Cause, Effect, and Player-Centric Time

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INTRODUCTION
A central aspect of playing video games is determining the causal connections between entities. To achieve their objectives, players need to set chains of events in motion that will yield the desired outcomes. But how do players detect these causal relations? Studies conducted by psychologist Albert Michotte in the 1940s showed that "we see causality just as directly as we see color" (Kahneman 2011: 76). Causal relations appear before us effortlessly, to the point that we are prone to perceive them where there are none—which is why statisticians insistently repeat that *correlation does not imply causation*.

This presentation focuses on the semantic category of *force dynamics* proposed by linguist Leonard Talmy (1988). Talmy's theory postulates that we see causation by applying a basic script: At the center of the action we see an *agonist* tending, which is influenced by an *antagonist* with the opposite tendency, to which the agonist reacts. From this configuration, a series of patterns emerge with which we glue events together in order to make sense of the world. These patterns can be of the *causative* type (an entity makes another entity do something), the *despite* type (an entity keeps doing something despite another entity's influence), and the *letting* type (an entity allows another entity to do something).

There are several reasons to believe that this model describes the psychology of causation[1]. First, the script of an antagonist impinging on an agonist, "underlies the meaning of the causal constructions in most, perhaps all, of the world's languages" (Pinker 2007, p. 222). Second, Talmy's theory exhibits strong parallels to Andrea diSessa's notion of phenomenological primitives (compare Talmy 1988, p. 91; diSessa 1986). Third, Phillip Wolff's (2007) experiments based on force dynamics have provided evidence that supports Talmy's theory. Finally, Talmy's model also resembles medieval theories of physics, which postulated an internal impetus in objects that led them to be at rest or in motion—modern physics, on the contrary, can be starkly counterintuitive (Talmy 1988, p. 92). Therefore, force dynamics can provide valuable insights about a central aspect of player psychology.

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This presentation argues that our interaction with virtual worlds relies on the detection of these force-dynamics patterns. While playing video games, players are on the lookout for entities that can be assigned the roles of agonist and antagonist, which allows them to elucidate the causal relations between said entities.

Triggers—that is, entities that can initiate events in the gameworld—are of specific interest in this context[2]. While triggers are useful tools, they also have a disadvantage: they make time in video games player-centric, given that events do not occur unless the player character interacts with them. This brings about the first of two problems analyzed in this presentation. Events that are portrayed as being disconnected from player agency are actually caused by the player character's presence. The player can detect these causal patterns, which can make time in games feel artificial.

A second problem can be observed between the causal structure of the narrative and the mechanical layers of some games: the problem of *freedom vs. urgency*. The issue in question is typical of open-world games, which tell a story that conveys a sense of urgency while at the same time give players freedom to do what they please—often ignoring the story. The story typically resumes when the player interacts with an NPC or arrives at a location and activates a trigger. This presentation will resort to *The Witcher 3: Wild Hunt* (CD Projekt Red 2015) as a case study. In this game, the main character, Geralt, needs to find and help Ciri, a character running from the titular Wild Hunt. Even though Ciri's predicament is a race against the clock, Geralt can spend indefinite amounts of time attending to numerous side quests and activities that distract him from this primary mission. These include contracts to hunt beasts, horse races, helping people in distress, and playing a card game called Gwent. The main story, however, will not continue unless Geralt actively returns to it. In this way, the player can enjoy the whole content of the game without missing out on the main events. The problem is that Geralt cannot *let* (in the force-dynamics sense) things happen in the main story by staying away from it. It can never be the case that Ciri is caught by the Wild Hunt because Geralt was busy playing Gwent. This, the presentation will argue, constitutes a case of ludonarrative dissonance.

Thus, the theory of force dynamics not only helps understand how players detect causal relations in video games, but also points out aspects of the medium that can clash with our causal intuitions.

BIO

Federico Alvarez Igarzábal studied Audiovisual Communications and Visual Arts in Córdoba, Argentina. He is currently working on his Ph.D. thesis on the topic of time in video games and time perception entitled "Time and Space in Video Games" at the Department of Media Culture and Theater of the University of Cologne and the Cologne Game Lab of the TH Köln – University of Applied Sciences. Additionally, he works as research assistant at the Cologne Game Lab. He is also a media artist and has exhibited his work in different galleries and museums in Argentina and Germany.

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ENDNOTES

1 Theories of causation can be traced back at least to philosopher David Hume (2007), who postulated two prominent accounts. These are now known as *constant conjunction* and the *counterfactual theory of causation*. The former states that we observe causation after repeated occurrences of an event that end in the same result. The latter theory states that one can say that an event causes another, if the absence of the first event entails the absence of the second. But, as studies have shown, we do not need to see events repeatedly nor think in counterfactual terms to observe a causal relation. This presentation focuses on Talmy's theory of force dynamics, which maps to our intuitive understanding of causation.

2 The term "trigger" is borrowed from game-engine vernacular, but it is used here in a more general way that eschews specific technical details. The Unreal Engine 4 Documentation, for example, defines them as follows: "Triggers are Actors that are used to cause an event to occur when they are interacted with by some other object in the level. In other words, they are used to trigger events in response to some other action in the level." (Unreal Engine 4 Documentation 2014-2017). The Valve Developer Community Wiki defines triggers as "entities which respond to the presence of other entities." (Valve Developer Community Wiki 2016).