HCIT Dissertation

What mobile in-app purchase protection methods are parents using to protect their children from overspending? Why do they use these methods and are they linked to socioeconomic status?

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KEYWORDS

Microtransactions, SES, Socioeconomic Status, Parental Protection Methods, PPM, Overspending, Mobile Gaming

ABSTRACT

Most mobile app games in the Google Play App Store, Apple App Store and Steam featuring loot boxes and microtransactions are certified 12+. Children aged 6–12, are therefore being exposed to gambling-like mechanisms in microtransactions which could lead to overspending. In the gambling domain, overspending is a marker for problem gambling, which doesn't confirm problem gambling in the gaming domain, however there could be concern for parents of children that overspend. Overspending protection methods exist, however it's unclear which method is predominantly used, why that is and whether socioeconomic status (SES) has an influence. This is important given that SES correlates with gambling and expenditure. Research suggests a correlation between high impulsivity and the inability to manage household bills, and spending on mobile in-app microtransactions increases in people with low self-control. It could be that, as in other domains and for vulnerable individuals, high impulsivity, low self-control and low SES create a perfect storm for overspending. Findings suggest parents use 'Parental control', 'Monitoring your child(ren)' and 'Persuading and educating your child(ren)'. They use these methods to protect, but also teach good decision making, financial responsibility, and develop freedom and independence. This research finds no relationship between SES and the method parents implement, suggesting vulnerable children from low socioeconomic backgrounds are no more at risk. This study gives insight into parental behaviours. Developers can improve systems based on the theme of teaching discovered. Parents can be reassured that methods are accessible to all – not only protecting children from risks, but helping them thrive.

1 INTRODUCTION

The way games are sold to people has changed from selling a single game for £40–50 previously (Lizardi, 2012) to making games free to play, with small in-game purchases called microtransactions available to players as they progress through the game (Tomić, 2019). These microtransactions can be separated into cosmetic (Marder et al., 2018), pay-to-win (Reza et al., 2019) and loot boxes (Collins Dictionary, 2022). Loot boxes have been shown to be psychologically akin to gambling (Drummond & Sauer, 2018) and their prevalence is well documented (Zendle, Meyer, Cairns, Waters & Ballou, 2020). Zendle, Meyer, Cairns, Waters & Ballou (2020) suggest that of the Android and iPhone games that featured loot boxes, 93.1% and 94.9% respectively, were considered suitable for 12+ certification, indicating a relatively young audience could have access to gambling-like mechanisms.

Frigerio et al. (2020) find a positive correlation between high impulsivity and inability to keep up with the payment of household bills, indicating that some people are more vulnerable when it comes to prioritising spending. Research also suggests that SES correlates with gambling and overall gambling expenditure (Welte et al., 2002). In a study (Soroush et al., 2014) investigating the relationship between self control and in-app purchasing in Candy Crush Saga™, it was found that the high spending on in-app purchases is correlated with lower levels of self-control. It could be that, as in other domains, high impulsivity, low levels of self-control and low SES could be a perfect storm for overspending and therefore could be a risk factor for gambling harms.

Loot boxes have similarities to electronic gambling machines (EGMs) where continuous play and numerous microtransactions are enjoyed via a video screen. Binde, Romild & Volberg (2017) found in relation to problem gambling, that EGM gambling was most closely related to problem gambling than any other form of gambling. If loot boxes or microtransactions can keep players engaged continuously, the fear is players could crave constant arousal or become desensitised to arousal, either way potentially becoming addicted to loot box or in-app spending (Brady & Prentice, 2021) and opening a pathway to more serious gambling behaviours.

Revenue generated from gambling has been shown to be highly concentrated to a small subsection of the gambling population, these individuals are known as problem gamblers. In an online casino study on bwin.party by Tom et al. (2014), it was found that only 4.9% of subscribers accounted for 80% of gambling losses. These gamblers are also known as 'whales' (Alha et al., 2014; Lovell, 2011) and the argument by Close et al. (2021) is that the biggest spenders tend to consist of a small proportion of individuals. They also discovered there was no correlation between loot box spend and earnings, suggesting the biggest loot box spenders may also not be able to afford to spend and therefore may be problem gamblers, which supports previous literature (Zendle & Cairns, 2018; 2019). These 'whales' therefore do not necessarily spend more because they earn more (Close et al., 2021). Therefore it is clear expenditure is a marker for problem gambling severity. Although overspending on mobile gambling-like in-app microtransactions is not a clear cut indicator of problem gambling, it could still be a cause for concern for parents.

González-Cabrera et al. (2022) found that of adolescents who had purchased loot boxes in the last 12 months, prevalence rates were 3.66% for internet gaming disorder and 4.85% for online gambling disorder. In the same study, a positive and significant relationship was established between the purchase of loot boxes with internet gaming disorder and online gambling disorder. Consequently, the infusion of gambling-like mechanisms, such as loot boxes, in sizable portions of mainstream mobile video games (Zendle, Meyer, Cairns, Waters & Ballou, 2020) could open the way for a small percentage of the population, ergo a large quantity of individuals, to overspending. This is highlighted by Müller et al., (2015) in a cross-national representative study on prevalence rates of internet gaming disorder in adolescents aged 14–17, which suggests an internet gaming disorder rate of 2–4% across seven European countries.

The ultimate fear is that children who are susceptible to low self-control, high impulsivity and come from a socially and economically disadvantaged background have already been dealt a tough hand. But with added exposure to gambling-like games, with microtransactions that can keep them engaged continuously and desensitised to the thrills of repetitive microtransaction purchasing and gameplay, it is feared that children could be vulnerable to the risks of overspending, similar to individuals at risk to overspending in the domain of gambling.

With these concerns, Gong & Rodda (2022) suggest parents deploy eight methods to protect their child(ren) from the risks of overspending on loot boxes. The focus of the three studies in this paper will be more general, aimed at mobile in-app overspending via microtransactions more broadly. Moreover, it is of great importance to understand how the choice of implementation of these eight methods by parents could be affected by SES. Could some methods be more favoured by parents from low socioeconomic backgrounds or vice-versa? If so, why do parents choose these methods? This study sets out to understand the area further in order to enlighten the research community. It also aims to highlight any issues parents from low socioeconomic backgrounds may face to inform other parents, as well as designers of the various interactive solutions currently available.

2 BACKGROUND

2.1 Gaming Population

The world population is predicted to grow by 1% year on year, to over 7.95Bn by the end of 2022 (Worldometer, 2022). In the same positive direction, the digital gaming population is predicted to grow 4.39% year on year, increasing to 3.09Bn gamers (Newzoo, 2021. p.23) in the same period equating to 38.9% of the world population. In Europe alone, it's estimated that 51% of the population aged 6-64 years play video games, with the most gamers being in the 6-14 years age range, indicating that video games are ingrained in modern day society (ISFE Europe's Video Games Industry, 2020). Therefore, the popularity and reach of digital games has never been so great, with plenty of scope for further growth.

2.2 Microtransactions and Traditional Revenue Model

The means in which game developers sell video games has changed. Video games used to be traditionally sold as a standalone product, with the consumer taking part in a one-off transaction and leaving with a single copy of said video game (Lizardi, 2012). More recently, game developers create revenue in other ways. One way to monetise video games is with an in-game purchase, normally for a few pounds, which is referred to as a microtransaction (Tomić, 2019). Over recent years, many popular online games and game franchises such as Counterstrike, FIFA, Overwatch and Destiny have adopted this revenue creation model. In 2017 alone, Activision Blizzard reported it had made more than $4Bn, approximately more than half its annual income, from microtransactions (Activision Blizzard, Inc., 2018). Globally, microtransaction revenue on mobile devices make up 40–67% of total mobile revenue (Unity for Games, 2021) with that revenue accounting for over 50% of global video game revenue (Newzoo, 2021. p.16).

There are various types of microtransaction that are currently prevalent in the gaming domain. Cosmetic microtransactions (Marder et al., 2018) and pay-to-win microtransactions (Reza et al., 2019) are both popular. Cosmetic microtransactions refer to the purchase of in-game content, for example, character clothing that does not give the player any advantage and is purely for cosmetic purposes, as well as player enjoyment. Pay-to-win microtransactions involve the purchase of an advantage for the player such as a rare weapon, levelling-up boost and power-ups. In both cosmetic and pay-to-win microtransactions, the player is fully aware of what they are buying before they commit to the transaction (King & Delfabbro 2018).

Mobile game developers have seemingly fully embraced this microtransaction revenue model, with developers going a step further to release the base game as 'free-to-play'. This revenue model relies on players purchasing various forms of microtransactions to make their games commercially successful. As microtransactions are a way for developers to make money, particularly in 'free-to-play' games, it's in their interests to design mechanisms to persuade all levels of spenders to spend more (Shi et al., 2015). This revenue model can lead to a situation in which gamers expenditure could exceed the monetary amount of a traditional one-off game purchase over the lifespan of the game. Moreover, microtransactions are small, readily available and relatively harmless in isolation, leading to concerns from parents and both the gaming and research communities alike that certain demographics, such as younger players, may be vulnerable to overspending and impulsive purchasing with one study by Dreier et al. (2017) discovering an internet gaming disorder prevalence of 5.2% in a sample of free-to-play gamers. Moreover, when compared to non-problem gamers, those displaying internet gaming disorder symptoms experienced higher psychosocial

symptoms, reported higher levels of perceived stress and applied dysfunctional coping strategies more frequently.

2.3 Loot Boxes and Gambling

Loot boxes are an entirely different form of microtransaction however. Collins Dictionary (2022) defines loot boxes as, “a box containing a prize of unknown value, esp one offered for sale to players as part of an online game”. Because the player is unaware of what is contained within the loot box before they complete the purchase, loot boxes have been shown to be psychologically akin to gambling (Drummond & Sauer, 2018) and associated with gambling and problem gaming (Brooks & Clark, 2019). Loot boxes can contain both cosmetic and pay-to-win items randomly, with a low probability of obtaining an item the player desires, enticing them to pay to repeatedly open them indeterminately. However, despite loot boxes resembling gambling psychologically, they do not meet some legal definitions of gambling. The UK Gambling Commission (2017) states:

> One commonly used method for players to acquire in-game items is through the purchase of keys from the games publisher to unlock “crates,” “cases” or “bundles” which contain an unknown quantity and value of in-game items as a prize. The payment of a stake (key) for the opportunity to win a prize (in-game items) determined (or presented as determined) at random bears a close resemblance, for instance, to the playing of a gaming machine. Where there are readily accessible opportunities to cash in or exchange those awarded in-game items for money or money's worth those elements of the game are likely to be considered licensable gambling activities (p.7, Section 3.17).
>
> Additional consumer protection in the form of gambling regulation, is required in circumstances where players are being incentivised to participate in gambling style activities through the provision of prizes of money or money's worth. Where prizes are successfully restricted for use solely within the game, such in-game features would not be licensable gambling, notwithstanding the elements of expenditure and chance (p.8, Section 3.18).

Therefore, because digital loot box items do not hold real-life value, they cannot be considered gambling by the UK Gambling Commission, although Belgium has taken a step forward and is one of the first countries to declare loot boxes illegal under the Belgium Gaming Commission (Gerken, 2018). However, in the UK there are third-party websites out there that trade digital loot box items for real money, enabling gamers to realise the monetary worth of the digital items they have collected via loot boxes or other microtransactions, and thus it may just be a matter of time before some form of regulation is approved. In most countries, even though it's illegal for adolescents to gamble, and although loot boxes have been shown to be psychologically akin to gambling (Drummond & Sauer, 2018), the UK gaming community is not being protected from current and future harm by The Gambling Act 2005 (2005 c 19) which should protect them, as these laws protect individuals from current and future gambling harm.

2.4 Gambling, Problem Gambling, Loot Boxes and Physiological Arousal

Recent research by Baudinet & Blaszczynski (2013) suggests physiological arousal is involved in the early stages and maintenance of gambling. Research suggests excitement and arousal measured by increased heart rate is a major part of gambling (Brown, 1986). Again, increased heart rate was shown to be an indicator of arousal in both low and high frequency gamblers at various stages of the betting process in a study of off-course horse racing betting (Coventry & Norman, 1997). Brown (1986) also suggests that winning money is not a major driver for continued gambling, but rather it is the increase in arousal. Barton et al. (2017) found that losses disguised as wins and near misses

increase galvanic skin response (GSR) echoing Brown (1986) that gamblers do not need to win money to obtain arousal from gambling. Moreover, Lole, Gonsalvez, Barry & Blaszczynski (2014) have suggested that problem gamblers can become hyposensitive to rewards when gambling in a casino with their own money. Again, a further study shows that problem gamblers are hyposensitive to wins and losses (Lole, Gonsalvez, & Barry, 2015). This suggests that problem gamblers differ from other types of gamblers, insofar as they can become desensitised to the thrills of gambling as arguably it becomes more habitual than thrill-seeking.

Loot boxes have similarities to electronic gambling machines (EGMs) where continuous play and numerous microtransactions are enjoyed via a video screen. The continuous nature of EGMs keep the player engaged, rarely letting arousal decline. In a study by Binde, Romild, & Volberg (2017) analysing the most popular forms of gambling in relation to problem gambling, researchers found that EGM gambling was most closely related to problem gambling than any other form of gambling. If loot boxes can keep players engaged continuously akin to EGM gambling, the fear is players could crave constant arousal or become desensitised to arousal, either way potentially becoming addicted to loot box or in-app spending (Brady & Prentice, 2021) and potentially opening a pathway to more serious gambling behaviours.

2.5 Loot Box Prevalence

Loot boxes are prevalent in many major mobile video games, with recent research suggesting 58.0% of the top 100 Google Play store games, 59.0% of the top 100 iPhone games and 36.0% of the top 50 Steam store games contained loot boxes (Zendle, Meyer, Cairns, Waters & Ballou, 2020). In a recent study, it was also concluded that the majority of gamers (56%) have purchased a loot box (Kristiansen & Severin, 2020). With loot boxes being so prevalent in popular game culture, Zendle, Meyer, Cairns, Waters & Ballou (2020) also discovered that of the Android and iPhone games that featured loot boxes, 93.1% and 94.9% respectively, were considered suitable for 12+ certification, indicating a young audience could have access to gambling-like mechanisms. In another study by Zendle, Meyer & Ballou (2020), 71.2% of the study sample played games with loot boxes and 85.89% played games with cosmetic microtransactions, thus highlighting players are being consistently exposed over long periods to the temptations of gambling-like mechanisms.

2.6 Adolescent Gambling Exposure

Anecdotally, there have been stories in the media such as the 19 year old that spent over $13,500 (circa £11,000) over several years on microtransactions (Gach, 2017) or the adolescent that spent over £3,000 on FIFA loot boxes (Hannah & Andrews, 2020). Therefore, it's clear large portions of gamers are exposed to mechanisms similar to gambling of which they may not be mature enough to control. Furthermore, previous findings (Jacobs, 2000; Wynne et al., 1996) show exposure to gambling in early life correlates with problem gambling in later life and younger people seemingly preferring mobile devices for general media consumption (Kabali et al., 2015). It has also been suggested that availability to gambling via proximity to casinos increases the prevalence of problem gambling (Adams et al., 2007; Storer et al., 2009; Welte et al., 2016) so it's a reasonable assumption that how easily adolescents are exposed to gambling mechanisms could be a major factor for adolescents' likelihood of developing problem gambling later in life.

2.7 Socioeconomic Status, Impulsivity and Overspending

The English Indices of Deprivation 2019 (IoD2019) is based on 39 separate indicators, organised across seven domains of deprivation which are combined and weighted to calculate the latest Index of Multiple Deprivation 2019 (IMD2019). The IoD measures the SES of a given area by postcode in

terms of 1) income, 2) employment, 3) education, skills and training, 4) health and disability, 5) crime, 6) barriers to housing and services, 7) living environment deprivation, as well as the income deprivation affecting children index (IDACI) and the income deprivation affecting older people index (IDAOPI). An overall aggregate score of 1–10 is then generated to create the Index of Multiple Deprivation (IMD) decile rank score. The IMD (Ministry of Housing, Communities and Local Government, 2019) is therefore an overall measure of multiple deprivation, not just economic deprivation, experienced by people living in an area in England. However, there is one main limitation with an area-based method of measuring SES as noted by Clelland & Hill (2019). This is that living in a deprived area doesn't necessarily mean an individual is themself deprived. Affluent individuals could live in a deprived area and vice versa. The IMD decile rank score is used as a main method to measure SES in both the UK and Scotland (SIMD) and has been used effectively in previous research (Bowyer et al., 2019; Morley et al., 2015). The IMD is also easy to implement in a study, with only a postcode needed from participants. For these reasons, combined with the nine criteria above that form the IMD, it is a suitable method to understand the SES of participants in this study.

Frigerio et al. (2020) suggest a positive correlation between high impulsivity and the inability to keep up with the payment of household bills, indicating that some people are more vulnerable when it comes to prioritising spending. Research also suggests that SES correlates with gambling and overall gambling expenditure (Welte et al., 2002) with individuals with higher SES experiencing lower rates of pathological gambling and gambling expenditure. In a study (Soroush et al., 2014) investigating the relationship between self control and in-app purchasing in Candy Crush Saga™, it was discovered that the amount players spend on in-app purchases is correlated with gamers who have lower levels of self-control. Therefore it could be that, as in other domains, high impulsivity, low levels of self-control and low SES is a perfect storm for overspending, and therefore could be a risk factor for gambling harms.

2.8 Expenditure is a Key Indicator of Problem Gambling

In the domain of gambling, revenue generated has been shown to be highly concentrated to a small subsection of the gambling population. These individuals are known as problem gamblers. In an online casino study on bwin.party by Tom et al. (2014), it was found that only 4.9% of subscribers accounted for 80% of gambling losses. A study by Fiedler (2012) found that when analysing the data from over 2 million Pokerstars players, 1% of the gamblers account for 60% of operators' income, 5% account for 83%, and the top 10% of players account for 91% of the operators' income. As problem gamblers' spending is extreme and disproportionate when compared to the mean, it's clear that an indicator of problem gambling is expenditure. This has again been shown in other literature, where the amount individuals spend on loot boxes has been linked to problem gambling severity, the more they spend on loot boxes, the more severe their problem gambling (Fiedler et al., 2019; Zendle & Cairns, 2018). Although overspending on mobile gambling-like in-app microtransactions is not a clear cut indicator of problem gambling, it could still be a cause for parental concern.

2.9 Who are the 'Whales?'

As the topic of problem gambling has been researched, the amount individual gamblers spend has been given marine mammal terminology (Alha et al., 2014; Lovell, 2011), with the biggest spenders being labelled 'whales' (€20 per month). Whilst many people spend this very modest amount of real-world money on loot boxes (Zendle & Cairns, 2018; 2019), and whilst the threshold is different, the argument by Close et al. (2021) remains that the biggest spenders consist of a small proportion of individuals. Only 5% of the sample spent over $100 a month, but generated over half of revenue,

indicating that spend distribution is largely skewed. Close et al. (2021) also discovered both interestingly and alarmingly, there was no correlation between loot box spend and earnings, suggesting the biggest loot box spenders may also not be able to afford to spend as they do and therefore may be problem gamblers, which supports previous literature (Zendle & Cairns, 2018; 2019). These 'whales', a term that refers to high spenders in the domain of gambling, therefore do not necessarily spend more because they earn more (Close et al., 2021).

2.10 Internet Gaming Disorder, Problem Gambling and Loot Boxes

The American Psychiatric Association's (2013) Diagnostic and Statistical Manual of Mental Disorders (5th ed.; DSM-5) is the most widely accepted nomenclature used by clinicians. Internet Gaming Disorder (IGD) is defined by a persistent and recurrent involvement with videogames, often leading to significant impairments of daily work and/or educational activities and has been suggested by the APA (2013) as a tentative psychiatric disorder requiring further study. According to the DSM-5 (APA, 2013), internet gaming disorder is indicated by endorsement of at least five core symptoms (out of nine) over a period of 12 months. In 2018, World Health Organization (2019) International Statistical Classification of Diseases and Related Health Problems (11th ed.) also recognised ICD as a serious disorder.

In two meta-analyses of recent literature on the relationship between problem gambling, internet gaming disorder and loot boxes, problem gambling and excessive gaming were both positively related to loot box spending (Garea et al., 2021; Raneri et al., 2022). However, in Garea et al. (2021), it could be that loot box spending may produce problem gambling symptoms or excessive gaming time through a pattern of learned behaviour. Likewise, existing problem gamblers may purchase loot boxes inordinately, and therefore spend more time doing so, when compared with non-problem gamblers. Nonetheless, the infusion of gambling-like mechanisms, such as loot boxes, in sizable portions of mainstream mobile video games (Zendle, Meyer, Cairns, Waters & Ballou, 2020) could open the way for a small percentage of the population, ergo a large quantity of individuals to gambling. This is highlighted by Müller et al. (2015) in a cross-national representative study on prevalence rates of internet gaming disorder in adolescents aged 14–17, which suggests an internet gaming disorder rate of 2–4% across seven European countries.

Recent research has also demonstrated that the amount of money spent in 'free-to-play' games is significantly linked to the internet gaming disorder classification and significant associations with a considerable percentage of children and adolescents meeting criteria for internet gaming disorder being classified as 'whales' (Dreier et al., 2017). This is similar to a study by González-Cabrera et al. (2022) finding that of adolescents who had purchased loot boxes in the last 12 months, prevalence rates were 3.66% for internet gaming disorder and 4.85% for online gambling disorder. In the same study, a positive and significant relationship was established between the purchase of loot boxes and both internet gaming disorder and online gambling disorder. In a study (Soroush et al., 2014) investigating the relationship between self control and in-app purchasing in Candy Crush Saga™, it was discovered that the more players spend on in-app purchases is correlated with gamers who have lower levels of self-control. This again highlights the need for policy makers to protect people who are potentially vulnerable.

2.11 Problem Gambling Impacts

Browne et al. (2016) conclude that there are many negative impacts of problem gambling from a large, cross-sectional study conducted in Victoria, Australia. Aside from the obvious negative financial impacts, there are other negative impacts that affect work/study, health, emotional/psychological

well-being and relationships. This is mirrored in another study (Fiedler et al., 2019) highlighting that high excess spending from problem gamblers also indicates a high social cost such as treatment costs, productivity losses from work and reductions in quality of life.

2.12 Safety Methods for Mobile In-app Purchasing

As mentioned previously, Zendle, Meyer, Cairns, Waters & Ballou (2020) discovered that of the Android and iPhone games that featured loot boxes, 93.1% and 94.9% respectively, were considered suitable for 12+ certification. For the foreseeable future at least, until gambling legislation is changed in the UK, the responsibility for managing in-app purchase expenditure is likely to fall on the shoulders of parents. However, there are various safety methods available to these parents developed by Google and Apple for example. In the Google Play store, parents can set a expenditure limit for their child's account which is linked to their child's device, alerting them when their child is close to or has surpassed the agreed expenditure limit. Alarmingly however, the child can continue spending beyond the expenditure limit, with the main aim merely to inform parents of their child's current expenditure status, with parents needing to manually stop their child from spending any further (Google Play Help, 2022). Apple however offers a few more options for parents. Parents can turn in-app purchases off entirely, giving parents complete peace of mind. However, this may be impractical in most cases as inevitably their child may desire an occasional in-app purchase. Apple has also foreseen this situation with the 'Ask to Buy' mechanism, which enables parents to approve or decline the purchase their child wished to make on a case by case basis (Apple Support, 2022a). Apple also provides a spending limit mechanism via shared Apple Card Family (Apple Support, 2022b). Parents can set a hard total expenditure limit and also an individual microtransaction expenditure limit on the shared Apple Family Card account, allowing for more control knowing a limit cannot be passed, unlike in the Google Play store.

In an announcement in 2018, the Pan-European Game Information (PEGI), which certifies video games based on themes contained within them, announced it will provide an in-game purchases logo and descriptor on physical copies of video games (Pan-European Game Information (PEGI), 2021). Whilst welcome for parents, merely labelling games is not going to be enough to protect the next generation of gamers. In a study by Gong & Rodda (2022), researchers found that eight main loot box expenditure strategies were employed by parents to control the amount their child(ren) spent on loot boxes. These were; environmental restructuring (36.3%), persuasion and education (16.4%), monitoring and feedback (15.9%), knowledge and information (13.9%), shaping knowledge (limits) (9.5%), reward and threat (3.5%), substitution (game and money) (3.5%) and professional advice (1.0%). Therefore these eight safety mechanisms are referred to as the parental protection methods (PPMs).

2.13 Conclusion

As discussed above, when considering the prevalence of loot boxes in many popular mobile games with 12+ certification, the similarities of loot boxes and microtransactions to gambling and EGMs, the relationships between problem gambling, loot boxes and internet gaming disorder it is clear microtransactions in video games could cause issues for certain types of people, such as those from low socioeconomic backgrounds in adolescence. The current literature regarding in-app purchasing and loot boxes, as discussed, mainly focuses on the similarities to gambling, relationships between problem gambling and internet gaming disorder and the impacts of those. Very little research has been conducted into what in-app purchase protection methods parents are using to protect their children from overspending, and how these could be potentially influenced by SES. Furthermore,

research is also lacking as to why parents deal with the potential problem of excessive in-app purchase expenditure the way they do.

In the domain of gambling, individuals from lower socioeconomic backgrounds spend more money playing (Welte et al., 2002). Due to the gambling-like nature of loot boxes and microtransactions, it could be that certain people from lower socioeconomic backgrounds are potentially more likely to overspend on in-app microtransactions whilst playing mobile games. It could be that the continuous nature of mobile games that keep the player engaged, therefore rarely letting arousal decline, could cause problems for players who crave constant arousal or become desensitised to arousal, either way potentially becoming addicted to loot box or in-app spending (Brady & Prentice, 2021) and potentially opening a pathway to more serious gambling behaviours. Moreover, those individuals may already have issues with high impulsivity (Frigerio et al., 2020) and low self-control (Soroush et al., 2014) and be at an age where they're not able to make good choices, such as children at middle childhood age, and could be susceptible to overspending.

It's important to understand if SES does have an effect on what mobile in-app parental protection methods parents are using to protect their child(ren) from overspending on these gambling-like microtransactions, to inform the research community and parents alike in order to further understand what we can do in the future to ensure vulnerable children can be protected, across all socioeconomic backgrounds, but in particular those from low socioeconomic backgrounds. It is also important to understand why parents implement the methods of protection they do in order to inform developers of protection methods, such as Google and Apple, to refine them and make them more effective.

2.14 Research Questions

Because of this importance, the following research questions will be used to further the knowledge base on this topic:

- RQ1: What mobile in-app purchase protection methods are parents using to protect their children from overspending?
- RQ2: Does the socioeconomic status of parents influence the choice of the mobile in-app purchase safety method that they mainly use?
- RQ3: Why do parents choose the mobile in-app purchase safety method they do in order to protect their children from overspending?

3 STUDY 1

In order to investigate research question one, *'What mobile in-app purchase protection methods are parents using to protect their children from overspending?',* and research question two, *'Does the socioeconomic status of parents influence the choice of the mobile in-app purchase safety method that they mainly use?'*, Study 1 involved a survey with parents of children (6–12 years), who have children that play digital games and have made an in-app purchase in the last 12 months. This is to understand which parental protection methods parents are using to protect their child(ren) from mobile in-app overspending and if their SES correlates with their choices.

3.1 Research Questions

3.1.1 Research Questions

The research questions Study 1 is aiming to answer are:

- RQ1: What mobile in-app purchase protection methods are parents using to protect their children from overspending?
- RQ2: Does the socioeconomic status of parents influence the choice of the mobile in-app purchase safety method that they mainly use?

3.1.2 Hypothesis

H_O: Socioeconomic status will not have an effect on the main Parental Protection Methods (PPMs) parents implement to protect their child(ren).

H_1: Socioeconomic status will have an effect on the main Parental Protection Methods (PPMs) parents implement to protect their child(ren).

3.2 Methods

3.2.1 Ethics

Ethical approval for Study 1 was granted by the Computer Science Ethics department on 8 June 2022 to conduct an online survey. As part of the online survey, participants were shown an information sheet and consent form before data collection could occur. The information sheet fully explained the purpose of the study, what participation would involve, what data would be required, the storage and anonymity of that data, and the remuneration given for participation in the study. Participants were informed they could ask questions at any time and could withdraw from the study at any time. The information sheet can be found in Appendix A. Participants were then asked to consent to the study thereafter via Qualtrics. Consent can be found in Appendix B.

3.2.2 Participants

Participants (n = 185) were recruited via the online participant recruitment platform *Prolific*. Participants were parents of child(ren) and were further screened by asking the questions *'Do you live with a child or children that regularly play video games that are aged between 6–12?'* and *'Have either you (on behalf of your child(ren)) or they made a mobile in-app purchase in the past 12 months? E.g. a mobile in-app purchase is buying in-game money, in-game loot boxes, in-game items such as weapons, clothes, characters, extra lives etc with real-world money.'* If they answered yes to both the screening questions, they were included in the final data and analysis. A participant budget of £120 was employed to facilitate recruitment. Participants were compensated at the rate of £9 per hour equating to £0.45 for the 2–3 minutes it took to complete the survey. Participants that did not meet the study inclusion criteria (n = 42), and therefore did not qualify for the final study data and analysis, were still compensated at the aforementioned rate. Furthermore, a number of participants (n = 24) were excluded because their postcode was not available on the IMD database. A total of 119 participants qualified for the final study. As soon as survey data was collected, participants were promptly paid.

Table 1 shows the various demographic statistics from the sample. The age of the participants ranged from; 18–25 (n = 2, 1.68%), 26–30 (n = 12, 10.08%), 31–35 (n = 26, 21.85%), 36–40 (n = 21, 17.65%), 41–45 (n = 29, 24.37%), 46–50 (n = 13, 10.92%), 51–55 (n = 10, 8.40%), 56–60 (n = 5, 4.20%), 61–65 (n = 0, 0.0%) and 66–70 (n = 1, 0.84%). The distribution of participants across the age groups is fairly

even (31–35 = 21.85%, 36–40 = 17.65% and 41–45 = 24.37%). In terms of gender, the sample was made up of female (n = 79, 66.39%), male (n = 39, 32.77%) and non-binary (n = 1, 0.84%). The highest level of education of participants' parents or guardians at the age of 18 ranged from above degree level (n = 8, 6.78%), degree or equivalent (n = 37, 31.36%), below degree level (n = 55, 46.61%), no qualifications (n = 14, 11.86%), I prefer not to say (n = 1, 0.85%) and I do not know (n = 3, 2.54%). One person did not answer this question so n = 118 for this demographic.

Table 1. Study 1 Sample Demographics

Demographic	Participants (n)	%
Age	**n = 119**	
18–25	2	1.68%
26–30	12	10.08%
31–35	26	21.85%
36–40	21	17.65%
41–45	29	24.37%
46–50	13	10.92%
51–55	10	8.40%
56–60	5	4.20%
61–65	0	0.00%
66–70	1	0.84%
Gender	**n = 119**	
Female	79	66.39%
Male	39	32.77%
Non-binary	1	0.84%
Parent Education	**n = 118**	
Above degree level	8	6.78%
Degree or equivalent	37	31.36%
Below degree level	55	46.61%
No qualifications	14	11.86%
I prefer not to say	1	0.85%
I do not know	3	2.54%

3.2.3 Definition of Middle Childhood

Middle childhood is a key development period for young children which bridges the gap between preschoolers and young teens or adolescents (Centers for Disease Control and Prevention (CDC), 2022).It's generally agreed upon in the literature that middle childhood starts at the age of six (Centers for Disease Control and Prevention (CDC), 2022; Eccles, 2012) but the literature diverges slightly as to when this period ends, between 10 and 12 being the most agreed upon (Centers for Disease Control and Prevention (CDC), 2022; Eccles, 2012; Greenspan & Pollock, 1991; Montemayor et al., 1990). For this study therefore, the age range of 6–12 for the period referred to as middle childhood.

3.2.4 Survey

Parental Protection Methods (PPMs)

Gong & Rodda (2022) suggest parents deploy eight methods to protect their child(ren) from the risks of overspending on loot boxes. These can be seen in Table 2 below. These will be referred to as main Parental Protection Methods (PPMs). For the purposes of making the survey as easy and understandable as possible, regardless of participants' education levels or current understanding of in-app overspending issues, this part of the survey was rewritten in plain English as in Table 2. The reference to 'loot boxes' was also changed to 'in-app purchases' or similar. This was because the focus of the study was more general, focusing on in-app purchases more broadly. With loot boxes being a form of microtransaction, it's a fair conclusion that the eight adapted PPMs (Table 2) from Gong & Rodda (2022) are suitable for use in this study when referring to methods parents use to protect their child(ren) from mobile in-app purchases.

Table 2. Main Parental Protection Methods (PPMs)

Parental Protection Methods (PPMs) (Gong & Rodda, 2022)	Parental Protection Methods (PPMs) (rewritten for this study)
1. Environmental restructuring	1. Parental control
2. Persuasion and education	2. Persuading and educating your child(ren)
3. Monitoring and feedback	3. Monitoring your child(ren)
4. Knowledge and information	4. Parental understanding
5. Shaping knowledge (limits)	5. Agreeing spending limits with your child(ren)
6. Reward and threat	6. Rewarding or punishing your child(ren)s behaviour
7. Substitution (game and money)	7. Substituting the game
8. Professional advice	8. Professional advice

Participants were asked which one of the eight PPMs they mainly used to protect their child or children from overspending with the question *'In the past 12 months, which one of the following safety methods do you mainly use to manage your child(ren)'s mobile in-app spending?'* The full category descriptions and list of survey questions can be found in Appendix C.

Socioeconomic Status

The English Indices of Deprivation 2019 (IoD2019) is based on 39 separate indicators, organised across seven domains of deprivation which are combined and weighted to calculate the latest Index of Multiple Deprivation 2019 (IMD2019). The IoD measures the SES of a given area by postcode in terms of 1) income, 2) employment, 3) education, skills and training, 4) health and disability, 5) crime, 6) barriers to housing and services, 7) living environment deprivation, as well as the income deprivation affecting children index (IDACI) and the income deprivation affecting older people index (IDAOPI). An overall aggregate score of 1–10 is then generated to create the Index of Multiple Deprivation (IMD) decile rank score. The IMD (Ministry of Housing, Communities and Local Government, 2019) is therefore an overall measure of multiple deprivation, not just economic deprivation, experienced by people living in an area or neighbourhood in England. The IMD decile rank score has been used effectively in previous research (Bowyer et al., 2019; Morley et al., 2015), in order to measure SES, with an IMD decile rank score of 1 demonstrating the participant comes from a low socioeconomic background. In contrast, an IMD decile rank score of 10 demonstrates the participant comes from a high socioeconomic background. The IMD tool can be found here: https://imd-by-postcode.opendatacommunities.org/imd/2019.

In order to generate the IMD decile rank score, participants were asked *'What is your postcode? If you have more than one property, please give the postcode of the property you mainly live in.'* This was then input into the online IMD tool to convert all postcodes into IMD decile rank scores.

The rationale for using the IMD to determine SES can be found in section 2.7.

3.2.5 Pilot

To ensure the study is conducted with no unforeseen errors, the online survey was piloted with a small number of participants (n = 5). The pilot study revealed no major issues that may hinder the study or jeopardise the quality of the data to be collected. Data gathered from the pilot study were discounted from the final results and analysis.

3.3 Results

Data analysis was carried out using R Studio.

3.3.1 Distribution of Socioeconomic Status (SES) – Index of Multiple Deprivation (IMD)

Looking at Table 3, the data sample is fairly evenly spread in terms of IMD decile rank scores and therefore SES. Table 4 shows a median = 6 and standard deviation = 2.76, demonstrating participants' SES varied from approximately 3–9, which covers 70% of the data sample. Table 3 also shows every IMD decile score was fairly evenly represented, although IMD decile rank scores of 5 and 9 were slightly more represented, which can again be seen in Fig. 1.

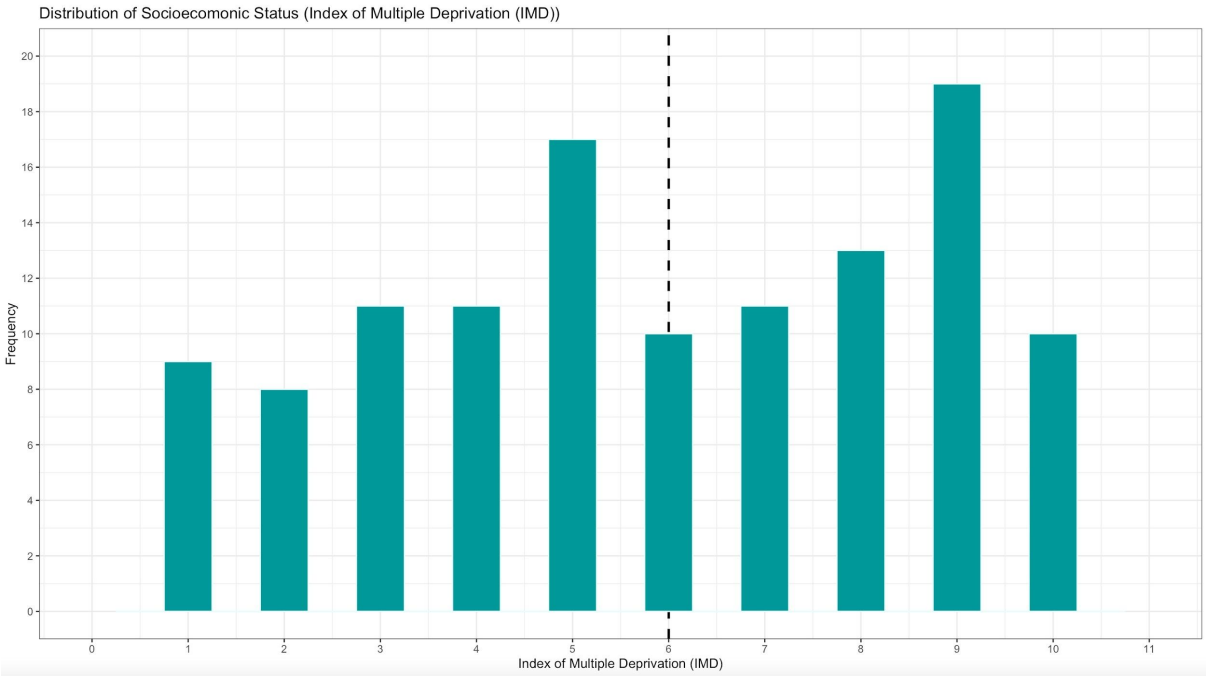

Fig. 1. Distribution of Socioeconomic Status (SES) – Index of Multiple Deprivation (IMD). Median (Dashed Line) = 6.

Table 3. Frequency of Socioeconomic Status (Index of Multiple Deprivation (IMD))

Index of Multiple Deprivation (IMD) Decile Rank Score	n	%	Index of Multiple Deprivation (IMD) Decile Rank Score	n	%
1	9	7.56%	6	10	8.40%
2	8	6.72%	7	11	9.24%
3	11	9.24%	8	13	10.92%
4	11	9.24%	9	19	15.97%
5	17	14.29%	10	10	8.40%
Total				**649**	**99.98% (not 100% due to rounding)**

3.3.2 Main Parental Protection Method (PPM) in the Last 12 Months and Socioeconomic Status (SES)

Any possible relationship between which Parental Protection Method (PPM) parents mainly implement in order to protect their child(ren) from overspending on mobile in-app purchases and SES is particularly interesting to this study. Participants were asked which single main PPM they used in the last 12 months.

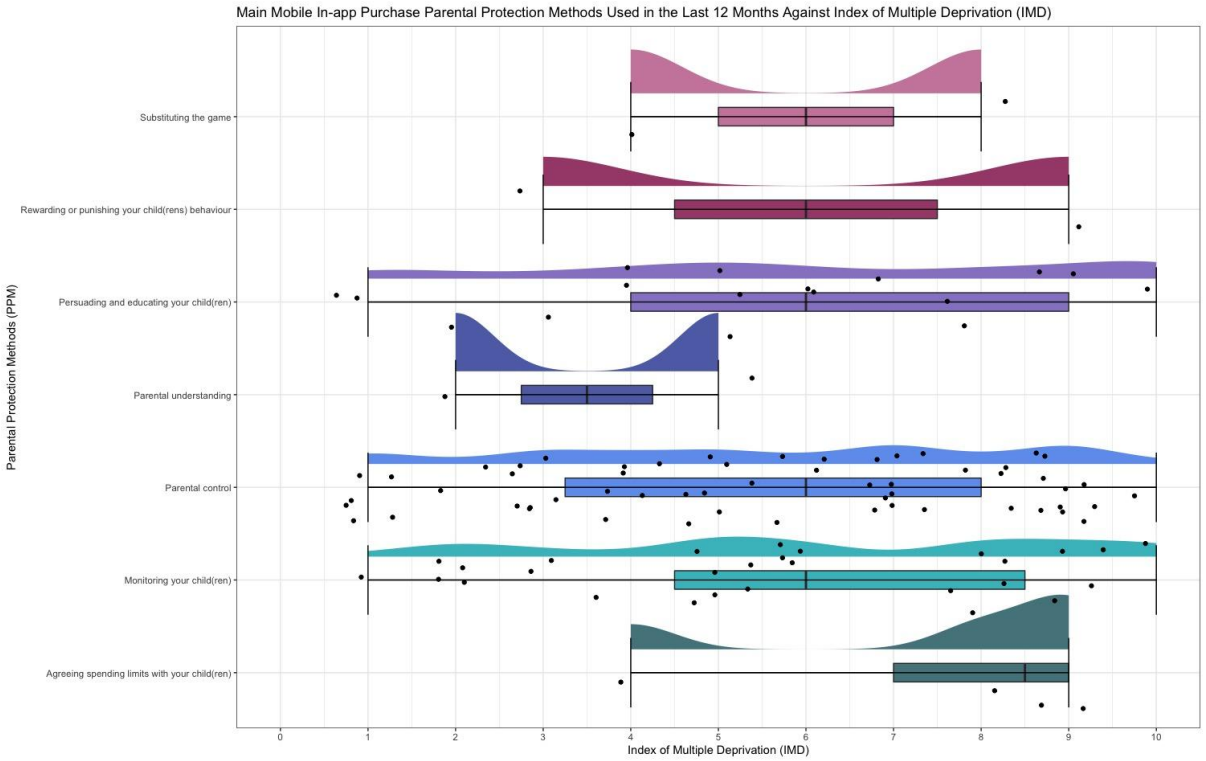

Fig. 2. Main Parental Protection Methods (PPMs) Plotted Against Socioeconomic Status (SES) – Index of Multiple Deprivation (IMD)

Table 4. Descriptive Statistics of Main Parental Protection Methods (PPMs) Used in the Last 12 Months Against Socioeconomic Status (Index of Multiple Deprivation (IMD))

Parental Protection Methods (PPMs)	Index of Multiple Deprivation (IMD)					
	Mean	Median	IQR	SD	N	%
All Parental Protection Methods (PPMs)	5.87	6	4	2.77	119	100%
Parental control	5.62	6	4.75	2.70	58	48.74%
Persuading and educating your child(ren)	6.15	6	5	3.05	20	16.81%
Monitoring your child(ren)	6.10	6	4	2.81	31	26.05%
Parental understanding	3.5	3.5	1.5	2.12	2	1.68%
Agreeing spending limits with your child(ren)	7.5	8.5	2	2.38	4	3.36%
Rewarding or punishing your child(ren)'s behaviour	6	6	3	4.24	2	1.68%
Substituting the game	6	6	2	2.83	2	1.68%
Professional advice	0	0	0	0	0	0.00%

Testing the Hypothesis

For testing the hypothesis and data for significance, and therefore to determine if SES has an effect on PPM, a nonparametric method was used due to the limited sample size. The researcher will accept p≤0.05 as significant, meaning it will be accepted that the probability of the result observed due to random chance is 5%. Table 5 shows a Kruskal-Wallis test was performed on the data and found no significance (chi-squared = 3.85, p = 0.92) confirming, in this study, that SES has no effect on PPM so analysing post-hoc pairwise comparisons was not needed. Effect size was also calculated (Cohen's *d* = 0.342), which is nearing the recommended minimum effect size representing a 'practically' significant effect of ≥0.41 according to Ferguson (2009).

Table 5. Results of Kruskal-Wallis Test

Chi-squared	P-value	Effect Size (Cohen's *d*)
3.85	0.92	0.342

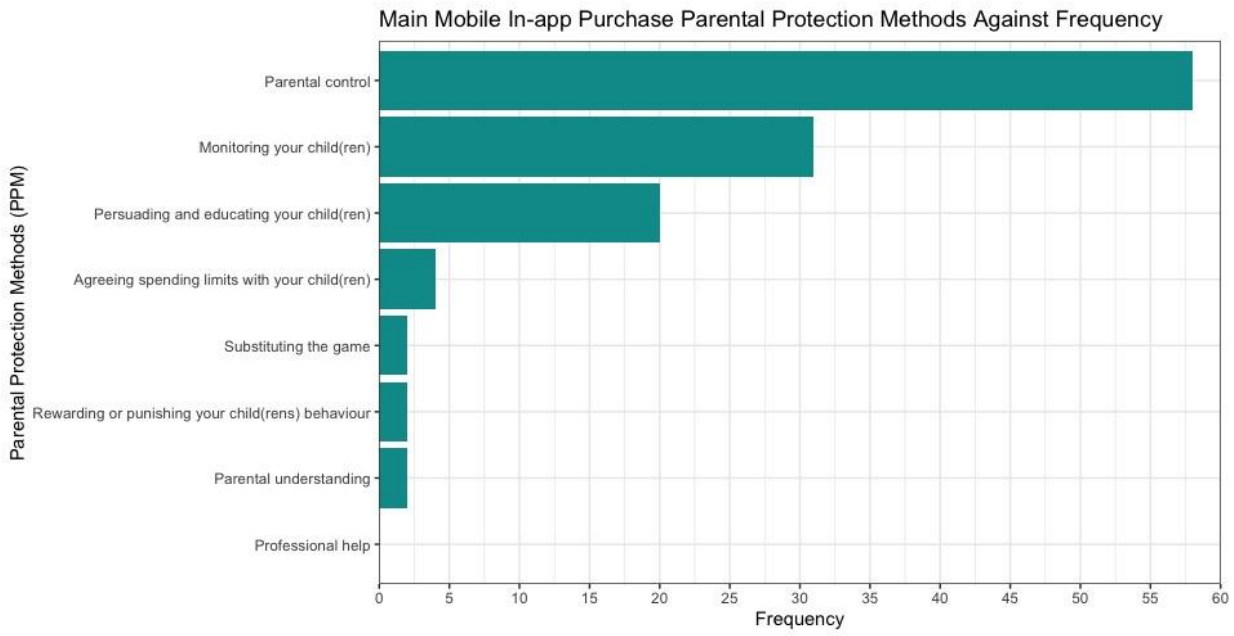

Fig. 3. Main Parental Protection Methods (PPM) Against Frequency

3.3.3 Main Parental Protection Method (PPM) Implemented in the Last 12 Months

Table 4 shows the most frequently implemented main PPMs in descending order, with 'Parental control' most frequent (n = 58, 48.74%), followed by 'Monitoring your child(ren)' (n = 31, 26.05%), 'Persuading and educating your child(ren)' (n = 20, 16.81%), 'Agreeing spending limits with your child(ren)' (n = 4, 3.36%), 'Parental understanding' (n = 2, 1.68%), 'Substituting the game' (n = 2, 1.68%), 'Rewarding or punishing your child(ren)'s behaviour' (n = 2, 1.68%) and finally 'Professional help' (n = 0, 0.0%).

3.4 Discussion

A Kruskal-Wallis test, see Table 5, was used to test the hypothesis and data for significance, and therefore to determine if SES has an effect on the main PPM parents implement to protect their child(ren) from mobile in-app overspending. The results of the Kruskal-Wallis test ($p = 0.92$, therefore no significance found) show a result this extreme which is obtained in Fig. 2. could occur by random chance 92% of the time. Therefore it's plausible that the differences in descriptive statistics seen here are the product of random chance. The effect size is Cohen's $d = 0.342$, which is nearing the recommended minimum effect size representing a 'practically' significant effect of ≥0.41 according to Ferguson (2009). Although the differences seen between the PPM groups in relation to SES are plausibly the product of random chance 92% of the time, the effect size of these differences is very close to the minimum described by Ferguson (2009) as being practically significant. However, the null hypothesis cannot be rejected, and therefore there is no relationship between SES and the choice of main PPM that parents are implementing and there are not enough participants to detect a minimum (0.41), moderate (1.15) or strong effect size (2.70) (Ferguson, 2009). Research question two, *'Does the socioeconomic status of parents influence the choice of the mobile in-app purchase safety method that they mainly use?'* has been answered. However, in order to test the hypothesis more severely, a larger sample size could be used which could yield a significant p-value (≤0.05), but also detect a practically significant effect size (≥0.41) in order to understand how much SES is having an effect, if indeed at all.

The small sample size also creates a few problems. The first being that SES could be having an effect on PPM choice, but there aren't enough participants to show it, therefore a type II error could be occurring. Again looking at Fig. 2, specifically at 'Parental understanding' and 'Agreeing spending limits with your child(ren)' main PPMs, it appears SES is having an effect here. However, due to having only a few data points for these main PPMs – a type I error is likely occurring. Meaning there are not enough data points for these PPMs and the data is skewed and appearing to show an effect that is not actually present. Therefore, because Study 1 has been enlightening, a refined version of this study, with a larger sample, will be conducted. With that in mind, Study 2 will more thoroughly test the null hypothesis, possibly nullifying the type I and type II errors, and yielding a significant p-value and practically significant effect size.

The findings in this study are in divergence with the literature when looking at parental SES and educational achievement (Martens et al., 2014; Sewell & Shah, 1967), parents providing a safe environment for play with their children (Milteer et al., 2012), child abuse and neglect (Ondersma, 2002), child development (Bradley & Corwyn, 2002; Bornstein & Bradley, 2002), child obesity in developed countries (Sobal & Stunkard, 1989; Wang, 2001), child mental health (Bøe et al., 2012) and physical activity levels in adolescents (Stalsberg & Pedersen, 2010). In all these areas, SES has a negative effect.

Looking at Fig. 2. and Table 4 and at what mobile in-app purchase protection methods parents are using to protect their children from overspending, the results show that parents use three main methods of mobile in-app purchase PPMs. These are 'Parental control' (n = 58, 48.74%), 'Monitoring your child(ren)' (n = 31, 26.05%) and 'Persuading and educating your child(ren)' (n = 20, 16.81%). These account for 91.60% of the data sample, clearly showing that there is a large inclination for parents to use these PPMs as the main way to protect their children from mobile in-app overspending. This answers research question one, *'What mobile in-app purchase protection methods are parents using to protect their children from overspending?'*.

Looking more in depth, it could be that 'Parental control', which includes using built in system software such as features available in Amazon Parent Dashboard, third-party screen time apps, Apple and Google account spending limits and adding passwords to the child's account, are mechanisms that offer control to parents conveniently, making this their main PPM of choice. It could also be that limiting screen time acts as an incentive for achieving homework or reading goals.

It could be that 'Monitoring your child(ren)', which includes the child asking permission for each purchase either in person or via a system such as Apple 'Ask to Buy', monitoring bank accounts and the games they play come naturally to parents. It's natural for child(ren) to ask their parents for everything from a young age and so this PPM is ingrained in human behaviour already. It's also an extremely natural parental behaviour to watch over what a child does from the moment they are born and so monitoring the games a child plays, a child's behaviour and the associated bank account, is again completely natural.

When looking at the last PPM, 'Persuading and educating your child(ren)', it's feasible to suggest this is again natural behaviour between a parent and child. Every parent, no matter what background they are from or how skilled they are at parenting, has taught their child from the moment they were born. Particularly between the ages of 6–12. It's therefore possible that natural instincts and deep-rooted human behaviours are driving the main PPMs that people choose.

Due to the small sample size of Study 1, Study 2 could show different results in relation to what mobile in-app PPMs parents are using to protect their children from overspending.

4 STUDY 2

In order to investigate research question one, *'What mobile in-app purchase protection methods are parents using to protect their children from overspending?',* and research question two, *'Does the socioeconomic status of parents influence the choice of the mobile in-app purchase safety method that they mainly use?',* Study 2 involved a survey with parents of children (6–12), who have children that play digital games and have made an in-app purchase in the last 12 months. This is to understand which parental protection method parents are using to protect their child(ren) from mobile in-app overspending and if their SES correlates with their choices.

4.1 Research Questions

4.1.1 Research Questions

As Study 2 is a more focused version of Study 1, the research questions the study is aiming to answer are the same as Study 1:

- RQ1: What mobile in-app purchase protection methods are parents using to protect their children from overspending?
- RQ2: Does the socioeconomic status of parents influence the choice of the mobile in-app purchase safety method that they mainly use?

4.1.2 Hypothesis

As Study 2 is a more focused version of Study 1, the hypothesis therefore remains the same as Study 1.

H_O: Socioeconomic status will not have an effect on the main Parental Protection Methods (PPM) parents implement to protect their child(ren).

H_1: Socioeconomic status will have an effect on the main Parental Protection Methods (PPM) parents implement to protect their child(ren).

4.2 Methods

4.2.1 Ethics

Ethical approval for Study 2 was granted by the Computer Science Ethics department on 21 July 2022 to conduct an online survey. As part of the online survey, participants were shown an information sheet and consent form before data collection could occur. The information sheet fully explained the purpose of the study, what participation would involve, what data would be required, the storage and anonymity of that data, and the remuneration given for participation in the study. Participants were informed they could ask questions at any time and could withdraw from the study at any time. The information sheet can be found in Appendix D. Participants were then asked to consent to the study thereafter via Qualtrics. Consent can be found in Appendix E.

4.2.2 Participants

Participants (n = 1,000) were recruited via an identical procedure to that followed in Study 1 (see section 3.2.2). A participant budget of £420 was employed to facilitate recruitment. Participants were compensated at the rate of £9 per hour equating to £0.30 for the 2 minutes it took to complete the survey. Participants that did not meet the study inclusion criteria (n = 215), and therefore did not qualify for the final study data and analysis, were still compensated at the aforementioned rate. Furthermore, a number of participants (n = 136) were excluded because their postcode was not available on the IMD (IMD) database. A total of 649 participants qualified for the final study. As soon as survey data was collected, participants were promptly paid.

Table 6 shows the various demographic statistics from the sample. The age of the participants ranged from; 18–25 (n = 12, 1.85%), 26–30 (n = 58, 8.94%), 31–35 (n = 126, 19.41%), 36–40 (n = 161, 24.81%), 41–45 (n = 135, 20.80%), 46–50 (n = 78, 12.02%), 51–55 (n = 51, 7.86%), 56–60 (n = 14, 2.16%), 61–65 (n = 9, 1.37%) and 66–70 (n = 5, 0.77%). The distribution of participants across the age groups is fairly even (31–35 = 19.41%, 36–40 = 24.81% and 41–45 = 20.80%). In terms of gender, the sample was made up of female (n = 371, 57.16%), male (n = 277, 42.68%) and non-binary (n = 1, 0.15%).

Table 6. Study 2 Sample Demographics

Demographic	Participants (n)	%
Age	**n = 649**	
18–25	12	1.85%
26–30	58	8.94%
31–35	126	19.41%
36–40	161	24.81%
41–45	135	20.80%
46–50	78	12.02%

51–55	51	7.86%
56–60	14	2.16%
61–65	9	1.37%
66–70	5	0.77%
Gender	**n = 649**	
Female	371	57.16%
Male	277	42.68%
Non-binary	1	0.15%

4.2.3 Definition of Middle Childhood

The definition of middle childhood is identical to Study 1 (see section 3.2.3).

4.2.4 Survey

Parental Protection Methods (PPMs)
Parental Protection Methods (PPMs) are measured in an identical fashion to Study 1 (see section 3.2.4). The full category descriptions and list of survey questions can be found in Appendix F.

Socioeconomic Status
Again, as in Study 1, SES was measured via The English Indices of Deprivation 2019 (IoD2019) (see section 3.2.4).

4.2.5 Pilot

As a pilot had been conducted for Study 1, and Study 2 was a streamlined version of Study 1 with the same key questions with various questions removed, it was unnecessary to pilot Study 2.

4.3 Results

Data analysis was carried out using R Studio.

4.3.1 Distribution of Socioeconomic Status (SES) – Index of Multiple Deprivation (IMD)

The distribution of the data sample in terms of IMD decile rank score in Fig. 4. and Table 7 is excellent and very evenly spread in terms of IMD decile rank scores and therefore SES. Table 8 shows a median = 5 and standard deviation = 2.87, demonstrating that participants' SES varied from approximately 2–8, which covers 70.57% of the data sample. In real terms, participants are evenly spread across all SES backgrounds and therefore participants' SES is not confounding any results that emerge from the data.

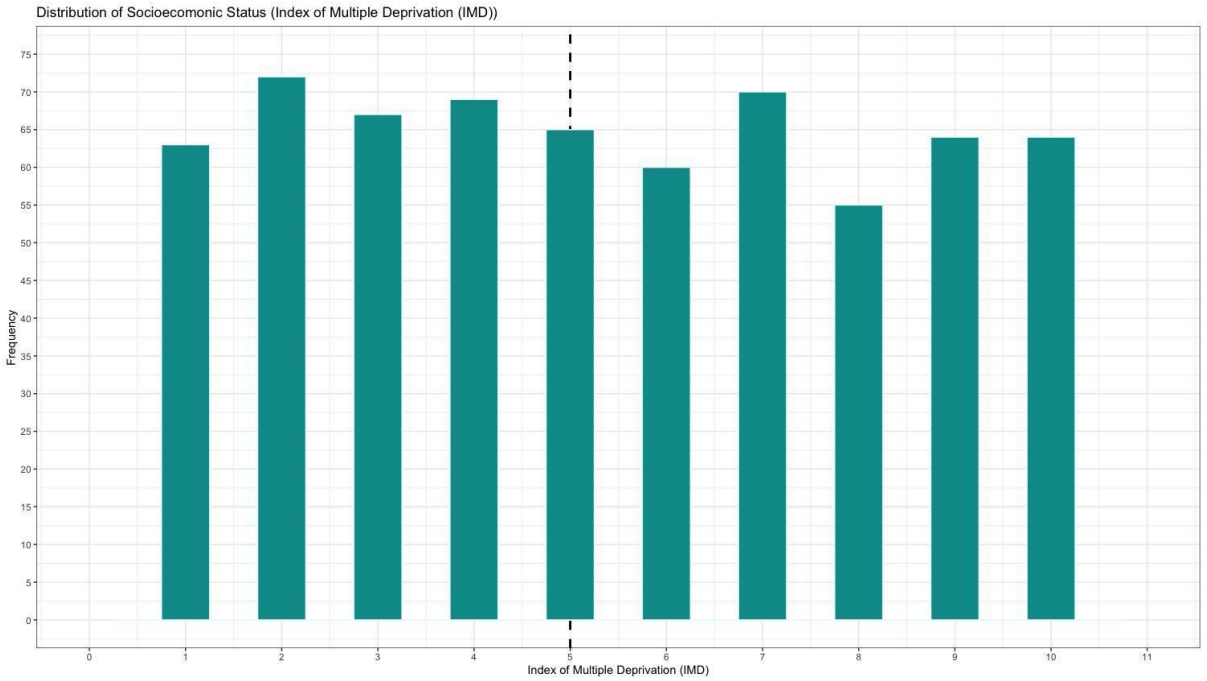

Fig. 4. Distribution of Socioeconomic Status (SES) – Index of Multiple Deprivation (IMD). Median (Dashed Line) = 5.

Table 7. Frequency of Socioeconomic Status (Index of Multiple Deprivation (IMD))

Index of Multiple Deprivation (IMD) Decile Rank Score	n	%	Index of Multiple Deprivation (IMD) Decile Rank Score	n	%
1	63	9.71%	6	60	9.24%
2	72	11.09%	7	70	10.79%
3	67	10.32%	8	55	8.47%
4	69	10.63%	9	64	9.86%
5	65	10.02%	10	64	9.86%
Total				**649**	**99.99% (not 100% due to rounding)**

4.3.2 Main Parental Protection Method (PPM) in the Last 12 Months and Socioeconomic Status (SES)

Any possible relationship between which Parental Protection Method (PPM) parents mainly implement in order to protect their child(ren) from overspending on mobile in-app purchases and SES is particularly interesting to this study (see Fig. 5.). Participants were asked which single main PPM they used in the last 12 months.

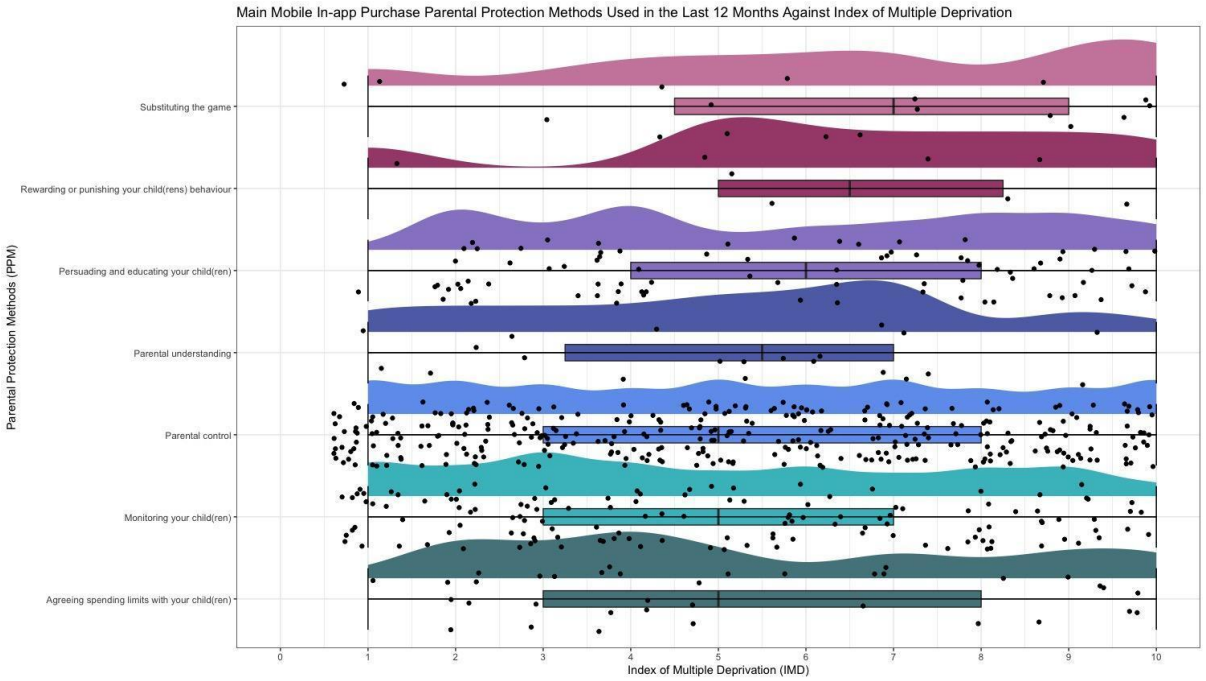

Fig. 5. Main Parental Protection Methods (PPMs) Plotted Against Socioeconomic Status (SES) – Index of Multiple Deprivation (IMD)

Table 8. Descriptive Statistics of Main Parental Protection Methods (PPMs) Used in the Last 12 Months Against Socioeconomic Status (Index of Multiple Deprivation (IMD))

Parental Protection Methods (PPMs)	Index of Multiple Deprivation (IMD)					
	Mean	Median	IQR	SD	N	%
All Parental Protection Methods (PPMs)	5.42	5	5	2.87	649	100%
Parental control	5.43	5	5	2.94	344	53.00%
Persuading and educating your child(ren)	5.79	6	4	2.76	85	13.10%
Monitoring your child(ren)	4.96	5	4	2.79	134	20.65%
Parental understanding	5.27	5.5	3.75	2.57	22	3.39%
Agreeing spending limits with your child(ren)	5.38	5	5	2.82	37	5.70%
Rewarding or punishing your child(ren)'s behaviour	6.38	6.5	3.25	2.83	8	1.23%
Substituting the game	6.47	7	4.5	2.97	19	2.93%
Professional advice	0	0	0	0	0	0.00%

Testing the Hypothesis

For testing the hypothesis and data for significance, and therefore to determine if SES has an effect on PPM, a nonparametric method was used due to the sample size. The researcher will accept p≤0.05 as significant, meaning it will be accepted that the probability the result observed due to chance is 5%. Table 9 shows a Kruskal-Wallis test was performed on the data and found no significance (chi-squared = 9.92, p = 0.36) confirming, in this study, that SES has no effect on PPM so analysing post-hoc pairwise comparisons was not needed. Effect size was also calculated (Cohen's *d* = 0.135), which is below the recommended minimum effect size representing a 'practically' significant effect of ≥0.41 according to Ferguson (2009).

Table 9. Results of Kruskal-Wallis test

Chi-squared	P-value	Effect Size (Cohen's *d*)
9.92	0.36	0.135

4.3.3 Main Parental Protection Method (PPM) Implemented in the Last 12 Months

Table 8 shows the most frequently implemented main PPMs in descending order, with 'Parental control' most frequent (n = 344, 53.00%), followed by 'Monitoring your child(ren)' (n = 134, 20.65%), 'Persuading and educating your child(ren)' (n = 85, 13.10%), 'Agreeing spending limits with your child(ren)' (n = 37, 5.70%), 'Parental understanding' (n = 22, 3.39%), 'Substituting the game' (n = 19, 2.93%), 'Rewarding or punishing your child(ren)'s behaviour' (n = 8, 1.23%) and finally 'Professional help' (n = 0, 0.0%).

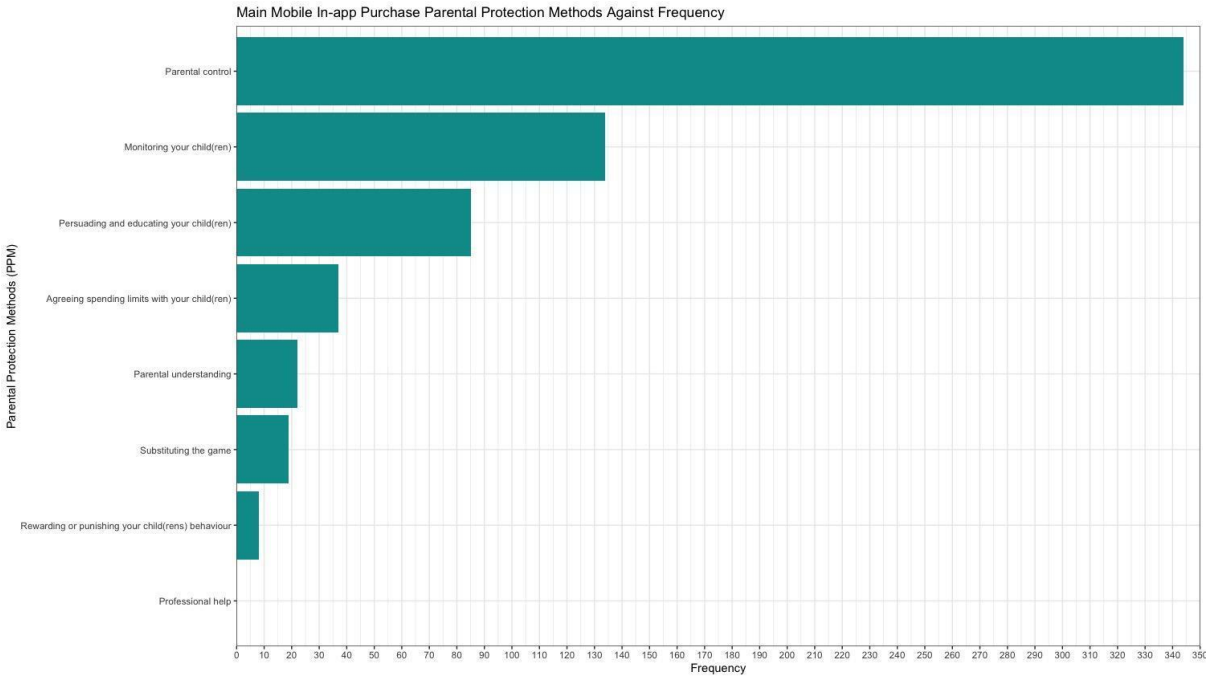

Fig. 6. Main Parental Protection Methods (PPM) Against Frequency

4.4 Discussion

A Kruskal-Wallis test, see Table 9, was used to test the hypothesis and data for significance, and therefore to determine if SES has an effect on the main PPM parents implement to protect their child(ren) from mobile in-app overspending. The results of the Kruskal-Wallis test ($p = 0.36$, therefore no significance found) show a result this extreme which is obtained in Fig. 5. could occur by random chance 36% of the time. It's therefore plausible that the differences in descriptive statistics seen here are the product of random chance. The effect size is Cohen's $d = 0.135$, which is below the recommended minimum effect size representing a 'practically' significant effect of ≥0.41 according to Ferguson (2009). The differences seen between the PPM groups in relation to SES are plausibly the product of random chance 36% of the time and the effect size of these differences is well below the minimum described by Ferguson (2009) as being practically significant. Even though Study 2 is a more precise study with a larger sample size, the result is essentially no different to that of Study 1. Consequently, the null hypothesis still cannot be rejected, and therefore it's plausible there is no relationship between SES and the choice of main PPM that parents are implementing. Therefore, research question two, *'Does the socioeconomic status of parents influence the choice of the mobile in-app purchase safety method that they mainly use?'* has been answered.

The findings in this study, as in Study 1, are in divergence with the literature when looking at parental SES and educational achievement (Martens et al., 2014; Sewell & Shah, 1967), parents providing a safe environment for play with their children (Milteer et al., 2012), child abuse and neglect (Ondersma, 2002), child development (Bradley & Corwyn, 2002; Bornstein & Bradley, 2002), child obesity in developed countries (Sobal & Stunkard, 1989; Wang, 2001), child mental health (Bøe et al., 2012) and physical activity levels in adolescents (Stalsberg & Pedersen, 2010). In all these areas, SES has a negative effect.

A critic may suggest that IMD is not measuring SES correctly. IMD is not strictly a measure of individual SES. An affluent individual could live in a deprived area and vice-versa. However, as mentioned in section 2.7, the IMD decile rank score is used as a main method to measure SES in both the UK and Scotland (SIMD) and has been used effectively in previous research (Bowyer et al., 2019; Morley et al., 2015). The IMD consists of nine criteria to rank postcodes of participants making it a thorough, but not perfect, measure of SES. Another measure of SES is The National Statistics Socio-economic classification (NS-SEC), which in its most detailed format is a 17 category survey. Although the NS-SEC is a more thorough measure of SES, it too has drawbacks in relation to its implementation. In its 17 category format it would be too unwieldy, with knock-on effects in relation to the time participants would require to complete the survey, which would in turn then have cost implications, effectively reducing sample sizes in both studies. The second drawback would be that the NS-SEC relies on participants recalling details and answering questions in relation to when they were younger. In particular, '*Q16: If you finished school after 1980, were you eligible for Free School Meals at any point during your school years?'.* Some participants may not know this and may guess the answer. A third drawback is that certain questions are open to social desirability bias such as *'Q24: Do you consider yourself to be from a lower socio-economic background?'.* Some participants may feel pressure to answer yes to this question when in fact they should answer no. Taking into account the advantages and disadvantages of both the IMD and NS-SEC measures of SES it was decided by the researcher that the IMD was the most practical and accurate measure of SES and therefore SES is being measured correctly.

Study 2 is a more powerful study, with a larger data sample ($n = 649$ compared to $n = 119$), testing the hypothesis more rigorously when compared to Study 1. However, the results remain largely the

same in terms of most popular main PPMs implemented by parents. Looking at Table 8 and Fig. 6., the three main PPMs are also in the same order of popularity as in Study 1. These are 'Parental control' (n = 344, 53.00.7%), 'Monitoring your child(ren)' (n = 134, 20.65%) and 'Persuading and educating your child(ren)' (n = 85, 13.10%). These account for 86.75% of the data sample, clearly showing that there is still a large inclination for parents to use these PPMs as the main way to protect their children from mobile in-app overspending. This therefore answers research question one, *'What mobile in-app purchase protection methods are parents using to protect their children from overspending?'*.

Looking more in depth as with Study 1, it could be that 'Parental control', which includes using built in system software such as features available in Amazon Parent Dashboard, third-party screen time apps, Apple and Google account spending limits and adding passwords to the child's account, are mechanisms that offer control to parents at the touch of a convenient button. They make it easy for parents to implement this as their main PPM of choice. It could also be that limiting screen time acts as an incentive for achieving homework or reading goals.

Again, it could also be that 'Monitoring your child(ren)', which includes the child asking permission for each purchase either in person or via a system such as Apple 'Ask to Buy', monitoring bank accounts and monitoring the games they play, comes naturally to parents. It's natural for child(ren) to ask their parents for everything from a young age and so this PPM is ingrained in human behaviour already. It's also an extremely natural parental behaviour to watch over what a child does from the moment they are born and so monitoring the games a child plays, a child's behaviour and the associated bank account, is again completely natural.

When looking at the last PPM, 'Persuading and educating your child(ren)', it's feasible to suggest this is again natural behaviour between a parent and child. Every parent, no matter what background they are from or how skilled they are at parenting, has taught their child from the moment they were born particularly between the ages of 6–12. It's therefore possible that natural instincts and deep-rooted human behaviours are driving the main PPMs that people choose.

When looking at the PPMs from Gong & Rodda (2022), they are derived from found data with a thematic analysis conducted to create the eight PPMs which were adapted slightly for this study. It seems that parents use only three of these main PPMs ('Parental control', 'Monitoring your child(ren)' and 'Persuading and educating your child(ren)'). Thematic analysis by definition does not quantify the PPMs in Gong & Rodda (2022), so there was no indication prior to conducting this study as to which could be the most frequently implemented PPMs by parents. Moreover, the PPMs seem to realistically cover all the potential methods parents could use to protect their children from mobile in-app overspending.

5 STUDY 3

To investigate research question three, *'Why do parents choose the mobile in-app purchase safety method they do in order to protect their children from overspending?',* Study 3 involved semi-structured Zoom interviews with parents of children (6–12), who have children that play digital games and have made an in-app purchase in the last 12 months. This was to understand why parents choose the mobile in-app purchase safety method they do to protect their children from overspending.

5.1 Research Question

The research question Study 3 is aiming to answer is:

- RQ3: Why do parents choose the mobile in-app purchase safety method they do in order to protect their children from overspending?

5.2 Methods

5.2.1 Ethics

Ethical approval for Study 3 was granted by the Computer Science Ethics Department on 21 July 2022 to conduct a series of interviews. As part of the study, participants were shown an information sheet and consent form before data collection could occur. The information sheet fully explained the purpose of the study, what participation would involve, what data would be required, the storage and anonymity of that data, and the remuneration given for participation in the study. Participants were informed they could ask questions at any time and could withdraw from the study at any time. The information sheet can be found in Appendix G. Participants were then asked to consent to the study thereafter via Qualtrics. Consent can be found in Appendix H.

5.2.2 Participants

Participants (n = 6) were recruited via the online survey from study 1. This was a convenience sample, participants were already pre-screened, being parents of a child(ren) aged 6–12 that played video games and either the parent or child(ren) had made a mobile in-app purchase in the last 12 months. A participant budget of £84 including fees, was employed to facilitate recruitment. Participants were compensated at the rate of £20 per hour equating to £10 for the 30 minutes it took to complete the interview.

Looking at Table 10, at age in particular, most parents were in the 31–35 age range (n = 3, 50.00%), then 36–40 age range (n = 1, 16.66%) and finally 41–45 age range (n = 2, 33.33%). In terms of gender, most parents who agreed to the interview were female (n = 5, 83.33%) and then male (n = 1, 16.66%) with non-binary not represented (n = 0, 0.00%).

Table 10. Study 3 Sample Demographics

Demographic	Participants (n)	%	Demographic	Participants (n)	%
Age	**n = 6**		**Gender**	**n = 6**	
31–35	3	50.00%	Female	5	83.33%
36–40	1	16.66%	Male	1	16.66%
41–45	2	33.33%	Non-binary	0	0.00%

5.2.3 Semi-structured Interviews

In order to address research question three '*Why do parents choose the mobile in-app purchase safety method they do in order to protect their children from overspending?'* and therefore understand why parents are using the main PPM they do, the study will involve a series of Zoom interviews. Guidance from Braun & Clark (2013 p.76–105) was followed on qualitative interview techniques. Specifically, building rapport and online interviews help shift the power balance from the

researcher and therefore they can elicit higher quality data by making participants feel more comfortable. Previous research concurs with Braun & Clark (2013) about the benefits of online interviews (Archibald et al., 2019). They indicate that the Zoom platform is generally preferred by participants and researchers over alternative interviewing mediums such as face-to-face, telephone, and other video conferencing services. In the same study, researchers suggest the viability of Zoom as a tool for the collection of qualitative data because of its relative ease of use, cost-effectiveness, security options and data management features. Therefore, the Zoom platform is an ideal tool to perform interviews, benefiting both the participant and the researcher.

In a study specifically looking at how many qualitative interviews are needed to achieve data saturation, the point in which new codes were no longer being generated from the data, Guest, et al. (2006) found that data saturation had occurred by the time they had conducted and analysed 12 interviews. However, they also discovered that if they were looking only for top-level themes, six interviews would have been enough. Therefore, the study will involve a sample size of six, as suggested by Rosala (2021), with a view to increasing sample size until new codes are no longer being generated from the interviews. After conducting six interviews, it was clear that no new themes were being generated from the interview data and data saturation had occurred. The interviews were organised over the *Prolific* platform with an initial friendly message to make sure participants were comfortable from the outset, please see Appendix I. Interested participants were then contacted a couple of days before the interview with a message, not only to remind them of the date and time of the interview, but also to provide them with the study information sheet, informed consent form, Zoom link and participant number, which can be seen in Appendix J. At all stages, it was important to remain casual and friendly in order to build rapport from the very beginning to ensure participants were comfortable and more likely to divulge richer, deeper insights.

5.2.4 Content Analysis of Zoom Interview Data

The data from the Zoom interviews was then analysed using content analysis. Guidance by Robson (2011, p.348–358) was followed by the researcher to ensure the quality of data analysis is kept high. Content analysis is the quantitative analysis of qualitative data (Mayring, 2000) and is defined by Krippendorff (2004) as "a research technique for making replicable and valid inferences from texts (or other meaningful matter) to the contexts of their use" (p.18) and defined by Neuendorff (2017) as "The systematic, objective, quantitative analysis of message characteristics", which makes it ideal for analysing and evaluating the answers from interviewees on the specifics of research question three, *'Why do parents choose the mobile in-app purchase safety method they do in order to protect their children from overspending?*'. Being able to quantify qualitative data and therefore understand how popular the reasons for why parents use the PPMs they do is the main reason to use content analysis instead of thematic analysis. A further advantage of using content analysis over thematic analysis is the ability for re-analysis, therefore allowing reliability checks and replicability studies, as described by Robson (2011, p.356).

Because the interviews in Study 3 were specifically conducted to address research question three, data was therefore created for this purpose only. Subsequently, this is not found data and so has been produced with no other intent or by other actors, as for example, in an online news article, the researcher can be sure biases were kept to a minimum. Consequently, we know the answers to the main concerns of Carr (1961) of – who produced the data, for what purpose and from what mindset. This would have been very different had the researcher not attempted to answer research question three with interviews conducted specifically for this study. The interviews were audio and video recorded and then transcribed by Zoom. However, due to Zoom's transcription software not being

100% accurate, manually re-transcribing portions of the interview data was necessary. As all interviews were both audio and video recorded, the researcher was able to review all interviews numerous times to understand the data produced. Following guidance from Robson (2011, p352–357) the content analysis procedure was as follows.

Start With a Research Question

Only data relating to research question three *'Why do parents choose the mobile in-app purchase safety method they do in order to protect their children from overspending?*' was included in the analysis. This could be the direct answer to the specific question of the interview *'Why do you use that method as the main way to protect your child from in-app overspending?'* or it could be data generated indirectly from responses to other questions.

Decide On a Sampling Strategy

As content analysis was performed on six participants' interview data, the sampling strategy was straightforward and only involved these six participants. As mentioned in section 5.2.2, participants were already screened for being parents of at least one child aged 6–12 who regularly take part in mobile in-app purchases in digital games.

Define the Recording Unit

It was decided that the recording unit, as described by Robson (2011, p.353), would be on a paragraph by paragraph basis. If participants reiterated the same point later in the paragraph, it was only recorded as one count. However, on some occasions where participants' answers spanned two paragraphs, this was deemed as the same train of thought and therefore the paragraphs were amalgamated and only analysed once. Two or more different codes could be applied to one paragraph.

Construct Categories For Analysis

The data was coded inductively, creating codes that emerged from the data. The initial codes generated were refined a number of times to create higher level, high-inference categories and not just literal categories. A code dictionary was then created in order to develop a criterion for the various categories that were established.

Test the Coding and Assess Reliability

A code dictionary with category criteria, frequency count and illustrative quotes was created. This code dictionary was given to a fellow researcher and they were instructed to count the codes by using the code dictionary. Inter-coder reliability was then calculated, the code dictionary was amended and the data was re-analysed as described in section 5.3.1.

Quality of Content Analysis

Whenever qualitative data is collected and analysed, there are always concerns about the quality of the process. In the interests of creating high quality and rigorous research, the researcher has aimed to be transparent in data collection and analysis of this overarching paper, as well as specifically in conducting content analysis on the interview data. As previously mentioned, guidance from Robson (2011) enables the researcher to execute a high quality content analysis in terms of process. When executing a content analysis, reliability is also exceptionally important and can be defined as the extent to which a measuring procedure yields the same results on repeated trials (Carmines & Zeller, 1979). Reliability ensures that the coding scheme can be replicated by other researchers and still come to the same conclusion (Popping, 2010). Most importantly, Neuendorff (2017) comments that: "Given that a goal of content analysis is to identify and record relatively objective (or at least intersubjective) characteristics of messages, reliability is paramount. Without the establishment of

reliability, content analysis measures are useless." (p.165). Therefore by performing an inter-coder reliability check with a fellow researcher, the content analysis will be reliable and replicable, and combined with guidance from Robson (2011), the content analysis will be of high quality.

5.2.5 Pilot

As recommended by Braun & Clark (2013), it would have been advantageous to conduct a pilot interview with a small number of participants (n = 1) to help refine and familiarise oneself with the questions, to deliver a higher quality interviewing technique, put participants at ease and elicit richer data for the remaining interviews. However, due to the small number of participants from Study 1 that were interested in taking part in the interviews for Study 3, and interviewees not attending (n = 4), it was not possible to have enough participants to be able to facilitate this.

5.3 Results

5.3.1 Content Analysis of Interview Data

Study 3 is focused on answering research question three, *'Why do parents choose the mobile in-app purchase safety method they do in order to protect their children from overspending?'* and therefore participants were asked various questions to elicit this data. The interview questions can be found in Appendix K. As described in section 5.2.4, data that related specifically to research question three was coded inductively, creating codes that emerged from the data. It was decided that analysis would be on a paragraph by paragraph basis, if participants reiterated the same point later in the paragraph, it was only counted once as answers were generally only a paragraph. However, two or more different codes could be applied to one paragraph. A code dictionary was then created. In order to improve the quality of the findings, an inter-coder reliability check was undertaken by a second researcher. The initial reliability check uncovered some disagreements between coders (agreement = 59%, Cohen's Kappa = 0.574) indicating a moderate agreement between researchers. With further discussion and iteration, as can be seen from Table 11, agreement between researchers was excellent at 90.90% (Cohen's Kappa 0.899) indicating that the code dictionary is reliable and replicable.

Table 11. Inter-coder Reliability

	Agreement (%)	Cohen's Kappa (K)
Why Parents Implement the Main PPM They Do	90.90%	0.899

5.3.2 Code Count

Table 12. Code Count From Zoom Interview Data

Code	n	%	Criteria	Quote
Teaching good decision making	31	40.26%	Teaching our children good decision making skills that protect them later on in life, whether it's related to gaming, money, boundaries or	"Yeah because I may not always be there, but I want them to grow up able to not fall into those type of traps and end up in debt to even spill over into other areas of life that are not gaming." P01

			limits. Teach children that we can't just chase pleasure without consequences. Explaining why and not just saying no.	
Teaching financial responsibility	19	24.68%	Using budgeting or the comparison of in-app purchases with real-world alternatives that could be purchased, such as toys or sweets. Teaching the value of money. Fear of a big app bill.	"…we'll sit down and they can have a pot that they can just spend on whatever they want, erm, then they'll put how much they want into their own savings account or ISA and then they'll also, erm, we teach them investing in the markets and stock markets as well." P05
Teaching freedom and independence	12	15.58%	Giving children some element of freedom by still staying in control as a parent via an app, system or with good communication with your child.	"…because they, didn't let, you know, didn't let me have any freedom whatsoever, erm, so I want him have the complete opposite, but not to the extent, of like, you know, I don't care what he's doing." P03
Protection from gambling or addiction	8	10.39%	Protecting children from the harms of gaming addiction or gambling.	"…I don't want them to kind of have that sensation say oh, this is, you know it's really exciting to spend lots of money in this game or to make those frequent purchases and things like that, so we would be I think that's why we're kind of quite careful about, about it…" P07
Teaching about real money v in-game money	6	7.79%	Teaching children the difference between in-game money and real money.	"We've explained many times that it's real money, because you know there seems to be a disconnect, you know… You know how there's a lot of games where you actually collect coins which are free, and then you buy things with those coins. So I wanted her to understand that, you know that that is not the same basically." P04
Most practical or easiest solution	1	1.30%	Practical or easiest method to implement	"…but I also think there's sort of a laziness involved as well, because

			to manage in-app spending.	actually to set up those, to, the restrictions on them buying things, means setting up this whole kind of hierarchy of, of permissions on various devices, and that means that if you then want to kind of authorise a purchase it's actually quite laborious…" P07
Total	**77**	**100%**		

5.3.3 Codes From Zoom Interviews

Looking at Table 12, there were six codes that emerged from the data. Four relating to teaching and one related to protection. Additionally, only one parent cited a practical reason such as a PPM being practical and easy to implement. On the most part, parents cited much higher level reasons as to why they implement their main PPMs of choice, as seen below.

Teaching Good Decision Making (n = 31, 40.26%)
The most frequently mentioned reason for implementing the main PPM that parents do is that it gives them an opportunity to teach their children good decision making skills in order to equip them for similar decisions in the future. The PPM choices that relate to 'Teaching good decision making' are 'Parental control', 'Monitoring your child(ren)', 'Persuading and educating your child(ren)', and 'Agreeing spending limits with your child(ren)'.

> "…I do think that protection also involves kind of educating them about it and then being aware. So it's not just kind of making it not possible for them, because at some point it's going to be possible, and then they could spend hundreds of pounds on something. So it's also about them kind of experiencing it and learning that." (P07)

Teaching Financial Responsibility (n = 19, 24.68%)
The second most frequent reason parents gave was that it gave them an opportunity to teach their children the basics of financial responsibility. This included agreeing weekly budgets and having open discussions as to how much children are allowed to spend on in-app purchases and how much to save in the real world, as well as highlighting to their children what they could buy in the real world instead of on a digital item. This approach is used to ultimately teach children the value of money. The PPM that facilitated teaching financial responsibility was 'Agreeing spending limits with your child(ren)'.

> "…I was never taught any sort of financial responsibility, like I was just always allowed, so then it's just I have money and it burns a hole in my pocket until I spend it and I don't want, I don't want, like, my child to grow up like that and then to not understand, you know – well why can't I do that? Well because if you spend that money there, you're not going to be able to buy this that you've been wanting to buy that's, you know, a real life thing that you've been asking for for ages…" (P03)

Teaching Freedom and Independence (n = 12, 15.58%)
Parents used the control gained from screen time apps and built-in system accept or deny notifications, such as Amazon Parent Dashboard, to require the child to ask permission for an in-app

purchase from parents either electronically or in person. This gives their children a certain amount of freedom, albeit with the parent fully in control of screen time and every in-app purchase. Parents were keen to avoid being strict and entirely rule out in-app purchases, mainly due to not wanting their child to miss out on what their friends are doing. The PPMs of 'Parental control' and monitoring your children were used to introduce children to freedom and independence within the safe parental context.

> "…because they, didn't let, you know, didn't let me have any freedom whatsoever, erm, so I want him have the complete opposite, but not to the extent, of like, you know, I don't care what he's doing." (P03)

Protection From Gambling or Addiction (n = 8, 10.39%)
Surprisingly, there were only a small number of mentions for the fear of gambling or gaming addiction. Parents were more concerned about how they could positively turn the situation into a learning opportunity. The PPM that facilitated 'Protection from gambling or addiction' was mainly 'Monitoring your child(ren)' but also included 'Persuading and educating your child(ren)', 'Parental control' and 'Agreeing spending limits with your child(ren)'.

> "I think it's that addiction isn't it? Because they make these games so amazing for them that, you know, you have to be careful, on that they don't get addicted because for them, you know, it's very exciting, and the colours and to achieve, you know, they like badges and things don't they?." (P04)

Teaching About Real Money v In-game Money (n = 6, 7.79%)
Although this was only mentioned in a few instances, this is an important reason as to why parents use the PPMs of 'Persuading and educating your child(ren)' and 'Agreeing spending limits with your child(ren)'. Parents used these methods to open up discussions about budgeting and teaching their children about the difference between in-game coins or money and real-world money.

> "That's, that's important to, to know that it's real money. And I, that's why, I don't have, she doesn't have a lot of games like this, because you know it's easy, I think, to lose control of how things work in different games…" (P04)

Most Practical or Easiest Solution (n = 1, 1.30%)
Lastly, practical and pragmatic reasons for implementing a PPM were only briefly mentioned by one parent. Monitoring your child(ren) PPM was used by this parent.

> "…but I also think there's sort of a laziness involved as well, because actually to set up those, to, the restrictions on them buying things, means setting up this whole kind of hierarchy of, of permissions on various devices, and that means that if you then want to kind of authorise a purchase it's actually quite laborious…" (P03)

5.4 Discussion

To answer research question three, 'Why do parents choose the mobile in-app purchase safety method they do in order to protect their children from overspending?', a qualitative series of Zoom interviews was undertaken. With the potential overspending risks facing parents and their children, parents used this situation as more of a teaching opportunity rather than to protect their children from these risks directly. Most notably, 'Teaching good decision making' (n = 31, 40.26%) was the most popular reason cited. This involved teaching children good decision making skills that protect them later in life, whether it's related to gaming, money or to improve their judgement generally. It

also involved teaching children that they can't just chase pleasure without consequences and educating them about what the consequences are. Lastly, this category involved teaching boundaries and limits, as well as explaining why children can't have something rather than just saying no, in order to reinforce the teaching of good decision making. This category could be the most popular simply because it's natural and important for parents to teach their children in all other parts of their lives. Parents in the study had children at middle childhood age (6–12), who are at school and are already undergoing extensive learning, so it seems logical that they would be ready to learn life-skills outside of school. Therefore, this category makes perfect sense to use as yet another opportunity to impart knowledge and experience, and teach their children how to take a little responsibility and start making decisions that will equip them for later life. This will ultimately make the child less vulnerable to the trappings of microtransaction overspending. It's important to teach children good decision making skills, as research shows that adolescents may have less decision-making competence than adults in areas such as advice-seeking, evaluation processes and learning (Byrnes, 2002).

'Teaching financial responsibility' (n = 19, 24.68%) is another example of where, as previously mentioned, the child's age and vulnerability makes it an ideal opportunity for parents to teach them how to be responsible with their money. Current research confirming that college students often have problems with money management and controlling impulse spending (Roberts & Jones, 2001) and another study in which students with higher financial self-efficacy and greater financial optimism about the future are significantly less likely to report financial stress (Heckman et al., 2014), both show that this is an important skill to learn early in life. It appears that it's therefore a great idea for parents to practice maths, budgeting and saving, explaining that money is not just there to spend in the short-term and that they have the alternative option to spend their money on real-world things such as toys or sweets. Again, all this could be because of the fact the child is already going through extensive schooling and that they are open to learning important life-skills that they will use for the rest of their lives.

Thirdly, another important lesson and category 'Teaching freedom and independence' (n = 12, 15.58%) was popular. Chen et al., (1997) argue that when looking at authoritarian versus authoritative parenting styles, authoritative parents help children to seek independence and freedom and those children were associated positively with indices of social and school adjustment and negatively with adjustment problems. Conversely, children of authoritarian parents were more aggressive and negatively associated with peer acceptance, sociability-competence and academic achievement. To avoid the negative consequences of authoritarian parenting, parents in this sample were keen to give their children some kind of freedom and independence. This can be challenging, as from birth parents are keen to protect their children from everything that may harm them. But in doing so, naturally, parents limit what their children are exposed to. Rather than just protecting their children from in-app overspending, they have chosen to allow their children a taste of freedom by letting them game and take part in in-app purchasing, but only if they ask their parents for permission in-person or via some kind of electronic system. This way the children get a taste of freedom that is within almost total control of the parents. It's consequently only a perceived freedom by the child, however it means that they can partake in activities that their friends do, but within a safe context created by parents. Moreover, Rezai Niaraki & Rahimi, (2013) suggest this authoritative parenting style has a positive effect on mental health, self-esteem and quality of life when compared to authoritarian parenting.

Another important insight brought to the fore by this qualitative study is that in real-life, parents are using a combination of the eight PPMs in order to create, what they experience at least, as one master solution for their family. Parents are using combinations of 'Monitoring your child(ren)', 'Agreeing spending limits with your child(ren)', 'Parental control', and 'Persuading and educating your child(ren)', to give them the balance between overseeing their children and providing them opportunities to learn freedom and independence. In effect they are tackling the problem more indirectly, by teaching their children life-skills that can be applied to a variety of situations instead of just making them, and being themselves, fearful of the consequences of mobile in-app overspending. They are equipping their children with an arsenal of skills, drip fed by experiencing the systems that they could be fearful of, in order to gradually learn through experience, and positively tackle the potential risks. Rather than cutting microtransactions out of their lives, potentially alienating them from their friends, parents are giving children freedom to fail in a controlled manner. If a child doesn't respect the PPMs set up by parents, it's likely this will involve a small but still unwanted bill, and will present a teachable moment in terms of an opportunity for children to feel the emotions of making a mistake and being remorseful. The literature concurs with the approach of parents that children need to be exposed to the issue at hand, and learn through first hand experience rather than just being closed off from life risks (Cline & Fay 2006). As Cline & Fay (2006) comment, "Responsibility cannot be taught; it must be caught. To help our children gain responsibility, we must offer them opportunities to be responsible." (p.22). Hopefully by experiencing any teachable moments, children will, by the later ages of middle childhood, be skillful at good decision making, have a grasp of financial responsibility and have experienced life with a taste of freedom and independence.

6 DISCUSSION

6.1 Discussion

Answering research question one, *'What mobile in-app purchase protection methods are parents using to protect their children from overspending?'*, it was found that parents used three main PPMs, which accounted for 91.60% of the data sample in Study 1 and 86.75% of the data sample in Study 2, to protect their children from mobile in-app overspending. These are 'Parental control', 'Monitoring your child(ren)' and 'Persuading and educating your child(ren)'.

The most frequently chosen main PPM was 'Parental control' which includes parents using software such as features available in Amazon Parent Dashboard, third-party screen time apps, Apple and Google account spending limits, and adding passwords to the child's account. These are mechanisms that add control for parents at the touch of a convenient button and are a way parents can easily manage their child's exposure to in-app microtransactions.

The second most implemented PPM was 'Monitoring your child(ren)', which includes the child asking for permission for each purchase either in person or via a system such as Apple 'Ask to Buy', monitoring bank accounts and the games they play. It's natural for child(ren) to ask their parents for everything from a young age and so this PPM is likely ingrained in human behaviour already.

The third and final most popularly implemented PPM of note was 'Persuading and educating your child(ren)'. This involves discussing the risks of loot boxes and in-app overspending together, educating them about the similarities between loot boxes and gambling, as well as talking to their child about gambling, the difference between a bit of fun and chasing big winnings, the value of money and the negligible value of loot boxes and microtransactions. Again, it's natural to persuade

and educate your child from the moment they are born so it could be that this is a PPM that appeals to natural parental behaviours.

Consequently, parental principles are intertwined with main PPM choices. Parents' choices reflect rules and limits, monitoring and permission, and persuading and educating, which are all natural parental principles as supported by Steinberg (2004). When referring to rules and limits Steinberg (2004) comments:

> "The main reason is that over time, [rules and limits] help your child develop the ability to manage his own behavior… over time, the control of your child's behavior gradually shifts from being external (imposed by you and other adults) to being internal (imposed by your child herself)." (p.88).

When referring to monitoring and permission, Steinberg (2004) comments:

> "Know where your child is, with whom, and doing what, and do it in a way that demonstrates concern rather than suspiciousness. Don't treat your child as if he's on the witness stand." (p.96).

Lastly, when commenting on persuading and educating, and therefore open communication with your child, Steinberg (2004) states:

> "When researchers ask children and adolescents to name the things they wish were different about their family life, one of the top things on the list is almost always that they wish their parents would spend more time just talking with them." (p.183).

Other than these parenting principles, these PPMs all expose their children to the risks of mobile in-app microtransactions in order to teach them through experience. Experiential Learning Theory (ELT) (Kolb et al., 1999) is a long-standing and well practised theory. Kolb's Experiential Learning Cycle (Kolb, 1984) advocates that experiencing a task, reflecting on that experience, learning from that experience and experimentation of what you have learned is a highly effective way to develop performance of a task and master it. Kolb (1984) states, "The process whereby knowledge is created through the transformation of experience. Knowledge results from the combination of grasping and transforming experience." (p.41). Instead of ruling out microtransactions completely, parents are exposing their children to the experience of in-app microtransactions allowing them to learn whilst still overseeing their children safely. ELT has been successful in higher education as championed by Kolb & Kolb (2005) so there is no reason to doubt that the PPMs implemented by parents to educate their children in life-skills in this study will not have the same desired effect.

To answer research question two, *'Does the socioeconomic status of parents influence the choice of the mobile in-app purchase safety method that they mainly use?'*, a survey was conducted in Study 1 and Study 2. In Study 1, a Kruskal-Wallis test, see Table 5, was used to test the hypothesis and data for significance, and therefore to determine if SES has an effect on the main PPM parents implement to protect their child(ren) from mobile in-app overspending. On the surface SES doesn't appear to have an effect on any main PPMs excluding 'Parental understanding' and 'Agreeing spending limits with your child(ren)' PPMs, to which SES appears it could be influencing PPM choice. However, the results ($p = 0.92$, therefore no significance found) show a result this extreme, which is obtained in Fig. 2. could occur by random chance 92% of the time. Therefore it's plausible that the differences in descriptive statistics seen here are the product of random chance. The null hypothesis cannot be rejected and therefore there is no relationship between SES and the choice of main PPM that parents are implementing. However, the effect size was calculated as Cohen's $d = 0.342$, which is nearing the

recommended minimum effect size representing a 'practically' significant effect of ≥0.41 according to Ferguson (2009). This is of interest as it suggests there is almost an effect size of significance there, which logically leads to the conclusion that with a more precise study with a larger sample size, the study could show that SES could have an effect on the main PPM parents are using to protect their children from mobile in-app overspending. Whilst research question two has been answered, in order to test the hypothesis more severely, a larger sample size could be used which could yield a significant p-value (≤0.05), but also detect a practically significant effect size (≥0.41) in order to understand how much SES is having an effect, if indeed at all. Other noteworthy points are worth considering in Study 1. The first being that SES could be having an effect on PPM choice, but there are not enough participants to demonstrate it, therefore a type II error could be occurring. Again looking at Fig. 2, specifically at 'Parental understanding' and 'Agreeing spending limits with your child(ren)' main PPMs, it appears SES is having an effect here. However, due to having only a few data points for these main PPMs – a type I error is likely occurring. Meaning there are not enough data points for these PPMs and the data is skewed and appearing to show an effect that is not actually present.

To more rigorously test the hypothesis in Study 2, a Kruskal-Wallis test, see Table 9, was used to test the hypothesis and data for significance, and therefore to determine if SES has an effect on the main PPM parents implement to protect their child(ren) from mobile in-app overspending. The results of the Kruskal-Wallis test ($p = 0.36$) show a result this extreme, which is obtained in Fig. 5., could occur by random chance 36% of the time. It's plausible that the differences in descriptive statistics seen here are the product of random chance. The effect size is Cohen's $d = 0.135$, which is below the recommended minimum effect size representing a 'practically' significant effect of ≥0.41 according to Ferguson (2009). Concretely, the differences seen between the PPM groups in relation to SES are plausibly the product of random chance 36% of the time and the effect size of these differences is well below the minimum described by Ferguson (2009) as being practically significant. Therefore, even though Study 2 is a more precise study with a larger sample size, the result is essentially no different to that of Study 1. Consequently, the null hypothesis still cannot be rejected, and therefore it is plausible there is no relationship between SES and the choice of main PPM that parents are implementing. More importantly, research question two, *'Does the socioeconomic status of parents influence the choice of the mobile in-app purchase safety method that they mainly use?'* has been answered thoroughly. Concretely, Study 1 and Study 2 failed to find evidence that there is a relationship between SES and main PPMs parents implement to protect their children from mobile in-app overspending, plausibly suggesting that SES is not having an influence on main PPMs implemented.

It's important to understand if SES does have an effect on what mobile in-app parental protection methods parents are using to protect their child(ren) from overspending in these gambling-like microtransactions, to inform the research community and parents alike in order to further understand what we can do in the future to ensure vulnerable children can be protected, across all socioeconomic backgrounds, but in particular those from low socioeconomic backgrounds. In real terms, it seems that middle childhood children who are from lower socioeconomic backgrounds, who could be susceptible to high impulsivity and low self-control, and therefore more at risk of overspending on mobile in-app microtransactions, are just as likely to be protected by their parents from overspending, as a child from a higher socioeconomic background. This is positive news as these children are from families that are least likely to be able to afford the financial consequences **of oversp**ending. The fear was that, as in the gambling domain, low SES correlates with increased spending and higher pathological gambling rates when compared with people with higher SES.

Consequently, there could be a similar overspending issue in the domain of gaming and microtransactions specifically, mirroring the findings seen in the gambling community. This seems to not be the case however. All PPMs seem to be accessible and implemented by parents from all socioeconomic backgrounds, which is reassuring that families or children are not being left behind and taken advantage of in terms of the methods open to them. As mentioned previously, the findings in Study 1 and Study 2 are in divergence with current research when looking at the relationship with parental SES and other important areas such as educational achievement (Martens et al., 2014; Sewell & Shah, 1967), parents providing a safe environment for play with their children (Milteer et al., 2012), child abuse and neglect (Ondersma, 2002), child development (Bradley & Corwyn, 2002; Bornstein & Bradley, 2002), child obesity in developed countries (Sobal & Stunkard, 1989; Wang, 2001), child mental health (Bøe et al., 2012) and physical activity levels in adolescents (Stalsberg & Pedersen, 2010). In all these areas, SES has a negative effect.

Finally, the paper addresses research question three, *'Why do parents choose the mobile in-app purchase safety method they do in order to protect their children from overspending?'*. With the potential risks of their child overspending, parents used this situation as a teaching opportunity rather than to protect their children from these risks directly. The justifications for why main PPMs were implemented were because of high level reasons mainly based around teaching children, and not practical reasons, such as easy implementation of a main PPM.

The main category that emerged was 'Teaching good decision making' (n = 31, 40.26%). This involved teaching children effective decision making skills that protect them later on in life. It also involved teaching children that they can't just chase pleasure without consequences and educating them on what the consequences are. Lastly, this category involved teaching boundaries and limits, explaining why children can't have something rather than just saying no, in order to reinforce the teaching of good decision making skills. This reason could be the most popular simply because parents in the study had children at middle childhood age (6–12), who are at school and are already undergoing extensive learning, so it seems logical that they would be ready to learn life-skills outside of school. It's important to teach children good decision making skills, as research shows that adolescents may have less decision-making competence than adults in areas such as advice-seeking, evaluation processes and learning (Byrnes, 2002).

The next most popular reason was 'Teaching financial responsibility' (n = 19, 24.68%). This is another example of where, as previously mentioned, the child's age and vulnerability, makes it an ideal opportunity for parents to educate them how to be responsible with their money. Current research confirming that college students often have problems with money management and controlling impulse spending (Roberts & Jones, 2001), and a separate study in which students with higher financial self-efficacy and greater financial optimism about the future are significantly less likely to report financial stress (Heckman et al., 2014), both demonstrate that it's important to learn about budgeting, saving and the reality of money early in life.

Lastly, another important reason parents were keen to teach their children was that of 'Teaching freedom and independence' (n = 12, 15.58%). Chen et al. (1997) argue that when looking at authoritarian versus authoritative parenting styles, authoritative parents help their child to seek independence and freedom. Those children were associated positively with indices of social and school adjustment, and negatively with adjustment problems. Consequently, instead of just shielding their children from in-app overspending and potentially alienating their children from their friends, they have chosen to allow their children a taste of freedom by letting them game and take part in in-app purchasing, but only if they ask for permission in-person or via some kind of electronic

system. This way the children get a taste of freedom, but freedom within control of the parents. This means they can partake in activities that their friends do within a safe context created by their parents. Moreover, Rezai Niaraki & Rahimi, (2013) suggest this authoritative parenting style has a positive effect on mental health, self-esteem and quality of life when compared to authoritarian parenting.

Another important insight brought to the fore by this qualitative study is that in real-life, parents are using a combination of the eight PPMs in order to create, what they experience at least, as one master solution for their family. Parents are using combinations of 'Monitoring your child(ren)', 'Agreeing spending limits with your child(ren)', 'Parental control', and 'Persuading and educating your child(ren)', to give them the balance between overseeing their children and giving them opportunities to learn through freedom and independence with their support.

Parents are tackling the problem of overspending more indirectly, by teaching their children life-skills that can be applied to a variety of situations instead of just making them, and being themselves, fearful of the consequences of mobile in-app overspending. They are equipping their children with an arsenal of skills, drip fed by experiencing the systems and risks that they could be fearful of, in order to gradually learn through experience by likely unwittingly applying ELT as recommended in the literature (Kolb, 1984; Kolb et al., 1999). Rather than cutting microtransactions out of their lives, potentially alienating children from their friends, parents are giving them freedom to fail in a controlled manner. If a child doesn't respect the PPMs set up by parents, it's likely this will involve a small yet still unwanted bill, but it will also present a teachable moment and an opportunity for children to feel the emotions of making a mistake and being remorseful. The literature concurs with the approach of parents that children need to be exposed to the issue at hand and learn through first hand experience rather than just being closed off from life risks (Cline & Fay 2006). As Cline & Fay (2006) comment, "Responsibility cannot be taught; it must be caught. To help our children gain responsibility, we must offer them opportunities to be responsible." (p.22). Hopefully by experiencing any teachable moments, children will, by the later ages of middle childhood, be very experienced at good decision making, have a grasp of financial responsibility and have experienced life with a taste of freedom and independence.

6.2 Limitations

The first limitation of the study is the self-report nature of studies 1, 2 and 3. Self-reported data is always open to social desirability bias (Rosenman et al., 2011). Social desirability bias is effectively a measurement error (Bound, Brown, & Mathiowetz, 2001) between the self-reported data and the truth. Study 1 and 2 in particular, due to the very nature of online surveys, could also be open to acquiescence bias, social desirability bias or satisficing in order for participants to just get the survey done and receive payment for it. Seasoned survey participants on the *Prolific* platform could see this as a constant revenue stream and therefore have the goal of completing multiple surveys per day/week in the most efficient manner. However, due to the relatively large data sample in Study 2 (n = 649), acquiescence bias, social desirability bias and satisficing should be accounted for in the natural variance of the dataset. Study 3 could be more susceptible to social desirability bias as data was elicited via Zoom interviews. It's possible that even though the interviews weren't in the same actual physical space, the added element of visual contact with another person could trigger an element of social desirability bias. That being said, surveys and interviews are extremely popular methods of data elicitation in the research community, with social desirability bias accepted as part and parcel of data collection. To minimise the effects of social desirability bias, rapport building techniques such as using humour (Hewer et al., 2019) and researcher self-disclosure (Vallano &

Compo, 2011) removes interview power dynamics and therefore creates trust with participants. These techniques were applied in Study 3 to minimise social desirability bias. Another limitation is that in reality, parents used a combination of PPMs and not a single main PPM. Parents were forced to choose the PPM they used mainly, which doesn't fully describe the actual situation at hand. However, asking parents to pick a top three for instance, would have been possibly beyond the resources of the study. In addition, parents that took part in all studies could be hypersensitive to the risks of in-app microtransactions and therefore highly motivated to come forward for the study. This could mean that the data is skewed towards these types of parents and is not a representation of parents in general. Another possible limitation is the IMD used as a measure for SES. IMD was used as a practical measure as it's quick, isn't open to self-report bias and allowed a larger sample size due to the nature of asking for the participants' postcodes. The tradeoff is that this is not an individual measure of SES as affluent individuals could live in deprived areas and vice-versa. It's more of a measure of SES of an area. In this study, practicality had to prevail due to limited resources.

6.3 Further Study

From a practical standpoint, further study could involve looking at ways to analyse recorded data to remove the self-report bias element of this study. Another path for further study could be asking parents to record the top three PPMs they implement, which whilst more complicated, could provide a more realistic picture of the PPMs implemented in a real-life situation. With a larger budget, participants would have the time to complete the NS-SEC, which involves more questions to determine SES of individuals, instead of the IMD, which tends to measure the SES of the area individuals live in. This could therefore more accurately determine the SES of individuals. Further study could also involve looking at the effects of SES on larger samples, in a cross-cultural study or in a longitudinal study or a combination of all these.

From a wider perspective, it seems young children are being protected from the pitfalls of microtransaction overspending, with this study laying the foundations for further research. This is just the beginning however, despite the gaming industry generating vast amounts of money, not much is known about how parents protect their children, which leaves plenty of scope for expanding upon this study. We now know that parents use 'Parental control', 'Monitoring your child(ren)' and 'Persuading and educating your child(ren)' almost exclusively as the methods to protect their children from the risks of overspending. We also know that parents use these methods independently or in combination to create one master solution. We know that parents don't see the risks of microtransactions as something to be fearful of enough to completely cut them out of their child's lives. Rather they use them as a teaching opportunity to upskill their children and teach them, through ELT, good decision making and financial responsibility, as well as let them experience life with a taste of freedom and independence. We also know that these protection methods are available to parents from all socioeconomic backgrounds. Therefore, children in more vulnerable situations have the same opportunity to be protected as those from higher socioeconomic backgrounds. The next step however, is to understand how successful these protection methods are. This study has established what PPMs parents are using and why, and whether they are available to parents from all socioeconomic backgrounds, however could it be that parents have varying success rates when it comes to implementing them in the long-term? Studies designed to understand this would be the next brick in the knowledge base to help grow this area of research. These could be studies that measure the impact of PPMs at various time points to understand if children actually did learn the lessons their parents are trying to teach them whilst protecting them from the risks of microtransaction overspending.

7 CONCLUSION

Discovering what PPMs parents implement to protect their children from mobile in-app overspending, why they use that particular PPM and whether PPM choice is affected by SES is important for parents, designers of microtransaction management solutions and the research community alike. For parents, the findings show the PPMs out there are accessible by parents of all socioeconomic backgrounds. Parents from low socioeconomic backgrounds can protect their children as easily as families from higher socioeconomic backgrounds. This means that vulnerable middle childhood children from low socioeconomic backgrounds with issues of low self-control and high impulsivity are not as vulnerable to overspending as previously thought, which is in divergence with findings in the gambling community. It was feared that by being exposed to gambling-like mechanisms in the majority of mobile app games, these children could possibly be taken advantage of and feel the full repercussions of overspending. However, it seems parents are easily able to implement these PPMs. When in isolation or when combined, they can do more than just protect their children, they can allow parents an opportunity to teach good decision making, financial responsibility, and freedom and independence through ELT.

For the research community, this means that this study has provided plausible evidence that despite the warranted concerns about the similarities to gambling, the risks of overspending on microtransactions are being vastly reduced because parents from all socioeconomic backgrounds are able to, and are responding to the risks, and using it as a reason to teach their children the life skills as mentioned previously. Hopefully this study will be used as a platform for fellow researchers to explore further as mentioned in section 6.3.

Lastly, the designers of microtransaction protection solutions by companies such as Amazon, Apple and Google can understand the motivation behind parents' PPM choices in order to develop and improve their systems and accommodate the teaching theme running through the qualitative interview data. These systems can be streamlined to inspire teaching of all children from all socioeconomic backgrounds, improving lives and assisting parents to continually minimise the risks of mobile in-app overspending. This will continue to protect a small percentage, but large number of people across the world, who could be more at risk than the rest of the ever expanding gaming population.

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APPENDIX A

Study 1 – Information Sheet

What mobile in-app purchase safety methods are parents using to protect their children from overspending?

Thank you for your interest in taking part in this online survey and study. This information sheet provides details about the online survey and study, why the research is being conducted, what participating would mean for you and how I/we will use the information you provide.

Purpose of the research

As part of the MSc Human-Centred Interactive Technologies course at the University of York, Human-Centred Interactive Technologies assessment module, we are examining the mobile in-app purchase methods parents use to protect their child(ren) from their excessive spending on in-app purchases on their mobile phones, and how these strategies may vary across different social and economic groups. The purpose is to help us determine from parents what mobile in-app purchase safety methods parents use to protect their children from excessive mobile in-app spending and whether or not different groups tend to make different parental choices. This is part of a Masters Degree in Human-Centred Interactive Technologies.

Your participation

- **You need to be over the age of 18 AND be a parent of a child aged 6–12 that is regularly involved in mobile digital gaming that makes or has made a mobile in-app purchase in the last 12 months.**
- Your participation is completely voluntary. If you are no longer interested in taking part, please let us know so we can try to recruit further.
- You are free to withdraw at any time, without having to provide a reason and without any negative consequences. If you wish to withdraw your data within a period of up to one week after participation, you can do so by contacting the researchers (see below).
- You can ask questions about the study by contacting Chris Cowl: cdc528@york.ac.uk

The study itself

The study will involve the following activities:

- You will be briefed and asked for informed consent (which is part of this survey on the next page).
- You will directed to a short online survey (taking 2-3 minutes to complete) which is on the next page, asking you various questions including your postcode. You will also be asked if you have (in the last 12 months) or currently use any of the in-app purchase safety methods listed in the survey.
- Your data will be collected and stored securely. Specifically, your post code data will be changed into a code from the English Indices of Deprivation as determined by The Ministry of Housing, Communities and Local Government.
- We do not foresee any possible disadvantages to taking part. We are able to offer you compensation for your time at the rate of £9p/h equating to approximately £0.45. We are very grateful for your participation and helping to complete our survey.

- The benefits of the study are that you will help us build an evidence base regarding what mobile in-app purchase safety methods parents use with reference to mobile in-app spending.
- At the end of the survey, you will be provided with an opportunity to ask any questions you may have.

Personal details

The survey will involve providing some of the below:

Basic demographic information such as parental age, parental gender, parental education levels and other questions relating to socioeconomic status are used to describe the data sample.

All questions in the questionnaire will be mandatory. We have taken care to minimise the data that we are collecting, and are only asking questions that are critical to our research goals: As such, the answers to all questions are necessary to address the research questions at hand.

What will happen to your information

Any personal information, such as name or email, will be kept confidential and stored separately from the data set. The data set will be anonymised, so you will not be directly identifiable from any reports or publications.

In accordance with data protection law, the University of York is the Data Controller for this project. This means that the University are responsible for making sure your personal information is kept secure, confidential and anonymous. The University will also ensure that the information is only used in the way you have been told it will be used. Your information will only be accessible in its original form to myself Chris Cowl (cdc528@york.ac.uk), my supervisor David Zendle (david.zendle@york.ac.uk), and in rare occasions, other members of UoY staff who are involved in supervision or assessment.

Information from this study will be stored on University of York's cloud storage systems. The University's cloud storage solution is provided by Google, which means that data can be located at any of Google's globally spread data centres. The University has data protection compliant arrangements in place with this provider (see https://www.york.ac.uk/it-services/google/policy/privacy/). The University processes personal data for research purposes under Articles 6 (1) (e) and 9 (2) (j), of the General Data Protection Regulation (GDPR) (see https://www.york.ac.uk/records-management/dp/guidance/gdprcompliantresearch/). Any personal data (including recordings) will be kept only until the final marks are formally approved for the project module. In accordance with University of York records retention policies, the anonymised data set will be kept for a minimum of 10 years.

If you have concerns about how your information is being processed, please contact the University's Data Protection Officer at dataprotection@york.ac.uk. If you are concerned about the way in which the University has handled your personal data, you have a right to lodge a complaint to the Information Commissioner's Office (Tel: 0303 123 1113, see www.ico.org.uk/concerns for more information).

What if I have any questions?

You are very welcome to ask any questions you have about this research, at any stage before, during or after the study. You can contact me Chris Cowl (cdc528@york.ac.uk) or my supervisor, David Zendle (david.zendle@york.ac.uk) with any questions or concerns about this study.

APPENDIX B

Study 1 – Consent Form

What mobile in-app purchase safety methods are parents using to protect their children from overspending?

Informed Consent Form

Thank you very much for offering to take part in this online survey and study. Before you participate in this study please complete the following:

Consent required to take part in this study:

I confirm that I have read and understood the information sheet explaining this online survey and have had an opportunity to ask questions about it.

As explained in the information sheet, I understand that my participation is voluntary and I am free to withdraw at any time, as explained in the information sheet. I also understand that my personal information is confidential and that my data will be anonymised.

Please make sure:

- **You are over the age of 18 AND you are a parent of a child aged 6–12 that is regularly involved in mobile digital gaming that makes or has made a mobile in-app purchase in the last 12 months.**
- You are aware your participation is completely voluntary. If you are no longer interested in taking part, please let us know so we can try to recruit further.
- You are free to withdraw at any time, without having to provide a reason and without any negative consequences. If you wish to withdraw your data within a period of up to one week after participation, you can do so by contacting the researchers (see below).
- You know you can ask questions about the study by contacting Chris Cowl: cdc528@york.ac.uk

I consent to taking part in this study:
Yes

Todays date:
Date (dd/mm/yyyy):

APPENDIX C

Study 1 – Survey

Screening Questions

1. **Do you live with a child or children that regularly play video games that are aged between 6–12?**
   Yes/No

2. **Have either you (on behalf of your child(ren)) or they made a mobile in-app purchase in the past 12 months?**
   E. g. a mobile in-app purchase is buying in-game money, in-game loot boxes, in-game items such as weapons, clothes, characters, extra lives etc with real-world money.
   Yes/No

Demographics Questions

3. **How old are you?**
   18–25
   26–30
   31–35
   36–40
   41–45
   46–50
   51–55
   56–60
   61–65
   66–70

4. **What is your gender?**
   Please answer with the term you would identify yourself with.
   Female
   Male
   Non-binary
   Other (please specify)

Individual Parental Protection Methods Questions

1. **In the past 12 months, have you used 'Parental control' as a method to protect your child from mobile in-app overspending?**
   E.g. enabling parental controls or installing parental control software, password protecting your child(ren)s account, setting spending limits on your child(ren)s account via Google Play spending limit or Apple Spending Limit with Apple Family Card, turning Apple in-app purchases off completely, limiting device use, limiting access to games with in-app purchases, purchasing pre-paid games cards to limit spending, setting up a pre-loaded credit card.
   Yes/No

2. **In the past 12 months, have you used 'Persuading and educating your child(ren)' as a method to protect your child from mobile in-app overspending?**
   E.g. understanding and discussing the risks of loot boxes and in-app overspending together, educating them about the similarities between loot boxes and gambling and the small chances of opening a loot box and getting an item you want, talking to your child about gambling and the difference between a bit of fun and chasing big winnings, discussing the value of money and the negligible value of loot boxes.
   Yes/No

3. **In the past 12 months, have you used 'Monitoring your child(ren)' as a method to protect your child from mobile in-app overspending?**
   E.g. overseeing every purchase manually or with Apple 'Ask to Buy', monitoring your credit card bills or bank account, monitoring the games your child(ren) play, monitoring your child(ren) for problem behaviour e.g. at school, social or physical activity levels).
   Yes/No

4. **In the past 12 months, have you used 'Parental understanding' as a method to protect your child from mobile in-app overspending?**
   E.g. learning as a parent which games have in-app purchases in them, understanding the risks and in-game safety features available, becoming familiar with the games your child(ren) play and play with them, understanding the PEGI game rating system.
   Yes/No

5. **In the past 12 months, have you used 'Agreeing spending limits with your child(ren)' as a method to protect your child from mobile in-app overspending?**
   E.g. negotiating and teaching your child(ren) how to set a weekly/monthly budget that allows for in-app spending and sticking to the budget.
   Yes/No

6. **In the past 12 months, have you used 'Rewarding or punishing your child(rens) behaviour' as a method to protect your child from mobile in-app overspending?**
   E.g. if your child(ren) respect(s) spending limits or in-app purchase usage – that behaviour is positively reinforced. If they go over their spending limits there will be repercussions, such as uninstalling the game or no further in-app spending allowed.
   Yes/No

7. **In the past 12 months, have you used 'Substituting the game' as a method to protect your child from mobile in-app overspending?**
   E.g. uninstalling games with in-app purchases in favour of games without in-app purchases or encouraging your child(ren) to do other non-screen activities.
   Yes/No

8. **In the past 12 months, have you used 'Professional advice' as a method to protect your child from mobile in-app overspending?**
   E.g. seeking professional help to manage an in-app spending problem that your child(ren) has/have.
   Yes/No

Main Parental Protection Methods Question

1. **In the past 12 months, which one of the following safety methods do you mainly use to manage your child(ren)s mobile in-app spending?**

   Parental control:
   E.g. enabling parental controls or installing parental control software, password protecting your child(ren)s account, setting spending limits on your child(ren)s account via Google Play spending limit or Apple Spending Limit with Apple Family Card, turning Apple in-app purchases off completely, limiting device use, limiting access to games with in-app purchases, purchasing pre-paid games cards to limit spending, setting up a pre-loaded credit card.

   Persuading and educating your child(ren):
   E.g. understanding and discussing the risks of loot boxes and in-app overspending together, educating them about the similarities between loot boxes and gambling and the small chances of opening a loot box and getting an item you want, talking to your child about gambling and the difference between a bit of fun and chasing big winnings, discussing the value of money and the negligible value of loot boxes.

   Monitoring your child(ren):
   E.g. overseeing every purchase manually or with Apple 'Ask to Buy', monitoring your credit card bills or bank account, monitoring the games your child(ren) play, monitoring your child(ren) for problem behaviour e.g. at school, social or physical activity levels).

   Parental understanding:
   E.g. learning as a parent which games have in-app purchases in them, understanding the risks and in-game safety features available, becoming familiar with the games your child(ren) play and play with them, understanding the PEGI game rating system.

   Agreeing spending limits with your child(ren):
   E.g. negotiating and teaching your child(ren) how to set a weekly/monthly budget that allows for in-app spending and sticking to the budget.

   Rewarding or punishing your child(rens) behaviour:
   E.g. if your child(ren) respect(s) spending limits or in-app purchase usage – that behaviour is positively reinforced. If they go over their spending limits there will be repercussions, such as uninstalling the game or no further in-app spending allowed.

   Substituting the game:
   E.g. uninstalling games with in-app purchases in favour of games without in-app purchases or encouraging your child(ren) to do other non-screen activities.

   Professional advice:
   E.g. seeking professional help to manage a in-app spending problem that your child(ren) has/have.

Socioeconomic Status – Index of Multiple Deprivation (IMD) Questions

1. **What is your postcode?**
   If you have more than one property, please give the postcode of the property you mainly live in.

Further Socioeconomic Status Questions

1. **What was the occupation of your main household earner when you were aged about 14?**
   Modern professional and traditional professional occupations such as: teacher, nurse, physiotherapist, social worker, musician, police officer (sergeant or above), software designer, accountant, solicitor, medical practitioner, scientist, civil or mechanical engineer.

   Senior, middle or junior managers or administrators such as: finance manager, chief executive, large business owner, office manager, retail manager, bank manager, restaurant manager, warehouse manager.

   Clerical and intermediate occupations such as: secretary, personal assistant, call centre agent, clerical worker, nursery nurse.

   Technical and craft occupations such as: motor mechanic, plumber, printer, electrician, gardener, train driver.

   Routine, semi-routine manual and service occupations such as: postal worker, machine operative, security guard, caretaker, farm worker, catering assistant, sales assistant, HGV driver, cleaner, porter, packer, labourer, waiter or waitress, bar staff.

   Long-term unemployed (claimed Jobseeker's Allowance or earlier unemployment benefit for more than a year).

   Small business owners who employed less than 25 people such as: corner shop owners, small plumbing companies, retail shop owner, single restaurant or cafe owner, taxi owner, garage owner.

   Other such as: retired, this question does not apply to me, I don't know.

   I prefer not to say.

2. **Which type of school did you attend for the most time between the ages of 11 and 16?**
   A state-run or state-funded school.

   Independent or fee-paying school.

   Independent or fee-paying school, where I received a bursary covering 90% or more of my tuition.

   Attended school outside the UK.

   I do not know.

   I prefer not to say.

3. **If you finished school after 1980, were you eligible for free school meals at any point during your school years?**
   Yes/No

   Not applicable (finished school before 1980 or went to school overseas).

   I do not know.

   I prefer not to say.

4. **What is the highest level of qualification achieved by either of your parent(s) or guardian(s) by the time you were 18?**
   Above degree level (for example MA, MSc, MPhil, PhD).

   Degree or equivalent (for example first or higher degrees, postgraduate diplomas, NVQ/SVQ Level 4 or 5.

   Below degree level (for example A level, SCE Higher, GCSE, O level, SCE Standard or Ordinary, NVQ/SVQ, BTEC).

   No qualifications.

   I do not know.

   I prefer not to say.

   Not applicable.

APPENDIX D

Study 2 – Information Sheet

What mobile in-app purchase safety methods are parents using to protect their children from overspending?

Information Sheet

Thank you for your interest in taking part in this online survey and study. This information sheet provides details about the online survey and study, why the research is being conducted, what participating would mean for you and how I/we will use the information you provide.

Purpose of the research

As part of the MSc Human-Centred Interactive Technologies course at the University of York, Human-Centred Interactive Technologies assessment module, we are examining the mobile in-app purchase methods parents use to protect their child(ren) from their excessive spending on in-app purchases on their mobile phones, and how these strategies may vary across different social and economic groups. The purpose is to help us determine from parents what mobile in-app purchase safety methods parents use to protect their children from excessive mobile in-app spending and whether or not different groups tend to make different parental choices. This is part of a Masters Degree in Human-Centred Interactive Technologies.

Your participation

- **You need to be over the age of 18 AND be a parent of a child aged 6–12 that is regularly involved in mobile digital gaming that makes or has made a mobile in-app purchase in the last 12 months.**
- Your participation is completely voluntary. If you are no longer interested in taking part, please let us know so we can try to recruit further.
- You are free to withdraw at any time, without having to provide a reason and without any negative consequences. If you wish to withdraw your data within a period of up to one week after participation, you can do so by contacting the researchers (see below).
- You can ask questions about the study by contacting Chris Cowl: cdc528@york.ac.uk

The study itself

The study will involve the following activities:

- You will be briefed and asked for informed consent (which is part of this survey on the next page).
- You will be directed to a short online survey (taking 2 minutes to complete) which is on the next page, asking you various questions including your postcode. You will also be asked if you have (in the last 12 months) or currently use any of the in-app purchase safety methods listed in the survey as your main way to protect your child(ren) from mobile in-app overspending.
- Your data will be collected and stored securely. Specifically, your postcode data will be changed into a code from the English Indices of Deprivation as determined by The Ministry of Housing, Communities and Local Government.

- We do not foresee any possible disadvantages to taking part. We are able to offer you compensation for your time at the rate of £9p/h equating to approximately £0.30. We are very grateful for your participation and helping to complete our survey.
- The benefits of the study are that you will help us build an evidence base regarding what mobile in-app purchase safety methods parents use with reference to mobile in-app spending.

At the end of the survey, you will be provided with an opportunity to ask any questions you may have.

Personal details

The survey will involve providing some of the below:

- Basic demographic information such as parental age, parental gender and whether there are a number of children in the 6-12 age range in your household that make in-app purchases regularly.

All questions in the questionnaire will be mandatory. We have taken care to minimise the data that we are collecting, and are only asking questions that are critical to our research goals: As such, the answers to all questions are necessary to address the research questions at hand.

What will happen to your information

Any personal information, such as name or email, will be kept confidential and stored separately from the data set. The data set will be anonymised, so you will not be directly identifiable from any reports or publications.

In accordance with data protection law, the University of York is the Data Controller for this project. This means that the University are responsible for making sure your personal information is kept secure, confidential and anonymous. The University will also ensure that the information is only used in the way you have been told it will be used. Your information will only be accessible in its original form to myself Chris Cowl (cdc528@york.ac.uk), my supervisor David Zendle (david.zendle@york.ac.uk), and in rare occasions, other members of UoY staff who are involved in supervision or assessment.

Information from this study will be stored on University of York's cloud storage systems. The University's cloud storage solution is provided by Google, which means that data can be located at any of Google's globally spread data centres. The University has data protection compliant arrangements in place with this provider (see https://www.york.ac.uk/it-services/google/policy/privacy/). The University processes personal data for research purposes under Articles 6 (1) (e) and 9 (2) (j), of the General Data Protection Regulation (GDPR) (see https://www.york.ac.uk/records-management/dp/guidance/gdprcompliantresearch/). Any personal data (including recordings) will be kept only until the final marks are formally approved for the project module. In accordance with University of York records retention policies, the anonymised data set will be kept for a minimum of 10 years.

If you have concerns about how your information is being processed, please contact the University's Data Protection Officer at dataprotection@york.ac.uk. If you are concerned about the way in which the University has handled your personal data, you have a right to lodge a complaint to the Information Commissioner's Office (Tel: 0303 123 1113, see www.ico.org.uk/concerns for more information).

What if I have any questions?

You are very welcome to ask any questions you have about this research, at any stage before, during or after the study. You can contact me Chris Cowl (cdc528@york.ac.uk) or my supervisor, David Zendle (david.zendle@york.ac.uk) with any questions or concerns about this study.

APPENDIX E

Study 2 – Consent Form

What mobile in-app purchase safety methods are parents using to protect their children from overspending?

Informed Consent Form

Thank you very much for offering to take part in this online survey and study. Before you participate in this study please complete the following:

Consent required to take part in this study:

I confirm that I have read and understood the information sheet explaining this online survey and have had an opportunity to ask questions about it.

As explained in the information sheet, I understand that my participation is voluntary and I am free to withdraw at any time, as explained in the information sheet. I also understand that my personal information is confidential and that my data will be anonymised.

Please make sure:

- **You are over the age of 18 AND you are a parent of a child aged 6–12 that is regularly involved in mobile digital gaming that makes or has made a mobile in-app purchase in the last 12 months.**
- You are aware your participation is completely voluntary. If you are no longer interested in taking part, please let us know so we can try to recruit further.
- You are free to withdraw at any time, without having to provide a reason and without any negative consequences. If you wish to withdraw your data within a period of up to one week after participation, you can do so by contacting the researchers (see below).
- You know you can ask questions about the study by contacting Chris Cowl: cdc528@york.ac.uk

I consent to taking part in this study:
Yes

Todays date:
Date (dd/mm/yyyy):

APPENDIX F

Study 2 – Survey

Screening Questions

1. **Do you live with a child or children that regularly play video games that are aged between 6–12?**
   Yes/No

2. **Have either you (on behalf of your child(ren)) or they made a mobile in-app purchase in the past 12 months?**
   E. g. a mobile in-app purchase is buying in-game money, in-game loot boxes, in-game items such as weapons, clothes, characters, extra lives etc with real-world money.
   Yes/No

Demographics Questions

1. **How old are you?**
   a. 18–25
      26–30
      31–35
      36–40
      41–45
      46–50
      51–55
      56–60
      61–65
      66–70

2. **What is your gender?**
   Please answer with the term you would identify yourself with.
   Female
   Male
   Non-binary
   Other (please specify)

Main Parental Protection Methods Question

1. **In the past 12 months, which one of the following safety methods do you mainly use to manage your child(ren)s mobile in-app spending?**

   Parental control:
   E.g. enabling parental controls or installing parental control software, password protecting your child(ren)s account, setting spending limits on your child(ren)s account via Google Play spending limit or Apple Spending Limit with Apple Family Card, turning Apple in-app purchases off completely, limiting device use, limiting access to games with in-app purchases, purchasing pre-paid games cards to limit spending, setting up a pre-loaded credit card.

   Persuading and educating your child(ren):
   E.g. understanding and discussing the risks of loot boxes and in-app overspending together, educating them about the similarities between loot boxes and gambling and the small chances of opening a loot box and getting an item you want, talking to your child about gambling and the difference between a bit of fun and chasing big winnings, discussing the value of money and the negligible value of loot boxes.

   Monitoring your child(ren):
   E.g. overseeing every purchase manually or with Apple 'Ask to Buy', monitoring your credit card bills or bank account, monitoring the games your child(ren) play, monitoring your child(ren) for problem behaviour e.g. at school, social or physical activity levels).

   Parental understanding:
   E.g. learning as a parent which games have in-app purchases in them, understanding the risks and in-game safety features available, becoming familiar with the games your child(ren) play and play with them, understanding the PEGI game rating system.

   Agreeing spending limits with your child(ren):
   E.g. negotiating and teaching your child(ren) how to set a weekly/monthly budget that allows for in-app spending and sticking to the budget.

   Rewarding or punishing your child(rens) behaviour:
   E.g. if your child(ren) respect(s) spending limits or in-app purchase usage – that behaviour is positively reinforced. If they go over their spending limits there will be repercussions, such as uninstalling the game or no further in-app spending allowed.

   Substituting the game:
   E.g. uninstalling games with in-app purchases in favour of games without in-app purchases or encouraging your child(ren) to do other non-screen activities.

   Professional advice:
   E.g. seeking professional help to manage a in-app spending problem that your child(ren) has/have.

Socioeconomic Status – Index of Multiple Deprivation (IMD) Questions

1. **What is your postcode?**
   If you have more than one property, please give the postcode of the property you mainly live in.
   Please put a space in your postcode (e.g. XXXX XXX).

APPENDIX G

Study 3 – Information Sheet

Why do parents choose the mobile in-app purchase safety method they do to protect their children from overspending?

Information Sheet

Thank you for your interest in taking part in this Zoom interview and study. This information sheet provides details about the Zoom interview and study, why the research is being conducted, what participating would mean for you and how I/we will use the information you provide.

Purpose of the research

As part of the MSc Human-Centred Interactive Technologies course at the University of York, Human-Centred Interactive Technologies assessment module, we are examining why parents choose the mobile in-app purchase safety method they do to protect their children from in-app overspending. The purpose is to help us determine from parents what mobile in-app purchase safety methods parents use to protect their children from excessive mobile in-app spending and why they make these choices. This is part of a Masters Degree in Human-Centred Interactive Technologies.

Your participation

- **You need to be over the age of 18 AND be a parent of a child aged 6–12 that is regularly involved in mobile digital gaming that makes or has made a mobile in-app purchase in the last 12 months.**
- Your participation is completely voluntary. If you are no longer interested in taking part, please let us know so we can try to recruit further.
- You are free to withdraw at any time, without having to provide a reason and without any negative consequences. If you wish to withdraw your data within a period of up to one week after participation, you can do so by contacting the researchers (see below).
- You can ask questions about the study by contacting Chris Cowl: cdc528@york.ac.uk

The study itself

The study will involve the following activities:

- You will be briefed and asked for informed consent (which is part of this survey on the next page).
- You will be sent a Zoom link to take part in a short online interview lasting approximately 30 minutes.
- Your data will be collected and stored securely.
- We do not foresee any possible disadvantages to taking part. We are able to offer you compensation for your time at the rate of £20p/h equating to £10. We are very grateful for your participation and helping to complete our interview.
- The benefits of the study are that you will help us build an evidence base regarding what mobile in-app purchase safety methods parents use with reference to mobile in-app spending.
- The interview will be recorded for data analysis purposes.

At the end of the interview, you will be provided with an opportunity to ask any questions you may have.

Personal details

The interview will involve providing some of the below:

- Basic demographic information such as parental age and parental gender.

All questions in the interview will be mandatory. However, there are no questions that would cause participants to want to skip. We have taken care to minimise the data that we are collecting, and are only asking questions that are critical to our research goals: As such, the answers to all questions are necessary to address the research questions at hand.

What will happen to your information

Any personal information, such as name or email, will be kept confidential and stored separately from the data set. The data set will be anonymised, so you will not be directly identifiable from any reports or publications.

In accordance with data protection law, the University of York is the Data Controller for this project. This means that the University are responsible for making sure your personal information is kept secure, confidential and anonymous. The University will also ensure that the information is only used in the way you have been told it will be used. Your information will only be accessible in its original form to myself Chris Cowl (cdc528@york.ac.uk), my supervisor David Zendle (david.zendle@york.ac.uk), and in rare occasions, other members of UoY staff who are involved in supervision or assessment.

Information from this study will be stored on University of York's cloud storage systems. The University's cloud storage solution is provided by Google, which means that data can be located at any of Google's globally spread data centres. The University has data protection compliant arrangements in place with this provider (see https://www.york.ac.uk/it-services/google/policy/privacy/). The University processes personal data for research purposes under Articles 6 (1) (e) and 9 (2) (j), of the General Data Protection Regulation (GDPR) (see https://www.york.ac.uk/records-management/dp/guidance/gdprcompliantresearch/). Any personal data (including recordings) will be kept only until the final marks are formally approved for the project module. In accordance with University of York records retention policies, the anonymised data set will be kept for a minimum of 10 years.

If you have concerns about how your information is being processed, please contact the University's Data Protection Officer at dataprotection@york.ac.uk. If you are concerned about the way in which the University has handled your personal data, you have a right to lodge a complaint to the Information Commissioner's Office (Tel: 0303 123 1113, see www.ico.org.uk/concerns for more information).

What if I have any questions?

You are very welcome to ask any questions you have about this research, at any stage before, during or after the study. You can contact me Chris Cowl (cdc528@york.ac.uk) or my supervisor, David Zendle (david.zendle@york.ac.uk) with any questions or concerns about this study.

APPENDIX H

Study 3 – Consent Form

Why do parents choose the mobile in-app purchase safety method they do to protect their children from overspending?

Informed Consent Form

Thank you very much for offering to take part in this Zoom interview and study. Before you participate, please complete the following:

Consent required to take part in this study:

I confirm that I have read and understood the information sheet explaining this Zoom interview and study and have had an opportunity to ask questions about it.

As explained in the information sheet, I understand that my participation is voluntary and I am free to withdraw at any time, as explained in the information sheet. I also understand that my personal information is confidential and that my data will be anonymised.

I agree to the video and audio of the interview being recorded and transcribed.

Please make sure:

- **You are over the age of 18 AND you are a parent of a child aged 6–12 that is regularly involved in mobile digital gaming that makes or has made a mobile in-app purchase in the last 12 months.**
- You are aware your participation is completely voluntary. If you are no longer interested in taking part, please let us know so we can try to recruit further.
- You are free to withdraw at any time, without having to provide a reason and without any negative consequences. If you wish to withdraw your data within a period of up to one week after participation, you can do so by contacting the researchers (see below).
- You know you can ask questions about the study by contacting Chris Cowl: cdc528@york.ac.uk

I consent to taking part in this study:
Yes

Todays date:
Date (dd/mm/yyyy):

APPENDIX I

Study 3 – Recruitment Message

Hi

I would like to thank you for taking part in my first survey study on the topic of parental protection methods parents use to protect their child(ren) from mobile in-app overspending – so thanks!

I am contacting you now as you expressed an interest in taking part in a further Zoom interview study.

The study is a follow-on from the first study, which is about the reasons why parents use this main method to protect your child(ren) from mobile in-app overspending.

Your participation will involve answering a few simple questions in a casual and friendly interview which will last approximately 30 minutes.

We won't be testing you so don't worry – we're really interested in what you have to say – there are no right or wrong answers!

Compensation for your time will be £10 equating to £20 an hour.

If you are still interested, I still have available Zoom interview slots on:
Monday 8 August
10.30am–11am
11.30am–12noon
12.30pm–1pm
2.30pm–3pm

Wednesday 10 August
9.30am–10am
10.30am–11am
11.30am–12noon
12.30pm–1pm
1.30pm–2pm
2.30pm–3pm

Thursday 11 August
10.30am–11am
11.30am–12noon
12.30pm–1pm
1.30pm–2pm
2.30pm–3pm

If you are still interested, please specify your preferred date and time of Zoom interview from the list above.

For study consistency reasons, the interview must be performed on Zoom.

Thanks again – your help is very much appreciated!

APPENDIX J

Study 3 – Reminder Message

Hi

This is just a gentle reminder that you have a Zoom interview on Wednesday 10 August at 9.30am.

In order to participate in this interview please follow the three steps below.

1. The link for information about the study and for informed consent is here:
https://york.qualtrics.com/jfe/form/SV_0xobDRl0BiDw3b0

Please note – you must consent to being interviewed (which includes the interview audio and video being recorded and transcribed).

2. Your participant number is:
P7

You will need to select your participant number from the drop down menu on the consent form.

3. The Zoom link for the interview is:
https://york-ac-uk.zoom.us/j/95474131469

Thanks again!

APPENDIX K

Study 3 – Interview Questions

Welcome/Rapport Building

Hi - how are you doing today? Did you have a good weekend? Weather?

Thanks for participating today - I really appreciate your help and your time today. Hopefully I won't keep you too long!

Just to remind you that you can withdraw at any time but also that there are no right or wrong answers here! I'm simply trying to understand your experiences.

So the study is basically trying to understand why parents use the methods they do in order to protect their child(ren) from overspending in mobile app games, specifically on in-app purchases in these games as they are normally cheap but plentiful!

So, let's start…

Opening questions/Rapport Building

1. How many children do you have in your household that are between the ages of 6–12 play mobile app games regularly?

2. How often would you say that is?

3. Do they play video games with in-app microtransactions in?

4. What kind of games do they enjoy?

5. What are the favourite games they play?

6. Do you get involved and play as a family or is gaming a way to get some important alone time?

RQ specific questions/Rapport Building

I know my daughter would love nothing more than unlimited access to my wallet, especially when it comes to online gaming!!

7. Could you describe to me what would typically happen if and when your child wants to make a mobile in-app purchase?

8. How often in a typical month does that happen, would you say?

9. Thinking back at the main parental protection method you picked in the survey - which one did you use as the main method to protect your child(ren)?

10. Why do you use that method as the main way to protect your child from in-app overspending? (probe the answers to this question in particular)

11. Is this method something you rigidly stick to?

12. How successful is this method in keeping on top of mobile in-app overspending?

13. Why do you think it's important to protect your child(ren) when it comes to in-app spending?

14. Do you think there are potentially any other dangers other than just overspending, if any?

15. At what age do you think you wouldn't want to oversee their spending?

16. Why is that, do you think?

Finishing questions

17. Is there anything else you would like to add regarding mobile in-app microtransactions?

Thank you

Thank you again for helping us understand more about why parents use the methods they do to protect their kids from overspending on mobile in-app purchases.

Do you have any questions about the study?