Educational Technology Research and Development

A SYSTEMATIC LITERATURE REVIEW OF “EMPATHY” AND “GAMES”

--Manuscript Draft--

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Full Title:	A SYSTEMATIC LITERATURE REVIEW OF “EMPATHY” AND “GAMES”
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Abstract:	Although the intersection of games and empathy is limited in terms of research, peer-reviewed articles on this area have increasingly been published over the past decade. This study investigates this area to understand how researchers are describing, defining, and communicating their work. For example: how are research articles about games defining empathy? From which disciplines are the researchers framing their studies? 49 articles were found, coded, and analyzed by searching six different databases. For this investigation, each article was analyzed based on the discipline, keyword(s) used to find the article, definition(s) of empathy used, types of games used in the article, and associated terms that were used in the article. Articles emerged from multiple disciplines (12) and described over 14 different types of empathy. Findings were shared, as well as recommendations for researchers studying this area.
Response to Reviewers:	COMMENTS TO THE AUTHOR: Reviewer #1: This literature review on empathy and games is well researched and written. The research method and data analysis are well described too. While I think it is acceptable, I have one a couple of main concerns and some minor comments before to be accepted. Main Comments: (1) In the findings section, I find the "game category" confusing. This is perhaps my biggest concerns for this paper. You have subcategories for commercial games, educational games, digital games, etc. However, these various games could be overlapping. Commercial games could include educational games, and educational games could be commercial games. Role-playing games and other types of games can also be included in both commercial and educational games. In addition, which games are not digital? Are you comparing digital games with other non-digital games? If so, then make it digital vs. non-digital games. Likewise, make the comparison between educational games vs. non-educational games, commercial games vs. non-commercial games, etc. I suggest that you reexamine and define each of the sub-categories. If necessary, you may need to re-organize the categories by re-analysizing

the data.

Researchers: Thank you for this question. We agree that these categories can be overlapping. We have clarified this by explaining that each research article could have a game in it that was coded with multiple game categories. So, for instance, one game could be a digital game and a commercial game. Or, a game could be an analog game and an educational game. We chose the up to three game categories that best described the games in each of the articles. We have updated the article with this information.

(2) My second concern is with the definition of disciplines in the findings section. How were the game disciplines were defined? It is confusing. It is important to define the disciplines first.

Researchers: Thanks! Great point to clarify. We added the following to the methodology:
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Minor Comments:

(1) On Page 18, "Many of these papers do not use quantitative approaches, such as in "Empathy at Play: Embodying posthuman subjectivities in gaming." What do you mean by quantitative approaches? Somewhere else in the paper, you also mention the use of quantitative approaches (p. 20), so you may need to explain and contrast the quantitative vs. qualitative approaches in the analysis section or the finding section.
Researchers: We have updated the text with what we mean by qualitative approaches.

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through the paper for grammar and language accuracy.
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I hope this feedback is helpful as you work on the revisions. I look forward to seeing an improved and refined manuscript.

Researchers: Thank you for the wonderful feedback.

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Reviewer #4: The focus of this literature review -- empathy and games -- is an intriguing and promising one, so I was excited to read the manuscript. Unfortunately, the literature review as presented was rather mechanically done, and did not (to my eye) synthesize the literature reviewed appropriately to be of service to readers who want to learn about what extant literature about empathy and games is reporting. Methodologically, the focus for this literature review upon counting terms and reporting their frequencies seems to miss the point of doing a literature review -- which is to *synthesize* the primary findings *across* studies, sub-foci, and disciplines. Frequencies such as the ones reported here can be helpful to consider, but only if the primary findings from each and all of the studies are summarized and synthesized across publications that were examined.
Researchers: Thank you for bringing this up. We agree that a literature review, as traditionally done, should be more interpretive and analytical, as you have written. We have clarified the purpose of this article and the methodology we have undertaken in the article. Rather than a traditional literature review, this article aims to use a systematic literature review, which involves looking at specific keywords. We have updated the methodology accordingly.

The ways in which the 49 publications were selected also seems problematic to me, since there is no explanation of how the databases consulted were selected, and the list of databases provided demonstrates that comprehensive searches were not done. For example: why was the Sage database consulted, but not, for example, Routledge, Taylor & Francis? And why were databases such as JSTOR and PsychInfo not searched?

Researchers: We have updated the methodology to include why we chose these databases. We chose these databases as they were available through our libraries and have been previously used to conduct literature reviews related to gaming and games (Schrier, 2015). Systematic literature reviews can use a sample of databases rather than being exhaustive of all databases that exist

To be published in a leading journal like ETR&D, there is quite a bit more literature-based research that has to be done, and the manuscript will therefore have to be changed to reflect the results of this additional searching. As importantly, the results of the literature searches should be synthesized *across publications* as to their essential findings, comparing and contrasting them, and analyzing how they differ (if they do) among different disciplines. At present, this manuscript mostly lists information, rather than synthesizing and critiquing it, reporting results as frequencies (of terms, articles in labelled subcategories, etc.) and brief, separate summaries (e.g. the paragraphs about the terms used in each discipline). Higher-level analyses of extant literature about empathy and games still need to be added to this work.

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Below, please find specific questions and suggestions that I hope will be helpful as you continue to work on this manuscript.

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Researchers: We changed and removed this term throughout.

- Why is this a relevant or important question? "Which databases are frequently including games and empathy articles?" It seems that it shouldn't matter in which databases this literature is published if the intent of the article is to do a comprehensive literature review.

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Researchers: We have reorganized the reasons and importance of this area of inquiry and expanded and clarified more on it, in the beginning of the paper.

- At the bottom of page 7, you listed the databases searched, but did not explain why these databases were selected. For example: why search the Sage database, and not the Routledge and/or Taylor & Francis databases? There needs to be some justification included that will persuade the reader of the comprehensiveness of the literature review as presented.

Researchers: We have clarified and justified why we chose these databases.

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Researchers: We have updated this terminology accordingly.

- Also, "in vivo" is used incorrectly here. In vivo coding uses words of phrases that are taken from the sections of the data that are being coded, and using those words or phrases as the codes themselves. This does not seem to be what you did to analyze the 49 articles, based upon your description of your data analysis process.

- The appendices are labelled incorrectly. You call them "I" and "II" in the text and "A"

	and "B" in the appendices. In addition, the numbers in the final column in Appendix B are not explained anywhere in the manuscript. Even more importantly, Researchers: The appendix labeling has been updated for cohesiveness. We have also updated the chart to include the labels for the table. - (pages 10-11): How were disciplines deduced? More importantly, why did you decide to code the articles in this particular way? Researchers: We have updated the description of how we arrived at the disciplines in the research. We have also updated the article with greater description of how we arrived at the codes. To decide which discipline(s) to ascribe to an article, we used the following methods. One, we looked at the key terms of the article and title of the article. Two, we looked at the journal, and what subjects it is categorized under. Three, we looked at the text of the article, and which types of literature and methodologies were used and cited in the article. For instance, an article such as “Determining reactive and proactive aggression and empathy levels of middle school students regarding their video game preferences,” was coded as being from the disciplines: psychology, communications, and education. - (pages 13 - 14): Instead of listing the different types of empathy that were included in the articles, it would be much more helpful to synthesize the definitions, comparing their particular similarities and dissimilarities, origins, and interpretations.The range of terms used is interesting, but there is little meaning made of it -- and synthesis, comparison, and constructive critique are some of the most important aspects of a successful literature review. Researchers: As mentioned above, we have updated the text by adding in subheads to relate to each of our original research questions, and to provide interpretation and analysis of the results. - It was helpful to see the different types of games that were studied in these 49 publications, but there was no cross-walk provided to show the reader the types of empathy that were most commonly identified in particular types of games, if those patterns exist. If those patterns don't exist, it would be equally helpful to point this out and suggest why this may be so. Researchers: The types of empathy by types of games, while interesting, was not one of our research questions is out of scope for our study. - The cross-walk that you provided between disciplines and empathy terminology was helpful, but each of the disciplines and their accompanying terms were merely listed, rather than compared and contrasted. Some of the disciplines, for example, used similar terms, while others used more dissimilar terms. This could be synthesized and possible explanations for the patterns could be offered. Researchers: We have added interpretations of the research results in each of the (newly-created) subsections in the results section. - In the Recommendations section. "Establish norms around measurement and assessment" is a helpful suggestion, but there is no clear link made between what was presented earlier in the manuscript and why this recommendation was made. Researchers: We have clarified the connection between the findings and the recommendation listed. - Also in the Recommendations section, I'm not understanding how the suggestions that follow "Generate more research that seek to answer key questions" explain it, or how (specifically) this relates to the findings presented earlier in the manuscript. Researchers: We believe the fact that there are only 49 articles in all of these databases during the time period supports the recommendation, and we have further edited it. However, we are not sure if this is sufficient, and hope that the reviewer can give us further insight if this is not sufficient.

View Letter

COMMENTS TO THE AUTHOR:

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Researchers: The appendix labeling has been updated for cohesiveness. We have also updated the chart to include the labels for the table.

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Researchers: The types of empathy by types of games, while interesting, was not one of our research questions is out of scope for our study.

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Researchers: We have added interpretations of the research results in each of the (newly-created) subsections in the results section.

- In the Recommendations section. "Establish norms around measurement and assessment" is a helpful suggestion, but there is no clear link made between what was presented earlier in the manuscript and why this recommendation was made.

Researchers: We have clarified the connection between the findings and the recommendation listed.

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Running Head: Running Head: A SYSTEMATIC LITERATURE REVIEW OF "EMPATHY" AND "GAMES"

Submitted for Review: March 6, 2020

Karen Schrier, Marist College, Poughkeepsie, NY, United States, kschrier@gmail.com

Matthew Farber, University of Northern Colorado, Greeley, Colorado, United States, Matthew.Farber@unco.edu

Abstract

Although the intersection of games and empathy is limited in terms of research, peer-reviewed articles on this area have increasingly been published over the past decade. This study investigates this area to understand how researchers are describing, defining, and communicating their work. For example: how are research articles about games defining empathy? From which disciplines are the researchers framing their studies? 49 articles were found, coded, and analyzed by searching six different databases. For this investigation, each article was analyzed based on the discipline, keyword(s) used to find the article, definition(s) of empathy used, types of games used in the article, and associated terms that were used in the article. Articles emerged from multiple disciplines (12) and described over 14 different types of empathy. Findings were shared, as well as recommendations for researchers studying this area.

Keywords: games, empathy, gaming, digital games, research

The authors have received no funding for this research and there is no conflict of interest. The authors also certify that they have NO affiliations with or involvement in any organization or entity with any financial interest (such as honoraria; educational grants; participation in speakers' bureaus; membership, employment, consultancies, stock ownership, or other equity interest; and expert testimony or patent-licensing arrangements), or non-financial interest (such as personal or professional relationships, affiliations, knowledge or beliefs) in the subject matter or materials discussed in this manuscript.

Bios

Dr. Karen Schrier

Dr. Karen Schrier is an Associate Professor and the founding director of the Games & Emerging Media program at Marist College. She has also spent 15 years producing websites, apps, and games at organizations such as Scholastic, Nickelodeon, BrainPOP, and McGraw-Hill. She has written or edited over 100 published works, including single-authored articles published in journals such as *Educational Technology Research & Development* and the *Journal of Moral Education*. She is the editor of the book series, Learning, Education & Games, published by ETC Press (Carnegie Mellon), and co-editor of two books on games and ethics. She also authored the book, *Knowledge Games: How Playing Games Can Help Solve Problems, Create Insight, and Make Change,* published by Johns Hopkins University Press. From 2018-2019 she served as a

Belfer Fellow for the ADL's Center for Technology & Society. Dr. Schrier holds a doctorate from Columbia University/Teachers College, master's degree from MIT, and a bachelor's degree from Amherst College.

Dr. Matthew Farber

Matthew Farber, Ed.D. is an assistant professor of Technology, Innovation, and Pedagogy at the University of Northern Colorado. He has been invited to the White House, to keynote for UNESCO, and he has been interviewed about games and learning by NPR, Fox News Radio, USA Today, and The Wall Street Journal. With Karen Schrier, Ed.D., he co-authored the UNESCO MGIEP working paper, "The Limits and Strengths of Using Digital Games as 'Empathy Machines.'" Dr. Farber's books include Gamify Your Classroom: A Field Guide to Game-Based Learning — Revised Edition, and Game-Based Learning in Action: How an Expert Affinity Group Teaches with Games, which features a foreword from James Paul Gee. For more, please visit http://matthewfarber.com.

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Introduction

“Empathy” is not a new concept; however, it is being intentionally deliberated and practiced in new contexts and applied in new ways, which require further analysis (Brown, 2018; Sousa & Tomlinson, 2017; Tomlinson & Murphy, 2018). For instance, games are being purposefully designed and used to support prosocial behaviors and social and emotional learning, which includes empathy and related skills and concepts (Schrier & Farber, 2019). Moreover, the efficacy and design of games for empathy has been increasingly studied by researcher communities from different fields, such as computer science, media studies, or the social sciences. However, they may not yet be in dialogue with each other, and there is no meta-level discussion of what and how it is being studied in the area of games and empathy. This paper seeks to fill this gap, and conduct a systematic literature review of papers related to empathy and games.

The intersection of games and empathy is an emerging area of inquiry. It is becoming increasingly important to understand how games may limit or support empathy, or how they may address related behaviors, such as prosocial activity. There are a number of reasons for this. One, people are spending more time playing games and being engaged in game worlds (Entertainment Software Association, 2019). During this time, players may experience both prosocial interactions, such as friend-making and antisocial interactions, such as harassment and bullying through online games (ADL, 2019). Moreover, practicing empathy through games may help to reduce conflict and aggression toward others, including bullying (de Vos, van Zomeren, Gordijn, & Postmes, 2013). Second, games may be yet another type of experience, alongside others, including film, books, and theater, which may help us understand more about ourselves, others, and humanity (Schrier, 2018), as well as help support the practice of social and emotional skills

and behaviors. For example, Bréjard, Bonnet, and Gaetan (2016) observed those who self-report frequent digital game play as being more adept at regulating their emotions than those who report occasional play. Third, because games may connect players from all over the world, or may represent different types of people, cultures, and/or perspectives, games may possibly help players see others as more familiar and as part of their “in-group,” rather than an “out-group,” possibly enhancing empathy, connection, and caring about those from different backgrounds, cultures, and worldviews (Darvasi, 2016; Farber & Schrier, 2017). Finally, many games pose moral choices, or enable the practice of ethics. Developing empathy through games may be useful for moral education, as they may support the practice of ethics, alongside caring for others (Noddings, 2010; Read, 2019).

Thus, in this paper, we seek to review the intersection among two fields of research: games and empathy. This intersection has been explored in a number of recent articles and books (Sampat, 2016; Farber & Schrier, 2017; Darvasi, 2017), though is still understudied. Moreover, the area of empathy and games has been not well defined and there has been no comprehensive and systematic review of the current and recent scholarship.

As such, we aim to explore the scholarship in this area, describe the disciplinary approaches, identify their definitions, and recommend next steps. We specifically want to understand the following:

- What are the types of empathy that are discussed in research (peer-reviewed and scholarly) on games and empathy?
- What are the disciplinary approaches that are used in the research?
- What are the themes that emerge in the articles on games and empathy?

- Among the different disciplines, are there certain themes they are discussing, and what types of games are they using?

We hope that this investigation will serve as an initial map to this emerging area of inquiry and will help us to explore new questions and areas within it.

What is Empathy and Why Study It?

What is empathy? Colloquially speaking, empathy is feeling how someone else feels, which can be the result of by walking in someone else’s shoes, or imagining a walk in someone else’s shoes (Gaesser, 2013). Gerdes, Segal, Jackson, and Mullins’ (2011) describe empathy as having four core components: “(1) the capacity for an automatic or unconscious affective response to others that may include sharing others’ emotional states; (2) a cognitive capacity to take the perspective of another; (3) the ability to regulate one’s emotions; and (4) a level of self-other-awareness that allows some temporary identification between self and other, but also ultimately avoids confusion between self and other” (p. 112, expanding on Batson (1991), Decety & Jackson (2004) and Decety & Moriguchi (2007)).

There are a number of reasons why it is useful to study empathy. Researchers have connected empathy to prosocial behavior, or behaviors that aim to help others and connect people (Gaesser, 2013). Batson (1991) hypothesized that empathetic concern for an others’ plight could lead to more altruistic, prosocial outcomes. Empathy and perspective-taking are key components of the Collaborative for Academic, Social, and Emotional Learning’s (CASEL) Framework (Core SEL Competencies, 2020), which describes the types of skills needed for social and emotional understanding.

While some researchers have called for the need to teach empathy in schools and the workplace (Brown, 2018; Sousa & Tomlinson, 2017; Tomlinson & Murphy, 2018), other

researchers have criticized empathy as not being useful, or even harmful (Bloom, 2017). Researchers have suggested that the societal value of being empathetic compared to other social emotional traits (e.g., sympathy, compassion) may in fact be overstated (e.g., Bloom, 2017; Marinova, Singh, & Singh, 2018). Being empathetic can cause some people to become biased toward in-groups over out-groups (Bloom, 2017; Field, 2017). However, some researchers critique the value and uses of empathy. For instance, Bloom argues that compassion may in fact lead to more altruistic and prosocial outcomes, rather than empathy or behaviors associated with empathy, because empathy can be exploited or misused (Bloom, 2017). However, empathy has been seen as an integral component to moral education (Read, 2019); to reducing conflict and bullying in educational settings and beyond (de Vos, van Zomeren, Gordijn, & Postmes, 2013); and to developing a strong teacher-student relationship (Tomlinson & Murphy, 2018).

Empathy and Digital Games

Generally speaking, games can be defined as “a system in which players engage in an artificial conflict, defined by rules, that results in a quantifiable outcome” (Salen & Zimmerman, 2003, p. 80). Players experiment with outcomes and solutions to well-ordered problems in the “possibility space” of a bound system of rulesets and goals (Suits, 1978, p. 121). Players willingly accept these imagined conditions by having a “lusory attitude” (Suits, 1978), knowing that their actions will be free from real-world consequences (Huizinga, 1938/1955). The boundaries of what a game is—whether a walking simulator, VR experience, live action role playing game (LARP), or board game—is not the focus of this article. We included research on games and empathy based on what the researchers themselves defined as “games” (by using the word, “games,” in our search).

An overriding research question is whether digital games can support the practice of empathy, and related skills and behaviors, such as perspective-taking, empathic concern, and prosocial behavior. Related questions posited by researchers include: whether a game can spur participants to practice empathy outside of the game, similarly to within the game; whether empathy practice can lead to prosocial attitudes and behaviors; and whether designing games, as well as playing them, can support empathy practice (Schrier & Farber, 2019). For example, research has considered whether games can stimulate imagination and episodic memory in ways that may induce empathy (Addis & Schacter, 2008; Gaesser, 2013; Szpunar & Schacter, 2012). Research has also considered whether some games can mentally transport players into fictional worlds (Gerrig, 1993; Gerrig & Prentice, 1991; Green & Brock, 2000; Murphy, Frank, Moran, & Patnoe-Woodley, 2011), although this immersion may also require a strong narrative context (Bowman, 2010; Cragoe, 2016). Players who are transported may feel empathetic toward experience as a whole, as well as with virtual characters that populate the fictional worlds (Schrier, 2017; Belman & Flanagan, 2010; Greitemeyer & Osswald, 2010; Flanagan & Nissenbaum, 2014; Mahood & Hanus, 2017). For instance, in some digital games, players navigate a digital onscreen persona, projecting their identity onto an avatar. The extent to which players can perspective-take using a projective identity onto a digital avatar, choice-making as another persona, may (or may not) evoke feelings of empathy (Belman & Flanagan, 2010). Players may also feel empathy toward nonplayable (computer-controlled) characters, as well as other players, in online multiplayer game worlds (Greitemeyer, Osswald, & Brauer, 2010; Harth, 2017; Isbister, 2016; Lepron, Causse, & Farrer, 2014; Mahood & Hanus, 2017; Turkle, 2011). Researchers have also explored whether the social interactions in online multiplayer game

worlds can support (or limit) the practice of empathy-building skills, as well as ethics and morality (e.g., Schrier, 2015; Belman & Flanagan, 2010; Maclagan, 2003; Noddings, 2010).

Why Conduct a Systematic Literature Review on Empathy and Games?

The application of empathy to gaming is a promising new area of inquiry. As this area continues to be studied, we argue that it is a useful moment to take a step back and understand how researchers are investigating empathy in relation to gaming—thus motivating this investigation. There are two main reasons that justify our pursuits in describing the research in this nascent area.

First, empathy itself is an "umbrella term" (Zaki, 2017, p. 60), and can have different nuanced meanings, based on context used. In the field of service design, empathy can mean the imagined potential experience of a client or customer or patient (Hess & Fila, 2016), while historical empathy purports to engage people in the reconstruction of "others' beliefs, values, and goals, any or all of which are not necessarily those of the historical investigator" (Riley, 1998, p. 33). As we discuss, later in this paper, a number of different types of empathy have been identified and described by researchers. For instance, cognitive empathy describes "intentionally taking another person's point of view" (Belman & Flanagan, 2010, p. 6), and affective empathy defines empathy as connected to emotions and feeling what others feel (Oswald, 1996). Being able to appropriately define empathy will help us to better understand it in relation to games and gaming, and will help to further establish this area of inquiry, and to better foster dialogue across researchers.

Second, empathy is a complex concept that is challenging to measure and assess. Researchers have pointed to investigating specific skills, actions, behaviors, attitudes, and

practices, such as perspective taking, empathic concern, personal distress, and fantasy involvement (Davis, 1983), as well as ability to express, identify, and regulate one’s emotions (Batson, 1991; Baron-Cohen & Wheelwright, 2004). For example, the ability to take on other perspectives may be fundamental to being an empathetic person, as it describes those who: 1) see the world as others see it; 2) are non-judgmental; 3) understand another’s feelings; 4) and, can communicate this understanding (Wiseman, 1996, p. 1165). Being able to appropriately measure and assess it will also help us to accurately and effectively understand how games may (or may not) support the development of empathy, and will help to further define and legitimize this new area of inquiry.

As described in the previous sections, current research on empathy often asks more questions than answers them. Thus, an impetus for this study is to review the current research that exists around empathy and compassion, particularly in relation to games and gaming, and to identify gaps, and to describe and further define its terms and metrics.

Methodology

In this section we describe the methodology for conducting the systematic literature review of published research on empathy and games.

Use of a Systematic Literature Review

Systematic literature reviews are form of standalone research review where constructs such as search terms and databases are predetermined by researcher(s) (Adroher, Prodinger, Fellinghauer, & Tennant, 2018; Fink, 2019; Okoli, 2015). Similar to other forms of literature reviews, researcher(s) take the following steps: (1) decide upon research questions; (2) develop an agree upon review protocol; (3) search literature databases; (4) rescreen for inclusion of all search terms; (5) assess quality of search results; (6) extract data; (7) analyze and synthesize

data; and, finally (8) report the findings (Xiao & Watson, 2019, p. 102). However, unlike other approaches to literature reviews (i.e., experimental, narrative, scoping), systematic literature reviews have “clearly formulated research objectives and questions, rigorous research plans, valid data collection, and exacting data analysis and interpretation” (Fink, 2019, p. 15).

In our systematic literature review, our research objectives are to understand how the literature describes, defines, and communicates work on empathy and games. Our research plans are further described in the Methodology section, and include specifying search terms, databases, validating data, and then analyzing the findings.

Systematic literature reviews have methodological roots in the health sciences (e.g., Okoli, 2015), but increasingly this approach is also conducted in other fields such as information sciences, learning sciences, and in game-based learning (Fink, 2019; Hainey, Connolly, Boyle, Wilson, & Razak, 2016; Papamitsiou & Economides, 2014). For instance, Hainey et al. (2016) conducted an extensive systematic literature review on game-based learning in primary education over a 13-year period. In this review, Hainey et al. (2016) sought to understand efficacy through analysis and synthesis of empirical evidence of outcomes found in literature.

In a similar study, Connolly, Boyle, MacArthur, Hainey, and Boyle (2012) conducted a systematic literature review on the search terms ‘computer games’ and ‘serious games,’ also seeking an empirical understanding of efficacy. Connolly et al. (2012) created codes based on search results, and then categorized. Next, specific articles in databases were identified, ranked based on quality, and checked for interrater operability. Finally, research was synthesized.

Boyle et al. (2016) updated (and replicated) Connolly et al. (2012) findings four years later using a similar approach. Both studies observed there were not clear genres of computer games or serious games. Each game may have been developed for entertainment or educational

purposes; educational games may have been designed to teach content or to train players on a skill.

Similar to these studies, we chose systematic literature reviews as our methodological approach. As with Boyle et al. (2016) and Connolly et al. (2012), we suspected that search terms ‘empathy’ and ‘games’ may be used differently in different contexts depending of fields of study (empathy may mean something different in an historic-set educational game than in a nursing student training game). Unlike Boyle et al. (2016) and Connolly et al. (2012), we agreed upon the use of Boolean logic, which enabled us to combine search terms (i.e., search: ‘empathy and games’ rather than each term on its own).

Databases Searched

Thus, we used a systematic literature review in which we searched and reviewed literature with specific keywords using specific inclusion and exclusion criteria, and relevant databases (see for instance, Androher, et al., 2018; Noyes, et al, 2020). To conduct our review and analysis of relevant literature, we looked at six different major databases, ACM Digital Library, ProQuest, Academic Search Elite (EBSCO), Google Scholar, Sage, and DOAJ, during March and April of 2018. We chose these databases as they were available through our libraries and have been previously used to conduct literature reviews related to the intersection of gaming and games with social and emotional learning (Schrier, 2015). Systematic literature reviews can use a sample of databases rather than being exhaustive of all databases that exist (Okoli, 2015; Xiao & Watson, 2019).

Search Terms and Inclusion Criteria

Then, using these databases, we systematically searched for all relevant studies and scholarly research literature using the following search terms: Empathy AND games and

Empathy AND videogames. We used the following criteria to find the set of articles: (1) published in the previous 10 and a half years from our search start date (2) appeared in scholarly, peer-reviewed journals or proceedings and (3) related to videogames and empathy as a primary focus of the study, rather than just having those two words appearing in the article, as determined in part by the “relevance” of being in the first 100 search results (e.g., an article with the idiom “blame game” in the title may fit the search criteria but not be relevant to the area of inquiry), as well as by the reviewers review of each paper to ensure it fit the criteria of relevance. Our search took place during Winter 2018; we set the publication date criteria to begin on July 2007 and to go up through December 2017, as 2007 and 2008 are when studies on empathy and games started to appear more frequently. We also omitted any article that was (1) not peer-reviewed, (2) was only an abstract (and not a full article), (3) was only a book or ebook, or (4) was not in English, due to our inability to otherwise read and interpret the article (this is a limitation of our study). Our search using these criteria resulted in 49 total articles. (Please see Appendix I for a list of all the articles).

Coding Strategies and Interrater Reliability

We coded 49 articles on six different categories: (1) discipline(s) of the article, (2) the database used to find the article, (3) keyword(s) used to find the article (Empathy AND games or Empathy AND videogames), (4) types and definition(s) of empathy used, (5) types of games used or researched, and (6) whether 17 specific terms or phrases were used in the article (in other words, whether the exact term or phrase was found in the article). Other categories were coded but were not included in this particular paper. The discipline areas were defined based on both a top down and bottom up approach. We first looked at the common groupings of disciplines, based on the list of subject guides in an institution’s [anonymized] database. Then, we also

looked at the fields typically represented in the study of games, and how these disciplines are grouped (Coavoux, Boutet, Zabban, 2016). Finally, we looked at the tags and key words in the articles we found to narrow down the list of fields we used to categorize. We omitted any disciplines that were unrelated or unrepresented by the articles.

To elicit the codes we used and create a coding scheme (including the list of 15 themes), we first reviewed 10% of the articles and generated codes using an inductive thematic analysis (Corbin & Strauss, 2014). A list of possible codes was generated from the key terms and phrases that emerged from an inductive, qualitative approach, conducted done by the researchers, which involved in vivo (labeling significant words) and thematic coding (Saldana, 2011) of the articles. Overlapping and similar codes were omitted or revised. After the researchers individually created a series of possible codes, they then collaboratively compared the codes, refining the list iteratively and an initial list was developed to be further validated. Finally, the researchers coded an additional 10% of the articles and then compared the codes used, further refining the final coding scheme until they achieved 100% agreement on the coding scheme for the research.

Finally, the researchers coded all of the remaining articles. Individually, they first achieved 89% agreement for the codes in the six categories. They then re-reviewed all of the codes and articles together until they achieved 100% agreement on the codes used. The full coding scheme can be viewed in Appendix II. The list of 49 articles can be viewed in Appendix I.

Methodological Limitations

Systematic literature reviews are standalone studies that have specified methodological approaches. Systematic literature reviews are not intended to be exhaustive, but rather snapshots of empirical research in a specified field of study (Xiao & Watson, 2019).

As with literature reviews in general, there are always limitations such as refinements in search engines, restrictions to search terms used, Boolean logic of search engines, as well as time windows for searches, and databases selected. In our systematic literature review, we explored how researchers are describing, defining, and communicating their work on empathy and games. We omitted any article that was (1) not peer-reviewed, (2) was only an abstract (and not a full article), or (3) was not in English, due to our inability to otherwise read and interpret the article. We also selected databases that were available through our university libraries, and have been previously used to conduct literature reviews related to the areas of inquiry (e.g., Boyle et al., 2016; Connolly et al., 2012; Hainey et al., 2016).

Results and Analysis

The total number of articles included in this study were 49 (N=49, or 49 cases). To find these articles, we used six different databases, ACM Digital Library, ProQuest, Academic Search Elite (EBSCO), Google Scholar, Sage, and DOAJ. The most articles were from Google Scholar, and the fewest were found in the Sage database. Sage covers around 1,000 different journals that range from chemistry to cultural studies, whereas Google Scholar searches the entire Internet and all databases that it has access to. Some articles were in more than one database, and duplicates were removed when coding the cases. A full list of articles by database (including duplicates) is found in Table 1.

Table 1.

Database	**N**	**Percent of cases**
ACM Digital Library	16	32.7%
ProQuest	16	32.7%

Sage	4	8.2%
EBSCO (Academic Elite)	17	34.7%
DOAJ	6	12.2%
Google Scholar	20	40.8%

Table 1. The number of articles that fit the criteria for this study, found in each database searched. Note: The total is greater than 49 because some articles show up in multiple databases.

Disciplines Used

Disciplinary approaches used in each article were also coded. Overall, the two highest disciplines that were coded as relating to the articles were psychology (including psychological effects; social; behavioral aspects of games) with 25 articles being coded as relating to this discipline, or 51% of the total articles. Additionally, Communication/Media Effects and Education/Learning were coded for 13 different articles each. Table 2 shows the disciplines that were coded for the 49 articles. Some articles were coded with multiple disciplines. To decide which discipline(s) to ascribe to an article, we used the following methods. One, we looked at the key terms of the article and title of the article. Two, we looked at the journal, and what subjects it is categorized under. Three, we looked at the text of the article, and which types of literature and methodologies were used and cited in the article. For instance, an article such as “Determining Reactive and Proactive Aggression and Empathy Levels of Middle School Students Regarding Their Video Game Preferences,” was coded as being from the disciplines: psychology, communications, and education.

Table 2.

Discipline	**N**	**Percent of cases with this**

Psychology	25	51%
Nursing/Health	6	12.2%
Economics/Social Science	6	12.2%
Gaming/gaming studies	9	18.4%
Communication/Media Effects	13	26.5%
Design (HCI/User experience design)	10	20.4%
Philosophy/Ethics	4	8.2%
Computer science	3	6.1%
Civics	4	8.2%
Art/performing arts	3	6.1%
Education/Learning	13	26.9%
Humanities/Media Studies	5	10.2%

Table 2. The number of articles coded with the 12 different disciplinary approaches. Note: The total is greater than 49 because some articles were coded as being different disciplines.

The wide range of disciplines (including art/performing arts, computer science, nursing, and philosophy/ethics) that were represented in the 49 articles reflects the multidisciplinary nature of empathy and games, as well as their intersection. Many articles were coded with multiple disciplines, suggesting that research in this area may benefit from having researchers from multiple different disciplines, and/or may be effective when including perspectives from a number of different approaches. When looking at the list of 49 articles, some journals appeared

more than once (*Computers in Human Behavior*, *PLoS One*, and *Frontiers in Psychology*). However, there was a wide range of journal types and disciplines of journals (for instance, journals and proceedings as diverse as the Theatre Journal and the PervasiveHealth '17: Proceedings of the 11th EAI International Conference on Pervasive Computing Technologies for Healthcare). This further suggests that the diversity of approaches and fields for research around games and empathy, spanning all disciplinary areas, including social science, humanities and technical fields. However, the highest frequency of articles, in sum, comes from the social science fields (psychology, economics/social science, education/learning, civics).

Themes that Emerged

Fifteen different themes associated with research on empathy and games were identified and coded by identifying the terms and phrases used in the articles (see Table 3). In analyzing the associated themes that were most frequently used overall by all 49 articles, “Feelings/emotional understanding/emotion/Empathetic concern” was by far the most frequently discussed, with 41 instances and 83.7% of the articles including this theme. After that, “Perspective-taking/perspective/put self in other’s shoes” showed up in 75.5% of the articles analyzed. Other terms “Narrative/storytelling,” “Identification with others/relate to others,” and “Immersion/engagement” showed up in almost half the articles. Less frequent were themes such as those related to ethics and fairness; critical thinking; empathy as integral to altruism; or civics and civic engagement.

A common misperception is that research on games and empathy is focused more on the cognitive aspects of empathy rather than the more affective, feeling-focused ones (Pavliscak, 2018). However, our research suggests that emotions, feelings, and care were also investigated, as themes associated with emotion were frequently mentioned in the articles reviewed (83.7%).

The themes that more frequently emerged in relation to empathy and games also suggest how games are being used to elicit the practice of empathy. Many of the more frequent themes are related to skills that a player may perform through a game or behaviors that the game may help elicit (perspective taking, communication, reflection, identification with others, concern for others), as well as game design principles that may connect to an immersive, engaging environment where empathy can be practiced (storytelling, engagement). Thus, these themes may suggest possible goals for future empathy games, and design patterns and processes that may be more or less useful (Björk & Holopainen, 2005). These findings can help to direct the creation of future frameworks and processes for creating effective empathy games.

The themes that emerged also suggest that the majority of the research on this topic is not just related to the limitations of and social issues with games (e.g., aggression, violence), but also on the prosocial, educational, and beneficial aspects (e.g., to support perspective-taking, cultural awareness, feelings). Some of the articles did not focus on the constructive and prosocial aspects of empathy and games, as “violence” was also a frequent term, and was used in almost a third of the articles reviewed. However, while media reports frequently express the limitations of games, these findings suggest that there is also research that is pointing to, and grappling with, its potential social benefits, and not just the negative aspects (Schrier, 2019).

Table 3.

Theme	**N**	**Percent of cases with this**
Reflection	9	18.4%
Communication	11	22.4%
Perspective-taking/perspective/put self in other's shoes	37	75.5%

Prosocial	19	38.8%
Critical thinking	3	6.1%
Cultural awareness/Global / cultural understanding	14	28.6%
Agency	12	24.5%
Narrative/storytelling	21	42.9%
Feelings/emotional understanding/emotion/Empathetic concern	41	83.7%
Civics/civic engagement	6	12.2%
Identification with others/relate to others	23	46.9%
Immersion/engagement	22	44.9%
Violence/violent	15	30.6%
Altruism	3	6.1%
Ethics/values/fairness/justice	4	8.2%

Table 3. The 15 terms that were coded, and how frequently they appeared in the 49 articles analyzed. Often, multiple different terms appeared in the same article.

Types of Empathy

Many different types of empathy were described and defined in the research articles analyzed. Thirteen different kinds of empathy emerged (see Table 4), including a general term for “empathy.” Shin and Ahn (2013) describe cognitive empathy as a social behavior that involves reading and interpreting the thoughts of others. Dodge (2011) describes cognitive

empathy as including four different processes: “perspective taking (understand another's point of view) and fantasy identification (imagining oneself in the place of another), as well as … empathy reflection (recollecting one's response) and empathy projection (hypothesizing response in another context)” (p. 288). Edele, Dziobek, and Keller (2013) distinguish between cognitive and affective empathy, and explain that cognitive involves “understanding what another person is thinking or feeling” and relates to actions like “metalizing, perspective-taking, social cognition, mindreading or theory of mind.” Affective empathy focuses on experiencing or sharing another’s feelings or emotional state, and relates to activities such as “emotional contagion, affect matching, empathic concern” or sympathy (Edele et al., 2013). Edele et al. (2013) argue that these two types of empathy comprise both the cognitive and affective aspects. Cognitive empathy and emotional/affective empathy were used somewhat frequently, in about one-third of the cases. Likewise, these two types of empathy are often found together in the same article, with 18 articles mentioning both cognitive and affective empathy. Overall, the most frequently used definition type was a general use of the word “empathy,” which was used in 89.8% of the articles, rather than a specific type of empathy. Other types of empathy were used, though less frequently, such as reactive (8.2%), parallel (6.1%), and cultural empathy (6.1%). Types of empathy that were coded as “other types of empathy” included player-specific empathy and auto-empathy.

Two additional types of empathy (historical empathy and literary empathy) were found in research that was outside the criteria we identified for this study (for instance, they appeared in the other published research formats we reviewed (dissertations, book chapters, and abstracts), and/or were outside of the time frame that we used to find the articles), and thus, were not found

in the analyzed set of articles. Although they did not appear in this study, researchers may want to consider them when defining and interpreting empathy in future research.

The use of so many different types of empathy-related terms suggests that there is little consistency across disciplines and across the researchers overall in how they are defining, applying, and measuring empathy. Some articles define empathy as having cognitive aspects only, and some with affective attributes, and some use both terms, which has completely different implications for how empathy is then designed and operationalized in a game, or researched and measured through a game environment. Moreover, the majority of articles use the term “empathy” in a general sense, rather than just focusing on a specific type of empathy, suggesting that many of the articles are using this complex concept as a stand-in for a number of skills, behaviors, and practices, rather than using previously defined models, standards, or measurements. Part of the reason for this may be because empathy itself has been understudied, misunderstood, and used differently depending on the context (Zaki, 2017). There is no empathy “discipline,” and, as discussed earlier, multiple disciplines may approach this concept differently, which then affects how it is further applied to games. The wide range of how empathy is used in the 49 articles, and the fact that there are so many different types of empathy that emerged in such a small sample, suggest the need for standardizing the definitions of the term “empathy” and how it is measured and used. Researchers should also consider whether it is empathy they are studying and whether there is another term, skills, behavior, concept, or process that would be more relevant.

Table 4.

Definitions	**N**	**Percent of cases with this**

Cognitive Empathy	18	36.7%
Emotional/affective empathy	19	38.%
Psychological/psychoanalytic empathy	1	2%
Reactive empathy	4	8.2%
Global empathy	2	4.1%
Other (auto, player-specific)	12	24.5%
General empathy also (general term of empathy)	44	89.8%
Parallel empathy	3	6.1%
Fantasy empathy	1	2%
Cultural empathy	3	6.1%
Trait Empathy	3	6.1%
Game/gameplay empathy	2	4.1%
Critical empathy	2	4.1%

Table 4. The types of empathy that were identified and/or defined in the articles. Note: The total is greater than 49 because some articles included more than one type of empathy in the research.

Types of Games

The type of game(s) that were described, researched, and interpreted in the research articles were also coded (e.g., digital games, analog games) (see Table 5). Digital games, generally, were the most frequently coded in terms of what type of game was used in the study (87.8% of all articles include at least one digital game in their research). Commercial off-the-

shelf (CoTS) games were also used frequently in this research, with 44.9% of the cases. There could be more than one of these terms coded and applied to each article. In other words, an article could cover both a digital game and a CoTS game, and/or a game that the researchers used for their own testing—and the same game could fit into each of these categories. Around a quarter of all the articles included a game that was created by the researchers, and was used to conduct the research. For instance, Tong, Ulas, Jin, Gromala, and Shaw (2017) researched a game, *As If*, which aims to help players understand what it is like to have chronic pain and experience body limitations. This game was coded as being their own game, and a digital game. Likewise, Kors, Ferri, van der Spek, Ketel, and Schouten (2016) researched *A Breathtaking Journey*, which is a mixed reality game that the researchers created, which helps to share the perspective of a refugee. This was coded as a digital game, as a game made by the researchers, and as a game for change. We chose the up to three game categories that best described the games in each of the articles. While some of the categories are not overlapping (analog vs. digital game), many of the categories can be overlapping (commercial off-the-shelf (CoTS) game and digital game).

These results suggest that practicing empathy is not the domain of just one type of game (such as a game for social change or educational game) but that it may be part of the experience of many different types of games, including ones that are solely focused on entertainment and commercial gain. Participating in the practice of empathy is part of the human experience, and as such, enhances any type of game, and not just ones that are related to prosocial goals. The results also showed that about a quarter of the research included a researcher-created game. This suggests the interest on the part of researchers to create games for empathy, the possible lack of models to use to answer research questions about empathy, and the need for supporting research

in this field by funding both the creation of game experiences alongside the research of those experiences.

Table 5.

Game Categories	**N**	**Percent of cases with this**
Commercial off-the-shelf (CoTS)	22	44.9
Educational game	8	16.3
Analog (non-digital) game	6	12.2
Games for Change/Social impact	16	32.7
Digital games	43	87.8
Role-playing games	4	8.2
Their own game used for testing	13	26.5
Economics/game theory game	5	10.2

Table 5. The types of games used or researched in the articles. Note: The total is greater than 49 because some articles included more than one type of game in their research, or the game was coded with multiple categories.

Disciplines by Themes and Type of Games Used

In general, the different disciplines tended to discuss and approach research on empathy and games slightly differently, as would be predicted by the differences in their disciplines. Among those articles that were coded as relating to the psychology discipline, the most common

themes that emerged are perspective-taking (19), prosocial (17) and feelings/emotions (21). The most common empathy types are, cognitive empathy (9), Emotional/affective empathy (9), and just “empathy” (23). Common game categories applied were digital game (20) and CoTS (15). For example, in “Playing with Trauma: Interreactivity, Empathy, and Complicity in the Walking Dead Video Game,” the paper explores a CoTS digital game, *The Walking Dead*. Many of these papers focused on psychological changes and effects related to existing digital games.

In the nursing/health discipline, the most common themes were also perspective-taking (5), feelings (5), and Identification with others (5). The most common definitions areas were cognitive empathy (3), Emotional/affective empathy (3), and just “empathy” (6). The most commonly applied game categories were digital game (4), their own game used for testing (3), and educational game (3). Many of the papers from the nursing discipline focused on empathy for patients and how to support that; thus, educational games were also common, such as in “Impact of the Geriatric Medication Game on Nursing Students’ Empathy and Attitudes Toward Older Adults” (Chen, Kiersma, Yehle, & Plake, 2015).

In economics/social science (not including psychology and civics), the most common themes are perspective-taking (4) and feelings (4), and the most common definitions areas are: just “empathy” (6), “other” (2), and Emotional/affective empathy (2). The most common game category was Economics/game theory game (5), their own game used for testing (3), and digital game (3). This is not surprising, given that economics simulation games, an established research tool for economics, were commonly used. For example, the *Dictator Game*, an economic game that delves into how individuals act given economic choices, was used in Guo and Feng’s (2017) study on parenting styles, empathy and altruistic choices made by children in China.

In the gaming/game studies discipline, the most common themes are narrative/storytelling (8), feelings (9), and identification with others (8). The most common definitions are: just “empathy” (8), Cognitive empathy (5), and emotional/affective empathy (5). The common game categories were digital game (9), games for change/social impact (4), and CoTS (5). Many of these papers use qualitative approaches, such as textual analysis and the application of critical theory to games, such as in “Empathy at play: Embodying posthuman subjectivities in gaming” (Wilde & Evans, 2019).

In the communications/media effects discipline, the most common themes are perspective-taking (9), prosocial (11), and feelings (11). The most common definitions are: cognitive empathy (5), emotional/affective empathy (5), just “empathy” (11), and “other” (5). The common game categories were digital game (13), games for change/social impact (6), and CoTS (9). For instance, many of the articles looked at effects, representation, and how information was shared and negotiated by audiences, such as in, “Are Newsgames Better Journalism? Empathy, Information and Representation in Games on Refugees and Migrants” (Plewe & Fürsich, 2018).

In the design (HCI/user-centered design), the most common themes are perspective-taking (10), feeling (8), and narrative/storytelling (7). The most common definitions are: just “empathy” (9), cognitive empathy (2), Emotional/affective empathy (2), and “other” (2). The most common game categories were digital game (9) and their own game used for testing (8). Many of these articles designed their own games and walked through their design process, such as, “The Design and Evaluation of a Body-Sensing Video Game to Foster Empathy Towards Chronic Pain Patients” (Tong et al., 2017).

In the philosophy/ethics discipline, the most common themes are perspective-taking (4) and feelings (4), and the most common definitions are just “empathy” (4) and “other” (2). The common game categories were digital game (4) and CoTS (4). Many of these articles discussed empathy in terms of the ethical and moral components of game playing and game worlds, and discuss issues such as violence, as in the case of “Violent Computer Games, Empathy, and Cosmopolitanism” (Coeckelbergh, 2007).

In the computer science discipline, the most common themes are feelings (3). The most common definitions are: just “empathy” (3), Cognitive empathy (2) and Emotional/affective empathy (2). The most common game category was digital game (3). Many of these articles focused on technical aspects of games, including “Educating bicycle safety and fostering empathy for cyclists with an affordable and game-based VR app” (Wang et al., 2016).

In the civics discipline, the most common themes are feelings (4), reflection (3), and perspective-taking (3). The most common definitions are: just “empathy” (3) and Emotional/affective empathy (2). The most common game category was digital game (4). Often, this game research related to using games for developing skills related to global and civic awareness, such as “Simulating REAL LIVES: Promoting Global Empathy and Interest in Learning Through Simulation Games” (Bachen, Hernández-Ramos, & Raphael, 2012).

In the arts discipline, the most common themes are perspective-taking (3), feelings (3), and identification with others (3). The most common definitions are: just “empathy” (3). The most common game category were digital games (3) and games for change/social impact (3). For instance, “Revitalizing Japanese American Internment: Critical Empathy and Role-Play in the Musical Allegiance and the Video Game Drama in the Delta” (Roxworthy, 2014) took a critical and cultural studies approach to a performance and video game.

In the Education/Learning discipline, the most common themes are perspective-taking (9), feelings (12), and cultural awareness (7). The most common definitions are: Cognitive empathy (7), Emotional/affective empathy (7), and just “empathy” (11). The most common game categories were educational games (5), Games for Change/Social impact (6), and digital game (12). Not surprisingly, educational games were often used in this type of study, such as “Online Videogames in an Online History Class” (Martin, 2008).

In the humanities/media studies discipline, the most common themes are agency (5), narrative/storytelling (5), feelings (5), and Identification with others (5). The most common definitions are cognitive empathy (3), emotional/affective empathy (3) and just “empathy” (4). The common game categories were digital games (5) and CoTS (4). Many of these researchers used qualitative approaches, such as textual analysis of the games, to look at elements related to empathy, such as narrative elements, which may also be found in other media, such as literature or film.

With so many disciplines approaching the intersection of empathy and games, it is essential to understand how they are discussing them differently. Not surprisingly, the disciplines from the social sciences (e.g., psychology, economics, civics, education) are looking at the affective and emotional aspects of games, as well as the cognitive aspects. Notably, the economics discipline more regularly created and used their own games to help better understand human behavior, such as around altruism, and other economic relationships. However, it is more surprising that other disciplines were also considering emotion and feelings, such as computer science and HCI. It suggests that researchers studying interactions among computers and human beings are not just thinking about technical and usability questions, but are also considering the affective aspects of these interactions. Moreover, researchers from philosophy had previously

focused on it as an objective pursuit, removed from feelings and emotions. Only recently have philosophers begun to consider how empathy, care, and feelings matter when making ethical decisions or exercising one’s morality (Noddings, 2010). Thus, this research points to how philosophy is also evolving to embrace this intersection. The humanistic pursuits—such as game studies, arts, and media studies have themes of feelings, but also perspective-taking, narrative/storytelling, and identifying with others, suggesting that these disciplines consider games a type of text, where story, characters, and other elements draw in a player, and help them to empathize with others, just as they might with good literature or film.

Finally, certain disciplines were more likely to use certain types of games. As mentioned before, economics researchers used their own games, while nursing and HCI did as well, which suggests that these fields may be helping to also innovate the field of empathy and games with new types of experiences, and could benefit from a more cohesive design framework. We should also encourage other fields to develop these types of games so that we can see the full range of what games can do, and not just limit their use to certain fields (such as testing for usability and human interactions as in the case of HCI, or addressing healthcare needs or nursing education). Not surprisingly, education researchers focus on educational games and games for social impact. However, as suggested by this research, some fields may be focusing more on analyzing digital games and commercial games, such as computer science, psychology, philosophy, and humanities. We may want to encourage such disciplines to also consider applying their analyses to non-digital games, games for social change and games for education. This will help to further the area of empathy and games, as it will benefit from other types of questions being asked and answered, and other types of methodologies and analyses being applied (Zaki, 2017).

Next steps and recommendations

This research served to describe and analyze the current scholarship being generated around the emerging intersection of empathy and games. This area of inquiry is characterized by being extremely diverse in term of disciplines used to approach the topic, where this scholarship is found, and the ways in which empathy is used and defined in the articles. Moving forward, we make the following recommendations for researchers hoping to approach this area.

Define and interpret how to use the term empathy. This study suggested that at least 14 different “types of empathy” or empathy-related definitions are present in the literature. A common language and standards for comparison would be helpful when comparing and contrasting “empathy” across different disciplines. Rather than continuing to generate new definitions of empathy or new ways of describing empathy (e.g., affective empathy, critical empathy, historical empathy), researchers should consider devising a set of standardized, clearly defined, and measurable terms. Researchers need a shared language and taxonomy to be able to build on each other’s studies and replicate results.

Establish norms around measurement and assessment. This study has also suggested that there are a number of different disciplinary approaches taken when studying empathy (12 distinct disciplines emerged), each with their own standards, metrics, and terminology. Rather than finding novel ways to measure empathy, researchers should first consider how to establish norms and standards for assessing and comparing types of empathy across disciplinary boundaries, while also enabling and encouraging different types of assessment based on the variety of disciplinary approaches.

Partner or collaborate with researchers from other disciplines. This study has suggested that a wide range of disciplinary approaches are being used to study empathy and games. Given the complex and interdisciplinary nature of both empathy and games, as well as their intersection, researchers may want to connect with researchers from other types of fields to better approach this area.

Generate more research in this area. The area of empathy and games is still nascent, and as yet, has only 49 peer-reviewed journal articles published on the topic in the past decade. Yet, many open questions remain (Schrier & Farber, 2019). Researchers may want to further explore elements associated with empathy and games (such as those 15 terms/phrases identified in this study) or consider the limits as to how games and game design may support the practice of empathy toward game characters, one’s avatar, other players, and people outside the game.

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Appendix

Appendix I. List of Articles Analyzed.

Title of Paper	Author(s)	Journal(s)	Year Published	Database(s)
Superman vs. BAD Man? The Effects of Empathy and Game Character in Violent Video Games	Happ, C., Melzer, A., & Steffgen, G.	*Cyberpsychology, Behavior, and Social Networking*	2013	Google, EBSCO
How do presence, flow, and character identification affect players empathy and interest in learning from a serious computer game?	Bachen, C. M., Hernandez-Ramos P., Raphael C., & Waldron, A.	*Computers in Human Behavior*	2016	ACM
Games for Empathy for Social Impact	Papoutsi, C., & Drigas, A.	*International Journal of Engineering Pedagogy*	2016	EBSCO, Google
Revitalizing Japanese American Internment: Critical Empathy and Role-Play in the Musical Allegiance and the Video Game Drama in the Delta	Roxworthy, E.	*Theatre Journal*	2014	EBSCO, ProQuest
Playing with Trauma in Video Games: Interreactivity, Empathy, Perpetration	Smethurst, T.		2015	Google, SAGE, ProQuest
The Design and Evaluation of a	Tong, X., Ulas, S., Jin, W.,	*PervasiveHealth '17: Proceedings*	2017	ACM

Body-Sensing Video Game to Foster Empathy towards Chronic Pain Patients	Gromala, D., & Shaw, C.	*of the 11th EAI International Conference on Pervasive Computing Technologies for Healthcare*		
Someone Else's Shoes - Using Role-Playing Games for Empathy and Collaboration in Service Design	Vaajakallio, K., Lehtinen, V., Kaario, P., Mattelmäki, T., Kuikkaniemi, K., & Kantola, V.	*Swedish Design Research Journal*	2010	Google
Developing children’s cultural awareness and empathy through games and fairy tales	Muravevskaia, E., Gardner-McCune, C., & Tavassoli, F.	*IDC '16*	2016	ACM
A Breathtaking Journey. On the Design of an Empathy-Arousing Mixed-Reality Game	Kors, M. J. L., Ferri, G., van der Spek, E. K., Ketel, C., & Schouten, B. A. M.	*CHI PLAY '16*	2016	ACM
Playing with Empathy: Digital Role-Playing Games in Public Meetings	Gordon, E., & Schirra, S.	*C&T’11*	2011	ACM
Educating bicycle safety and fostering empathy for cyclists with an affordable and game-based VR app	Wang, W., Singh, K. P., Chu, Y. T., & Huber, A.	*MobileHCI '16 Proceedings of the 18th International Conference on Human-Computer Interaction with Mobile Devices and Services Adjunct*	2016	ACM
Violent computer games, empathy, and cosmopolitanism	Coeckelbergh, M.	*Ethics and Information Technology*	2007	ACM

Bringing empathy into play: on the effects of empathy in violent and nonviolent video games	Happ, C., Melzer, A., & Steffgen, G.	*ICEC'11: Proceedings of the 10th international conference on Entertainment Computing*	2011	ACM
Simulating REAL LIVES: Promoting Global Empathy and Interest in Learning Through Simulation Games	Bachen, C. M., Hernández-Ramos, P. F., & Raphael, C.	*Simulation and Gaming*	2012	ACM, Google, ProQuest, EBSCO, SAGE
Determining reactive and proactive aggression and empathy levels of middle school students regarding their video game preferences	Siyez, D., & Baran, B.	*Computers in Human Behavior*	2017	ACM
Measuring Empathy to Support Learning Design and Narrative Game: A Phenomenological Approach	Mangione, G. R., Discepolo, T., Di Tore, P. A., Di Tore, S., Cozzarelli, C., & Corona, F.	*CISIS '13: Proceedings of the 2013 Seventh International Conference on Complex, Intelligent, and Software Intensive Systems*	2013	ACM
Dream Lucidity: Yume Nikki and Learning the Empathy Dreamscape	Bommarito, C., & Dunlap, K.	*International Journal of Gaming and Computer-Mediated Simulations*	2014	ACM
A Model of Motivation Based on Empathy for AI-Driven Avatars in Virtual Worlds	Rebolledo-Mendez, G., de Freitas, S., & Gaona, A. R. G.	*VS-GAMES '09: Proceedings of the 2009 Conference in Games and Virtual Worlds for Serious Applications*	2009	ACM

Exposure to violent computer games and Chinese adolescents’ physical aggression: The role of beliefs about aggression, hostile expectations, and empathy	Zhen, S., Xie, H., Zhang, W., Wang, S., & Li, D.	*Computers in Human Behavior*	2011	ACM, ProQuest, Directory of Open Access Journals (DOAJ), EBSCO, Google
Playing with trauma: Interreactivity, empathy, and complicity in the walking dead video game	Smethurst, T., & Craps, S.	*Games and Culture*	2015	SAGE, Google, ProQuest
Empathy at play: Embodying posthuman subjectivities in gaming	Wilde, P., & Evans, A.	*Convergence: The International Journal of Research into New Media Technologies*	2017	SAGE
Are Associations Between 'Sexist' Video Games and Decreased Empathy Toward Women Robust? A Reanalysis of Gabbiadini et al.	Ferguson, C., & Donnellan, M.	*Journal of Youth & Adolescence*	2017	EBSCO, ProQuest
Video games as virtual teachers: Prosocial video game use by children and adolescents from different socioeconomic groups is associated with increased empathy and	Harrington, B., & O’Connell, M.	*Computers in Human Behavior*	2016	EBSCO

prosocial behaviour				
Impact of an Aging Simulation Game on Pharmacy Students' Empathy for Older Adults	Chen, A. M. H., Kiersma, M. E., Yehle, K. S., & Plake, K. S.	*American Journal of Pharmaceutical Education*	2015	EBSCO, ProQuest
Gaming for Affect: Museum Online Games and the Embrace of Empathy	Kidd, J.	*Journal of Curatorial Studies*	2015	EBSCO, Google
Impact of the Geriatric Medication Game on nursing students’ empathy and attitudes toward older adults	Chen, A. M. H., Kiersma, M. E., Yehle, K. S., & Plake, K. S.	*Nurse Education Today*	2015	EBSCO, ProQuest
Perception of Space, Empathy and Cognitive Processes: Design of a Video Game for the Measurement of Perspective Taking Skills	Di Tore, P.A.	*International Journal of Emerging Technologies in Learning*	2014	EBSCO
Do problematic and non-problematic video game players differ in extraversion, trait empathy, social capital and prosocial tendencies?	Collins, E., & Freeman, J.	*Computers in Human Behavior*	2013	EBSCO
Associations Between Game Use and Cognitive Empathy: A Cross-	Shin, D., & Ahn, D.	*CyberPsychology, Behavior & Social Networking*	2013	EBSCO

Generational Study				
Explaining altruistic sharing in the dictator game: The role of affective empathy, cognitive empathy, and justice sensitivity	Edele, A., Dziobek, I., & Keller, M.	*Learning & Individual Differences*	2013	EBSCO, ProQuest
Exposure to violent computer games and Chinese adolescents’ physical aggression: The role of beliefs about aggression, hostile expectations, and empathy	Zhen, S., Xie, H., Zhang, W., Wang, S., & Li, D.	*Computers in Human Behavior*	2011	EBSCO, Google, ProQuest, DOAJ, ACM
Observed bodies and tool selves: kinaesthetic empathy and the videogame avatar	Chin, G. P. W.	*Digital Creativity*	2017	EBSCO
Long-Time Exposure to Violent Video Games Does Not Show Desensitization on Empathy for Pain: An fMRI Study	Xuemei G., Wei P., Li, C., Weng, L., Yao, M., & Chen, A.	*Frontiers in Psychology*	2017	DOAJ
Games for Empathy for Sensitive Social Groups	Drigas, A., & Papoutsi, C.	*International Journal of Recent Contributions from Engineering*	2016	DOAJ, Google
The Associations between Perceived Parenting Styles, Empathy, and Altruistic Choices in Economic	Guo, Q., & Feng, L.	*Frontiers in Psychology*	2017	DOAJ ProQuest, Google, ACM

Games: A Study of Chinese Children				
Acting like a Tough Guy: Violent-Sexist Video Games, Identification with Game Characters, Masculine Beliefs, & Empathy for Female Violence Victims	Gabbiadini, A., Riva, P., Andrighetto, L., Volpato, C., & Bushman, B. J.	*PLoS One*	2016	ProQuest
Empathy Emerges Spontaneously in the Ultimatum Game: Small Groups and Networks	Iranzo, J., Floría, L. M., Moreno, Y., &Sánchez, A.	*PLoS One*	2012	ProQuest
Observers versus agents: Divergent associations of video versus game use with empathy and social connectedness	Ahn, D., & Shin, D.	*Information Technology & People*	2016	ProQuest
Disease dynamics in a stochastic network game: a little empathy goes a long way in averting outbreaks	Eksin, C., Shamma, J. S., & Weitz, J. S.	*Scientific Reports (Nature Publisher Group)*	2017	ProQuest
The Impact of Emotions and Empathy-Related Traits on Punishment Behavior: Introduction and Validation of the Inequality Game	Klimecki, O. M, Vuilleumier, P., & Sander, D.	*PLoS One*	2016	ProQuest, DOAJ
Playing prosocial video games increases empathy	Greitemeyer, T., Osswald, S., & Brauer, M.	*Emotion*	2010	Google

and decreases schadenfreude				
Designing Games to Foster Empathy	Belman, J., & Flanagan, M.	*Cognitive Technology*	2009	Google
Like the good or bad guy--empathy in antisocial and prosocial games	Happ, C., Melzer, A., & Steffgen, G.	*Psychology of Popular Media*	2015	Google
Unraveling fairness in simple games? The role of empathy and theory of mind	Artinger, F., Exadaktylos, F., Koppel, H., Sääksvuori, L.	*Jena economic research papers*	2010	Google
Empathy and Identity in Digital Games: Towards a New Theory of Transformative Play	Tanenbaum, J., & Tanenbaum, K.	*Proceedings of the 10th International Conference on the Foundations of Digital Games (FDG 2015)*	2015	Google
Playing at Empathy: Representing and experiencing emotional growth through Twine games	Salter, A.	*SeGAH 2016 (Conference Proceedings)*	2016	Google
Barriers to learning about mental illness through empathy games-results of a user study on perfection	Harris, B., Shattell, M., Rusch, D. C., & Zefeldt, M.J.	*Well Played Journal*	2015	Google
Are newgames better journalism? Empathy, information and representation in games on refugees and migrants	Plewe, C., & Fürsich, E.	*Journalism Studies*	2017	Google
Online Videogames in an Online History Class	Martin, V. S.	DIGITEL '08: Proceedings of the 2008 Second IEEE International	2008	ACM

		Conference on Digital Game and Intelligent Toy Enhanced Learning		

Appendix II. Coding Scheme.

Label for the Code	**Code Number Used**
Database	600
ACM	601
ProQuest	602
Sage	603
EBSCO	604
DOAJ	605
Google Scholar	606

Search Keywords	700
Empathy AND games	702
Empathy AND videogames	703

Discipline	100
Psychology (psychological effects; social; behavioral aspects of games)	101
Nursing/Health	102
Economics/social science	103
Gaming/game studies	104
Communications/Media Effects	105
HCI/user-centered Design	106
Philosophy/Ethics	107
Computer science	108
Civics/social studies	109
Art/performing arts	110
Education/Learning	111
Humanities/Media Studies	113

Associated Terms	200

Reflection	201
Communication	202
Perspective-taking/perspective/put self in other's shoes	203
Prosocial	206
Critical thinking	207
Cultural awareness/Global /cultural understanding	208
Agency	209
Narrative/storytelling	210
Feelings/emotional understanding/emotion/Empathetic concern	211
Civics/civic engagement	212
Identification with others/relate to others	213
Immersion/engagement	217
Violence/violent	220
Morality/ethics	224
Altruism	225
Ethics/values/fairness/justice	226

How empathy is defined/ Type of empathy terms used	300
Cognitive empathy	301
Historical empathy	302
Literary empathy	303
Emotional/affective empathy	304
Psychological/psychoanalytic empathy	305
Reactive empathy	306
Global empathy	307
Other (auto, critical, player-specific)	308
General empathy also (general term of empathy)	309
Parallel empathy	310
Fantasy empathy	311
Cultural empathy	312
Trait Empathy	320
Game/gameplay empathy	321
Critical empathy	322

Game genre/category	800
CoTs	801
Educational Game	802
Sport/outdoor game	803
Indie game	804
Analog game	805
LARPs	806
Other	807
Games for Change/Social impact	808
Digital game	809
Role-playing games	810
Their own game used for testing	811
Economics/game theory game	820