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# Blending in Hybrid Games: Understanding Hybrid Games Through Experience

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## Abstract

The meaning of what hybrid games are is often fixed to the context in which the term is used. For example, hybrid games have often been defined in relation to recent developments in technology. This creates issues in its usage and limitations in thinking. This paper argues that hybrid games should be understood through conceptual metaphors. Hybridity is the blending of different cognitive domains that are not usually associated together. Hybrid games usually blend domains related to games, for example digital and board games, but can blend also other domains. Through this type of thinking, designers can be more open to exploring how their games can be experienced.

## Author Keywords

Augmented reality games; conceptual blending; conceptual metaphor; games; hybridity; hybrid games; mixed reality games; pervasive games.

## ACM Classification Keywords

K.8.0 [Personal Computing]: General – Games.

## General Terms

Theory, Human Factors, Design

## Introduction

Hybrid games can be seen as an exciting new category of games. While research projects have explored the possibilities of different hybrids for several decades, commercial products have been rarer. Recently, this has started to change [19]. Although it seems that designing and developing hybrid games is now more popular than ever, examples such as board games with electric components have been made as early as the 1910's. Although it is common to view hybrid games as a combination of digital and physical elements in a single product, viewing them through such a lens can be seen as a limiting factor in their design and analysis. This type of definition also allows for problematic cases, as most digital games use physical input methods. Furthermore, games exist to players as experiences, more so than as technological compositions. Thus, to be able to design and analyse hybrid games, it is important to view hybrid games through the experiences they provide and not only through their technology.

## Previous Research

The focus of the studies concerning hybrid games has been mostly on augmenting traditional board games with digital technology, like RFID-sensors [6] or digital tabletops [9]. Some studies [5] have also explored how to better implement the social dimension of board games in augmented games. Another aspect explored under the label of hybrid games is location-aware or pervasive games, where the focus is tracking players in various locations [16]. It is notable that most studies have concentrated on research prototypes. Although *pervasive game* refers to a different, although partly overlapping, phenomenon it has also been used as a synonym for augmented board games [12]. In a study

Hinske et al. [11] use the term *mixed reality games* as a synonym for hybrid games. Another related category is *transmediality*. While this is not limited to games, it also tries to describe phenomena that combine or share media [10]. Although many of the terms above point to smaller elements of the larger phenomenon of mixing physical and digital in games, there seems to be no rigid hypernym encasing them all. This suggests that finding such definition is not an easy task. Linderoth [15] argues that division to digital and non-digital is in many cases a "blunt instrument" while discussing games. Instead he suggests they could be examined through the affordances they offer. Many studies share what Carter et al. [4] call the *digital augmentation fallacy*, the observation that these studies may have overlooked the unaugmented appeal of these games.

## Hybrid Games and Blending Theory

Many definitions of hybridity rely on a notion that it somehow involves the mixing of analogue and digital technology. Some early examples are pre-digital, so there we would replace digital with some related concept, for example electrical. Often, the relation is one where digital is seen to augment the analogue in some way [4]. These definitions view the issue of hybridity mainly through the lens of technology. However, when examining multiple actual examples with these definitions in mind, one quickly runs into problems. A technology-based definition is easily invalidated by changes in technology, as is shown by the early examples with non-digital technology. There is also the issue of other uses of the term, outside of the technology-based definition, such as skill and luck hybrids (e.g. Poker), or hybrids of different game cultures (e.g. European and American board games).



Figure 1: Rock Band game controller next to a Gibson Les Paul 54 Custom electric guitar (CC BY 2.0 Fernando García)

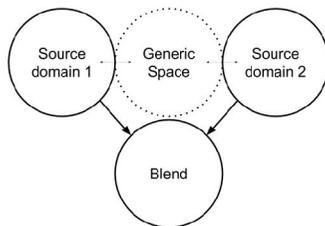


Figure 2: A simplified illustration of conceptual blending, adapted from Fauconnier and Turner [7]

### *Problematic hybrid cases*

The prototypical example of a hybrid game is an analogue board game with digital components [18]. This seems to lead to the conclusion that mixing some kind of analogue components with digital components would be sufficient to define a hybrid game. However, this is problematic because the prototypical digital (non-hybrid) game also requires both analogue and digital components in order to be played: digital games are played with analogue controllers. In addition to multi-purpose dedicated controllers (e.g. the Xbox 360 controller) games also have single-purpose controllers (e.g. the Rock Band guitar). If we are to argue that games played with these controllers are not hybrid, we would need to be able to make distinctions between these controllers, and the custom pieces used in games usually deemed hybrid. In both cases, physical objects are manipulated in order to play a digital game – both are “dedicated tangible interaction devices” [17]. Some games blur the boundaries further by appropriating objects made for other purposes for use in games (e.g. Rocksmith). Another game type that evokes hybridity without fitting neatly into labels is digital board games (e.g. Hitman Go). They are fully digital, but mimic the layouts, interfaces and actions of analogue board games. Instead of definitions relying on technology, we suggest understanding hybridity as an experiential and cognitive category. This also enables the inclusion of hybrid games outside of technological compositions. Our work is based on the theory of conceptual metaphors, established by Lakoff and Johnson [13]. Furthermore, we use the theory of conceptual blending

[7,8] to examine hybrid games as a case of metaphorical blending.<sup>1</sup>

### *Conceptual metaphor theory*

One of the basic tenets of conceptual metaphor theory is that cognition is deeply metaphorical and based on our bodily experiences. Metaphor is not simply a linguistic expression, but a fundamental feature of cognition. Experimental research has shown, for example, that thinking about time is tied into conceptions of space [3]. In conceptual metaphor theory, metaphor is defined as “a cross-domain mapping in the conceptual system” [14]. How the metaphorical mappings happen is a complex matter [8, 13,14]. There are typical ways metaphorical relations are mapped, learned and categorized. Once learned, these metaphorical structures are relatively stable and more or less universal to all humans. Conceptual metaphors can become conventionalized, thus working as building blocks for further metaphorical thinking.

### *Conceptual blending*

Conceptual blending is a theory of some specific cases of conceptual metaphors. Fauconnier and Turner [7] define blending as follows:

*In blending, structure from two input spaces is projected to a separate space, the “blend.” The blend inherits partial structure from the input spaces, and has emergent structure of its own.*

This is similar to a conceptual metaphor, where one thing is understood in terms of another thing, but in

<sup>1</sup> For previous work on hybrid games and conceptual metaphors in games, see [1,2].

Geocaching is a form of recreational treasure-hunt done in public spaces. Geocachers search for caches which are spread in public locations and their GPS-coordinates are published on dedicated websites. Geocaching blends the earlier practice of letterboxing with the positioning technology of GPS. Letterboxing relied on landmarks and clues, practices that have partially carried over to the geocaching.

In Rocksmith the player uses a regular electric guitar to play songs according to on-screen instructions. The game gives simplified instructions to less experienced players and experienced players can play according to the original songs. Rocksmith blends playing an electric guitar with rhythm games that are themselves blends of playing videogames and playing instruments.

this case the two things form a third, mixed area, called the blend. This blend has qualities corresponding to both of the source domains, but also qualities explained by neither of the source domains [cf. "hybrid design space" 19]. There is also a fourth domain, the generic space, which includes features shared by the source domains. Some of the qualities are inherited from the first source domain, some from the second source domain and some will be unique to the blend.

#### *Hybrid games as blends*

Blending theory is able to account for the problems mentioned above that result from understanding hybridity only in relation to technology. Hybrid games are not defined by their relation to technology, although this may in some cases and certain contexts be important. Rather, hybrid games are blends of different conceptual domains related to games. The broad array of things that are included under the concept of hybrid games exemplifies the different domains that make up the concept. Hybrid games include things ranging from electronic board games to pervasive street games. The common denominator seems to be a domain not usually associated with a certain type of playing blending with a familiar type of game domain. Looking at hybrids as blends avoids fixating on the viewpoint of technology. However, over time, it is possible for blends to become so commonplace that calling them hybrids may become more confusing than beneficial.

#### Examples of Hybrid Games as Blends

As the analysis shows (see Table 1 on the next page and examples in the sidebar), hybrid games draw from many different domains. A significant number of

domains are not related to technology, while technology does play an important role in many of them. Our analysis lists only some of the components of the generic space and blend. Our analysis is not exhaustive of all the features, as the goal is to introduce a certain approach to analysing hybrid games. One could use the domains listed here to generate new hybrid game products. By analysing the cases and separating the domains it becomes easier to recognize which elements form the resulting experience. Designers can then focus on applying the features that best fit the desired product.

#### Discussion and Conclusions

Previous research in hybrid games has been very technology-focused. Understanding hybridity in this manner makes comparing different hybrid projects difficult. Is hybridity mostly about digital tabletops [9], pervasive games [11] or augmented board games [6]? If we follow the logic of earlier research, all kinds of digital games end up looking like hybrid products simply because they have always included new and interesting user interfaces (e.g., The Power Pad for the NES in 1986). Using controllers for digital games always requires moving in physical space, even if it is only your thumbs that move. We suggest that more attention should be paid to how hybrid experiences are created. Hybridity is an example of blending, mixing of two different domains that are usually separated. With hybrid games, these domains usually involve one from (digital) games and some other domain. This means that technology is central, but not essential, to understanding hybrid games. An experiential approach to hybrid games can also result in the expansion of a designer's design space.

Table 1 lists six examples chosen for their variety. They do not cover all possible forms of hybrid games, but are used as examples to demonstrate the variety of different domains hybrid games draw from.

Example	Source Domain 1	Source Domain 2	Generic Space	Features of the Blend
XCOM: The Board Game	Board games	Digital games	Strategy Turns	Smart device as game play accessory
Keep Talking and Nobody Explodes	Puzzles	Operating manuals	Deciphering instructions	Social interaction
Hitman Go	Digital games	Board games	Strategy Turns	Expansion boxes locked by score
Anki Overdrive	Slot cars	Digital racing	Cars Track	AI cars on a physical track
Skylanders	Digital Games	Toy figures	Characters	Saving in the figures
Geocaching	Treasure hunts	Digital mapping	Geography Maps	Digital map -based treasure hunting
Rocksmith	Playing instruments	Rhythm games	Rhythm Music	Evaluation and feedback of learning instruments
Mechanical Pinball	Mechanical machines	Billiards	Object manipulation	Single-player gaming

Table 1: Examples of blends

In the end consumers are interested in new experiences hybrid products can offer, not the hybridity in itself. Designers of games should therefore pay attention to what domains they are working with, and what assumptions those domains draw from. Understanding how those domains interact is paramount in designing hybrids. By understanding hybridity as a larger phenomenon it becomes easier to come up with novel ideas for hybrid games. Our definition also has the consequence that the concept of hybridity changes over time. As different domains are no longer seen separate, one can no longer create hybrid experiences by combining them. We see this as

a strength: as our surroundings change, so must the theory that describes it.

#### References

1. Alissa N. Antle, Greg Corness, and Milena Droumeva. 2009. What the body knows: Exploring the benefits of embodied metaphors in hybrid physical digital environments. *Interacting with Computers* 21 (1-2), 66–75. doi:10.1016/j.intcom.2008.10.005.
2. Jason Begy. 2011. Experiential Metaphors in Abstract Games. In *DiGRA 2011: Think Design Play*, Utrecht: Utrecht School of the Arts.
3. Lera Boroditsky. 2000. Metaphoric Structuring: Understanding Time through Spatial Metaphors. *Cognition* 75(1): 1–28. <http://www.ncbi.nlm.nih.gov/pubmed/10815775>.

4. Marcus Carter, Harrop, M., & Gibbs, M. 2014. The Roll of the Dice in Warhammer 40,000. *Transactions of the Digital Games Research Association*, 1(3).
5. Gifford Cheung, A. Lee, K. Cheng, and H. J. Lee. 2013. Dispensable, Tweakable, and Tangible Components: Supporting Socially Negotiated Gameplay. *Games and Culture* 8 (4): 259–88. doi:10.1177/1555412013496893.
6. Sonal Deshmukh and V. B. Baru. 2013. Applications of RFID in Interactive Board Games. *Special Issue of International Journal of Electronics, Communication and Soft Computing Science & Engineering (IJECSCE)*: 87–92.
7. Gilles Fauconnier and Mark Turner. 1996. Blending as a Central Process of Grammar. In *Conceptual Structure, Discourse and Language*, Adele Goldberg (Ed.). Cambridge University Press.
8. Gilles Fauconnier and Mark Turner. 2005. Rethinking Metaphor. In *Cambridge Handbook of Metaphor and Thought*, Ray Gibbs (Ed.). Cambridge University Press, 1–32.
9. Michael Haller, Forlines, C., Koeffel, C., Leitner, J., & Shen, C. 2010. Tabletop games: Platforms, experimental games and design recommendations. *Art and Technology of Entertainment Computing and Communication: Advances in Interactive New Media for Entertainment Computing*, 271–297. [http://doi.org/10.1007/978-1-84996-137-0\\_11](http://doi.org/10.1007/978-1-84996-137-0_11)
10. Colin B. Harvey. 2015. *Fantastic Transmedia: Narrative, Play and Memory Across Science Fiction and Fantasy Storyworlds*. London: Palgrave Macmillan.
11. Steve Hinske, Lampe, M., Magerkurth, C., & Röcker, C. 2007. Classifying pervasive games: on pervasive computing and mixed reality. *Concepts and technologies for Pervasive Games-A Reader for Pervasive Gaming Research*, 1, 20.
12. Eva Kraaijenbrink et al. 2009. Balancing Skills to Optimize Fun in Interactive Board Games. *Lecture Notes in Computer Science (including subseries Lecture Notes in Artificial Intelligence and Lecture Notes in Bioinformatics)* 5726 LNCS: 301–13.
13. George Lakoff and Mark Johnson. 1980. *Metaphors We Live By*. Chicago: The University of Chicago Press.
14. George Lakoff. 1993. The Contemporary Theory of Metaphor. In *Metaphor and Thought*, Andrew Ortony (Ed.). Cambridge: Cambridge University Press, 1–48.
15. Jonas Linderoth. 2013. Beyond the Digital Divide: An Ecological Approach to Game-Play. *Transactions of the Digital Game Research Association*, 1(1), 1–17.
16. Carsten Magerkurth, Adrian David Cheok, Regan L. Mandryk, and Trond Nilsen. 2005. Pervasive Games: Bringing Computer Entertainment back to the Real World. *Comput. Entertain.* 3(3): 4–4. <https://dl.acm.org/citation.cfm?id=1077257>.
17. Carsten Magerkurth. 2012. Hybrid gaming environments: Keeping the human in the loop within the Internet of things. *Universal Access in the Information Society*, 11, 273–283. <http://doi.org/10.1007/s10209-011-0242-z>
18. Regan L. Mandryk and Diego S Maranan. 2002. False prophets: exploring hybrid board/video games. In *CHI '02 Extended Abstracts on Human Factors in Computing Systems - CHI '02*, 640–41. Minneapolis, Minnesota, USA: ACM. doi:10.1145/506443.506523.
19. Heikki Tyni, Annakaisa Kultima, Timo Nummenmaa, Kati Alha, Ville Kankainen, and Frans Mäyrä. 2016. *Hybrid Playful Experiences: Playing between Material and Digital*. Tampere: University of Tampere. <http://urn.fi/URN:ISBN:978-952-03-0081-4>.