

## Gaming attribute preferences in social marketing programmes: Meaning matters more than rewards

**Link to publication record in USC Research Bank:**

<http://research.usc.edu.au/vital/access/manager/Repository/usc:24800>

**Document Version:**

Author accepted manuscript (postprint)

**Citation for published version:**

Dietrich, Timo; Mulcahy, Rory; Knox, Kathy (2018) Gaming attribute preferences in social marketing programmes: Meaning matters more than rewards. *Journal of Social Marketing*, Vol. 52, No. 3/4, pp.837-865.

**Copyright Statement:**

Copyright © 2018 Emerald Group Publishing Limited. This article is © Emerald Group Publishing and permission has been granted for this version to appear here. Emerald does not grant permission for this article to be further copied/distributed or hosted elsewhere without the express permission from Emerald Group Publishing Limited.

**General Rights:**

Copyright for the publications made accessible via the USC Research Bank is retained by the author(s) and / or the copyright owners and it is a condition of accessing these publications that users recognize and abide by the legal requirements associated with these rights.

**Take down policy**

The University of the Sunshine Coast has made every reasonable effort to ensure that USC Research Bank content complies with copyright legislation. If you believe that the public display of this file breaches copyright please contact [research-repository@usc.edu.au](mailto:research-repository@usc.edu.au) providing details, and we will remove the work immediately and investigate your claim.

**Please cite as:** Dietrich, T., Mulcahy, R., & Knox, K. (2018). Gaming Attribute Preferences in Social Marketing Programs: Meaning Matters More than Rewards. *Journal of Social Marketing* (in press).

### **Abstract**

**Purpose:** There is growing evidence serious games can be effective tools in social marketing programs. Although multiple (serious) game attribute frameworks exist, there is limited knowledge about which game attributes are applicable for sensitive social marketing issues. This research aims to fill this gap by (1) compiling a taxonomy of game attributes for serious games based on the existing literature; and (2) to investigate which of the game attributes users prefer in the context of an alcohol program targeted at adolescents.

**Methodology:** Three serious games were administered to a sample of adolescents as part of a larger trial. Game feedback data from 640 participants were coded and compared using our synthesised classification taxonomy of reward-based and meaningful game attributes.

**Findings:** The findings suggest meaningful game attributes were more frequently preferred than reward game attributes across all three serious games.

**Implications:** This study proposes meaningful game attributes are more important than reward game attributes when designing serious games for (alcohol) social marketing programs. Nevertheless, social marketers must also recognise that reward based game attributes are important attributes as they are essential to making and motivating gameplay.

**Originality:** This research is the first social marketing study that provides insight into game attributes which are preferred by users of serious games or gamified technology in social marketing programs.

**Research limitations:** This study examined serious games targeting only one specific context (alcohol) in one market segment (Australian adolescents) on one gaming platform (online).

**Keywords:** *social marketing, serious games, gamification, gaming attributes*

## Introduction

There is growing realisation that social marketing struggles to compete with commercial offerings and strategies (Schuster, 2015), particularly those which are promoted through digital channels, such as *advergames* (Dias and Agante, 2011; Jones and Reid, 2010). For example, efforts to encourage adolescents to not consume alcohol to excess are hampered by commercial messages that promote over-consumption (Hastings and Sheron, 2013; Ross *et al.*, 2014). Social marketers have begun to employ gamification via serious games as one way to combat commercial promotion of alcohol consumption and encourage adolescents to abstain or reduce their drinking (Rundle-Thiele *et al.*, 2015; Mulcahy *et al.*, 2015; Russell-Bennett *et al.*, 2016).

The objective of a serious game is to provide or promote training or education through means of entertainment (Sawyer, 2009; Zyda, 2005). Serious games provide a new tool for social marketers and can be utilised to gain the attention of target audiences and encourage them to change or maintain behaviours. We know serious games can assist social marketers to increase adolescents' knowledge about alcohol and change attitudes towards binge drinking for the better (Rundle-Thiele *et al.*, 2015) while maintaining behavioural intentions to drink in moderation (Russell-Bennett *et al.*, 2016). However, evidence suggests serious games currently targeting underage alcohol consumption create low levels of customer value (Mulcahy *et al.*, 2015). It can be argued that this lack of perceived customer value is a result of limited insights into what users prefer in the design of serious games. To date, there have been limited empirical investigations of serious games targeting adolescent alcohol consumption (see Mulcahy, *et al.*, 2015; Russell-Bennett, *et al.*, 2016). No published study provides a comprehensive user-oriented approach to ensure serious games are designed with adolescents' preferences in consideration. The current research aims to contribute to social marketing knowledge by filling this gap.

Undertaking a user-oriented (customer oriented) approach is essential to social marketing (Leo, 2013; Dietrich *et al.*, 2016; French and Russell-Bennett, 2015) and game design (Charles *et al.*, 2011). In the serious game literature, various game attribute frameworks with differing dimensions are presented to assist in the design of serious games (Bedwell *et al.*, 2012; Wilson *et al.*, 2009). Although multiple frameworks exist, little is currently known about which game attributes are applicable for sensitive social and health issues, and which are preferred by audiences that social marketing programs seek to reach.

This is a significant gap in knowledge, given game attributes are known to be important for games that seek to influence outcomes such as motivation, knowledge, attitude change and behaviour performance (Johnson *et al.*, 2016): all of which are target outcome variables in social marketing research. In addition, understanding users' preferred game design attributes leads to improved gameplay experiences (Orji *et al.*, 2014). It is therefore proposed to further understand how serious games can assist social marketers to encourage individuals to perform desired behaviours, a greater understanding of game design is required. This paper seeks to achieve the following research aims:

1. To compile a comprehensive taxonomy of game attributes for serious games for social marketing.
2. To investigate what game attribute elements adolescents prefer in serious games (in the context of an alcohol social marketing program).

To achieve the research aims, the article begins with a review of the gaming attribute literature and critically evaluates the use of serious games and gamification to develop a comprehensive classification framework. Next, we apply the classification framework to an empirical investigation of what game attributes adolescents prefer in serious games for alcohol social marketing programs. Drawing on existing game attribute frameworks, we offer novel insights into the design of serious games that aim to influence adolescent alcohol knowledge and attitudes. Although some prior work has begun to address the evaluation and effectiveness of serious games targeting adolescent alcohol consumption (Russell-Bennett *et al.*, 2016), social marketing practice is missing comprehensive insights into what is required in game design to achieve improved outcomes such as game knowledge and game enjoyment. This study took a quantitative approach by assigning scores to open ended comments sourced from the feedback sheets that users completed post game play. The findings and the integrated implications of this study and the opportunities for future research are discussed.

### **Defining Serious Games and Gamification**

In the social marketing literature multiple terms have been used to describe gamification and serious games including: 'electronic games' (Mulcahy *et al.*, 2015); 'interactive games' (Buller *et al.*, 2009); 'social marketing games' (Russell-Bennett *et al.*, 2016); and edutainment (Rundle-Thiele *et al.*, 2015). It can be argued games studied in the social marketing context have a similar aim to that of '*serious games*' (Yam *et al.*, 2017), as

they both aim to improve social, environmental or health-related behaviours (Connolly *et al.*, 2012; Johnson *et al.*, 2016). This is consistent with the definition of serious games being those designed for broad purposes including marketing, education and healthcare (Connolly *et al.*, 2012). When serious games are used in combination with other elements of a social marketing program, rather than being labelled as edutainment (Rundle-Thiele *et al.*, 2015), Johnson and colleagues (2016) argue that the use of game design elements (outside of a game to motivate and track individual well-being behaviours) should be classified as gamification (Deterding *et al.*, 2011). This is an important clarification to draw as gamification and serious games are intersected and draw from one another (Johnson *et al.*, 2016). Games used for social marketing purposes are herein labelled *serious games* and social marketing programs which use (serious) games in conjunction with other program elements are labelled as ‘*gamified*’ social marketing programs.

There is growing evidence gamification and serious games can be effective for social marketing programs that target a range of behaviours including household energy use (Yam *et al.*, 2017), food and vegetable intake (Buller *et al.*, 2009), physical activity (Mitchell *et al.*, 2017) and alcohol consumption (Mulcahy *et al.*, 2015; Russell-Bennett *et al.*, 2016; Rundle-Thiele *et al.*, 2015). While social marketing studies provide evidence as to the capacity for serious games to support behavioural change, user research indicates limited engagement and value in some of these designed games (Mulcahy *et al.*, 2015; Dietrich *et al.*, 2017). Table 1 provides an overview of social marketing studies that have used serious games. The majority of studies have focused on the use of marketing frameworks but provide little to no insight into what game attributes are required for effective game design and what game attributes users’ prefer. Instead, most studies have focused on explaining the customer experience of playing a serious game and the associated impact on outcome variables (Yam *et al.*, 2017), except two studies which examined challenge and competition aspects of serious games (Russell-Bennett *et al.*, 2016). Studies outside of the social marketing domain indicate that there are many more gaming attributes (see Table 2 for a comprehensive overview) and it is important for social marketers to consider and understand these. Therefore, the next section of the literature review provides a review of game attributes for serious games and gamification to demonstrate the current knowledge base outside of social marketing.

<INSERT TABLE 1 ABOUT HERE>

## Game Attributes for Serious Games and Gamification

In the existing literature, there is little consensus on a generalisable game attribute framework for serious games and gamification (Johnson *et al.*, 2016). As scholars began to recognise the potential of games to be used for purposes other than entertainment (learning and behaviour change), additional game attributes were introduced over time (see Table 2). Numerous studies attempted to conceptualise games and the game attributes required for their design (Thiagarajan, 1999, Wilson *et al.*, 2009, Malone and Lepper, 1987, Bedwell *et al.*, 2012, Marlow *et al.*, 2016). With a large number of different frameworks in existence, criticism has emerged, highlighting the problem of an “expansive overlap among similar [game] attributes” (Marlow *et al.*, 2016, p. 415). The conceptualisation of game attributes has also led to relabelling of many similar game attributes, which further intensifies the problem of disentangling overlapping game attributes (Bedwell *et al.*, 2012, Wilson *et al.*, 2009). It is not surprising such problems exist given serious games are designed for very diverse purposes such as learning (Wilson, *et al.* 2009) and health behaviour change (Thompson *et al.*, 2010, Orji *et al.*, 2014).

<INSERT TABLE 2 ABOUT HERE>

Garris *et al.*'s (2002) study was one of the first to attempt to synthesise a game attribute framework. They proposed a taxonomy of six game attributes for games focused on assisting learning (labelled instructional games). Later, Wilson *et al.*'s (2009) review led to a proposed nine category game attribute framework with 18 specific game attributes for serious games targeting learning. Thompson *et al.* (2010) conceptualised 13 design attributes (labelled as change procedures) for targeting health behaviours using behavioural science theories, including self-determination theory (Deci and Ryan, 2004) and the Elaboration Likelihood Model (Petty and Cacioppo, 1986). Other gaming attributes have since been introduced such as Oriji *et al.*'s (2014) eight gaming attributes based on persuasive technology strategies and Hamari *et al.* (2014) ten gaming attributes founded on the notion of motivation affordances. In 2015, Nicholson proposed to distinguish gaming attributes into two main categories; reward-based gamification and meaningful gamification. Most recently, Marlow *et al.* (2016) conducted a systematic literature review to investigate relevant gaming attributes for facilitating effective teamwork. The authors used selective gaming attributes from Bedwell *et al.* (2012) which they deemed relevant in affecting training outcomes. Taken

together, a plethora of different game attributes for serious games targeting learning, training and health have emerged over time. It remains unclear which game attributes constitute effective attributes for a serious game and which of these gaming attributes users prefer. The more frameworks are introduced, the more confusion this creates. Overlapping gaming attributes and definitions create conceptual difficulty in distinguishing differences between attributes (e.g. customisation vs personalisation, praise vs reward, etc.). Baranowski et al. (2008) and Thompson et al. (2010) acknowledge there is little consensus on serious game development. This is further supported by a recent systematic review (Johnson *et al.*, 2016) which criticises the limited consensus regarding definitions and categorisations for game attributes.

In an attempt to develop a comprehensive taxonomy, the previously introduced gaming attributes and respective frameworks as well as systematic reviews have to be taken into consideration. The authors propose Nicholson's (2015) dichotomy of reward-based gamification and meaningful gamification marks a strong starting point to categorise existing gaming attributes. Nicholson's (2015) dichotomy is underpinned by self-determination theory (Deci and Ryan, 2004), which assists in understanding the short-term (reward-based) and long-term (meaningful) effects of gamification. Furthermore, it assists in understanding the extrinsic (reward-based) and intrinsic (meaningful) qualities of gamification. However, Nicholson (2015) only puts forward game attributes for meaningful but not for reward-based gamification and does not consider the previous game attribute frameworks that were proposed by other authors (see Table 2). Nevertheless, the framework by Nicholson (2015) provides a useful distinction between short-term and extrinsically oriented (reward) versus long-term and intrinsically oriented (meaningful) attributes. Therefore, in an endeavour to develop a taxonomy of game attributes, we adopted Nicholson's conceptualisation of reward-based gamification and meaningful gamification and synthesised previously suggested game attributes into a two-tiered classification. Table 3 gives an overview of our proposed taxonomy of reward and meaningful gamification, their associated attributes, as well as a definition of each of the attributes.

<INSERT TABLE 3 ABOUT HERE>

The two-tiered taxonomy of gaming attributes simplifies classification of game attributes, taking into consideration the body of existing literature and various alternative

nomenclatures. It remains unclear which game attributes constitute effective attributes for a serious game, and thus far no social marketing study provides a comprehensive user-oriented approach to ensure serious games are designed with users' preferences in consideration. This study aims to fill this latter gap by investigating which game attributes are preferred by users in the context of serious games targeting prevention and moderation of adolescent alcohol consumption. Next, the method section of the paper will describe in detail the study setting, data collection and procedure for data analysis.

## **Method**

### *Design and Setting*

Game On: Know Alcohol (GOKA) (Dietrich *et al.*, 2015; Rundle-Thiele *et al.*, 2015) was an alcohol social marketing program delivered to 14-16 year-olds (Year 10 students) between 2013-2014. The program aimed to increase students' knowledge and change attitudes and behavioural intentions towards binge drinking behaviour using a multi-component approach that centred on gamification, interactivity, and a single-substance focus. Details of the program and resources have been published in (Rundle-Thiele *et al.*, 2015; 2013). This article focuses on three serious online games that were part of the GOKA program. Ethical approval was granted (MKT/26/10/HREC).

### *Participants*

There were 1907 adolescents who received the GOKA program. Their mean age at baseline was 15.14 years (95% CI 14.84 to 16.45 years). There were approximately equal numbers of male ( $n = 746$ , 51.4%) and female participants. Of the program participants, 640 (33.5%) played one or more of the online games and gave useable written feedback.

### *Materials*

Three online games, Game 1 (Dumb Driver), Game 2 (Perfect Pour) and Game 3 (Alcohol Trivia) were developed for the GOKA program. The researchers collaborated with a game development agency with the aim to enhance engagement, interactivity and fun while learning about a serious topic. Game 1 game was designed to teach students about the effects of alcohol, specifically how drinking would lead to an increase in Blood Alcohol Concentration (BAC) and how this would affect visual impairment and gross motor skills.



The game simulates different BAC while operating a vehicle. As BAC rises the driver's vision is gradually impaired, obstacles increase, and traffic offences occurred resulting in police intervention. A leader board at the end of each gameplay showcases how well students performed.

<INSERT FIGURE 1 – GAME 1 - ABOUT HERE>

Game 2 was designed to teach students about the notion of a standard drink. The game aimed to demonstrate that a standard drink is a standardised measure, while also teaching students that it is difficult to pour exactly one standard drink. The game features six different beverages (see Figure 2) with different glass sizes to enhance difficulty and encourage repeat play. A feedback board at the end of each gameplay indicated how well students performed.

<INSERT FIGURE 2 – GAME 2 - ABOUT HERE>

Game 3 is an online quiz which features 14 non-randomised questions about alcohol, standard drinks, myths, and effects (see Figure 3). After answering each question, users received accuracy feedback with additional background information.

<INSERT FIGURE 3 – GAME 3 - ABOUT HERE>

### *Procedures*

School and student consent was obtained. Due to time, staff and resource requirements associated with delivery of the GOKA program in schools and the technology available at each site, not all participating sites were exposed to the online games. When resources, staff and time allowed, students (under supervision) accessed the online games on school computers and laptops. Students were permitted multiple attempts at the game play. At all sites where games were accessed, students played games for approximately the same duration of time.

Written feedback data were collected immediately following gameplay. Each student was given one feedback form per game to write on. Feedback consisted of participants' free text responses for each game. Participants were asked to describe what they liked about each

game. Participants were given enough space to hand-write their responses. These free text responses were coded and a quantitative measure (counts) of the frequency of endorsing an attribute were used in quantitative analyses.

### *Analysis*

Users' written responses to the serious games were quantitatively coded according to the gaming attributes they represented, using the classification taxonomy of reward-based and meaningful game attributes as developed in this paper (see Table 3). For example, a score of one was awarded if an associated game attribute was identified. This then allowed for the application and analysis of the taxonomy previously developed in the literature review. A similar coding procedure has been used to understand adolescents' perceptions of alcohol (Knox *et al.*, 2016). Three researchers sorted useful written responses from non-useful responses such as illegible text, drawings or blank response sheets (14.35% Game 1; 18.22% Game 2; 22.35% Game 3). Coders read and coded the responses regarding what was liked. Each coder then assessed 20% of their colleagues' work to ensure agreement. Discrepancies or omissions in the initial coding were resolved by re-examining the raw data and negotiating a consensus view. The resulting data were frequency counts of individual game attributes for each game. Coded game feedback data from 640 individual participants who played one or more online games and provided usable written feedback as part of the GOKA program were used for the analyses reported here.

We conducted inferential statistical tests with this frequency data to explore game attributes that users liked within and between games. Within each game, summated scores for the reward and meaningful gamification dimensions were compared using Wilcoxon Signed Rank Test, which is a non-parametric statistical hypothesis test for comparing two repeated measurements on a single sample to assess whether their population mean ranks differ (Howell, 2012). For users that played all three games and provided complete data ( $n = 74$ ), we compared summated reward and meaningful scores using repeated measures ANOVAs with Bonferroni-corrected post-hoc comparisons. 'Game' served as the within subject variable and had three levels (Game 1, Game 2, Game 3). A Hyundt-Feldt correction was applied to degrees of freedom to correct for violation of the assumption of sphericity when interpreting the ANOVA results (Hair *et al.*, 1998).

## Results

The result section begins with the presentation of users game attribute preferences for each of the three serious games and summarises which of the meaning and reward attributes were preferred by users (see Figures 4.1 and 4.2).

The frequency data indicated that reality (23%), performance (21%) and engagement (19%) were the most highly endorsed meaningful gamification attributes for Game 1, while competition (16%) was the most endorsed reward-based gamification attribute for Game 1. For Game 1, overall meaning dimensions were liked significantly more often than the reward dimension,  $Z = -13.74$  ( $N = 633$ ),  $p < .001$ .

<INSERT FIGURES 4.1. & 4.2 ABOUT HERE>

For Game 2, in terms of the meaningful gamification attributes, users preferred interaction (21%), information (20%), and engagement (19%). Frequency data indicated that the most liked reward-based gamification attributes were tasks (29%), followed by goals (18%) and competition (17%). Meaningful game dimensions in Game 2 were liked significantly more often than reward dimensions in Game 2,  $Z = -5.03$  ( $N = 640$ ),  $p < .001$ .

Frequency data from users for Game 3 indicated that by far the most liked meaningful game attributes was information (45%). Engagement (14%) and reflection (14%) were endorsed with less frequency. The most often mentioned reward-based gamification attribute were tasks (17%) followed by goals (9%). In line with the other two games, meaningful game dimensions were liked significantly more often than reward dimensions,  $Z = -8.18$  ( $N = 433$ ),  $p < .001$ .

### *Comparison of games*

There was a significant effect of Game on meaningful scores ( $F(2,110.4) = 6.55$ ,  $p = .005$ , partial  $\eta^2 = .082$ ), such that meaningful scores for Game 2 were statistically higher than for Game 3 ( $p = .008$ , Figure 5). Scores did not differ between Game 1 and Game 2 ( $p = .119$ ) or Game 1 and Game 3 ( $p = .290$ ).

There was a significant effect of Game on reward scores ( $F(2, 113.5) = 9.97$ ,  $p < .001$ , partial  $\eta^2 = .120$ ), such that reward scores were statistically higher for Game 2 than Game 1

( $p = .005$ ) and Game 3 ( $p = .002$ ). As shown in Figure 5, reward scores did not statistically differ between Game 1 and Game 3 ( $p = 1.0$ ).

<INSERT FIGURE 5 ABOUT HERE>

## **Discussion**

This paper addressed two research aims: (1) To synthesise research and compile a comprehensive taxonomy of game attributes for serious games in social marketing; and (2) to apply this taxonomy system to investigate what game attributes adolescents prefer in the context of three serious games that are part of an alcohol social marketing program. Subsequently, this paper makes a novel contribution in that a synthesised game attribute framework was developed, and then applied. Our main findings regarding the categories of preferred game attributes are robust across the three serious games examined. Current findings demonstrate that preferences were subtly nuanced according to the nature of each serious game.

At a holistic level, the findings suggest meaningful game attributes (such as interactivity, aesthetics and functionality) were the most preferred across all three serious games. This is an interesting result, and somewhat unexpected. Reward based gamification attributes (such as rewards, points, competition and leaderboards) are often found and discussed as being pivotal to the design of games as they motivate gameplay (King *et al.*, 2010). In the case of serious games aimed at modifying adolescent alcohol culture, the game attributes classified as meaningful were the most preferred in the current study. The preference for meaningful game attributes might indicate that adolescents were able to identify the differences of serious games in comparison to other games. For example, it could be suggested from the results that adolescents identified the need for serious games to go beyond entertainment and provide additional benefits such as learning about the dangers of excessive alcohol consumption. However, to support this notion, future research is needed.

When findings are considered across all the three serious games, the results indicate the most preferred meaningful game attributes were information, engagement, interaction, reality and performance. For Game 1, the most preferred meaningful game attribute was

reality, for Game 2 interaction and for Game 3 information. The findings of information and interaction being preferred by users in serious games is consistent with the findings of prior research (Fu *et al.*, 2009, Russell-Bennett *et al.*, 2016, Yam *et al.*, 2017) which found similar features to be important in measuring the enjoyment of serious game users. With respect to the attribute of reality, our findings differ to previous game literature, which states that realism is a less effective and important game attribute in respect to others (Wouters *et al.*, 2013, Vogel *et al.*, 2006). Our findings resonate with research in entertainment-focused games, which have found improved levels of realism are important for motivating and engaging users (Wood *et al.*, 2004). Interestingly, realism was only important for Game 1 and much less for Game 2 and 3, which indicates the type of game will drive different attribute preferences. While our results are able to demonstrate (across all three games) that users preferred meaningful over reward based game attributes, our findings show that nuances start to emerge on an individual game attribute level when games are compared.

For the reward-based gamification game attributes, the results demonstrated tasks, competition, and goals were the most preferred attributes overall. In particular, the game attribute of tasks was the most preferred game attribute for Game 2 and Game 3. Whereas for Game 1, the most preferred game attribute was competition. These findings are consistent with previous research in entertainment focused games, which have found game attributes similar to tasks and competition as important for motivating gameplay (Jansz and Tanis, 2007, Yee, 2006). An interesting finding was the low preference for rewards, points, leaderboard and achievement game attributes across all three games. This contradicts studies in serious games (Orji, *et al.*, 2014) and gamification, which found similar game attributes were preferred and wanted by users (Hsu, Chang and Lee, 2013). One explanation for this result is that currently these game attributes may have been less well designed in the tested serious games, and have hence been scored low by participants in this study.

### *Theoretical implications*

This study makes three important theoretical contributions to social marketers' understanding of serious games. First, this study contributes to social marketers understanding of serious games through synthesising existing game attribute frameworks in the serious game literature and developing a two-tiered taxonomy of gaming attributes (Bedwell *et al.*, 2012; Garris *et al.*, 2002; Marlow *et al.*, 2016; Orji *et al.*, 2014; Wilson *et al.*, 2009). This was achieved by using the gamification classification scheme of Nicholson

(2015) which identified game attributes as being meaningful or reward focused. As a result, this classification scheme assists social marketers' theoretical understanding of the plethora of game attributes and game attribute frameworks which are presented in the literature. This comprehensive taxonomy of game attributes for serious games is of value to social marketers aiming to use serious games in their gamified social marketing programs.

Second, this study builds and extends upon the current research and evidence for serious games tackling adolescent alcohol consumption in social marketing (Mulcahy, *et al.*, 2015; Russell-Bennett, *et al.*, 2016; Rundle-Thiele, *et al.*, 2015). By applying the game attribute classification scheme to an empirical investigation into what game attributes adolescents prefer in serious games for alcohol programs, this paper provides clear guidelines for social marketers to design serious games with user preferences in mind. By doing so, this research addresses the lack of insight into the design of serious games for alcohol social marketing programs. This is an important contribution as it provides a framework which future research can leverage upon to understand the impact of the design of serious games on outcomes such as knowledge creation, attitude change and behavioural intentions, which have been previously investigated in social marketing alcohol research (Mulcahy, *et al.*, 2015; Russell-Bennett, *et al.*, 2016).

Third, this research is one of the first social marketing studies to begin to provide insight into game attributes or design features which are preferred by users of serious games or gamified technology. For alcohol social marketing programs, this study suggests that meaningful gamification and its related game attributes are more important design considerations for serious games. Social marketers must also recognise that whilst not significantly preferred in comparison to meaningful game attributes, reward based game attributes (challenge and assessment) are still important attributes as they are essential to making and motivating gameplay (Yee, 2006).

### *Practical implications*

This paper delivers practical contributions to social marketing. First, the paper features a list of game attributes for serious games targeting adolescent alcohol consumption, which provides direction to social marketing researchers and practitioners as to what to include in their game design. This is an important contribution as this can save social marketers time and money when tendering works for the creation and design of serious games for their programs. This research evaluated the preferences of the design of three specific serious games that were designed for an alcohol social marketing program. The

preferences and feedback from participants gained in this research can aid in the future development and evolution of these three serious games. The redevelopment of the serious games tested may improve the user experience and potentially behavioural outcomes. Emphasis may be placed on improving the design of less or more preferred game attributes. For example, in this study of three serious games, preferences for rewards, points and achievements were low and contradicted findings of previous research. This may suggest that more complex and improved design of these game attributes are required to improve their preferences amongst users.

### **Limitations and future research**

Despite the care taken in this study, there are limitations which create opportunities for future research. One limitation of this study is that is cross-sectional in nature. Future studies should seek to examine the preference of game attributes longitudinally, as potentially preferences for game attributes may change over time as users become more experienced with serious games. Another limitation is that this study examined serious games targeting only one specific context (alcohol) in one market segment (Australian adolescents) on one gaming platform (online). Future studies should identify the generalisable game attributes from this study for serious games played on different gaming platforms such as mobile and console which encourage different behaviours such as energy conservation and smoking, as well as those purposed for different market segments. Another interesting avenue for future research is to examine if preferences for game attributes are different across different users based upon characteristics such as skills with games, gender and stages of change. Research should also seek to investigate the impact of these game attributes on desirable outcomes such as attitude change, behavioural intentions and behaviour performance.

We acknowledge that our proposed gaming attribute framework comes with limitations. The proposed classification scheme is somewhat subjective, and there is room for debate regarding the classification of what gamification attributes may or may not fall into reward and meaningful gamification classification. There is an opportunity for future research to debate the proposed gamification classification and extend our work towards a more generalisable serious game attribute framework for social marketing and behaviour change.

Lastly, the small body of research on the use and effectiveness of serious games in gamified social marketing programs indicates the importance of expanding our understanding of how this technology can be used in social marketing research and practice. At present, we

have a limited understanding of which gaming attributes are relevant for gamified social marketing programs and future research is warranted to explore other work and contexts to help explore and add to the evidence base. Finally, the majority of research focuses on young adult Australian samples, there is a need for future research to investigate different geographic market segments to extend the generalisability of current studies and to further demonstrate the effectiveness of serious games and gamification for social marketing purposes.

### **Acknowledgements**

This article was funded by the Australian Research Council Linkage Program and Queensland Catholic Education Commission (LP130100345). The authors extend their gratitude to schools, teachers and students who participated. Without their support, this research would not have been possible.



## References

- BARANOWSKI, T., BUDAY, R., THOMPSON, D. & BARANOWSKI, J. 2008. Playing for Real: Video Games and Stories for Health-Related Behavior Change. *American Journal of Preventive Medicine*, 34, 74-82.
- BEDWELL, W., PAVLAS, D., HEYNE, K., LAZZARA, E. & SALAS, E. 2012. Toward a Taxonomy Linking Game Attributes to Learning: An Empirical Study. *Simulation & Gaming*, 43, 729-760.
- BULLER, M., KANE, I., DUNN, A., EDWARDS, E., BULLER, D. & LIU, X. 2009. Marketing Fruit and Vegetable Intake with Interactive Games on the Internet. *Social Marketing Quarterly*, 15, 136-154.
- CHARLES, D., CHARLES, T., MCNEILL, M., BUSTARD, D. & BLACK, M. 2011. Game-based feedback for educational multi-user virtual environments. *British Journal of Educational Technology*, 42, 638-654.
- CONNOLLY, T., BOYLE, E., MACARTHUR, E., HAINEY, T. & BOYLE, J. 2012. A systematic literature review of empirical evidence on computer games and serious games. *Computers & Education*, 59, 661-686.
- DECI, E. & RYAN, R. 2004. *Handbook of Self-Determination Research*, Rochester, NY, University of Rochester Press.
- DETERDING, S., DIXON, D., KHALED, R. & NACKE, L. 2011. From game design elements to gamefulness: defining "gamification". *Proceedings of the 15th International Academic MindTrek Conference: Envisioning Future Media Environments*. Tampere, Finland: ACM.
- DIAS, M. & AGANTE, L. 2011. Can advergames boost children's healthier eating habits? A comparison between healthy and non-healthy food. *Journal of Consumer Behaviour*, 10, 152-160.
- DIETRICH, T., TRISCHLER, J., SCHUSTER, L. & RUNDLE-THIELE, S. 2017. Co-designing services with vulnerable consumers. *Journal of Service Theory and Practice*, 27, 663-688.
- DIETRICH, T., RUNDLE-THIELE, S., SCHUSTER, L., DRENNAN, J., RUSSELL-BENNETT, R., LEO, C., GULLO, M. & CONNOR, J. 2015. Differential segmentation responses to an alcohol social marketing program. *Addictive Behaviors*, 49, 68-77.
- DIETRICH, T., RUNDLE-THIELE, S., SCHUSTER, L. & CONNOR, J. 2016. Co-designing social marketing programs. *Journal of Social Marketing*, 6, 41-61.
- FRENCH, J. & RUSSELL-BENNETT, R. 2015. A hierarchical model of social marketing. *Journal of Social Marketing*, 5, 139-159.
- FU, F., SU, R. & YU, S. 2009. EGameFlow: A scale to measure learners' enjoyment of e-learning games. *Computers & Education*, 52, 101-112.
- HAIR, J., BLACK, W., BABIN, B., ANDERSON, R. & TATHAM, R. 1998. *Multivariate data analysis*, Upper Saddle River, NJ, Prentice hall.
- HASTINGS, G. & SHERON, N. 2013. Alcohol marketing: grooming the next generation - Children are more exposed than adults and need much stronger protection. *British Medical Journal*, 346, 1-2.
- HOWELL, D. 2012. *Statistical Methods for Psychology*, Belmont, CA, Cengage Learning.
- JANSZ, J. & TANIS, M. 2007. Appeal of playing online first person shooter games. *Cyber Psychology & Behavior*, 10, 133-136.
- JOHNSON, D., DETERDING, S., KUHN, K., STANEVA, A., STOYANOV, S. & HIDES, L. 2016. Gamification for health and wellbeing: A systematic review of the literature. *Internet Interventions*, 6, 89-106.
- JONES, S. & REID, A. 2010. Marketing to children and teens on Australian food company web sites. *Young consumers*, 11, 57-66.
- KING, D., DELFABBRO, P. & GRIFFITHS, M. 2010. Video game structural characteristics: A new psychological taxonomy. *International Journal of Mental Health and Addiction*, 8, 90-106.
- KNOX, K., SCHMIDTKE, D., DIETRICH, T. & RUNDLE-THIELE, S. 2016. Everyone was wasted"! Insights from adolescents' alcohol experience narratives. *Young Consumers*, 17, 321-336.

- LEO, C. 2013. Social Marketing Customer Orientation: A Conceptualization, Typology, and Conceptual Framework. *Journal of nonprofit & public sector marketing*, 25, 56-80.
- MALONE, T. & LEPPER, M. 1987. Making learning fun: a taxonomy of intrinsic Human Factors. *The Journal of the Human Factors and Ergonomics Society*, 50, 903-933.
- MARLOW, S., SALAS, E., LANDON, L. & PRESNELL, B. 2016. Eliciting teamwork with game attributes: A systematic review and research agenda. *Computers in Human Behavior*, 55, Part A, 413-423.
- MITCHELL, R., SCHUSTER, L. & DRENNAN, J. 2017. Understanding how gamification influences behaviour in social marketing. *Australasian Marketing Journal (AMJ)*, 25, 12-19.
- MULCAHY, R., RUSSELL-BENNETT, R. & RUNDLE-THIELE, S. 2015. Electronic games: can they create value for the moderate drinking brand? *Journal of Social Marketing*, 5, 258-278.
- NICHOLSON, S. 2015. A RECIPE for Meaningful Gamification. In: REINERS, T. & WOOD, L. (eds.) *Gamification in Education and Business*. Switzerland: Springer International Publishing.
- ORJI, R., VASSILEVA, J. & MANDRYK, R. 2014. Modeling the efficacy of persuasive strategies for different gamer types in serious games for health. *User Modeling and User-Adapted Interaction*, 24, 453-498.
- PETTY, R. & CACIOPPO, J. 1986. The Elaboration Likelihood Model of Persuasion. *Advances in Experimental Social Psychology*, 19, 123-205.
- ROSS, C., OSTROFF, J., SIEGEL, M., DEJONG, W., NAIMI, T. & JERNIGAN, D. 2014. Exposure to magazine advertising for alcohol brands most commonly consumed by youth: Evidence of directed marketing. *Journal of Studies on Alcohol and Drugs*.
- RUNDLE-THIELE, S., SCHUSTER, L., DIETRICH, T., DRENNAN, J., RUSSELL-BENNETT, R., LEO, C. & CONNOR, J. 2015. Maintaining or Changing a Drinking Behavior? GOKA's Short-term Outcomes. *Journal of Business Research*, 68, 2155-2163.
- RUNDLE-THIELE, S., RUSSELL-BENNETT, R., LEO, C. & DIETRICH, T. 2013. Moderating teen drinking: combining social marketing and education. *Health Education*, 113, 392-406.
- RUSSELL-BENNETT, R., LEO, C., RUNDLE-THIELE, S. & DRENNAN, J. 2016. A Hierarchy-of-Effects Approach to Designing a Social Marketing Game. *Journal of Nonprofit and Public Sector Marketing*, 28, 105-128.
- SAWYER, B. 2009. Foreword: From Virtual U to Serious Game to Something Bigger. In: RITTERFELD, U., CODY, M. & VORDERER, P. (eds.) *Serious Games: Mechanisms and Effects*. Routledge.
- SCHUSTER, L. 2015. Competition and its influence on consumer decision making in social marketing. *Journal of Marketing Management*, 31, 1333-1352.
- THIAGARAJAN, S. 1999. Team activities for learning and performance. In: STOLOVITCH, H. & KEEPS, E. (eds.) *Handbook of human performance technology*. San Francisco, CA: Jossey-Bass/Pfeiffer.
- THOMPSON, D., BARANOWSKI, T., BUDAY, R., BARANOWSKI, J., THOMPSON, V., JAGO, R. & GRIFFITH, M. 2010. Serious video games for health: How behavioral science guided the development of a serious video game. *Simulation & Gaming*, 41, 587-606.
- VOGEL, J., VOGEL, D., CANNON-BOWERS, J., BOWERS, C., MUSE, K. & WRIGHT, M. 2006. Computer gaming and interactive simulations for learning: A meta-analysis. *Journal of Educational Computing Research*, 34, 229-243.
- WILSON, K. A., BEDWELL, W. L., LAZZARA, E. H., SALAS, E., BURKE, C. S., ESTOCK, J. L., ORVIS, K. L. & CONKEY, C. 2009. Relationships Between Game Attributes and Learning Outcomes: Review and Research Proposals. *Simulation & Gaming*, 40, 217-266.
- WOOD, R., GRIFFITHS, M., CHAPPELL, D. & DAVIES, M. 2004. The structural characteristics of video games: A psycho-structural analysis. *Cyber Psychology & Behavior*, 7, 1-10.
- WOUTERS, P., VAN NIMWEGEN, C., VAN OOSTENDORP, H. & VAN DER SPEK, E. 2013. A meta-analysis of the cognitive and motivational effects of serious games. *Journal of Educational Psychology*, 105, 249-265.
- YAM, A., RUSSELL-BENNETT, R., FOTH, M. & MULCAHY, R. 2017. How Does Serious M-Game Technology Encourage Low-Income Households To Perform Socially Responsible Behaviors? *Psychology & Marketing*, 34, 394-409.

YEE, N. 2006. Motivations for play in online games. *Cyber Psychology & Behavior*, 9, 772-775.  
ZYDA, M. 2005. From Visual Simulation to Virtual Reality to Games. *Computer*, 38, 25-32.