game rather than guilt about not doing some other activity). It seems plausible that the typical bias is to underreport rather than overreport barriers, so while it is important to be critical of the results, we assume it is more likely that they underestimate rather than overestimate the scale of the issues.

Current Study

The aim of the current study is to examine whether the barriers discussed above are evident in the attitudes and behaviours of women who play video games. We investigate how women living in the United Kingdom who play mobile games feel about gaming, and how this relates to their gaming behaviour. We present results from a new study of 1000 UK women and consider what gender theorists, game scholars, and the games industry can learn from this. Although

this is mainly an exploratory study, we had three main research questions that informed the design.

The first research question relates to how women think about their gaming identity. Given the literature above, we expected that most women would identify as ‘casual’ gamers, if they identified as ‘gamers’ at all.

The second research question concerns women's attitudes and emotions related to games. The studies above suggest that women are likely to feel guilty about taking leisure time to play, and to keep their gaming secret for fear of judgement. Experiencing these negative emotions may be inversely proportional to experiencing positive emotions like pride and anticipation of gaming.

The third research question is whether women's attitudes are a barrier to their gaming behaviour. This might be evidenced, for example, if the likelihood of experiencing guilt or keeping their gaming secret was associated with indices of being excluded from gaming culture. Furthermore, the literature on leisure time might predict that women are less likely to play games if they feel guilty about spending time playing. Similarly, women may be motivated to play depending on their attitudes and emotions and depending on the perceived benefits. For example, if playing reduces stress, then they should choose to play when they are stressed.

The questions and predictions mainly follow from the empirical observations in the literature above. However, although we are agnostic about the most suitable framework through which to view our results, the predictions may also be derived from various theories. For example, Chess (2017) invokes actor-network theory (Bijker et al., 1987; Latour, 2005) and notions of cultural assemblage (Taylor, 2009) to emphasise that there are complex relationships beyond those between an individual player and a game, including between other players, game makers, and wider cultural discourses. Given this, social role theory (Chappetta & Barth, 2022; Eagly, 1987) might predict that differences in leisure time and the under-representation of women in gaming in the past would lead to a stereotype that playing video games does not fit with a stereotypical feminine role. Similarly, Kelly et al. (2022) suggest that the stereotype content model (Fiske et al., 2002) would predict that gaming identity for women is related to notions of gaming competence. Women may attend to these stereotypes and group affiliations, developing gender schema that categorise games as ‘masculine’ (Beasley & Collins Standley, 2002; Bem, 1981). This may lead to them managing their social identity by avoiding association with the gaming community (Stone, 2019) or fearing being penalised for violating a perceived gender norm by playing games (Eareckson & Heilman, 2024), leading to negative emotions surrounding playing games.

Method

Participants and Procedure

Ethical review was conducted by Cardiff University. A well-known national survey company (Opinion Matters) was contracted to obtain a representative sample of 1000 women in the United Kingdom who play mobile games. A set of filtering questions confirmed that the respondents identified as women and had played a video game on their mobile device in the last 3 months. The sample was fairly balanced in terms of age and representative of UK regions (not significantly different from proportion of national populations, see Table 1). Participants answered a series of survey questions through an online interface.

Materials

To ensure the questions and possible responses were relevant for the gaming industry, this survey was designed in partnership with a video games company, *Undone Games*. The survey included 14 questions of different kinds organised in several sections (see Table 2). The first section collected demographic information. The second section asked about the participant's gaming habits, including the context in which they played and the type of games they played (multiple choice, multiple-answer questions, based on categories chosen by the gaming company to align with mobile market sectors). Participants were asked how much time they spent in an average day playing on mobiles, and an identical question about playing on other platforms. The

third section asked about their gaming attitudes (Table 3), including how they would define their gaming style, and their level of agreement with various attitudinal statements about gaming, such as whether they felt guilt, shame or stress related to gaming. Although free text responses were available, these were used in less than 2% of cases, so these answers were ignored in the main analyses.

Statistical Analysis

All analyses were carried out in R (R Core Team, 2021) using RStudio (RStudio Team, 2020). Likert scale responses were treated as ordinal variables. To increase statistical power for some analyses, Likert variables were divided into two binary categories 'agree' ("Somewhat agree," "Strongly agree") and 'do not agree' (all other choices). Each question that allowed multiple responses was split into multiple independent binary variables indicating whether the participant had selected the response or not. The final dataset included 116 variables for 1000 participants (see Table 2, discussed below).

Our exploratory analysis involved identifying factors that are associated with the key barriers outlined above, for example which factors predicted the level of agreement with experiencing guilt over playing games. However, looking at simple correlations (or categorical measures of association) between a target variable and over 100 other variables risks identifying false positive associations. While a (multinomial or ordinal) regression approach might evaluate the predictive strength of variables against each other, it would struggle to identify robust interactions with so many variables, and to avoid issues with multicollinearity.

Therefore, we use a 'random forest' method to identify the most important predictors. Random forest analysis is a machine learning method that can deal with correlated predictor variables and unbalanced datasets and identifies complex interactions in a tractable manner (see Hothorn et al., 2006; Strobl et al., 2008). The method is based on the calculation of thousands of decision trees. A decision tree is a way of explaining variation in a target variable by splitting the data into sub-groups according to predictor variables. The process identifies a series of yes-no questions to ask about the predictor variables to make a guess about the target variable. The structure is similar to a dialogue tree, or the boardgame 'guess who.' For example, imagine we had asked people to classify several games as 'core' or 'casual.' A decision tree predicting people's answers might include a question "Does the game cost more than \$10?", and if the answer is yes, then there is a sub-question "Does it require high-spec hardware?" Answering 'yes' to both would predict it was more likely to be a core game, and ending up in

Table 1 Demographic Information of Participants

	<i>n</i>	%
Total Sample	1000	100
Age		
16–24	135	13.5
25–34	271	27.1
35–44	263	26.3
45–54	193	19.3
55+	138	13.8
Region		
East Midlands	81	8.1
East of England	92	9.2
Greater London	98	9.8
North East	46	4.6
North West	113	11.3
Northern Ireland	24	2.4
Scotland	63	6.3
South East	138	13.8
South West	77	7.7
Wales	55	5.5
West Midlands	105	10.5
Yorkshire and the Humber	108	10.8

Table 2 Summary of Survey Materials

Question	Answer type	Number of independent variables	Categories
Demographic			
Gender	Multiple-choice, single answer	1 Categorical	All identified as female
Age	Categorical multiple-choice, single answer	1 Categorical	See Table 1
Region	Categorical multiple-choice, single answer	1 Categorical	See Table 1
Closest city	Categorical multiple-choice, single answer	1 Categorical	Major cities in the UK
Gaming Habits			
Where, if anywhere, do you typically play mobile games?	Multiple-choice, multiple answer	15 Binary + 1 free text for “other”	At my desk, At the gym, During work hours, In bed, In in-person work meetings, On journeys other than my commute, On my commute, On the sofa, On the toilet, When on Zoom online meetings, When stuck in traffic, While I’m looking after my child, Whilst watching TV, NA There is nowhere I typically play mobile games, Other please specify
What types of mobile games, if any, do you play?	Multiple-choice, multiple answer	17 Binary + 1 free text for “other”	Action, Board, Card, Casino, Coding, Driving, Fighting, Logical, Multiplayer, Platform, Puzzle, Real time strategy, Shooter, Spelling, Sports, Stealth, Word, NA, Other please specify
What, if any, scenarios do you typically find yourself gaming more often?	Multiple-choice, multiple answer	10 Binary + 1 free text for “other”	After a busy day, After a demanding day at work, During a busy day at work, During times of high stress or pressure, When bored, When feeling unwell, When seeking a sense of achievement, When socialising with friends, When socialising with strangers, NA, Other please specify
How much time, if any, do you spend on the following in an average day?	Multiple-choice, single answer	3 Ordinal (playing mobile games, playing games on other platforms, scrolling social media)	Up to 30 min, 31 min to 59 min, 1–2 h, 3–4 h, 5 + h, Not applicable
Gaming Attitudes			
How, if at all, would you define your gaming style?	Multiple-choice, multiple answer	5 Binary + 1 free text for “other”	Casual gamer, Competitive gamer, Hardcore gamer, Social gamer, NA I would not define my gaming style, Other please specify
To what extent do you agree or disagree with the following statements?	5-point Likert scale	16 Ordinal	See Table 3
Which, if any, of the following describes how gaming helps you?	Categorical Multiple-choice, multiple answer	7 Binary	Less anxious, less bored, less depressed, less lonely, less stressed, less unproductive, None of the above
What, if anything, motivates you to play brain stimulation games?	Categorical Multiple-choice, multiple answer	9 Binary + 1 free text for “other”	To boost my mental agility, To challenge myself, To improve my cognitive abilities, To improve my memory, To improve my problem solving abilities, To keep my mind active, To prevent cognitive decline, NA I do not play brain stimulation games, NA There is nothing in particular that motivates me to play brain stimulation games, Other please specify
What, if anything, do you believe it takes to be defined as a ‘gamer’?	Multiple-choice, multiple answer	12 Binary + 1 free text for “other”	Being a man, Following gaming news, Holding particular political views, Owning advanced gaming equipment, Playing a wide variety of games, Playing any game occasionally, Playing games on a particular platform, Spending a significant amount of time gaming, Strong skill level in specific games, Taking part in competitive gaming, Taking part in gaming culture, NA, Other please specify
What, if anything, do you feel when scrolling social media?	Categorical Multiple-choice, multiple answer	11 Binary + 1 free text for “other”	Anxious, Bored, Connected, Depressed, Entertained, Lonely, Productive, Relaxed, Stressed, NA I do not scroll social media, NA There is nothing that I feel in particular when scrolling social media, Other please specify

Table 3 Summary of Main Gaming Attitude Questions (Numbers Represent Number of Respondents)

Statement	Strongly disagree	Somewhat disagree	Neither agree nor disagree	Some-what agree	Strongly agree
I do not play enough games to consider myself a gamer	49	98	258	293	302
People who play games on mobile or tablet are not gamers	149	249	363	187	52
I would be embarrassed to call myself a gamer	163	189	339	167	142
I keep my gaming secret from friends	351	243	250	104	52
Gaming is mostly a male pastime	274	225	263	178	60
I'm proud of my achievements in the games I play on my device	44	78	376	364	138
Playing games on my device is one of the things I most look forward to each day	87	165	343	302	103
I have friendly competition amongst my friends with regards to the mobile games we play	194	185	278	253	90
I keep my gaming secret from friends and family for fear of judgement	350	253	241	107	49
I feel guilty about taking time to play games	184	265	263	220	68
I feel guilty about taking leisure time	220	258	266	191	65
Good games are too expensive	48	101	329	337	185
I don't know which games to try	94	197	399	247	63
Games are too violent	154	219	355	198	74
I would never pay for a mobile video game	89	176	248	234	253
I feel guilty if I spend too much time playing games	120	210	257	298	115

one of the other branches might suggest it was less likely to be a core game.

However, this single tree is just one of several possible effective trees (e.g., perhaps it's better to ask about hardware before cost, or to adjust the price from \$10 to \$40, or to ask about game length rather than cost), so many trees are generated using random sub-samples of data and predictor variables. This 'forest' of trees is evaluated to give a "variable importance" score to each predictor variable for a given dependent variable. We used an importance measure based on permutation (Strobl et al., 2007): The values of a given variable are randomly permuted and the prediction accuracy of each tree is re-calculated. The variable importance measure is the average difference in prediction accuracy between the unpermuted data and the permuted data for each tree. If the variable is critical to accurate prediction, then there should be a large difference and the importance scores will be high. One can then compare the importance scores of different independent variables to see which is contributing more to prediction (the relative ranking of the importance scores is relevant, while the absolute values of the importance measure depend on the overall accuracy of the tree and various other factors). That is, if variable A has a higher importance score than variable B, it suggests that knowing about A provides more effective information for predicting the target variable (it's more important to ask about A than about B). Essentially, the random forest process ranks a set of predictor variables according to how well they explain the variation in a target variable. This guided the investigation of specific associations in the data.

For each target variable, there were 111 possible non-demographic predictor variables. When applying random

forests analysis, variables that had logical implication relationships with the target variable were removed from the predictor list. For example, when predicting a respondent's level of agreement with the statement "I feel guilty about taking time to play games," we omitted the predictors "I feel guilty if I spend too much time playing games," and "I feel guilty about taking leisure time." See the supporting materials for more details.

To estimate the strength of association between two specific variables, we use a range of methods including Fisher's exact test (more accurate and fewer assumptions than the Chi-square test) for two binary categories, and ordinal regression with a cumulative distribution function (using the R package *brms*; Bürkner, 2021) for ordinal categorical variables. The final dataset included 116 variables (five demographic, 111 non-demographic) for 1000 participants. We divided the results into thematic groupings, including guilt, fear of judgement, time, and stress/boredom.

Results

Core and Casual Identities

We begin with a descriptive account of gamer identity. Participants were asked to pick labels that best described their gaming style, allowing them to choose multiple options from any of "Casual," "Social," "Competitive," "Hardcore," or "N/A." "Casual" was chosen by 74.8%, and exclusively by 62.5%. The next most chosen label was "Social" (24%, 12.5% exclusively) followed by "Competitive" (10%, 3.9% exclusively) and "Hardcore" (4.7%, 2.3% exclusively).

“N/A” was chosen by 3.7%. In terms of intersections (Fig. 1), “Casual” is occasionally alongside “Social” (9.7%) or “Competitive” (4.6%), but rarely with “Hardcore” (1.4%).

Puzzle games were the most popular genre, played by 77.5% of women, followed by similar ‘casual’ genres like word games (47.7%) and logic games (30.2%), and traditional games like card games (37.7%) and board games (23.4%). Genres such as real time strategy (RTS), shooters, driving, fighting, sports, and stealth were played by less than 10% of women (it should be noted that these questions are about mobile game genres, and women may be playing different genres on PCs or consoles). To identify clusters, we performed a principal component analysis (similar to Eklund, 2016, see supporting materials at https://osf.io/myeb8/?view_only=b6edbaaed1e0418daad4aeb2756cb871). However, the genres of games played were not significant predictors of our main variables of interest in the analyses below.

Guilt

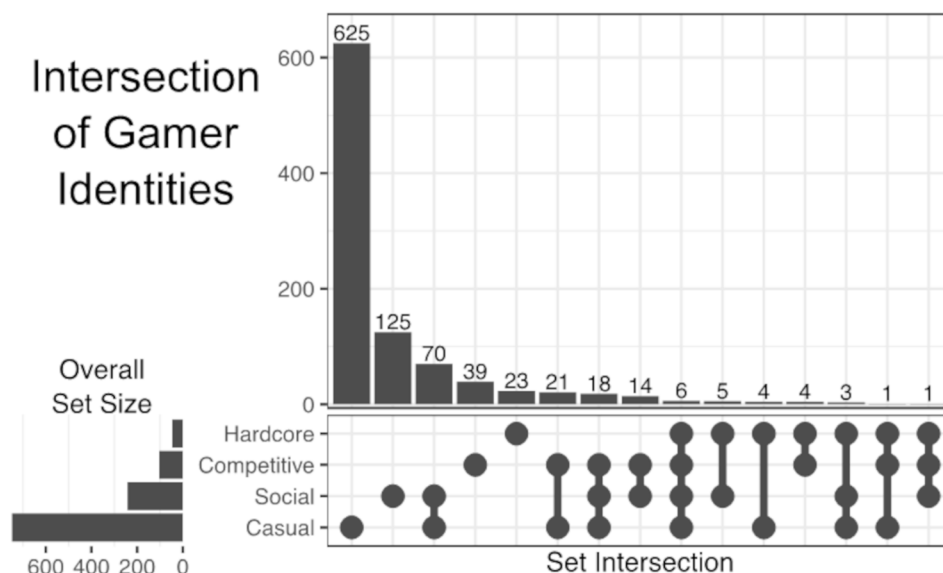
Out of the 1000 respondents, almost a third (28.8%) agreed with the statement that they felt guilty about taking time to play games. In terms of demographics, older players were less likely to feel guilty than their younger counterparts (31% of women aged 16–24 reported feeling guilty compared to 24% of those aged 55 or older). An ordinal regression predicting participant’s agreement with feeling guilty by their age category revealed a significant linear term ($\beta = -0.59$, 95% CI = $[-0.87, -0.30]$), indicating a general decline of guilt in older age categories (which may be related to more time free from work or childcare, for example). There was some regional variation in the proportion feeling guilty (from 21% in the West Midlands to 42% in London), but

exploratory analyses did not find any strong associations between region and behaviour or attitudes (see supporting information).

Figure 2 shows key explanatory variables identified using the random forest approach. Guilt was strongly associated with keeping gaming a secret from friends and family – women who kept gaming a secret were nearly three times more likely to feel guilty than women who did not (63% vs. 23%, Fisher’s $p < .001$, see Fig. 3). There were also relationships to feeling excluded from gaming culture: Participants were more likely to feel guilty if they thought that gaming is mostly a male past-time (47% vs. 23%, Fisher’s $p < .001$), would be embarrassed to call themselves a gamer (44% vs. 22%, Fisher’s $p < .001$), or thought that people who play games on mobile or tablet are not gamers (44% vs. 24%, Fisher’s $p < .001$). Finally, there were correlations with barriers related to game marketing: Women were more likely to feel guilty if they didn’t know which games to try (41% vs. 23%, Fisher’s $p < .001$), or thought that games were too violent (44% vs. 23%, Fisher’s $p < .001$). Other factors had considerably lower importance scores, suggesting they were less important predictors.

To test whether these key predictors contribute independently to predicting guilt (versus just being slightly different measures of the same thing), they were entered together as independent variables in an ordinal regression. All remained significant predictors suggesting that they were at least somewhat independent contributors (overall accuracy=43%, correlation between model prediction and independent variable, $\tau = .43$, $z = 16.8$, $p < .001$), except for thinking that people who play on mobiles or tablets are not gamers (see supporting materials at https://osf.io/myeb8/?view_only=b6edbaaed1e0418daad4aeb2756cb871). This latter

Fig. 1 ‘Upset plot’ of set intersections between different gamer identity labels. The set intersection guide indicate which choices were made by each column of results. The insert on the left shows the overall frequency of a label being selected



Predictors of guilt about spending time playing video games

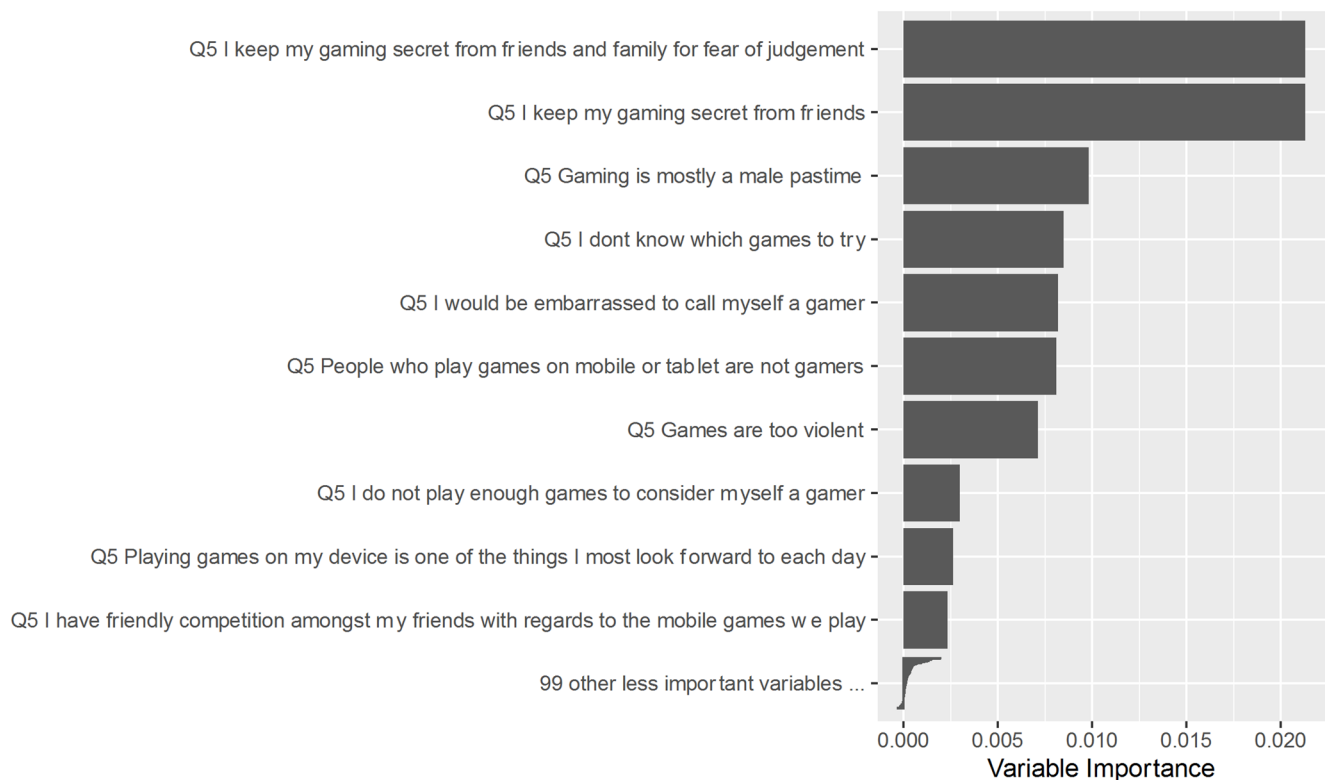


Fig. 2 Variable importance for factors predicting whether a respondent felt guilty about taking the time to play games. Higher scores indicate greater predictive power (not the direction of correlation). Only

er variable may score highly in the random forest because of its predictive power in interaction with other variables.

The factors associated with guilt combine cumulatively. For example, Fig. 4 shows a decision tree based on just three variables. Only 17% of respondents feel guilty if they disagreed that gaming is a male pastime and would not be embarrassed to call themselves a gamer. On the other hand, 63% of respondents felt guilty if they did not disagree that gaming was a male pastime and strongly agreed that they did not know which games to try. The regression model predicted that a woman who strongly agreed with each of the six most important predictor statements above would be 97% likely to feel guilty, compared to 2% likely if they strongly disagreed with each statement.

Secrets

Almost 1 in 6 respondents (16%) kept gaming a secret for fear of judgement. Due to the strong relationship with guilt identified above, the random forest analysis excluded questions related to guilt. The results revealed that keeping gaming a secret was associated with feeling anxiety or depression when scrolling social media: 31% of women

the relative distance between importance scores is meaningful, not the absolute importance score. The final row shows a condensed distribution for the 99 other less important variables

who felt anxious or depressed kept gaming a secret, compared to 12% of women who did not, $\chi^2(1)=43.78, p<.001$.

Motivation also played a role in secret-keeping. Women who played games to challenge themselves were half as likely to keep it a secret, $\chi^2(1)=13.81, p<.001$. However, women who felt very proud of their achievements in games were *more* likely to keep their gaming a secret than those who did not feel as proud, 22% vs. 14%, $\chi^2(1)=5.14, p=.023$.

Time

The median time playing games was 1–2 h per day and 4.6% of respondents play on their mobile for 5+ hours (Table 4). There is a positive correlation between time spent on mobile games and time spent playing games on other platforms, such as PC or console (Fisher's test $p<.001$). There was also a positive correlation between time spent playing mobile games and time spent scrolling social media (Fisher's test $p<.001$). There was no difference in time spent gaming between people who keep gaming a secret and those who do not (Fisher's test $p=.898$). Likewise, there was no difference in time spent gaming based on how guilty respondents feel (Fisher's test $p=.951$).

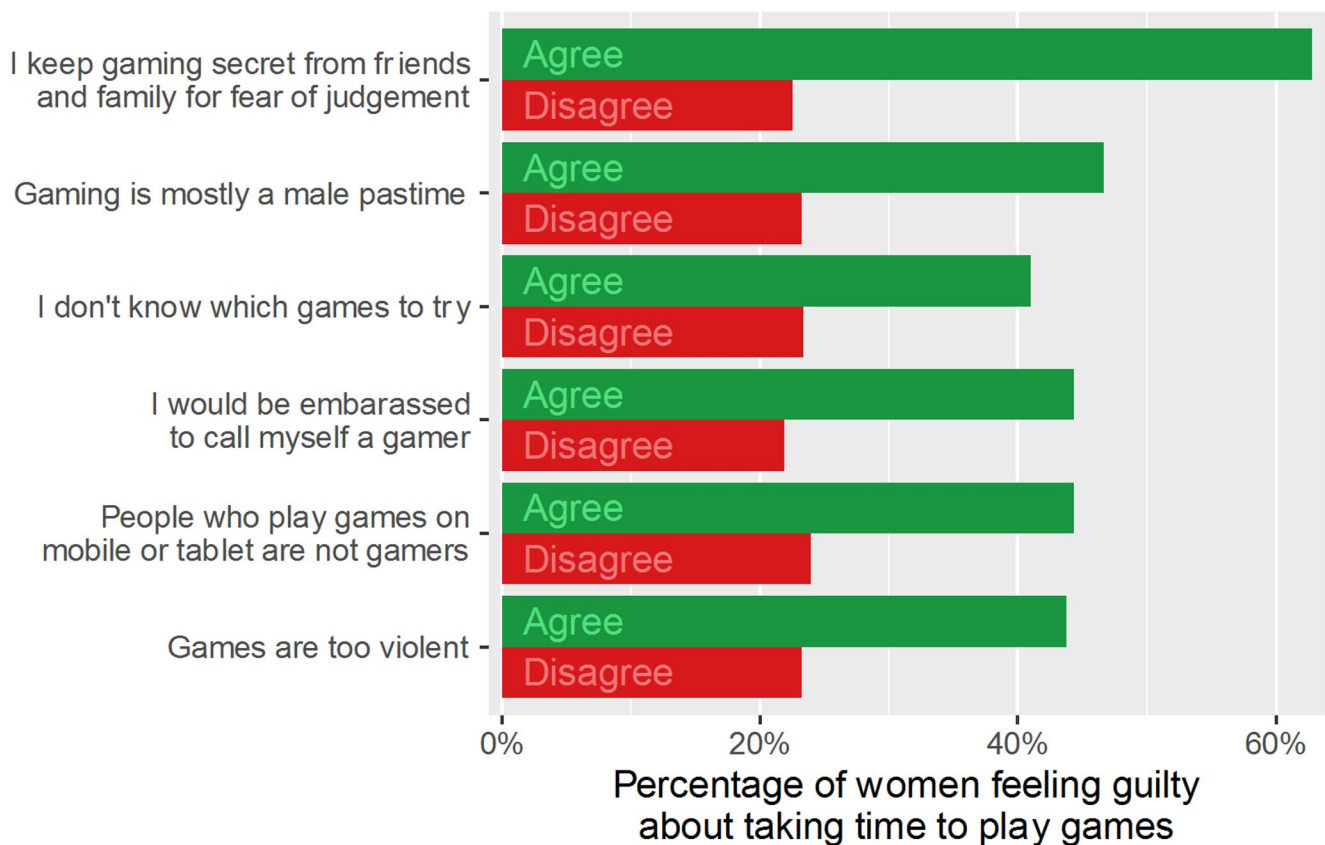


Fig. 3 The percentage of women feeling guilty about taking time to play games according to their responses to the key predictors identified by the random forest model. Percentages indicate the percentage within the subgroup agreeing or disagreeing with the question

What attitudes toward games do predict the amount of time spent playing mobile games? The random forest approach suggests several associations (Fig. 5). First, perhaps unsurprisingly, women who agree they do not play enough games to consider themselves to be a gamer play less than those who disagree (38% of women who agree play for more than an hour a day, compared to 53% of women who do not agree, Fisher's $p < .001$). While this may be an accurate reflection of gamer values, we note that 28% of women who play for more than 5 h per day still don't deem themselves to be playing enough to consider themselves a gamer. Similarly, 65% of women who play mobile games for more than 5 h a day still considered themselves 'casual,' while only 14% considered themselves 'hardcore.' The numbers are even more extreme for players who spend more than 5 h a day playing PC/console games (75%, 12%). This may reflect unrealistic perceptions of gamer behaviour, or that the identity tags of 'gamer' and 'hardcore' are perceived to be about the *type* of game one plays, or it may indicate a general aversion to 'gamer' identities.

The relation between time spent gaming and the willingness to pay for a mobile game is expected: Both are measures of investment in the hobby, and people may be more willing to play higher-quality games for longer. Interestingly,

women tended to play more if they were proud of their achievements (50% of women who were proud played for more than an hour a day, compared to 37% of women who were not proud, Fisher's $p < .001$). In contrast, women tended to play less if they agreed that gaming was mostly a male pastime (Fisher's $p = .022$) or think that games were too violent (Fisher's $p = .031$), though these effects were slightly weaker. Having friendly competition with friends was not a predictor on its own (Fisher's $p = .125$) but had a moderate importance score in the random forest analysis because it interacted with other variables. For example, for people who have friendly competition and strongly disagreed that games are too violent, 66% played for more than an hour a day compared to 43% of those who did neither (Fisher's $p < .001$).

Stress and Boredom

Respondents were asked whether they played when they were stressed or bored, and whether playing alleviates these negative emotions, which allowed us to investigate the motivation for, and benefits of, gaming. For example, Fig. 6 showed that the results for boredom are straightforward: Those who reported playing when bored were likely to

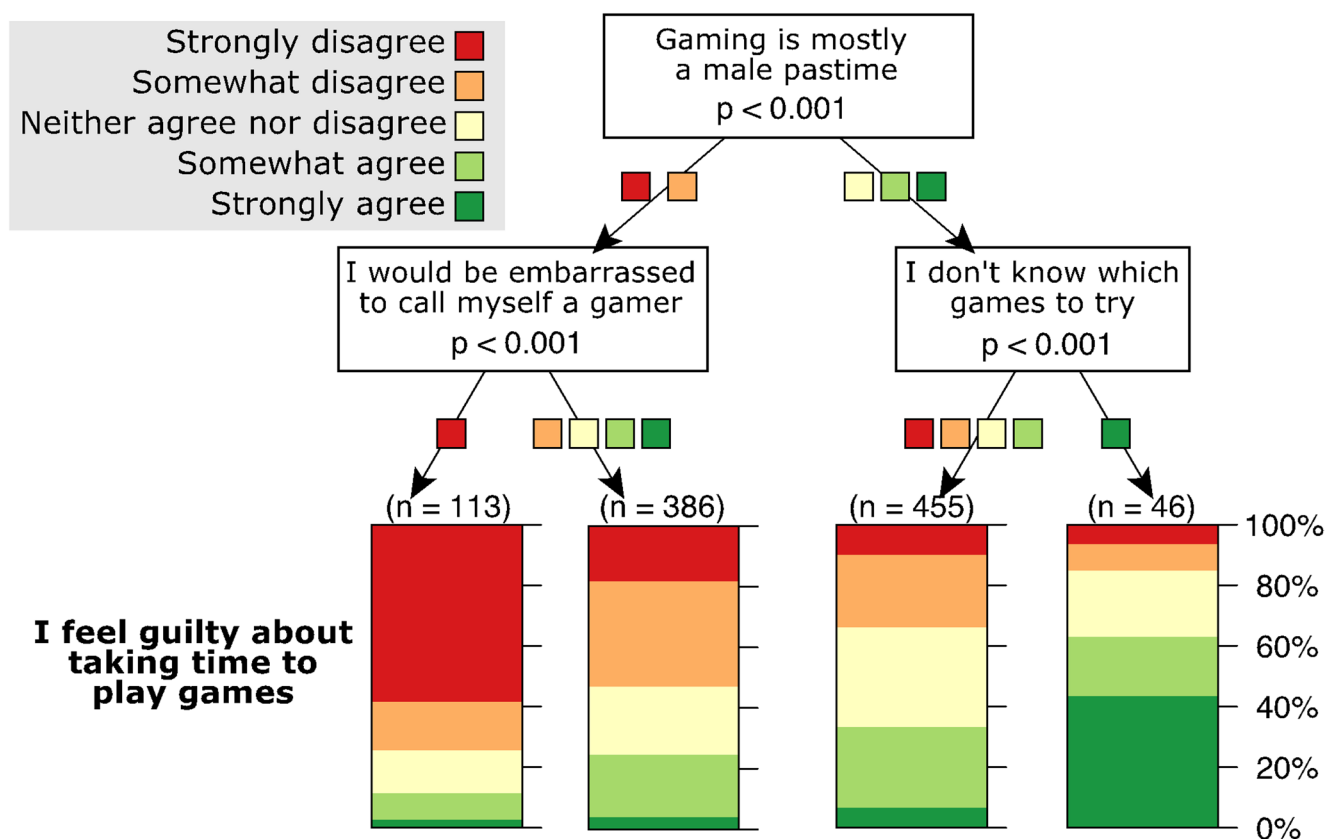


Fig. 4 Example of a decision tree with two levels using the most important variables identified by the random forest analysis to predict responses to whether participants feel guilty about taking the time to

play games. Colours indicate responses to each question. 'n' represents the number of participants in each partition

Table 4 Distribution of Average Time Spent Playing Mobile Games Every Day

Average time spent playing mobile games every day	Percentage of respondents
Up to 30 min	26.9%
31 min to 59 min	28.6%
1–2 h	28.8%
3–4 h	10.2%
5+h	4.6%
Not applicable	0.9%

agree that playing lowers boredom (73% agree vs. 27% do not agree), and those who reported that playing makes them feel less bored were more likely to report playing when bored (82% vs. 18%). This pattern is consistent with a general motivation to seek out games to help alleviate boredom.

However, there was an asymmetry for stress: most women who play when they are stressed feel less stressed when they play (77% vs. 23%), but under half of women who report that games make them feel less stressed report that they play when they are stressed (42% vs. 58%). That is, although most women feel less stressed when they play, they won't necessarily seek out games when they feel stressed.

The difference in results for boredom versus stress may be due to the context of the two emotions, and to (potentially gendered) assumptions about permissible remedies. When players are bored, they may have little else to do (hence the boredom) and so have time to play games. In contrast, when participants are stressed, they may have other demands on their time and thus not see play as a viable (or justifiable) option, even though it might make them feel better. This experience may be exacerbated by the fact that the types of video games being advertised to women are often considered unimportant and unserious, as discussed above. This suggests that there is a missed opportunity to market games to women as a legitimate form of stress relief.

We note that there is a similar asymmetry between agreeing that playing alleviates loneliness and whether they play with others: Only 16% of women who reported that playing makes them less lonely play with friends or strangers, and most of those who play socially say that playing does not make them less lonely (63%). However, relatively few women overall reported that playing alleviated loneliness (20.6%), and more work is needed to understand how women use games to engage with others or achieve the

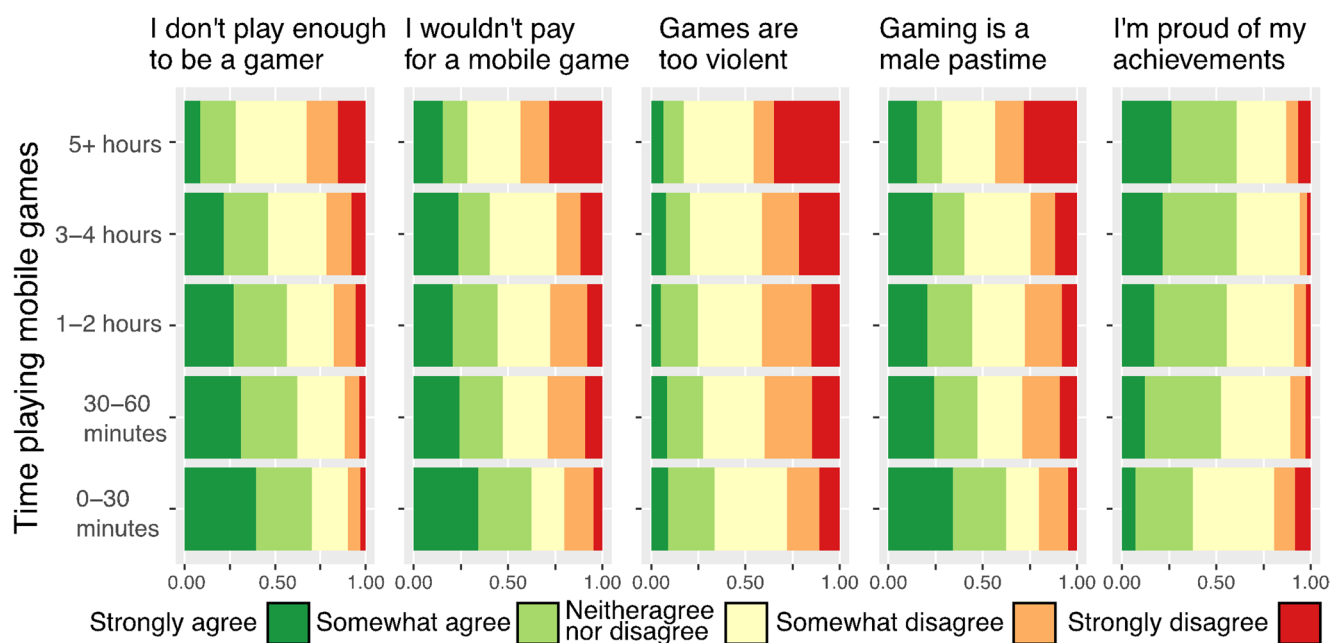


Fig. 5 Responses to attitudes to gaming according to the average number of hours of mobile games played daily

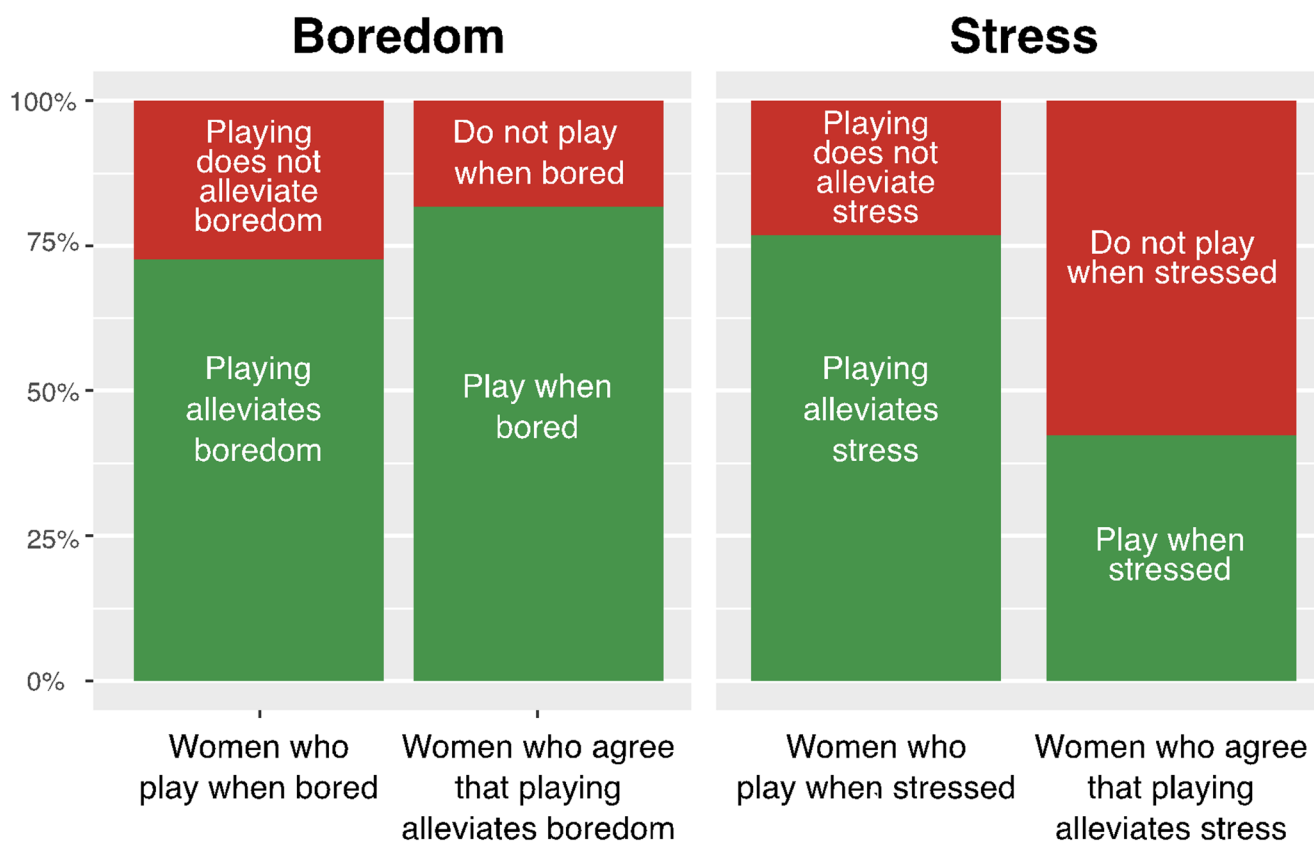


Fig. 6 Cross-section of respondents according to various attitudes to stress and boredom, showing an asymmetry for attitudes to stress

feeling of engaging with others (see e.g., Ballard & Spencer, 2023; Barr & Copeland-Stewart, 2022).

Discussion

Taken as a whole, we propose that the results suggest that many UK women feel excluded from video game culture, and that this exclusion can be a barrier to playing mobile games, or being open about one's play. In other words, many of the results can be explained by women's sense that games and gaming culture are not *for* them. For example, as noted above, almost a third of women (29%) feel guilty about taking time to play. This is in keeping with previous research, which has found many gender disparities in leisure time, with women being almost twice as likely to feel guilty about taking 'me time' than men (GameHouse, 2023). However, our study found that women who look forward to playing are more likely to feel guilty than those who do not (34% vs. 25%).

Those less familiar with games and gaming culture were also more likely to feel guilty: women were twice as likely to feel guilty if they did not know which games to try (41% vs. 23%) or if they thought games were too violent (29% vs. 10%). This aligns with barriers identified by Chess (2017): That women may not be aware of the diversity of games available, because there is a limited range marketed to them (thus the former), and yet when they think of 'games' simpliciter, they may not have casual games in mind (thus the latter).

Familiarity with gaming culture was not the only relevant factor in feeling guilty about gameplay; guilt also seemed to be related to whether women *identified* with gaming culture. 60% of women surveyed believed that they do not play enough games to consider themselves a 'gamer.' Women were twice as likely to feel guilty if they thought that gaming was mainly a male pastime (46% vs. 23%) or if they said they would be embarrassed to call themselves a gamer (55% vs. 35%). In contrast, women who felt that occasionally playing any game made you a gamer were 42% less likely to feel guilty. These patterns are suggestive of women feeling that games and gaming are not *for them*.

Another barrier to gaming for women is fear of judgement. For example, 16% of respondents keep gaming a secret from friends and family for fear of judgement. Furthermore, feeling and expressing pride in gaming as a woman is a difficult balancing act: Women who felt very proud of their achievements were actually slightly *more* likely to keep it a secret than those who did not feel as proud (22% vs. 14%). In contrast, women who were motivated to play games to challenge themselves were half as likely to keep it a secret (11% vs. 20%). Again, these patterns are

suggestive of women feeling excluded from games and gaming culture: that playing games is not the sort of thing of which one should feel proud of or identify with.

This study showed that significant numbers of women feel guilty about playing video games, and ashamed about what others think of them taking time to play games. However, to our surprise, feeling guilty or ashamed did not correlate with how much time women spent playing games. We expected a significant proportion of women to report feelings of guilt around playing video games and taking leisure time more generally, and this proved to be the case. But while we anticipated feelings of guilt and shame would have a negative impact on the amount of time women spent playing games, we did not find such a connection. Those who feel guilty or ashamed do not play less, but they feel worse.

Limitations and Future Research Directions

This study only considered responses from people identifying as women. While the results are valid and revealing, they do not demonstrate that women feel *more* guilty or ashamed about playing mobile games than men, or people of other genders. Other studies suggest this is likely, such as the GameHouse study which found that women were more likely to feel guilty while playing mobile or other video games compared to men (42% vs. 30%; GameHouse, 2023). Future research might consider gendered patterns in attitudes towards playing games and the differences in causes and associations. It might also consider intersectional factors beyond gender and age, such as socio-economic status, dis/ability, caring duties, and so on, as well as comparing the current results to results from other countries or non-mobile gaming platforms. Furthermore, future work could consider the role of feminist identity (McCullough et al., 2020) and perception of others within the gaming community on one's own self-perception (Yao & Rhodes, 2023), as well as directly investigating why women choose to quit or avoid games (Bergstrom, 2019b).

In relation to methodology, the survey asked participants to rate their agreement with statements about feeling guilt and shame. This follows the procedure in the Guilt Inventory (Jones et al., 2000), which also provides a set of statements (e.g., "Guilt and remorse have been a part of my life for as long as I can recall"), and asks participants to indicate their agreement on a 5-point Likert scale from "strongly agree" to "strongly disagree." However, measuring and distinguishing between these feelings is complex (Giner-Sorolla & McGee, 2020). Several scales have been developed, such as the Test of Self-Conscious Affect (TOSCA; Tangney & Dearing, 2002) and the Guilt and Shame Proneness scale (GASP; Cohen et al., 2011), but there were several drawbacks to using these for the current study. For example, TOSCA is

based on hypothetical scenarios and measures ‘constructive guilt’ around personal failure (e.g., guilt in relation to interpersonal conflict or committing crimes), while we were more interested in maladaptive feelings for consistently failing to adhere to a gendered expectation. Indeed, Giner-Sorolla et al. (2011, p. 445) suggest that TOSCA “may not measure the experience of guilt, but rather motivation to make amends for personal wrongdoing,” which does not fit our aim. Also, we were interested in chronic guilt specifically in relation to video game behaviour, rather than general proneness to guilt, and TOSCA measures correlate poorly with the Guilt Inventory measures (Benetti-McQuoid & Bursik, 2005). Furthermore, while there are specific scales developed to measure guilt around trauma (Günlü, 2025) or sexuality (Mosher, 2013), there are few that investigate guilt in relation to gendered expectations around leisure time. Future studies might develop the scales above and pair them with measures of gender role (see e.g., Benetti-McQuoid & Bursik, 2005; Eterović et al., 2022).

Practice Implications

The analyses of our survey of UK women found striking evidence of barriers to playing mobile video games. The results suggest that women tend to spend less time playing if they feel they don’t fit into gaming culture, for example if they believe that gaming is a male pastime, or that they don’t play enough games to be a gamer, are embarrassed to call themselves a gamer, or think video games are too violent. In contrast, women spend more time playing if they are proud of their gaming achievements. This suggests that guilt and fear of judgement are symptoms; while they are clearly negatively impacting women gamers, they are not directly barriers to play, and not the root of the problem.

Efforts to dismantle barriers are complicated by the interrelations between them. For example, recently, in response to their aforementioned survey, GameHouse launched a UK marketing campaign to encourage women to take more “me time” to play games. Despite the campaign’s positive message around leisure time, many of the games published by GameHouse focus on women in gendered service roles (cooking, caring for children or animals, planning a wedding) with time management mechanics, effectively recreating the pressure to be productive within leisure time activities (see e.g., Harrington & Dawson, 1995; Henderson, 1991; Ganzon, 2019). This suggests that understanding the relationships between barriers is complicated, and in reducing one barrier, it is easy to bolster another.

Removing barriers to (open) play for women may require deeper changes such as reducing leisure inequality – for instance, Chess (2021) encourages gamers to:

Find more people in your lives that aren’t getting enough leisure and play and help them to play more... because it will make us better humans and better feminists. And if more of us play more games we will make games better.

However, there are interim measures we might take that still acknowledge the many pressures on our time. Challenging the perception of casual games as less serious, lower quality, and less valuable than their ‘core’ counterparts is one such measure. For instance, Juul (2010) found that many players of casual games look for challenging experiences, but tend to play for shorter periods of time. Chess (2017) calls games with this feature ‘time positive’ (p. 52), allowing players to play for shorter intervals and to easily recommence play after a break. Accordingly, we echo Keogh’s (2016) argument that we should “constructively re-conceptualize causal games as those that are more flexible with the player’s time,” delineating them not on the basis of their hardware or skill demands, quality, or seriousness, but rather by how easily they can be “incorporated into the player’s everyday life” rather than existing “as an activity apart from it” (pp. 34–36).

The games industry, gaming scholars, and participants in gaming culture can also help by broadening the perception of who plays video games, who games are for, and what types of games are available. As discussed above, our study found that most women feel less stressed when they play, but won’t necessarily seek out games when they feel stressed. The need for games that alleviate stress is recognised by game makers, for instance a designer interviewed by Chess (2017) noted that “putting in mechanics that deliberately create stress or introduce the possibility of failure tend to not be as popular” with women who play mobile games as a way to relax or “decompress from the stresses of their lives outside of games” (p. 45–46). But participants’ responses in our study (both related to stress and unfamiliarity with the range of games available) suggest that marketers are not conveying the variety and potential benefits of mobile games. Chess (2017) notes that game companies are “well-known for being tight-lipped about actual and intended demographics” (p. 40), but our results suggest that the current marketing of, and messaging around, games is leaving out a significant proportion of possible gamers. Furthermore, since we found that pride in achievements is associated with more time playing, it may also help to normalize the celebration of gaming achievements for women.

There is danger in being too prescriptive about how we should design games for women, as too often such prescriptions reinforce spurious intuitions about gender difference (e.g., Ray, 2004). However, our results are grist to the mill

of those arguing for more inclusive game design in general (Chess, 2017; GDI, 2024; Lazzaro, 2008).

Conclusion

This study explored attitudes of women who play mobile games in the United Kingdom. It found that, despite being an important part of their lives, many women experience negative emotions related to games. These emotions are associated with gendered barriers to play, such as not feeling like a core part of the gaming community. Understanding the barriers to gaming in more detail is important for overcoming them, to increase the quantity and quality of women's gaming experience.

Funding Partial funding was provided by Unity consulting on behalf of Undone Games.

Data Accessibility To ensure the participants remain unidentifiable, we cannot release the full data. But a supplementary file shows the full statistical code and results for each of the analyses in the paper (see http://osf.io/myeb8/?view_only=b6edbaaed1e0418daad4aeb2756cb871).

Declarations

Competing Interests This study was conducted in collaboration with Unity and Undone Games.

References

- APA Task Force on Violent Media (2015). *Technical report on the review of the violent video game literature*. <https://www.apa.org/pi/families/review-video-games.pdf>
- Ballard, M. E., & Spencer, M. T. (2023). Importance of social videogaming for connection with others during the COVID-19 pandemic. *Games and Culture*, 18(2), 251–264. <https://doi.org/10.1177/15554120221090982>
- Barr, M., & Copeland-Stewart, A. (2022). Playing video games during the COVID-19 pandemic and effects on players' well-being. *Games and Culture*, 17(1), 122–139. <https://doi.org/10.1177/15554120211017036>
- Beasley, B., & Collins Standley, T. (2002). Shirts vs. skins: Clothing as an indicator of gender role stereotyping in video games. *Mass Communication & Society*, 5(3), 279–293. https://doi.org/10.1207/S15327825MCS0503_3
- Bem, S. L. (1981). Gender schema theory: A cognitive account of sex typing. *Psychological Review*, 88(4), 354–364. <https://doi.org/10.1037/0033-295X.88.4.354>
- Benetti-McQuoid, J., & Bursik, K. (2005). Individual differences in experiences of and responses to guilt and shame: Examining the lenses of gender and gender role. *Sex Roles*, 53(1), 133–142. <http://doi.org/10.1007/s11199-005-4287-4>
- Bergstrom, K. (2019a). Moving beyond churn: Barriers and constraints to playing a social network game. *Games and Culture*, 14(2), 170–189. <https://doi.org/10.1177/1555412018791697>
- Bergstrom, K. (2019b). Barriers to play: Accounting for non-participation in digital game play. *Feminist Media Studies*, 19(6), 841–857. <https://doi.org/10.1080/14680777.2018.1484790>
- Bijker, W. E., Hughes, T. P., & Pinch, T. (1987). *The social construction of technological systems: New directions in the sociology and history of technology*. MIT Press.
- Blackburn, G., & Scharrer, E. (2019). Video game playing and beliefs about masculinity among male and female emerging adults. *Sex Roles*, 80(5), 310–324. <https://doi.org/10.1007/s11199-018-0934-4>
- Bürkner, P. C. (2021). Bayesian item response modeling in R with Brms and Stan. *Journal of Statistical Software*, 100(5), 1–54. <https://doi.org/10.18637/jss.v100.i05>
- Bustos-Ortega, M., Romero-Sánchez, M., Megías, J. L., & Carretero-Dios, H. (2024). Gaming with a feminist: Sexism and perception of sexist incidents in online video games. *Sex Roles*, 90, 1200–1217. <https://doi.org/10.1007/s11199-024-01506-w>
- Chappetta, K. C., & Barth, J. M. (2022). Gaming roles versus gender roles in online gameplay. *Information Communication & Society*, 25(2), 162–183. <https://doi.org/10.1080/1369118X.2020.1764608>
- Chess, S. (2009). *License to play: Women, productivity, and video games*. [Doctoral dissertation, Rensselaer Polytechnic Institute]. Rensselaer Polytechnic Institute Library.
- Chess, S. (2016). A time for play: Interstitial time, invest/express games, and feminine leisure style. *New Media & Society*, 20(1), 105–121. <https://doi.org/10.1177/1461444816660729>
- Chess, S. (2017). *Ready player two: Women gamers and designed identity*. University of Minnesota Press. <https://doi.org/10.5749/j.ctt1pwt7z7>
- Chess, S. (2020). *Play like a feminist*. MIT Press.
- Chess, S. (2021). *How to: Play like a feminist*. Common Ground Research Networks [Video]. YouTube. <https://www.youtube.com/watch?v=ootruQ263Tg>
- Chess, S., & Paul, C. A. (2019). The end of casual: Long live casual. *Games and Culture*, 14(2), 107–118. <https://doi.org/10.1177/1555412018786652>
- Clement, J. (2025). *Mobile phone gaming penetration in the United Kingdom (UK) from 2012 to 2024, by gender*. Statista. Retrieved April 28, 2024, from <https://www.statista.com/statistics/300526/mobile-gaming-in-the-uk-by-gender/>
- Cohen, T. R., Wolf, S. T., Panter, A. T., & Insko, C. A. (2011). Introducing the GASP scale: A new measure of guilt and shame proneness. *Journal of Personality and Social Psychology*, 100(5), 947–966. <https://doi.org/10.1037/a0022641>
- Craig, L., & Mullan, K. (2013). Parental leisure time: A gender comparison in five countries. *Social Politics*, 20(3), 329–357. <https://doi.org/10.1093/sp/jxt002>
- Eagly, A. H. (1987). *Sex differences in social behavior: A social-role interpretation*. Erlbaum.
- Eareckson, H. B., & Heilman, M. E. (2024). Explaining penalties and rewards for gender norm violations: A unified theory. *Sex Roles*, 90(12), 1701–1716. <https://doi.org/10.1007/s11199-024-01540-8>
- Eklund, L. (2016). Who are the casual gamers? Gender tropes and tokenism in game culture. In T. Leaver, & M. Willson (Eds.) *Social, casual and mobile games: The changing gaming landscape* (pp. 15–30). Bloomsbury.
- Eterović, M., Marinić, L. M., Medved, V., & Bilić, V. (2022). Croatian version of the test of self-conscious affect-3: Gender differences and agreement with subjectively perceived shame-and guilt-proneness. *Current Psychology*, 41(9), 5991–6002. <https://doi.org/10.1007/s12144-020-01084-6>
- Fiske, S. T., Cuddy, A. J., Glick, P., & Xu, J. (2002). A model of (often mixed) stereotype content: Competence and warmth respectively follow from perceived status and competition. *Journal of Personality and Social Psychology*, 82(6), 878–902. <https://doi.org/10.1037/0022-3514.82.6.878>
- Fox, J., & Tang, W. Y. (2017). Women's experiences with general and sexual harassment in online video games: Rumination,

- organizational responsiveness, withdrawal, and coping strategies. *New Media & Society*, 19(8), 1290–1307. <https://doi.org/10.1177/1461444816635778>
- GameHouse (2023). *Me time - Game time*. Retrieved October 10, 2024, from <https://company.gamehouse.com/press>
- Ganzon, S. C. (2019). Investing time for your in-game boyfriends and BFFs: Time as commodity and the simulation of emotional labor in Mystic Messenger. *Games and Culture*, 14(2), 139–153. <https://doi.org/10.1177/1555412018793068>
- Garrido, J. M. F., Conde, M. D. D., Vázquez, M. Á. V., & Rodríguez, L. V. (2022). Are older adults' leisure patterns consistent with the active ageing model? The influence of the ageist stereotypes. *Social Policy and Society*, 21(4), 575–596. <https://doi.org/10.1017/S1474746421000221>
- GDI (2024). *The GDI playbook*. https://www.gdiplaybook.org/_files/ugd/0b7f70_60a1af7f147e4548bf9bcf49e18f05f8.pdf
- Giner-Sorolla, R., Piazza, J., & Espinosa, P. (2011). What do the TOSCA guilt and shame scales really measure: Affect or action? *Personality and Individual Differences*, 51(4), 445–450. <https://doi.org/10.1016/j.paid.2011.04.010>
- Giner-Sorolla, R., & McGee, D. (2020). Guilt and shame. In V. Zeigler-Hill, & T. K. Shackelford (Eds.), *Encyclopedia of personality and individual differences* (pp. 1855–1859). Springer.
- Günlü, A. (2025). Developing the shame and guilt scale in secondary traumas. *Psychiatric Quarterly Online Advance*. <https://doi.org/10.1007/s11126-025-10195-x>
- Hanford, N. A. (2018). At the intersection of difficulty and masculinity: Crafting the play ethic. *Masculinities in play* (pp. 149–164). Springer International Publishing.
- Harrington, M., & Dawson, D. (1995). Who has it best? Women's labor force participation, perceptions of leisure and constraints to enjoyment of leisure. *Journal of Leisure Research*, 27(1), 4–24. <https://doi.org/10.1080/00222216.1995.11969974>
- Hartmann, T., Möller, I., & Krause, C. (2014). Factors underlying male and female use of violent video games. *New Media & Society*, 17(11), 1777–1794. <https://doi.org/10.1177/1461444814533067>
- Henderson, K. A. (1991). The contribution of feminism to an understanding of leisure constraints. *Journal of Leisure Research*, 23(4), 363–377. <https://doi.org/10.1080/00222216.1991.11969866>
- Heritage, F., & Humphreys, C. (2024). Are videogames represented as violent in the press? Hypothesis testing using MD-CADS and corpora of UK newspapers from 2000 and 2020. *Corpora*, 19(2), 217–240. <https://doi.org/10.3366/cor.2024.0308>
- Hothorn, T., Hornik, K., & Zeileis, A. (2006). Unbiased recursive partitioning: A conditional inference framework. *Journal of Computational and Graphical Statistics*, 15(3), 651–674. <https://doi.org/10.1198/106186006X133933>
- Jones, W. H., Schratte, A. K., & Kugler, K. (2000). The guilt inventory. *Psychological Reports*, 87(3_suppl), 1039–1042. <https://doi.org/10.2466/pr0.2000.87.3f.1039>
- Juul, J. (2012). *A casual revolution: Reinventing video games and their players*. MIT Press.
- Kahn, A. S., Ratan, R., & Williams, D. (2014). Why we distort in self-report: Predictors of self-report errors in video game play. *Journal of Computer-Mediated Communication*, 19(4), 1010–1023. <https://doi.org/10.1111/jcc4.12056>
- Kan, M. Y., Zhou, M., Negraia, D. V., Kolpashnikova, K., Hertog, E., Yoda, S., & Jun, J. (2021). How do older adults spend their time? Gender gaps and educational gradients in time use in East Asian and Western countries. *Journal of Population Ageing*, 14, 537–562. <https://doi.org/10.1007/s12062-021-09345-3>
- Kelly, D., Nic Giolla Easpaig, B., & Castillo, P. (2022). You game like a girl': Perceptions of gender and competence in gaming. *Games and Culture*, 18(1), 62–78. <https://doi.org/10.1177/15554120221077730>
- Keogh, B. (2016). Between aliens, hackers and birds: Non-casual mobile games and casual game design. In M. Wilson, & T. Leaver (Eds.), *Social, casual and mobile games: The changing gaming landscape* (pp. 31–45). Bloomsbury Academic.
- Latour, B. (2005). *Reassembling the social: An introduction to actor-network-theory*. Oxford University Press.
- Lazzaro, N. (2008). Are boy games even necessary? In Y. B. Kafai, C. Heeter, J. Denner, & J. Y. Sun (Eds.), *Beyond Barbie and Mortal Kombat: New perspectives on gender and gaming* (pp. 199–230). MIT Press.
- Le Ngoc, M. T. (2024). *Spotlighting women gamers and how they play and spend on video games*. Newzoo. <https://newzoo.com/resources/blog/spotlighting-women-gamers-and-how-they-play-and-spend-on-video-games>
- McCullough, K. M., Wong, Y. J., & Stevenson, N. J. (2020). Female video game players and the protective effect of feminist identity against internalized misogyny. *Sex Roles*, 82(5), 266–276. <https://doi.org/10.1007/s11199-019-01055-7>
- Mosher, D. L. (2013). Revised Mosher guilt inventory. *Handbook of sexuality-related measures* (pp. 343–346). Routledge.
- Nakandala, S., Ciampaglia, G., Su, N., & Ahn, Y. Y. (2017). Gendered conversation in a social game-streaming platform. In *Proceedings of the international AAAI conference on web and social media 11(1)*, 162–171. <https://doi.org/10.1609/icwsm.v11i1.14885>
- Noonan, M. C., & Glass, J. L. (2012). The hard truth about telecommuting. *Monthly Labor Review*, 135(38), 38–45.
- Paaßen, B., Morgenroth, T., & Stratmeyer, M. (2017). What is a true gamer? The male gamer stereotype and the marginalization of women in video game culture. *Sex Roles*, 76, 421–435. <https://doi.org/10.1007/s11199-016-0678-y>
- Payne, C. S. (2017). *Leisure time in the UK: 2015*. Office for National Statistics. Retrieved December 10, 2024, from <https://www.ons.gov.uk/economy/nationalaccounts/satelliteaccounts/articles/leisuretimeintheuk/2015>
- Purdie, C. (2024). *UK video games consumer market valued at £7.82bn in 2023*. Bristows. <https://inquisitiveminds.bristows.com/post/102j5he/uk-video-games-consumer-market-valued-at-7-82bn-in-2023>
- R Core Team. (2021). *R: A Language and environment for statistical computing*. R Foundation for Statistical Computing. <https://www.R-project.org/>
- Ramirez, F. (2015). Affect and social value in freemium games. *Social, casual and mobile games: The changing gaming landscape*, 117–132.
- Ray, S. G. (2004). *Gender inclusive game design: Expanding the market*. Charles River Media.
- RStudio Team, & RStudio (2020). *RStudio: Integrated development for R*. PBC. <http://www.rstudio.com/>
- Shaw, A. (2011). Do you identify as a gamer? Gender, race, sexuality, and gamer identity. *New Media & Society*, 14(1), 28–44. <https://doi.org/10.1177/1461444811410394>
- Stone, J. A. (2019). Self-identification as a gamer among college students: Influencing factors and perceived characteristics. *New Media and Society*, 21(11–12), 2607–2627. <https://doi.org/10.1177/1461444819854733>
- Strobl, C., Boulesteix, A. L., Zeileis, A., & Hothorn, T. (2007). Bias in random forest variable importance measures: Illustrations, sources and a solution. *BMC Bioinformatics*, 8, 1–21. <https://doi.org/10.1186/1471-2105-8-25>
- Strobl, C., Boulesteix, A., Kneib, T., Augustin, T., & Zeileis, A. (2008). Conditional variable importance for random forests. *BMC Bioinformatics*, 9, 1–11. <https://doi.org/10.1186/1471-2105-9-307>
- Tangney, J. P., & Dearing, R. L. (2002). *Shame and guilt*. Guilford Press.
- Taylor, T. L. (2009). The assemblage of play. *Games and Culture*, 4(4), 331–339. <https://doi.org/10.1177/1555412009343576>

- Vanderhoef, J. (2013). Casual threats: The feminization of casual video games. *Ada: A Journal of Gender New Media and Technology*, 2, 1–28.
- Williams, D., Consalvo, M., Caplan, S., & Yee, N. (2009). Looking for gender: Gender roles and behaviors among online gamers. *Journal of Communication*, 59(4), 700–725. <https://doi.org/10.1111/j.1460-2466.2009.01453.x>
- Winn, J., & Heeter, C. (2009). Gaming, gender, and time: Who makes time to play? *Sex Roles*, 61, 1–13. <https://doi.org/10.1007/s11199-009-9595-7>
- Yao, S. X., & Rhodes, N. (2023). Protecting a positive view of the self: Female gamers' strategic self-attribution of stereotypes. *Sex Roles*, 88(3), 155–168. <https://doi.org/10.1007/s11199-022-01343-9>
- Yerkes, M. A., Roeters, A., & Baxter, J. (2020a). Gender differences in the quality of leisure: A cross-national comparison. *Community Work & Family*, 23(4), 367–384. <https://doi.org/10.1080/13668803.2018.1528968>
- Yerkes, M. A., André, S. C., Besamusca, J. W., Kruijnen, P. M., Remery, C. L., van der Zwan, R., Beckers, D. G., & Geurts, S. A. (2020b). Intelligent' lockdown, intelligent effects? Results from a survey on gender (in)equality in paid work, the division of childcare and household work, and quality of life among parents in the Netherlands during the Covid-19 lockdown. *PloS One*, 15(11), Article e0242249. <https://doi.org/10.1371/journal.pone.0242249>

Publisher's Note Springer Nature remains neutral with regard to jurisdictional claims in published maps and institutional affiliations.

Springer Nature or its licensor (e.g. a society or other partner) holds exclusive rights to this article under a publishing agreement with the author(s) or other rightsholder(s); author self-archiving of the accepted manuscript version of this article is solely governed by the terms of such publishing agreement and applicable law.