# Examining Misinformation and Disinformation Games: Dichotomies and Context

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## Keywords
Misinformation, Disinformation, Games for Behavior Change, Educational Games, Serious Games, Inoculation Theory, Transportation Theory, transference

## EXTENDED ABSTRACT INTRODUCTION
At the end of the 20th century, the optimism of pervasive access to knowledge supported by the Internet abounded (Wilson, 2004). In the 21st century it has become apparent that pervasiveness has also supported a plague of misinformation and an ability to easily amplify disinformation (Forbes, 2002). The result is mass confusion about even the most basic facts (Kata 2010). As has been the case with complex problems of the past, a variety of game designers have aimed to help address the problem through play. The result is a myriad of theories and playful interventions that aim to improve media literacy (Literat, 2021) and even inoculate players from misinformation and disinformation (Roozenbeck and Van Der Linden, 2019).

This paper analyzes the communication theories behind these designs, serving as a literature review and meta analysis of games designed to improve players abilities to identify and avoid misinformation and disinformation. It analyzes the games formally through three common communication theories for behavior modification and education; inoculation theory, excitation transference, and transportation theory.

The core tenets of transportation theory emphasize how an engrossing narrative situation can shape the attitudes and interests of the person consuming the media. In contrast inoculation theory aims to protect people through repeated exposure to negative stimuli. Similar to some medical inoculations similar to the medical use of inoculations, inoculation theory is a resistance model, employing weakened version of

stimuli to develop protection against them. Excitation-Transfer Theory (Zillman, 2008) focuses on emotional response and multiple media exposures. The theory explains how the emotions of one exposure to a media experience may transfer to another exposure, resulting in heightened emotional response.

Core motivations for this work include the need to support efficacy analysis through intervention and comparative analysis of design conventions across these shared social impact aims. In short, conducting this meta-analysis helps illuminate patterns for future designs by demonstrating formal the formal communication structures employed. This work aims to provide perspective on how often employed theories in social impact mass media communication have played through game designs.

Such work provides the following key observations:

- The philosophical or theoretical concepts that underpin the design of games about disinformation and misinformation

- The implementation specifics, including technologies and assessments

- The elements of these implementations that do not align with standards in the communication theories they employ.

This research demonstrates the dichotomy between games that require players to practice affirming behaviors or negative behaviors. We find that despite research that educational assessments and engagement may not be improved by practicing negative behaviors (e.g., playing the bad person) (Jackson et al., 2020) such games continue to encourage players to spread disinformation, misinformation and disrupt society. This is one of the most interesting epistemological anomalies, perhaps aligned with the characteristics of ludic engagement that presumes that doing the right thing (e.g., driving within traffic regulations) is less appealing than it's opposite (e.g., driving recklessly).

In other contexts, effective design biases toward affirmations, allowing players to be rewarded for practicing good math, not bad math for example. Yet, successful games in this domain, such as Get Bad News (2018) and Breaking Harmony Square (Roozenbeck and Van Der Linden, 2020) explicitly aim to teach through negative practice. Other games, such as Factitious (Grace and Hone, 2020) and Go Viral (2020), task players with practicing the specific skills of identification they need in the real world.

While each of these games has demonstrated popularity and success, their philosophy of knowledge construction and behavior modification vary greatly. Most importantly, the most popular of these games contradict core elements of the theories they apply. Inoculation theory, for example, suggests that interventions have three classic components: threat, counterarguments, and refutations (Compton and Pfau, 2009). Of the games that explicitly employ inoculation theory, none positions threat nor offers counterargument explicitly. This research also notes that complete implementations of these theories include social components absent from many of their implementation. The analysis helps explain why both in theory and practice, this is a necessary, but absent, feature.

Decanting these design characteristics harkens at a possible template for other purpose-driven ludic experiments. It aims to help offer future theoretical heuristics acquired in other media interventions. Interestingly, evidence in health communication indicates that misinformation is less a problem in education and more a problem in habits of

scrutiny (Anna, 2010). Despite this, the games that teach the qualities of disinformation have reported impressive efficacy.

Other dichotomies examined include narrative use and its absence, the application of role play and its absence, the use of or lack of analogy to abstract play activities from their real-world equivalents, and the divergence between curricular support and unstructured educational experiences. Some games have no role play, while others provide the role of being a journalist sorting fact from fiction (Trial Day, 2020). They range heavy on narrative (Breaking Harmony Square, 2019) to abstract analogy (Rawrer 2020), from substantial curriculum (Clever et al, 2020) to none at all (Factitious, 2019).

Media interventions in everything from improving health to public policy are typically grounded in a few common theories. For this analysis we focus on transportation theory (Green et al, 2004) excitation transfer theory from behavioral science (Zillman, 2008) and transportation theory. Yet, much of the work in this space does little to incorporate or acknowledge the heuristics of these allied theories.

The research published on Breaking Harmony Square (Roozenbeek Sander van der Linden, 2020), for example, documents its foundation in psychological vaccines (McGuire and Papageorgis, 1961) in inoculation theory (Compton, 2013) but ignores the aforementioned threats and social component elements of the theory. Does tasking players to seed misinformation build their resistance, or help them identify with misinformation spreaders? Factitious (Grace and Hone, 2020), on the other hand, emphasizes real world skill development, but fails to acknowledge behavior transference (Anderson et al, 2012). Are these games stumbling upon the principles of effective behavioral interventions or is there something distinct to game design that assumes the application of these theories?

The work aims to provide a useful set of dichotomies in design approach outlining the characteristics that differentiate these behavioral interventions. These include:

- Transportation theory as role play in completing either prosocial or antisocial tasks related to the spread of misinformation and disinformation.

- Behavior transference (via excitation or transportation theories) as practice of positive behavior and outcomes identification.

- Inoculation theory as exposure to negative and positive behaviors, practice, and reward

The result of such analysis should help put into perspective how these games work, how they might not work, and opportunities for future designs at intersections not previously demonstrated. It does so with an eye on fundamentals of social impact games (Grace, 2019).

This content analysis also provides observations about the practical design characteristics, including how often the games are provided in multiple languages, the length of time it takes to produce such work and how often the work is funded by an educational institution, government agency, or otherwise supported. The case study wide perspective includes well-funded games with independent projects like Lucas Pope's Republia Times (2012). It helps contrast games made from multi-year, large-scale initiatives to those made at weekend-long game jams like Complexity Jam (INDCOR, 2020).

The work is designed to prove useful beyond these specific designs by providing case study for future attempts at addressing pervasive societal issues through game play.

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