Article

Video Games as Time Machines: Video Game Nostalgia and the Success of Retro Gaming

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Abstract
This article conceptually integrates research on the experience of nostalgia—defined as a predominantly positive, social, and past-oriented emotion—into the fold of video game research. We emphasize the role of nostalgia as an explanation for contemporary retro gaming trends, and suggest that nostalgia towards gaming events is a necessary area of research. To those ends, we broadly review existing literature on nostalgia before specifically focusing on media-induced nostalgia, and demonstrate how theoretical and empirical observations from this work can be applied to understand video game nostalgia. In particular, we argue that engaging in older gaming experiences indirectly (via memories) and even directly (via replaying or recreating experiences) elicits nostalgia, which in turn contributes to players' self-optimization and enhanced well-being. Moreover, as gamers and the medium mature together, nostalgic experiences with the medium are likely to become increasingly prevalent. The broad aim of this article is to offer future directions for research on video game nostalgia and provide a research agenda for research in this area.

Issue
This article is part of the issue "Games Matter? Current Theories and Studies on Digital Games", edited by Julia Kneer (Erasmus University Rotterdam, The Netherlands) and Ruud Jacobs (University of Twente, The Netherlands).

1. Video Games as Time Machines: Video Game Nostalgia and the Success of Retro Gaming

The emergence of the video gaming industry in the 1980s has provided modern-day video gamers with over three decades of experience with the medium. From the Nintendo Entertainment System of 1984 that is largely credited with re-establishing the fledgling entertainment medium, games have gone through a number of critical, economic, and technological evolutions that have transformed them from children's toys (Ivory, 2015) to an integral part of society (Bogost, 2011).

Perhaps unsurprisingly then, retro gaming is a recent phenomenon in video game culture—gamers are starting to return to their initial and past experiences with games. Typically, retro gaming describes playing and col-

lecting old video games and consoles, although it can also include playing modern games with a "retro" style, such as using older graphics and audio mechanics. Especially over the last few years, video game developers have successfully relaunched a plethora of past video game content and technology. For instance, in 2016 with *Pokémon Go*, Nintendo launched the third most popular smartphone application of the year (Bell, 2016). The re-release of the Nintendo Entertainment System Classic Edition more than 30 years after its first appearance in the 1980s met with similar critical and commercial success, selling out mere hours after its release (Peckham, 2016). Pubs and taverns have begun setting up retro-style arcade machines, giving patrons the possibility to enjoy their beer with a game of *Pac-Man* or *Pong* (Axelrod, 2015).[1] Developers have even taken towards releasing unique games made to resemble 1980s and 1990s releases (Webster, 2017).

What makes these developments particularly interesting is that the renewed interest represents a devolution in gaming—despite the rapid advances in technology and the playing experiences modern games offer, people choose technologically inferior or less sophisticated games and platforms. Such a preference is at odds with the traditional push towards better graphics and faster hardware.[2]

One explanation for the recent success of retro gaming is that it creates a sense of nostalgia, which can serve as a psychological resource for the players' sense of self and well-being—in a way, retro gaming allows players to take a digital "time machine" to their bygone past. In the following, we (a) summarize the state of nostalgia research (including recent studies on video game nostalgia, specifically) and (b) outline a conceptual and methodological toolkit for future work on video game nostalgia.

2. Nostalgia

After reflecting on meaningful and self-referential past events, people will wallow in their memories and enter an emotional state that contains both positive emotions (warmth, tenderness, joy, elation) and negative emotions (loss, fear, sadness; Barrett et al., 2010). This mixed-affective state is *nostalgia*. Hepper, Ritchie, Sedikides and Wildschut (2012) found that characteristics of nostalgia most commonly include references to bygone events from the past. More specifically, emergent features included *memories*, *the past*, *personal meaning*, *yearning or longing*, *social relationships*, *happiness*, and *childhood*. Follow-up work (Hepper et al., 2014) substantiated these findings for various cultures. Summarizing this research, Sedikides et al. (2015b) define nostalgia as a "predominantly positive, social, and past-oriented emotion" (p. 198).

Research has found two types of triggers for nostalgia. The first type occurs externally through sensory stimuli in one's environment that remind people of their past. This has been demonstrated for smells (Reid, Green, Wildschut, & Sedikides, 2014), tastes (Supski, 2013), different objects (often childhood-related; Holbrook & Schindler, 1996) and music (Cheung et al., 2013; Routledge et al., 2011). The second type occurs internally and typically arises from feelings of psychological discomfort. For instance, if people feel lonely (Wildschut, Sedikides, Arndt, & Routledge, 2006), meaningless (Routledge, Wildschut, Sedikides, Juhl, & Arndt, 2012), or bored (van Tilburg, Igou, & Sedikides, 2013), they may turn their thoughts towards the past to cope with this discomfort.

2.1. Video Games and Nostalgia

Research on the potential of media stimuli to trigger nostalgia has found that trailers of video games and movies may hold the potential to make people feel nostalgic (Natterer, 2014). Wulf and Rieger (2017) found evidence that the parasocial relationships that viewers establish with on-screen media personae (cf. Horton & Wohl, 1956) lead to increased feelings of nostalgia when people remember past media content. Studies looking at the popular augmented reality mobile game *Pokémon Go* found that playing the game showed positive associations with nostalgic reverie (Bonus, Peebles, Mares, & Sarmiento, 2017). Indeed, Wulf and Baldwin (2018) found *personal meaningfulness* of the Pokémon franchise to have the strongest associations with nostalgia, even more so than trait nostalgia proneness; nostalgia in turn increased intentions to play the game. *Pokémon Go* is an interesting case for video game nostalgia. While it had the same basic "catch 'em all" mechanic which encouraged players to collect Pokémon as the original *Pokémon* (released in 1996), the original took place in the fictitious "Kanto region" (with its own unique characters and narrative) while the latter was played in an augmented reality format (using the player's own environment). Thus, Wulf and Baldwin (2018) suggest that nostalgia can be invoked by engaging elements of a game or franchise, and does not require an exact reproduction of the original game.

In an exploratory study on video game nostalgia, Wulf, Breuer, Bowman and Velez (2017) asked participants to recall enjoyable gaming experiences, randomly assigning them to recall (via an essay prompt) either past or recent gaming experiences that they had either alone or together with others. Additionally, participants had to estimate how autonomous, competent, and socially related they had felt when playing these games—measures of intrinsic need satisfaction critical to enjoyable gaming

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[1] This is in a way reminiscent of the original arcade machines—the first *Pong* arcade was installed in Sunnyvale, California, in a tab called Andy Capp's tavern 1972 (Kent, 2001).
[2] A prominent example from recent gaming history are the so-called "bit wars" of the 1990s in which game manufacturers challenged each other to develop more powerful consoles, usually measured by the number of bits (graphics detail) and colors displayed on-screen (cf. Workman, 2014).

experiences (cf. Tamborini, Bowman, Eden, Grizzard, & Organ, 2010). They found that nostalgia was positively associated with the fulfilment of competence (directly) and relatedness (influenced by social play) within the memory. Moreover, qualitative analyses of the essays written by participants found that past video game memories were more often associated with childhood, challenge, and overall (hedonic) media enjoyment compared to recent essays. Taken together, these findings suggest that simply remembering gaming experiences can create nostalgia and that competence and relatedness fulfillments within memory connect to nostalgic reverie.

2.2. Nostalgia as a Self-Related Emotion

In his self-discrepancy theory, Higgins (1987) differentiates between the *actual self*—"your representation of the attributes that someone (yourself or another) believes you actually possess" (p. 320)—and the *ideal self*—"your representation of the attributes that someone (yourself or another) would like you, ideally, to possess" (p. 321). When comparing their actual and ideal self, people may feel a discomfort that motivates them to reduce the gap between these entities. In general, how people remember and evaluate past life events impacts how they see themselves—people tend to self-enhance by remembering positive past life events, and turn away from past selves which they associate with negative life events (Wilson & Ross, 2003).

Nostalgia can serve to orient people closer to their ideal self. In this way, feelings of nostalgia seems to serve a "self-oriented function" (Sedikides et al., 2015b, p. 209). Research has demonstrated that when instructed to elaborate on a *nostalgic* life event (compared to an *ordinary* event), people showed higher accessibility of positive self-attributes (Vess, Arndt, Routledge, Sedikides, & Wildschut, 2012). Moreover, this accessibility to positive attributes also braced nostalgic people for subsequent self-threats (negative performance feedback in this study). Also, Baldwin, Biernat and Landau (2015) showed that participants remembering nostalgic experiences showed higher intrinsic self-focus, lower extrinsic self-focus, and perceived themselves as more authentic than participants who remembered an ordinary event. Finally, nostalgia also fosters self-acceptance by enhancing self-positivity (Vess et al., 2012) and personal growth via self-expansion and curiosity (Baldwin & Landau, 2014). These findings suggest that nostalgia not only provides people with an overall positive evaluation of themselves, but also encourages reflection on inner values and personality.

Finally, nostalgia contributes to self-continuity, "a sense of connection between one's past and one's present" (Sedikides et al., 2016, p. 524). As self-continuity involves perpetual self-development, nostalgia fosters self-continuity that in turn restores self-esteem (Sedikides, Wildschut, Routledge, & Arndt, 2015a). Thus, by remembering meaningful past experiences, people

sense that their life has a common thread. All these studies combined suggest that nostalgia functions as a resource for the self.

2.3. Video Games and Self-Relations

Playing video games may have an impact on how people see and identify themselves. Video games exist as media properties that defined a generation (Carstens & Beck, 2004) and as such, their images are iconic with a by-gone era of classic gaming (Hörtnagl, 2016). Given that the average gamer is in their mid-1930s and has been playing for nearly two decades (Entertainment Software Association, 2016), a large segment of the gaming market is comprised of people who have grown up with technologies popular in their youth (Heineman, 2014). Scholars such as Durkin (2006) argued that by the end of the 20th century, video games had become a ubiquitous social and cultural touchstone in a normal childhood development. Moreover, gamers defend their social identity as "gamers" from negative stereotypes of gamers (Kneer, Munko, Glock, & Bente, 2012; Nauroth, Gollwitzer, Bender, & Rothmund, 2015), and retro gaming fans constitute an even more nuanced gamer identity (Suominen, 2008).

A critical element of nostalgia and self-identity is that one can also tap media products that influenced past identities (or influenced previous versions of one's identity). Similar work on nostalgia elicited by song lyrics suggests that listeners who find nostalgic meaning in songs were more likely to explore their identity (Batcho, DaRin, Nave, & Yaworsky, 2008). Specifically, "an essential dimension of nostalgic sentiment is the awareness that the object of nostalgic longing is gone forever, trapped in a past that cannot be again" (p. 240). This is highly relevant for nostalgia as elicited by video games, as people still can play the referent nostalgic products. In contrast to songs that allow an acoustic journey to the past, video games allow people to return with more than the aural sense, namely visual and, in the case of past gaming controls, haptic sense. Hence, by engaging older games people can essentially return to the exact same virtual space that they explored in earlier times, which might "constitute an identity for themselves that is grounded in nostalgia, expertise, and an agonistic relationship to the modern games industry" (Heineman, 2014, p. 19). Retro gaming therefore allows gamers to revisit and maintain their gamer identity.

Finally, applying nostalgia's self-oriented function to video games, people who have had positive playing experiences might use these memories for actual self-enhancement and maintaining positive self-views. Nostalgia emerging from re-experiencing these games might also come with a particular kind of meaningfulness. For instance:

> Two friends playing a game together that they often played together as children might provide an enter-

tainment experience that differed in its meaningfulness compared to other games played at other times with other friends. (Elson, Breuer, Ivory, & Quandt, 2014, p. 535)

Such situations represent (self-)continuity in the players' lives in three different regards: First, the game itself appears as a steady, persistent component in both players' lives over time. Second, the situation portrays a playing experience together with a closely related person and therefore, playing the game mirrors the stable and ongoing friendship between these people. Finally, the fact that these two people enjoy playing the same game now that they often played as children also refers to the fact that their preferences for video games (or leisure time activities, globally) have not substantially changed over time.

2.4. Video Game Nostalgia and Well-Being

Research has commonly sought an explanation for those variables crucial for living a good and happy life. One group argues a good life is that of people who experience a lot of positive affect (pleasure and joy) and a minimum of negative affect (discontent and sadness). This view is defined as *subjective well-being* (cf. Diener, Emmons, Larsen, & Griffin, 1985; Kahneman, Diener, & Schwarz, 1999). A second perspective builds upon Aristotle's approach in his *Nicomachean Ethics* and focusses on the assumption that one has to live according to their true self—people who realize their inner goals and ambitions achieve highest fulfillment and well-being (Waterman, 1993). Following this latter perspective, *psychological well-being* consists of components that emerge in people who live according to their self (Ryff & Keyes, 1995, p. 720). Notably, subjective and psychological well-being show significant positive correlations, indicating that both concepts relate to each other (cf. Keyes, Shmotkin, & Ryff, 2002).

With respect to subjective well-being, nostalgia has been found to counter aversive states such as negative affect (Barrett et al., 2010) and boredom (van Tilburg et al., 2013). Furthermore, by enhancing self-concept clarity ("the extent to which self-beliefs are clearly and confidently defined", Campbell et al., 1996, p. 141), nostalgia enhances overall life satisfaction (Ritchie, Sedikides, Wildschut, Arndt, & Gidron, 2011) and increases optimism for the future (Cheung et al., 2013). Regarding psychological well-being, nostalgia fosters purpose in life (Routledge et al., 2011), and positive relations with others due to its social nature, reminding people of their peers (Wildschut et al., 2006). Moreover, people coping with threats for psychological well-being use nostalgia as an antidote: It counters loneliness (Wildschut et al., 2006), social exclusion (Wildschut, Sedikides, Routledge, Arndt, & Cordaro, 2010), and restores a lack of meaning in life after existential threats (Juhl, Routledge, Arndt, Sedikides, & Wildschut, 2010). Altogether, nostal-

gia holds a variety of contributions to facilitate living a good, satisfied, and meaningful life.

Does remembering video game experiences and replaying old or re-released video games elicit nostalgia in a way that contributes to well-being? Emerging studies show some evidence that video game nostalgia shows similar positive associations with well-being. Broadly, nostalgia triggered by remembering enjoyable video game experiences is positively connected with aspects of subjective well-being (vitality) as well as psychological well-being (social connectedness; Wulf et al., 2017). Two studies investigated how nostalgia triggered by playing *Pokémon Go* relates to particular well-being outcomes. Bonus et al. (2017) showing that playing *Pokémon Go* positively correlates with nostalgic reverie, which in turn contributes to resilience (defined as the ability to cope with setbacks in life), one dimension of well-being. Wulf and Baldwin (2018) showed that nostalgia triggered by playing *Pokémon Go* positively correlated with entertainment of the game, which boosted both subjective and psychological components of well-being.

Thus, we conclude that nostalgia can increase well-being through providing an overall entertaining gaming experience. Positive effects found for biographical nostalgia are therefore replicable in the video game context and point towards this area of research as potential venue for future research.

3. Venues for Future Research

Given the novelty of research on retro gaming and its psychological benefits, there is a variety of questions which future research could address. Below, we offer a discussion of promising venues that would benefit from understanding the motivations and effects of video game-induced nostalgia as well as a research agenda to investigate this emerging field.

First, the role of past technology (hardware, controllers, particular modules or discs) in the elicitation of nostalgia is still unclear (see Roth, Lugrin, von Mammen, & Latoschik, 2017). Several studies imply that the content and (social) circumstances of past games make people nostalgic, and that perhaps the technology itself is secondary to the experience. They found relationships to characters (Wulf & Rieger, 2017), personal meaningfulness for the franchise (Wulf & Baldwin, 2018), positive psychological experiences as well as social associations while playing the game positively related to nostalgia (Wulf et al., 2017). However, if the specific technology (such as the console) is not critical for the elicitation of nostalgia, then why do people pay substantial amounts of money for a Nintendo Entertainment System Classic Edition—and even more for an original console—instead of paying a small fraction of the costs to play the same games in other formats (such as the eShop for Nintendo Wii)? One assumption could be that these *classic* consoles are able to represent part of people's identity, somewhat suggested by Suominen (2008).

While some people decorate their places with old photographs or share vintage style pictures on Instagram to express themselves (Niemeyer, 2014; Sapio, 2014), others express their identity decorating their place with technological objects such as these classic consoles. Having these objects at home, owners and visitors may stop by, wallow in their (shared) gaming memories when seeing these artifacts, and become nostalgic as a result. To assess what role hardware plays for the experience of video game nostalgia, research is needed that presents participants with old or retro gaming hardware and, for example, compare the effects of playing old games on new versus old hardware or only interacting with the hardware (without playing a game).

Second, research needs more conceptualizing about the relationship between nostalgia and video game entertainment. Theoretically, nostalgia may contribute to several components of entertainment (Wulf & Schmitt, 2017). Generally, recent models of entertainment assume that there are two processes making video games, or media in general, entertaining (Vorderer, 2011): people experience *hedonic* entertainment as enjoyable, funny, lighthearted, or suspenseful. These experiences are opposed to *eudaimonic* or *non-hedonic* entertainment. These experiences are entertaining because of their potential to evoke critical thoughts and to question people's worldview, leaving the audience in a moved or pensive state (Oliver & Bartsch, 2010). Both of these experiences apply to video games (Oliver et al., 2015). We predict that nostalgia as a response to playing past-related video games may contribute to both of these experiences. First, nostalgia fosters hedonic experiences as people enjoy the playful time travel. Nostalgia is a predominantly positive emotion (Sedikides et al., 2015b) and *fond memories* as well as *happiness* belong to one of the central features identified (Hepper et al., 2012). Second, nostalgia contributes to eudaimonic entertainment. People might experience video game nostalgia as meaningful and feel moved by this experience. They also compare their present identity to the identity of the person they had been when playing that game earlier in their life. For those reasons, nostalgia theoretically connects to both hedonic and eudaimonic experiences.

Although there is some evidence for a positive relationship between nostalgia and entertainment in general (Wulf & Baldwin, 2018), future research needs to evaluate nostalgia's contribution to particular hedonic and eudaimonic entertainment. Such a focus could, for example, differentiate preferences for retro and present games, at both the state and more trait-based levels. For instance, recent conceptualizations of meaningful media focus on their potential to elicit self-transcendent emotions, such as gratitude (Dale et al., 2017; Oliver et al., in press). Feeling grateful of one's past or the possibility to reminiscence in past playing experiencing might be one of the reasons leading to positive nostalgic media experiences. In addition, while some prefer media usage for short-term fun and distraction, others prefer media experiences that offers them some meaningful insight (Oliver & Raney, 2011). Research bridging the gap between entertainment preferences and actual retro gaming combined with research on nostalgia's contribution to entertainment might unveil the characteristics and the motives behind people using retro games.

Looking at challenges for research on video game nostalgia, one major problem is nostalgia's idiosyncratic nature. While Person A might become nostalgic listening to a particular song as it reminds her or him on a specific situation (for instance, the first kiss), for Person B the same exact song could (and probably does) signify something completely different. The same holds true for video game content and technology: though Person A and Person B both identify as gamers, who vary in their experience with games and franchises, one could imagine for example Person A having played games on a Super Nintendo but Person B having preferred playing the same or other games on a Sega Genesis. To account for this idiosyncratic nature of nostalgia, we recommend future research to use yoked designs: in a pretest, researchers ask participants for their childhood gaming experiences (which console and games was their favorite). In the main study, participants then will re-play these exact games to make sure to hit the idiosyncratic experience. Of course, these differences could also help better unpack differences in the genesis of nostalgic affect—in the above example when playing the same game, players would have both a common touchpoint (game content) and also variable experience (game controller and console).

Related to this issue of replaying the exact same game, the above-mentioned studies asked players of *Pokémon Go*, a game that builds upon the Pokémon franchise but is quite different from the original *Pokémon* editions, or asked participants to remember and report past gaming experiences. Indeed, nostalgic and positive memories might foster people's intention to buy or re-play these games (Schindler & Holbrook, 2003; Sierra & McQuitty, 2007), but research has not yet investigated the actual re-playing experience. As recently shown, people might want to play on their classic console, especially classic Nintendo games which belong to the computationally hardest categories of games (Aloupis, Demaine, Guo, & Viglietta, 2015). Though these games may come with positive and supportive feelings of nostalgia, it is questionable to what extent people may become frustrated and disappointed when playing games that have been idealized in their nostalgic reverie (Kaplan, 1987). One can imagine that the feelings elicited by a game 20 years ago might not be the same feelings elicited today, for example given that action video games are known to boost cognitive abilities (Green & Bavelier, 2003) gamers with experience might not find older games as challenging as they did in their childhood. Thus, it is interesting to see how violations of anticipated playing experiences (positive or negative) shape the actual playing situation. Related to this issue, people tend to be wrong about estimating their future feelings:

Emotions can occur in complex blends...and people might fail to anticipate the precise nature of the mix they will experience...especially...events that produce a combination of positive and negative emotions. People often view the future in a simplistic manner, assuming that events will cause primarily good or bad feelings, rather than a rich mixture of both. (Wilson & Gilbert, 2003, p. 348)

It is reasonable that people, when deciding to re-play a video game associated with a meaningful past, miscalculate the fact that playing the game might also cause negative affect, such as nostalgic regret for the past or even frustration due to its (unexpected or forgotten) difficulty. Future research should control for, as well as specifically investigate, the discrepancy between expectations and actual re-playing experiences.

Finally, one issue that connects to a yet unanswered line of research is the limitation of cross-sectional data for video game nostalgia research. That means that studies have yet to evaluate how nostalgia relates to well-being and entertainment outcomes at one particular point of time but they cannot answer (a) how the integration of nostalgic games into people's life *changes* well-being in the long-run and (b) if entertainment gratifications may wear off after initially high enthusiasm—a sort-of novelty effect. For example, though games such as *Pokémon Go* had a steep rise attributed to nostalgia, most of the gamers have lowered their playing time or quit the game after a few months of enthusiastic play (cf. Kawa & Katz, 2016). For those reasons, research should keep in sight potential upcoming nostalgic video game releases and use longitudinal study designs to answer the question how long nostalgia's effects last.

4. Conclusion

This article has argued that nostalgia, as an experience evoked by replaying past video games, can significantly contribute to well-being and a sense of social identity. Hence, nostalgia is one—if not the—key factor for explaining the recent success of retro gaming. Although there are several preliminary studies that provide important insights, we see the opportunity and need for different types of additional research that is necessary to fully understand the phenomenon of retro gaming and its appeal to many people. We have tried to identify some yet unanswered research questions that we deem essential for this area of research as well as provide recommendations for methodological approaches that we would deem fruitful. Ultimately, we hope this contribution will encourage future work and debate about video game nostalgia and uncover how video games can serve not only as entertainment but also as time machines, bringing not only fun and joy but also well-being and meaning into the lives of players.

Conflict of Interests

The authors declare no conflict of interests.

References

Aloupis, G., Demaine, E. D., Guo, A., & Viglietta, G. (2015). Classic Nintendo games are (computationally) hard. *Theoretical Computer Science*, *586*, 135–160. doi:10.1016/j.tcs.2015.02.037

Axelrod, J. (2015). Arcade bar growth turns Valley into multiplayer arena. *Cronkite News*. Retrieved from https://cronkitenews.azpbs.org/2015/11/19/arcade-bar-growth-turns-valley-into-multiplayer-arena

Baldwin, M., Biernat, M., & Landau, M. J. (2015). Remembering the real me: Nostalgia offers a window to the intrinsic self. *Journal of Personality and Social Psychology*, *108*, 128–147. doi:10.1037/a0038033

Baldwin, M., & Landau, M. J. (2014). Exploring nostalgia's influence on psychological growth. *Self and Identity*, *13*, 162–177. doi:10.1080/15298868.2013.772320

Barrett, F. S., Grimm, K. J., Robins, R. W., Wildschut, T., Sedikides, C., & Janata, P. (2010). Music-evoked nostalgia: Affect, memory, and personality. *Emotion*, *10*, 390–403. doi:10.1037/a0019006

Batcho, K. I., DaRin, M. L., Nave, A. M., & Yaworsky, R. R. (2008). Nostalgia and identity in song lyrics. *Psychology of Aesthetics, Creativity, and the Arts*, *2*, 236–244.

Bell, K. (2016, December 6). Apple just revealed the most-downloaded app of 2016. *Mashable*. Retrieved from http://mashable.com/2016/12/06/most-downloaded-apps-2016/#dpop6MUdt5qO

Bogost, I. (2011). *How to do things with video games*. Minneapolis, MN: University of Minnesota Press.

Bonus, J. A., Peebles, A., Mares, M. L., & Sarmiento, I. G. (2017). Look on the bright side (of media effects): Pokémon Go as a catalyst for positive life experiences. *Media Psychology*. doi:10.1080/15213269.2017.1305280

Campbell, J. D., Trapnell, P. D., Heine, S. J., Katz, I. M., Lavallee, L. F., & Lehman, D. R. (1996). Self-concept clarity: Measurement, personality correlates, and cultural boundaries. *Journal of Personality and Social Psychology*, *70*, 141–156.

Carstens, A., & Beck, J. (2004). Get ready for the gamer generation. *TechTrends*, *49*, 22–25.

Cheung, W.-Y., Wildschut, T., Sedikides, C., Hepper, E. G., Arndt, J., & Vingerhoets, J. J. M. (2013). Back to the future: Nostalgia increases optimism. *Personality & Social Psychology Bulletin*, *39*, 1484–1496. doi:10.1177/0146167213499187

Dale, K. R., Raney, A. A., Janicke, S. H., Sanders, M. S., & Oliver, M. B. (2017). YouTube for good: A content analysis and examination of elicitors of self-transcendent media. *Journal of Communication*. doi:10.1111/jcom.12333

Diener, E., Emmons, R., Larsen, J., & Griffin, S. (1985). The satisfaction with life scale. *Journal of Per-*

sonality Assessment, 49, 71–75. doi:10.1207/s15327752jpa4901_13

Durkin, K. (2006). Game playing and adolescents' development. In P. Vorderer & J. Bryant (Eds.), *Playing video games: Motives, responses, and consequences* (pp. 415–428). New York, NY: Routledge.

Elson, M., Breuer, J., Ivory, J. D., & Quandt, T. (2014). More than stories with buttons: Narrative, mechanics, and context as determinants of player experience in digital games. *Journal of Communication*, 64, 521–542. doi:10.1111/jcom.12096

Entertainment Software Association. (2016). *Essential facts about the computer and videogame industry*. Retrieved from http://essentialfacts.theesa.com

Green, C. S., & Bavelier, D. (2003). Action video game modifies visual selective attention. *Nature*, 423, 534–537. doi:10.1030/nature01647

Heineman, D. S. (2014). Public memory and gamer identity: Retrogaming as nostalgia. *Journal of Games Criticism*, 1, 1–33.

Hepper, E. G., Ritchie, T. D., Sedikides, C., & Wildschut, T. (2012). Odyssey's end: Lay conceptions of nostalgia reflect its original Homeric meaning. *Emotion*, 12, 102–119. doi:10.1037/a0025167

Hepper, E. G., Wildschut, T., Sedikides, C., Ritchie, T., Yung, Y.-F., Hansen, N., . . . Zhou, X. (2014). Pancultural nostalgia: Prototypical conceptions across cultures. *Emotion*, 14, 733–747. doi:10.1037/a0036790

Higgins, E. T. (1987). Self-discrepancy: A theory relating self and affect. *Psychological Review*, 94, 319–340.

Holbrook, M. B., & Schindler, R. M. (1996). Market segmentation based on age and attitude toward the past: Concepts, methods, and findings concerning nostalgic influences on customer tastes. *Journal of Business Research*, 37, 27–39. doi:10.1016/0148-2963(96)00023-9

Hörtnagl, J. (2016). "Why? Because it's classic!" Negotiated knowledge and group identity in the retrogaming-community "Project 1999". *Medien & Zeit*, 4, 40–49.

Horton, D., & Wohl, R. (1956). Mass communication and para-social interaction: Observations on intimacy at a distance. *Psychiatry*, 19, 215–229.

Ivory, J. D. (2015). A brief history of video games. In R. Kowert & T. Quandt (Eds.), *The video game debate: Unravelling the physical, social, and psychological effects of digital games* (pp. 1–21). New York, NY: Routledge.

Juhl, J., Routledge, C., Arndt, J., Sedikides, C., & Wildschut, T. (2010). Fighting the future with the past: Nostalgia buffers existential threat. *Journal of Research in Personality*, 44, 309–314. doi:10.1016/j.jrp.2010.02.006

Kahneman, D., Diener, E., & Schwarz, N. (1999). *Well-being: Foundations of hedonic psychology*. New York, NY: Sage.

Kaplan, R. (1987). The psychopathology of nostalgia. *Psychoanalytic Review*, 74, 465–486.

Kawa, L., & Katz, L. (2016, August 22). These charts show that Pokemon Go is already in decline. *Bloomberg*. Retrieved from https://www.bloomberg.com/news/articles/2016-08-22/these-charts-show-that-pokemon-go-is-already-in-decline

Kent, S. (2001). *"And then there was pong". Ultimate history of video games*. New York, NY: Three Rivers Press.

Keyes, C. L. M., Shmotkin, D., & Ryff, C. D. (2002). Optimizing well-being: The empirical encounter of two traditions. *Journal of Personality and Social Psychology*, 82, 1007–1022. doi:10.1037/0022-3514.82.6.1007

Kneer, J., Munko, D., Glock, S., & Bente, G. (2012). Defending the doomed: Implicit strategies concerning protection of first-person shooter games. *Cyberpsychology, Behavior, and Social Networking*, 15, 251–256. doi:10.1089/cyber.2011.0583

Natterer, K. (2014). How and why to measure personal and historical nostalgic responses through entertainment media. *International Journal on Media Management*, 16, 161–180. doi:10.1080/14241277.2014.989567

Nauroth, P., Gollwitzer, M., Bender, J., & Rothmund, T. (2015). Social identity threat motivates science-discrediting online comments. *PLoS ONE*, 10, 1–26. doi:10.1371/journal.pone.0117476

Niemeyer, K. (2014). Introduction: Media and nostalgia. In K. Niemeyer (Ed.), *Media and nostalgia: Yearning for the past, present and future* (pp. 1–10). Basingstoke: Palgrave Macmillan.

Oliver, M. B., & Bartsch, A. (2010). Appreciation as audience response: Exploring entertainment gratifications beyond hedonism. *Human Communication Research*, 36, 53–81. doi:10.1111/j.1468-2958.2009.01368.x

Oliver, M. B., Bowman, N. D., Woolley, J. K., Rogers, R., Sherrick, B., & Chung, M.-Y. (2015). Video games as meaningful entertainment experiences. *Psychology of Popular Media and Culture*, 5, 390–405. doi:10.1037/ppm0000066

Oliver, M. B., & Raney, A. A. (2011). Entertainment as pleasurable and meaningful: Identifying hedonic and eudaimonic motivations for entertainment consumption. *Journal of Communication*, 61, 984–1004. doi:10.1111/j.1460-2466.2011.01585.x

Oliver, M. B., Raney, A. A., Slater, M. D., Appel, M., Hartmann, T., Bartsch, A., . . . Das, E. (in press). Self-transcendent media experiences: Taking meaningful media to a higher level. *Journal of Communication*.

Peckham, M. (2016, November 11). People are selling Nintendo's NES Classic Edition for hundreds of dollars. *Time*. Retrieved from http://time.com/4568238/nes-classic-sold-out

Reid, C. A., Green, J. D., Wildschut, T., & Sedikides, C. (2014). Scent-evoked nostalgia. *Memory*, 23, 157–166. doi:10.1080/09658211.2013.876048

Ritchie, T. D., Sedikides, C., Wildschut, T., Arndt, J., & Gidron, Y. (2011). Self-concept clarity mediates

the relation between stress and subjective well-being. *Self and Identity*, *10*, 493–508. doi:10.1080/15298868.2010.493066

Roth, D., Lugrin, J.-L., von Mammen, S., & Latoschik, M. E. (2017). Controllers & inputs: Masters of puppets. In J. Banks (Ed.), *Avatar, assembled: The social and technical anatomy of digital bodies* (pp. 281–290). Bern: Peter Lang.

Routledge, C., Arndt, J., Wildschut, T., Sedikides, C., Hart, C., Juhl, J., . . . Scholtz, W. (2011). The past makes the present meaningful: Nostalgia as an existential resource. *Journal of Personality and Social Psychology*, *101*, 638–652. doi:10.1037/a0024292

Routledge, C., Wildschut, T., Sedikides, C., Juhl, J., & Arndt, J. (2012). The power of the past: Nostalgia as a meaning-making resource. *Memory*, *20*, 452–460. doi:10.1080/09658211.2012.677452

Ryff, C. D., & Keyes, C. L. M. (1995). The structure of psychological well-being revisited. *Journal of Personality and Social Psychology*, *69*, 719–727. doi:10.1037/0022-3514.69.4.719

Sapio, G. (2014). Homesick for aged home movies: Why do we shoot contemporary family videos in old-fashioned ways? In K. Niemeyer (Ed.), *Media and nostalgia: Yearning for the past, present and future* (pp. 39–50). London: Palgrave Macmillan. doi:10.1057/9781137375889_3

Schindler, R. M., & Holbrook, M. B. (2003). Nostalgia for early experience as a determinant of consumer preferences. *Psychology and Marketing*, *20*, 275–302. doi:10.1002/mar.10074

Sedikides, C., Wildschut, T., Cheung, W.-Y., Routledge, C., Hepper, E. G., Arndt, J., . . . Vingerhoets, J. J. M. (2016). Nostalgia fosters self-continuity by augmenting social connectedness: Implications for eudaimonic wellbeing. *Emotion*, *16*, 524–539. doi:10.1037/emo0000136

Sedikides, C., Wildschut, T., Routledge, C., & Arndt, J. (2015a). Nostalgia counteracts self-discontinuity and restores self-continuity. *European Journal of Social Psychology*, *45*(1), 52–61. doi:10.1002/ejsp.2073

Sedikides, C., Wildschut, T., Routledge, C., Arndt, J., Hepper, E. G., & Zhou, X. (2015b). To nostalgize: Mixing memory with affect and desire. *Advances in Experimental Social Psychology*, *51*, 189–273. doi:10.1016/bs.aesp.2014.10.001

Sierra, J., & McQuitty, S. (2007). Attitudes and emotions as determinants of nostalgia purchases: An application of social identity theory. *The Journal of Marketing Theory and Practice*, *15*, 99–112. doi:10.2753/MTP1069-6679150201

Suominen, J. (2008). The past as the future? Nostalgia and retrogaming in digital culture. *Fibreculture*, *11*. Retrieved from http://eleven.fibreculturejournal.org/fcj-075-the-past-as-the-future-nostalgia-and-retro gaming-in-digital-culture

Supski, S. (2013). Aunty Sylvie's sponge: Food making, cookbooks and nostalgia. *Cultural Studies Review*, *19*, 28–49. Retrieved from http://epress.lib.uts.edu.au/journals/index.php/csrj/article/viewFile/3074/3419

Tamborini, R., Bowman, N. D., Eden, A., Grizzard, M., & Organ, A. (2010). Defining media enjoyment as the satisfaction of intrinsic needs. *Journal of Communication*, *60*, 758–777. doi:10.1111/j.1460-2466.2010.01513.x

van Tilburg, W. A., Igou, E. R., & Sedikides, C. (2013). In search of meaningfulness: Nostalgia as an antidote to boredom. *Emotion*, *13*, 450–461. doi:10.1037/a0030442

Vess, M., Arndt, J., Routledge, C., Sedikides, C., & Wildschut, T. (2012). Nostalgia as a resource for the self. *Self and Identity*, *11*, 273–284. doi:10.1080/15298868.2010.521452

Vorderer, P. (2011). What's next? Remarks on the current vitalization of entertainment theory. *Journal of Media Psychology*, *23*, 60–63. doi:10.1027/1864-1105/a000034

Waterman, A. S. (1993). Two conceptions of happiness: Contrasts of personal expressiveness (eudaimonia) and hedonic enjoyment. *Journal of Personality and Social Psychology*, *64*, 678–691. doi:10.1037/0022-3514.64.4.678

Webster, A. (2017). These are the developers creating new games for old consoles. *The Verge*. Retrieved from https://www.theverge.com/2017/5/9/15584416/new-games-retro-consoles-nes-snes-sega-genesis-famicom

Wildschut, T., Sedikides, C., Arndt, J., & Routledge, C. (2006). Nostalgia: Content, triggers, functions. *Journal of Personality and Social Psychology*, *91*, 975–993. doi:10.1037/0022-3514.91.5.975

Wildschut, T., Sedikides, C., Routledge, C., Arndt, J., & Cordaro, F. (2010). Nostalgia as a repository of social connectedness: The role of attachment-related avoidance. *Journal of Personality and Social Psychology*, *98*, 573–586. doi:10.1037/a0017597

Wilson, A., & Ross, M. (2003). The identity function of autobiographical memory: Time is on our side. *Memory*, *11*, 137–149. doi:10.1080/741938210

Wilson, T. D., & Gilbert, D. T. (2003). Affective forecasting. *Advances in Experimental Social Psychology*, *35*, 345–411. doi:10.1177/0098628315620952

Workman, R. (2014, May 13). Sega and Nintendo console war: Greatest moments. *Prima Games*. Retrieved from https://www.primagames.com/games/super-mario-3d-world/feature/15-greatest-moments-sega-and-nintendo-16-bit-console-war

Wulf, T., & Baldwin, M. (2018, January). *Me, myself, and Pikachu: Mediennostalgie als Mediennutzungs- und Wirkungsfaktor am Beispiel Pokémon Go* [*Me, myself, and Pikachu: Media nostalgia as a factor for media use and media effects using the example of Pokémon Go*]. Paper presented at the Annual Conference of the division Media Reception and Effects of the German Communication Association (DGPuK).

Hohenheim, Germany.

Wulf, T., Breuer, J., Bowman, N. D., & Velez, J. (2017, September). *Once upon a game: Gaming nostalgia, need-satisfaction, and well-being*. Paper presented at the meeting of the Media Psychology division of the German Psychological Society (DGPs). Koblenz-Landau, Germany.

Wulf, T., & Rieger, D. (2017). Wallowing in media-

past: Parasocial relationships as predictor of media-induced nostalgia. *Communication Research Reports*. doi:10.1080/08824096.2017.1383236

Wulf, T., & Schmitt, J. B. (2017). *Blissed by the past: Media-induced nostalgia as audience response factor for subjective and psychological well-being*. Paper presented at the 66th Annual International Communication Association Conference. San Diego, USA.

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