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## Exploring flow experiences in cooperative digital gaming contexts



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## ABSTRACT

Given the social nature of digital gaming, an investigation into social processes underpinning the experiences within social contexts of play is greatly warranted. The current research explored the underpinnings of “group flow” within cooperative-based gaming. In particular, this was intended to provide insight into the social processes which facilitate flow experiences in these contexts. This was achieved through a questionnaire in which gamers ( $N = 76$ ) provided retrospective open-ended accounts of flow during cooperative gaming. Additionally, quantitative data was obtained on flow and post-gameplay mood within this experience, as well as in solo gaming for comparative analysis. Thematic analysis of the qualitative responses revealed a number of factors which determined the experience of flow. These were; effective communication and team-work and task relevant knowledge of group members. Additionally, although flow was found to be lower in cooperative versus solo gaming, no differences in post-gameplay mood were observed. These findings aid conceptual development of facilitators of group flow in cooperative gaming, with insights into how this may extend to other cooperative activities. Additionally, they also provide new practical insight for representatives in the gaming industry on how gaming may be developed with the aim of promoting positive shared group experiences.

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## 1. Introduction

It is widely accepted that playing digital games with others can enhance the experiences of the activity, particularly for positive mood, arousal and engagement (Gajadhar, de Kort, & Ijsselstein, 2008, 2009a, 2009b; Kaye & Bryce, 2014; Mandryk, Inkpen, & Calvert, 2006; Ravaja et al., 2006). For example, previous research has typically identified differences in psychological and physiological effects between conditions of participants undertaking gaming tasks with other humans versus computer-controlled opponents (Eastin, 2006, 2007; Lim & Lee, 2009; Lim & Reeves, 2010). These findings suggest that social contexts of gameplay are an important determinant of the experiences and outcomes of the activity, highlighting the need for further research to address specific questions which may be raised from such research.

One such issue relates to the extent to which these previously observed differential outcomes are relevant to “real world” gaming experiences. That is, the typical laboratory setting may not be considered to be the most representative context for exploring everyday social gaming, which can be largely dynamic and varied in nature (Kaye & Bryce, 2012). Thus, it could be argued that findings

have little external validity to understanding the psychological and social underpinnings of real-world gaming experiences. Additionally, it remains unclear about the particular social processes which may underpin enhanced experiences in cooperative-based gaming, and particularly how these may function in facilitating the experience of flow (Csikszentmihalyi, 1975), for example. Specifically considering “flow”, this is defined as characterising an experience in which an individual feels “in the zone” during an intrinsically motivating and enjoyable activity (Csikszentmihalyi, 1975). The original flow framework outlines a number of key conditions and characteristics which underpin the flow experience (Csikszentmihalyi, 1975). These are; a balance of an individual's skill to meet a high challenge of a task, clear goals of a task, unambiguous feedback, focused attention, loss of self-consciousness, distorted sense of time, sense of control, and an overall autotelic experience. Whilst this original framework considered flow as an individual experience, more recent commentary has identified its utility to explain shared experiences, otherwise known as any of the following; “shared flow”, “group flow” or “networked flow” (Gaggioli, Milani, Mazzoni, & Riva, 2011; Gaggioli, Riva, Milani, & Mazzoni, 2012; Nakamura & Csikszentmihalyi, 2002; Sato, 1988; Sawyer, 2008; Walker, 2010). Some features found to be relevant in shared experiences of flow are; companionship, sense of belonging, and interactivity among group members (Rufi,

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Włodarczyk, Páez & Javaloy, in press; Sato, 1988). Similarly, aspects of interactivity on group identity and processes have been found to be relevant for social gaming, supporting the application of flow in digital gaming contexts (Argenton, Triberti, Serino, Muzio, & Riva, 2014; Chiang, Lin, Cheng, & Liu, 2011). Along similar lines, research findings in the similar fields of immersion and social presence are helpful to consider here (see Brown & Cairns, 2004; Gajadhar et al., 2008, 2009a, 2009b). Namely, research on social presence (i.e. a player's awareness of another through a mediated environment) has found that context, co-location and relatedness between players (i.e. online others, "real-world friends") has little impact on the behavioural involvement experienced during gameplay (de Kort, IJsselstein, & Poels, 2007). Similarly, flow experiences have been found to be largely equivalent when comparing solo and social gameplay contexts, as well as those between online versus offline gaming (Kaye & Bryce, 2014).

However, although previous research has considered the extent to which the experience of "flow" may be experienced within social-based gaming contexts (Kaye & Bryce, 2012) and whether this differs from solo-based gaming (Kaye & Bryce, 2014), the variety of group processes which underpin so-called "group flow" are not yet fully established. In particular, research exploring these issues in reference to specific gameplay contexts would be a beneficial line of enquiry. For example, greater focus is needed on exploring the social underpinnings of specific forms of gameplay (e.g., cooperative). Specifically when considering cooperative-based gameplay (i.e. two or more players undertaking a task which requires complementary participation to accomplish a shared goal), previous evidence shows flow to occur as the result of parallel and organised tasks, characterised by a shared sense of social belonging and collective competency (Kaye & Bryce, 2012). Additionally, awareness of other players' skills is particularly relevant in the group flow framework, based on the findings of research on competitive forms of gameplay (Kaye & Bryce, 2012). However, there is little available empirical evidence which identifies any further insights into this issue. Namely, what social factors and processes are most relevant in the context of cooperative-based gaming for promoting a shared experience of flow? Previous research enquiries have also failed to draw clear distinctions in experiences of group flow as a product of context of play (i.e., online versus offline). This formed the basis for the current study, in exploring gamers' selected self-reports of cooperative-based gameplay, to explore the facilitators of "group flow" within these contexts. This was achieved through obtaining gamers' qualitative accounts of their experiences in respect of cooperative-based gaming. Additionally, quantitative reports of players' experiences of flow and post-gameplay mood were also obtained in respect of these cooperative experiences as well as in solo gameplay, as a means of providing a comparative analysis of these issues between contexts. This formed the basis for the formation of a number of research questions:

*RQ1: What are the facilitators of "group flow" within cooperative-based gaming?*

*RQ2: To what extent are flow and post-gameplay mood different between cooperative and solo gaming contexts?*

## 2. Method

### 2.1. Design/procedure

A web-link to an online questionnaire was advertised to digital gamers on numerous online gaming sites and discussion boards. Participants were asked to consider a recent cooperative gaming

experience, and provide an open-ended account of the experiences and feelings they had derived from this (e.g., "Please provide an account of the experiences and feelings you got from this gameplay session"). To obtain further details on these experiences, participants were asked to indicate what type of game and gameplay context (online or offline) these experiences related to. Additionally, participants were also asked to provide quantitative self-report ratings for the experience of flow, positive and negative mood following gameplay in respect of this cooperative experience, as well as a recent solo gaming experience for comparative analysis.

To explore key indicators of group flow in cooperative gameplay contexts, analysis of the open-ended responses were analysed using thematic analysis. This was undertaken in line with Braun and Clarke's (2006) suggested strategy. This included the written responses being read through numerous times to aid familiarisation of the data. Following this, initial themes were identified which were then further scrutinised by identifying codes within the data. For a "theme" to be identified as such, it had to characterise a pattern in the responses in which at least a description of a phenomena is identified (Boyatzis, 1998). These themes were reviewed in line with the data, in which a "codebook" was developed as a means of organising the responses for fuller interpretation (Crabtree & Miller, 1999). Themes of "communication", "teamwork", and "task-relevant knowledge of others" were identified through this process in which these were given a definition and description in line with previous procedures in thematic analysis (e.g., Crabtree & Miller, 1999; Fereday & Muir-Cochrane, 2006). Finally, relevant extracts were chosen to reflect the themes as illustrations within the written report of the research.

### 2.2. Participants

Participants were digital gamers ( $N = 76$ ), who mainly identified themselves as being hard-core/experienced gamers (42.1%). Others were "serious" gamers (18.4%), "casual" gamers (23.7%) and "social" gamers (10.5%). Gamer descriptions were used in line with previous literature pertaining to these categories (e.g., Juul, 2010). Specifically, "hard-core/experienced" gamers are those who identify themselves as being more dedicated or invested as a gamer compared to those who are more "casual" by nature. "Serious" gamers, however differ in their investment from a professional-standpoint (e.g., might play or make games for a living). Finally, "social" gamers identify as such based on their primary motivation of play being attributed to socialising with others. Although these categories are not necessarily mutually exclusive, these were obtained through participants' own appraisals of the category which they felt most relevant to them. The majority of participants reported that they played digital games on average, for at least five hours per week (80.3%), and 22.4% of these reported that this exceeded 30 h per week. The majority of participants were male (71.1%), aged between 18 and 25 years (63.2%).

### 2.3. Materials

#### 2.3.1. Flow

The *Flow State Scale-Short Form* (Jackson & Eklund, 2002; Jackson & Marsh, 1996) was used to measure the experience of flow in the cooperative-based gaming contexts, as well as a solo one. Participants were asked to rate the extent to which they agreed with a series of eight statements about their experiences of flow on a 5-point scale (1 = strongly disagree, 5 = strongly agree). Items included "I felt I was competent enough to meet the high demands of the task"; and "I had a good idea while I was performing about how well I was doing" For the cooperative gaming context, a modified version of the FSS-Short Form was used in which the

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