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FULL PAPER

Being a kid again: Playing Pokémon Go contributes to well-being through nostalgia

Noch einmal Kind sein: Pokémon Go trägt über Nostalgie zum Wohlbefinden bei

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Abstract: This research investigates the augmented-reality smartphone game Pokémon Go and proposes that nostalgia is one particular reason for the game's popularity and success. We propose that nostalgia acts as both a precursor to individuals' desire to play the game, and a variable that predicts entertainment experiences and well-being while using the game. Two studies investigate these predictions. Study 1 was conducted in Germany before the game's release in 2016 and shows that the meaning players ascribe to Pokémon predicted anticipated nostalgia, which in turn motivated them to play the game. Study 2 replicates and extends these findings in an American sample after the game's release. Again, meaningfulness of Pokémon predicted game-induced nostalgia, which mediated the effect of meaningfulness on eudaimonic entertainment. Eudaimonic entertainment, in turn, predicted psychological well-being. Taken together, these findings draw a bi-directional link between nostalgia and media consumption and substantiate research regarding the well-being functions of both.

Keywords: Subjective and psychological well-being, nostalgia, Pokémon Go, media entertainment, media selection.

Zusammenfassung: Die vorliegende Arbeit befasst sich mit der Smartphone App Pokémon Go unter der Annahme, dass Nostalgie ein Grund für die Popularität und Erfolgsgeschichte des Spiels ist. Es wurde angenommen, dass Nostalgie einerseits dazu beiträgt, das Spiel zu spielen und, dass sich beim Spielen ausgelöste Nostalgie positiv auf Unterhaltungserleben und Wohlbefinden auswirkt. Diese Annahmen wurden mithilfe zweier Studien getestet. Studie 1 wurde kurz vor Veröffentlichung des Spiels 2016 in Deutschland durchgeführt und zeigt, dass persönliche Bedeutsamkeit, welche Spieler *Pokémon* beimessen, antizipierte Nostalgie vorhersagt, welche wiederum positiv mit der Absicht zusammenhängt, das Spiel zu spielen. Studie 2 replizierte und erweiterte diese Befunde anhand einer amerikanischen Stichprobe kurz nach der Veröffentlichung des Spiels. Erneut war beigemessene Bedeutsamkeit positiv mit Nostalgie beim Spielen der App assoziiert. Nostalgie wiederum mediierte den positiven Zusammenhang zwischen Bedeutsamkeit und eudaimonischem Unterhaltungserleben. Eudaimonische Unterhaltung zeigte weiterhin positive Zusammenhänge zu psychologischem Wohlbefinden. Zusammengenommen verknüpfen und untermauern diese Befunde Forschungsarbeiten, welche positive Auswirkungen von Nostalgie und Mediennutzung auf das Wohlbefinden annehmen.

Schlagwörter: Subjektives und psychologisches Wohlbefinden, Nostalgie, Pokémon Go, Unterhaltungsmedien, Medienselektion.

1. Introduction

> People can be nostalgic about experiences from any period of their lives but memories of childhood and adolescence are particularly powerful sources of nostalgia. If you spent endless hours playing Pokémon games as a kid, you are probably trying to "catch 'em all" on your smartphone right now. (Routledge, 2016)

Video games have become a substantial part of human media consumption, especially in the last couple of decades (Griffiths, Davies, & Chappell, 2004). Although first generation gaming made use of stationary video consoles and computers, modern games can be found on most smartphones. One particular game, Pokémon Go, which was released in July 2016 for smartphone users in large parts of the world, achieved overwhelming success and public attention by generating more than 500 million downloads worldwide (Schabel, 2016). Reasons for its success have been discussed since the game's inception. In the current research, we focus on one possible explanation that has recently drawn attention in the field of communication and media studies: *nostalgia*. As indicated in the introductory quote, the worldwide success of Pokémon Go may lie in the experience of nostalgia prompted by playing the game, as players today are taken back to time spent with the little creatures during childhood and adolescence.

Nostalgia, defined formally as a sentimental longing or affection for the past, has been the focus of much research in the last decade. Nostalgic experiences are characterized by recalling positive, meaningful events from the past that were typically experienced with close others (Wildschut, Sedikides, Arndt, & Routledge, 2006). Nostalgia can be triggered by psychological threats such as boredom (van Tilburg, Igou, & Sedikides, 2013), loneliness (Wildschut et al., 2006), meaninglessness (Routledge et al., 2011), or threats to authenticity (Baldwin, Biernat, & Landau, 2015), and incidental experiences such as smells (Reid, Green, Wildschut, & Sedikides, 2014), music (Cheung et al., 2013), movies, video game trailers (Natterer, 2014), and memories of playing games (Wulf, Bowman, Velez, & Breuer, 2018).

Furthermore, nostalgia serves existential and social functions, meaning that it is a psychological resource (Sedikides, Wildschut, Routledge, & Arndt, 2015a) that contributes to psychological well-being (Baldwin et al., 2015; Baldwin & Landau, 2014). Bridging the psychological research on nostalgia's positive impact with research on entertainment media, Wulf, Rieger, and Schmitt (2018) derived the media-induced nostalgic contributions to well-being (MINCoW) model. They assume that media-induced nostalgia—nostalgic reactions triggered by exposure to media content that connects to meaningful events in the past—contributes to entertainment experiences and well-being. Although some parts of this model have been addressed by previous research, the model as a whole has yet not been tested empirically.

The current research aims to fill this gap. In two studies, we test the hypothesis that nostalgia elicited by Pokémon 1) fosters the behavioral intention to play Pokémon Go, and 2) is a key prerequisite of entertainment while playing, which 3) contributes to well-being. Although Bonus and colleagues (2018) recently demonstrated that gameplay promotes well-being, their focus was primarily on life-

satisfaction and indices of mental health (e.g., depression). In the current research, we extend these findings by empirically testing the assumed relationships between nostalgia, entertainment experiences, and well-being as predicted by the MINCoW model (Wulf, Rieger et al., 2018).

2. Media entertainment and well-being

Motivations for entertainment media use have been discussed extensively, and research findings have led to a diversity of potential explanations; in general, it is said that media entertainment is a highly complex experience (Vorderer & Reinecke, 2015). Conventional approaches to entertainment media use claimed that media are pleasurable—they are *hedonic* leisure time activities people can enjoy and use to maintain their current mood state (Vorderer, Klimmt, & Ritterfeld, 2004; Zillmann, 1988). However, some approaches also consider that media content may be uncomfortable for recipients, as some media can confront viewers with concepts that serve to alter their default attitudes, beliefs, and perceptions of the world. Media that is consumed for the purpose of deep reflection, or that has effects on "deeper" psychological structures such as perceptions of meaning in life or self-conceptions is referred to as *eudaimonic* entertainment (Oliver & Bartsch, 2010).

Eudaimonic media experiences are characterized by thought provoking processes, the feeling of being moved or inspired, and the notion of media to have artistic value, in contrast to pleasurable or hedonic experiences (Oliver & Bartsch, 2010; Oliver & Raney, 2011). These outcomes may also motivate media users to select specific media content expecting an approach to questions of life and meaningfulness (Oliver & Raney, 2011). Engaging in media for these reasons promotes media *appreciation*.

Research on hedonic and eudaimonic entertainment experiences is closely related to research on well-being, and in particular, subjective and psychological well-being. Subjective well-being (SWB) is often defined by the presence of positive and the absence of negative affect (Kahneman, Diener, & Schwarz, 1999) and the experience of subjective vitality (Ryan & Frederick, 1997). Another component of SWB is an overall satisfaction with life (Diener, Emmons, Larsen, & Griffin, 1985). Media in general can foster SWB, for instance by enhancing subjective vitality through hedonic and eudaimonic entertainment experiences while watching movies (Rieger, Reinecke, Frischlich, & Bente, 2014). Specifically, playing video games can contribute to SWB by repairing negative mood states (Bowman & Tamborini, 2012; Rieger, Frischlich, Wulf, Kneer, & Bente, 2015; Zillmann, 1988). For example, research demonstrated that competence needs can be supported by winning a racing (Rieger, Wulf, Kneer, Frischlich, & Bente, 2014) or quiz game (Koban et al., 2019) and that such need satisfaction can contribute to mood repair. Interactive video games may also foster vitality by supporting recovery from stress or trauma (Reinecke, Klatt, & Krämer, 2011).

Psychological well-being (PWB), on the other hand, is "explicitly concerned with the development and self-realization of the individual" (Ryff & Singer, 2008, p. 14). Ryff's (1989) operational definition of PWB includes self-acceptance, positive relationships, purpose in life, personal growth, autonomy, and environmental

mastery. Thus, PWB focusses on the "deeper" variables that contribute to a meaningful and fulfilling life. Media can initiate psychological growth processes, for instance by inspiring the audience with portrayals of moral virtue (Oliver, Hartmann, & Woolley, 2012). Other research has shown that meaningful experiences with video games are related to the satisfaction of needs for insight and relatedness (Oliver et al., 2015). Studies that focused on video games from a self-determination theory perspective (e.g. Przybylski, Rigby, & Ryan, 2010; Ryan, Rigby, Przybylski, 2006) have shown that solving tasks and moving in an open world environment connect to environmental mastery and autonomy.

Considering the bigger picture of meaningful experiences with video games, Elson, Breuer, and Quandt (2014) proposed the integrated model of player experience (IMP) which distinguishes three main elements (context, player, and game) in three phases of the gaming process: the pregame (decision), midgame (playing), and postgame (feedback) phase. Throughout the cycle of video game use, a variety of unique entertainment experiences can arise from the interplay of these factors. Video games may elicit both hedonic and eudaimonic experiences as the idiosyncratic combinations of each of the elements (i.e., context, player, game) can create a diversity of player experiences. In terms of the IMP, the current research is focused on the case in which people play a video game that was meaningful to them in the past, in a context that is consistent with past experiences and connects them to their past selves. The model would imply that this case is highly meaningful to players, and we propose that a crucial link between the gaming experience in this case, and the resulting meaning in life (or well-being more broadly), is nostalgia.

3. Nostalgia and well-being

Content analyses have shown that nostalgic memories most often described social interactions with friends and family, but also portrayed momentous or important events, settings (e.g., parks), episodes of life (e.g., "the good old days"), animals (e.g., pets), commodities (e.g., toys), and past selves (e.g., "feeling like a princess"), and were overwhelmingly positive in tone (Wildschut et al., 2006). A prototype analysis conceptually replicated these findings (Hepper, Ritchie, Sedikides, & Wildschut, 2012). Lay conceptions of nostalgia's central (or primary) characteristics included fond memories, personal meaning, social relationships, keepsakes, happiness, and childhood. Consistent with theorizing (Baldwin et al., 2015; Stern, 1992), nostalgia was also described as a longing for an idealized past. In sum, nostalgic memories are primarily positive and self-focused, and nostalgic feelings result from recalling meaningful and idealized aspects of the past.

Compelling evidence from research in psychology has begun to show that, compared to thinking about other self-relevant experiences, nostalgia can promote and protect psychological resources that are necessary for achieving well-being (Baldwin et al., 2015; Routledge, Wildschut, Sedikides, & Juhl, 2013). For instance, nostalgia induces positive affect compared to recalling ordinary memories (e.g., Hepper et al., 2012; Wildschut et al., 2006) and is associated with *trait* happiness and life-satisfaction (Baldwin et al., 2015). These associations were sig-

nificant even after controlling for Big Five personality and *state* positive and negative affect, suggesting that dispositional nostalgia contributes to positive evaluations of life over and above personality dispositions and mood.

Additional lines of research demonstrate that nostalgia is more than a fleeting moment of happiness as it contributes to PWB. For instance, nostalgia increases positive evaluations of the self. Wildschut et al. (2006) found that participants who reflected on a nostalgic memory reported higher self-esteem compared to participants who reflected on an ordinary memory. This effect has been replicated a number of times using both guided imagery recall tasks (Baldwin & Landau, 2014) and incidental nostalgia priming with music (Cheung et al., 2013). This generally positive trend of nostalgia on increased well-being emerges for other outcomes associated with PWB including social connectedness (Wildschut, Sedikides, Routledge, Arndt, & Cordaro, 2010), meaning in life (Routledge et al., 2011), psychological growth (Baldwin & Landau, 2014), and perceived authenticity of the self (Baldwin et al., 2015). In sum, nostalgia is a source of well-being for individuals because it promotes positive affect, positive evaluations of life, and psychological resources considered necessary for fulfillment and self-realization.

In their MINCoW model, Wulf and colleagues (2018) apply these findings from psychology to theorize about the role of nostalgia while using certain media outlets. They argue that so-called media-induced nostalgia may function in similar ways and contribute to well-being via entertainment experiences. The model assumes that media-induced nostalgia contributes to hedonic and eudaimonic entertainment experiences which should be positively associated with subjective and psychological well-being.

4. Nostalgia and Pokémon Go

Speculation about the success of Pokémon Go is widespread. Some cite the novelty of augmented reality (Keogh, 2017, p. 38), others have focused on the social benefits of the game, noting that Pokémon Go can improve individuals' levels of exercise, fun, escapism, friendship maintenance, and achievement (Yang & Liu, 2017). In addition to these aspects, these discussions also mention nostalgia as one possible motivation for people to play Pokémon Go and as the reason why the game is fun. We aim to address these speculations with empirical evidence.

4.1 Pokémon as a source of nostalgia

Pokémon has been a successful consumer product since the 1990s. Many people have grown up with the Pokémon universe and have enjoyed being part of it, and might be reminded of their childhood and former times when thinking of Pokémon. If Pokémon remains something meaningful to those people over time, they may be expected to experience meaningfulness when (re-)engaging with the Pokémon franchise. As stated by Holbrook and Schindler (1996), childhood objects can function as an external trigger of nostalgia and are preferred to novel content (Morewedge, 2013). Moreover, *personal meaning* is one of the most central features of nostalgic reminiscence found in the prototype analysis of nostalgia from

Hepper and colleagues (2012). Taken together, these converging lines of research suggest that the meaning that people derive from Pokémon in general will be associated with the extent to which Pokémon is a source of nostalgia for that person. We expect to find this relationship when asking participants about Pokémon in general predicting their nostalgia when playing Pokémon Go in the future (H1a, Study 1) and when assessing their feelings about actual gameplay (H1b, Study 2).

4.2 Nostalgia as a motivator of gameplay

People engage with different media to regulate their current mood state (Zillmann, 1988). People do not necessarily decide on their media use consciously; users rather intuitively select the content that best fits their mood. For instance, people select different movie genres (Bryant & Zillmann, 1984), songs (Knobloch & Zillmann, 2002), or video games (Bowman & Tamborini, 2012) depending on their current mood. We expect nostalgic content to serve similar functions. Nostalgia may hold ready 'antidotes' against several negative states such as boredom (van Tilburg et al., 2013), stress (Routledge et al., 2011), and loneliness (Zhou, Sedikides, Wildschut, & Gao, 2008). In fact, state nostalgia covaries with negative affect and experiences on a moment-to-moment, and day-to-day basis (Newman, Sachs, Stone, & Schwarz, 2019). Considering that nostalgia is sensitive to these momentary fluctuations in mood, affect, and well-being, it stands to reason that people would benefit from nostalgic media that is readily accessible and can be used as a means to regulate these fluctuations. In other words, having learned intuitively that nostalgia provides benefits in real-time, people may turn to nostalgic content—such as video games—when they can use it to manage their current mood.

We take the perspective that people turn to their nostalgic memories to get a clearer picture of their "true" selves, or who they think they really are (Baldwin et al., 2015). Part of nostalgia's benefits in this domain are to reduce the extent to which extrinsic pressures influence one's sense of self (see also Vess, Arndt, Routledge, Sedikides, & Wildschut, 2012). Nostalgia for a childhood spent playing games such as Pokémon with friends, free from responsibility and other stress that comes with adulthood, may empower adults today to perceive themselves as free from extrinsic pressure and constraint. Thus, the nostalgia people draw from playing Pokémon Go might allow them to approach the game without fear of social reproach, as they are turning to the game to seek out information about who they really are inside.

Finally, nostalgia is a motivational force (Sedikides & Wildschut, 2016). Reflecting on personally nostalgic memories promotes growth-oriented behavioral intentions (Baldwin & Landau, 2014) and approach-oriented behavior (Stephan et al., 2014). Moreover, nostalgia has shown to inspire tourists joining the 2011 Tour de France (Fairley, Gibson, & Lamont, 2017). One purpose for tourists visiting the Tour de France was nostalgia for previous family experiences (for example a father and son trip). Tourists were motivated to engage with prototypical nostalgic images and ideas, by watching cycling and gazing upon iconic mountains for instance. In the same way, we predict that nostalgic recollection of experiences with Pokémon in one's past may function as a driver to play the game and

to reengage with the little creatures known from childhood. For all these reasons, we hypothesize that nostalgia for Pokémon is a key predictor of individuals' behavioral intention to play Pokémon Go (H2, Study 1).

4.3 Nostalgia for Pokémon as a source of media entertainment

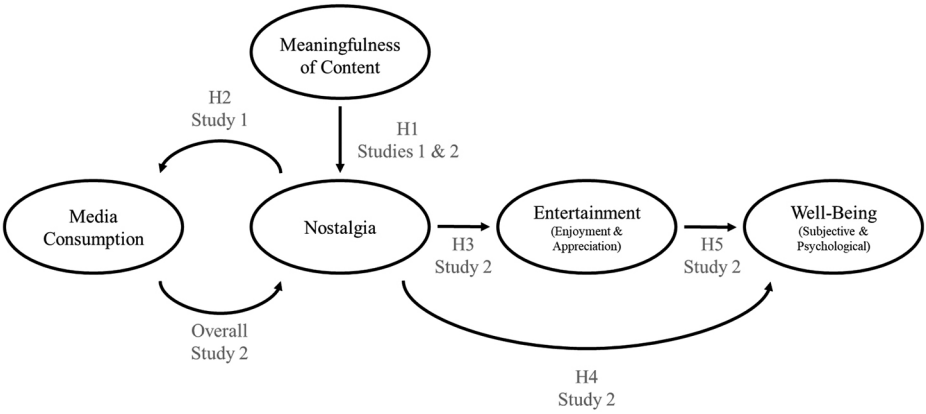
As hypothesized in the MINCoW model (Wulf, Rieger et al., 2018), nostalgia directly connects to hedonic entertainment experiences. The model predicts that nostalgia is linked to various aspects of media enjoyment such as parasocial relationships (Vorderer et al., 2004; Wulf & Rieger, 2018), mood enhancement (e.g. Wildschut et al., 2006; Zillmann, 1988), and feeling comfortable (Menke, 2017). The connection between nostalgia and hedonic experiences has already been demonstrated, for example in correlational studies on Pokémon Go (Yang & Liu, 2017). Thus, for players of Pokémon Go, we expect that nostalgia positively contributes to hedonic entertainment experiences (enjoyment, H3a, Study 2).

Further, nostalgia also connects to eudaimonic media experiences. Users of nostalgic media are offered the possibility to reflect on who they are inside and to explore their identity (Baldwin et al., 2014; Cavanaugh, 1989), facilitating access to their intrinsic self-concept (Baldwin et al., 2015). Aside from these functions, nostalgia provides people with a sense of meaning in life (Routledge et al., 2011). Thus, media-induced nostalgia may offer benefits closely related to those described as eudaimonic entertainment (Oliver & Bartsch, 2010). Whereas Pokémon Go appears a rather colorful, hedonic casual game to others, we predict that for those players who experience nostalgia when playing Pokémon Go, the game may provide additional meaningful (eudaimonic) entertainment experiences. We predict that nostalgia prompted by playing Pokémon Go also contributes to eudaimonic media experiences (appreciation, H3b, Study 2).

4.4 Nostalgia and Pokémon Go as a resource for well-being

Finally, both nostalgia (Sedikides et al., 2015a; 2015b) and certain entertainment experiences (Rieger, Reinecke et al., 2014) have been shown to contribute to SWB and PWB. Indeed, both hedonic and eudaimonic entertainment may help to enhance SWB, while mainly eudaimonic entertainment is discussed to have positive impact on PWB (see for example, Rieger, Reinecke et al., 2014). Adding nostalgia to the equation, we expect that nostalgia is a driver of media experiences. Therefore, nostalgia is most plausibly an indirect driver of well-being by contributing to entertainment experiences, as well as a direct driving force for both subjective and psychological well-being as hypothesized in the MINCoW model (Wulf, Rieger et al., 2018). Therefore, we predict that nostalgia when playing Pokémon Go has a direct effect on SWB (H4a) and PWB (H4b). Moreover, we predict that nostalgia has an indirect impact via hedonic entertainment experiences on SWB (H5a) and via eudaimonic entertainment experiences on both, SWB (H5b) and PWB (H5c). We tested H4 and H5 in Study 2. See Figure 1 for a full conceptual model of all predictions.

Figure 1. Conceptual model of nostalgic media consumption.



Notes. Meaningfulness of the media content (i.e., Pokémon) predicts nostalgia. Nostalgia drives motivation and intention to consume media (i.e., play Pokémon Go). Consuming the media prompts further nostalgia, which in turn, fosters entertainment of the media experience and well-being.

5. Study 1

In Study 1, we assessed German participants' attitudes toward Pokémon in general, their anticipated nostalgia for Pokémon Go, as well as their intention to play the game, all *before* the game's release to the public. We hypothesized that the more meaningful Pokémon was to participants, the more they would anticipate feeling nostalgia while playing Pokémon Go. We expected that nostalgia would be associated with intention to play the game once it is released.

5.1 Method

Participants. In total, we recruited 283 individuals to participate. We excluded 10 participants who failed the attention check items and those who guessed the purpose of the study. Thus, the final sample consisted of 273 participants. Participants ranged in age from 14 to 47 (M = 23.02, SD = 4.40), of which the majority was male (68.50%).

Materials and Procedure. We submitted posts with a short study description on German Pokémon community sites (e.g., bisafans.de) in early July 2016, about two weeks before the realease of Pokémon Go in Germany. Therefore, we did not select participants randomly but they selected themselves into the sample. After reading the survey instructions, participants wrote a few sentences about their general feelings toward Pokémon and answered questions about how meaningful Pokémon was to them. Then they read an actual press release with information about the functions and the possibilities of Pokémon Go and rated their intention to play the game as well as how nostalgic they feel when imagining playing the game. Finally, participants answered questions about their life experiences with

Pokémon, their motivations to use media, and some demographics. If not stated otherwise, participants rated scales using a 7-point scale (1 = Do not agree at all, 7 = Fully agree). After finishing the questionnaire, they had the option to join a lottery to win an Amazon gift card.

Meaningfulness of Pokémon. To assess meaningfulness of Pokémon, participants answered four items: *Pokémon is personally meaningful to me*, *There are many experiences in my life associated with Pokémon*, *Pokémon characters are like companions in my life*, and *Pokémon is dear to me*. The scale showed strong internal consistency ($\alpha = .89$), and as recruiting took place on Pokémon fan sites, participants strongly agreed with these statements ($M = 5.75$, $SD = 1.30$).

Intention to play the game. Participants answered two items to assess intention to play the game: *I am looking forward to the game's release* and *I am likely to play the game*. Participants were highly motivated to play the game ($M = 6.34$, $SD = 1.29$).

Anticipated Nostalgia. We created four items to assess participants' anticipated nostalgia: *Thinking about playing the game Pokémon Go…* 1) *I feel nostalgic*, 2) *I am reminded of my childhood*, 3) *makes a (childhood) dream come true*, and 4) *makes me feel warm* ($\alpha = .78$, $M = 5.96$, $SD = 1.11$). These items are conceptually similar to typical nostalgia measures established in the literature (e.g., Baldwin et al., 2015; Wildschut et al., 2006).

Hedonic and eudaimonic motivations. Finally participants answered 12 items from Oliver and Raney (2011) to assess motivations to engage in media; six for hedonic ($\alpha = .88$, $M = 4.65$, $SD = 1.22$) and six for eudaimonic ($\alpha = .88$, $M = 4.91$, $SD = 1.26$) motivations. Items asked for overall preferences when watching movies (example for hedonic: *For me, the best movies are ones that are entertaining*, for eudaimonic: *I like movies that make me more reflective*). We assessed these variables to control for dispositional media preferences, allowing isolating the unique contribution of nostalgia on motivation to play Pokémon Go.

5.2 Results

First, we examined intercorrelations among all of our variables. Table S1[1] in the supplementary file lists these correlations showing associations among the constructs as hypothesized. To investigate our hypotheses, we applied structural equation modelling (SEM) using the *lavaan* package for *R* (Rosseel, 2012).[2]

Model fit. We estimated one SEM that addressed the relations between meaningfulness of Pokémon, nostalgia, and overall trait hedonic and eudaimonic media preferences. Two items of the hedonic motivations subscale had to be excluded due to poor squared multiple correlations (SMC; we excluded items with SMC < .40; Homburg & Giering, 1996) leaving a scale with four items ($\alpha = .79$, $M = 4.99$, $SD = 1.31$). A fixed-factor method was used, which sets each latent variance to 1. In the case of latent variables being predicted by others, we freely estimated

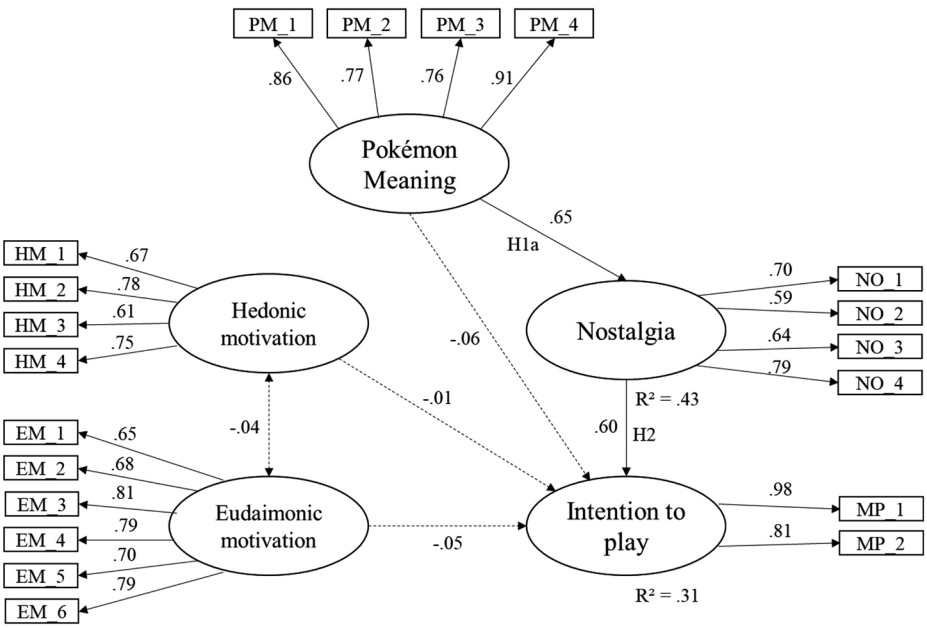
1 The supplementary file can be accessed at the OSF repository: https://osf.io/w6j82

2 In both Studies 1 and 2, full information maximum likelihood (FIML) estimation was used to account for missing data.

the residual variances of those latent factors. The model showed an acceptable fit (Schweizer, 2010), $\chi^2(162) = 359.588$, $p < .001$, $\chi^2/df = 2.22$, Comparative Fit Index (CFI) = .925, Root Mean Square Error of Approximation (RMSEA) = .067, 90% CI [.058; .076], Standardized Root Mean Square Residual (SRMR) = .050.

Path analyses. We analyzed all paths in our model as standardized regression coefficients (see Figure 2). Meaningfulness of Pokémon predicted more nostalgia when imagining playing Pokémon Go ($\beta = .65$, $p < .001$) supporting H1a. Additionally, nostalgia was identified as a strong predictor of the intention to play the game once it is released ($\beta = .60$, $p < .001$) supporting H2. The presence of each of these significant paths suggests that Pokémon meaningfulness predicts intention to play the game indirectly via nostalgia. We calculated this indirect effect using the bootstrapping technique and found that it was significant ($b = .47$, 95% CI [.27; .67], $\beta = .39$, $p < .001$). Neither eudaimonic ($\beta = -.05$, $p = .41$) nor hedonic ($\beta = -.01$, $p = .84$) trait motivation were significant predictors for the intention to play Pokémon Go; nostalgia is accounting for the intention to play, over and above dispositional hedonic and eudaimonic preferences for media.

Figure 2. Observed SEM of Study 1



Notes: For the sake of clarity, residuals are not displayed. Scores in the figure represent standardized path coefficients significant at p < .05. Dotted lines represent non-significant paths.

5.3 Discussion

These findings suggest that anticipated nostalgia is a crucial factor for the intention to play Pokémon Go. Indeed, people who rated Pokémon as meaningful were those who were likely to feel nostalgic after imagining playing Pokémon Go, and their anticipated nostalgia predicted intention to play the game. Moreover, we find that nostalgia is a stronger predictor of intention to play than general hedonic or eudaimonic motivations. However, because these scales focus on hedonic and eudaimonic motivations for consuming other media (and not video games specifically), we may be limited in interpreting the comparison between nostalgia and these motives in our study.

A few other limitations of this study are worth mentioning. First, we assessed anticipated nostalgia rather than experienced nostalgia. Research on affective forecasting suggests that people tend to overestimate anticipated emotions in general (Wilson & Gilbert, 2003), and this might hold true for anticipated nostalgia. Second, we recruited only German participants from predominantly fan-based communities, which means that the sample was skewed in favor of Pokémon. We aimed to account for these limitations in Study 2, and examined Americans' experienced nostalgia for the game, as well as nostalgia's influences on media entertainment and well-being.

6. Study 2

In Study 2, we aimed to replicate our general findings from Study 1 and extend these findings to actual game-play. Therefore, we asked Pokémon Go players for their experiences playing the game. We hypothesized that the more meaningful Pokémon was to participants, the more nostalgic they would feel when playing the game. We also included nostalgia proneness as a predictor of nostalgia while playing the game, to account for any differences among participants in their general tendencies to engage in nostalgia. Finally, we included three new dependent variables—a measure of participants' media experiences, as well as measures of SWB (subjective life-satisfaction) and PWB. We added these measures in order to test whether nostalgia for Pokémon contributes to well-being (H4 and H5) as we aimed at empirically testing the MINCoW model (Wulf, Rieger et al., 2018).

6.1 Method

Participants. Participants were 251 Americans recruited via Amazon Mechanical Turk. We invited only participants for participation who had installed and played the game Pokémon Go. We excluded six participants who failed the attention check item and one person who completed the survey by less than half of the average time of the other participants (M = 598 seconds, SD = 204 seconds) leaving the sample with N = 244 participants. Participants ranged in age from 18 to 71 (M = 32.57, SD = 9.49), gender was almost equally distributed (52% male).

Materials and Procedure. The study was conducted in August 2016, about one month after Pokémon Go had been released. After reading the survey instruc-

tions, participants wrote a few sentences about their experiences with Pokémon Go and indicated factual data of their game-play (game progress, last time played, and playing period). Then, they answered questions about their entertainment experiences and how nostalgic they feel when playing. Afterwards, we measured some constructs irrelevant for this paper. Then, we asked participants about how meaningful Pokémon was to them, and about their SWB and PWB. Finally, participants assessed trait control variables (Big Five personality, nostalgia proneness, and demographics). Unless stated otherwise, participants answered scales on a 7-point Likert scale (1 = Do not agree at all, 7 = Fully agree). Participants were paid $1 (USD) via Amazon MTurk after finishing the study.

Nostalgia. Nostalgia was measured with the same items as in Study 1 (α = .90, M = 4.58, SD = 1.71).

Nostalgia proneness. Participants answered four items of the Southampton Nostalgia Scale (SNS, Barrett et al., 2010) to assess nostalgia proneness. The scale was internally consistent (α = .89, M = 4.53, SD = 1.30).

Meaningfulness of Pokémon. To assess meaningfulness of Pokémon we used the same scale as in Study 1. The scale was internally consistent and the MTurk sample was not as biased toward positive scores as the fan sample (α = .93, M = 3.98, SD = 1.66).

Entertainment experiences. Participants answered the scale from Oliver and Bartsch (2010) to assess entertainment experiences. This scale assesses five dimensions of entertainment experiences including two hedonic (*fun* and *suspense*), and three eudaimonic (*thought-provoking*, *lasting impression*, and *artistic value)* subscales. Internal consistencies of all five subscales are shown in Table S2 in the supplementary document on OSF.

Well-being. We measured subjective life-satisfaction as one component of SWB with the Satisfaction with Life Scale (Diener et al., 1985). Participants used a 5-point scale (1= Strongly disagree; 5 = Strongly agree) to indicate their agreement with five items assessing global evaluations of life (e.g., *I am satisfied with my life*; α = .89, M = 3.48, SD = 1.03). We assessed PWB with the 8-item Flourishing Scale (Diener et al., 2010) which measures self-perceived success in various domains of eudaimonic experience (e.g., *I lead a purposeful and meaningful life*; α = .93, M = 5.47, SD = 1.04). Participants responded using a 7-point scale (1= Strongly disagree; 7 = Strongly agree). For all scale items used in this Study, see Table S3 in the Supplementary File on OSF.[3]

6.2 Results

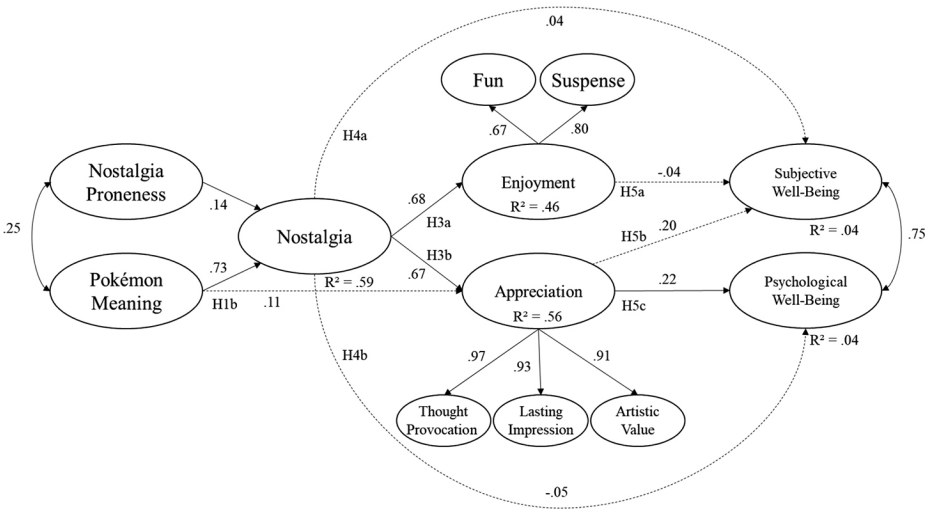
For correlations among the variables of interest, see Table S3. These correlations revealed associations among the constructs as hypothesized. To investigate our hypotheses, we again applied SEM using the *lavaan* package (Rosseel, 2012). We modelled both types of entertainment experiences as second-order latent factors. Hedonic entertainment was estimated by the latent constructs *fun* and *suspense*.

3 For copyright reasons, we did not include the well-being and nostalgia proneness scales as we used the exact same measures as shown in the referenced articles.

Eudaimonic entertainment was estimated by the latent constructs *thought-provocation*, *lasting impression*, and *artistic value*.

Model fit. We estimated an SEM that addressed the relations between nostalgia and its antecedents, its contribution to overall media experiences, and how these contribute to SWB and PWB (see Figure 3). The model showed an acceptable fit, $\chi^2(724) = 1534.404$, $p < .001$, $\chi^2/df = 2.12$, CFI = .898, RMSEA = .068, 90% CI [.063; .072], SRMR = .096.

Figure 3. Observed SEM of Study 2



Notes: Due to reasons of clarity, indicators of latent variables are not shown in the model. Permanent lines represent standardized path coefficients significant at p < .05. Dotted lines represent non-significant paths.

Path analyses. As predicted (H1b), and replicating Study 1, meaningfulness of Pokémon positively predicted nostalgia while playing Pokémon Go ($\beta = .73$, $p < .001$). Trait nostalgia proneness was also a significant (but weaker) predictor of nostalgia while playing ($\beta = .14$, $p = .009$). Regarding entertainment experiences, nostalgia predicted both hedonic ($\beta = .68$, $p < .001$) and eudaimonic entertainment experiences ($\beta = .67$, $p < .001$). Meaningfulness of Pokémon did not significantly predict eudaimonic entertainment ($\beta = .11$, $p = .24$). These findings support H3a and H3b. We also found a significant indirect effect of meaningfulness of Pokémon on eudaimonic entertainment through nostalgia ($b = .73$, $SE = .15$, 95% CI [.44; 1.02], $\beta = .48$, $p < .001$). The total effect of meaningfulness of Pokémon on eudaimonic entertainment experiences was significant ($b = .89$, 95% CI [.67; 1.12], $\beta = .59$, $p < .001$).

Regarding our hypotheses on well-being (H4a, H4b, H5a, H5b, and H5c), we first analyzed the direct effects of nostalgia on well-being. These paths were not significant (SWB: $\beta = .04$, $p = .723$, PWB: $\beta = -.05$, $p = .626$). Therefore, H4a and H4b were not supported. Next, we analyzed the direct effects of entertainment

experiences on well-being. The direct effect of hedonic entertainment experiences (enjoyment) on SWB was non-significant (β = -.04, *p* =.626). The same holds true for the direct effect of eudaimonic entertainment (appreciation) on SWB (β = .19, *p* =.194). Thus, H5a and H5b were rejected. Still, appreciation showed a significant association with PWB (β = .22, *p* = .037). Subsequent mediation analyses showed a small but significant indirect effect of nostalgia on PWB via appreciation (*b* =.10, *SE* = .05, 95% CI [.002; .189], β = .15, *p* =.045) supporting H5c.

6.3 Discussion

Study 2 builds on Study 1 and demonstrates that playing Pokémon Go elicits nostalgia for players who attribute meaning to Pokémon in general. We also show that nostalgia for Pokémon Go leads to hedonic and eudaimonic entertainment experiences. This indirect effect was significant even when controlling for general tendencies to experience nostalgia, which suggests that our findings cannot be explained by alternatives such as the possibility that nostalgia-prone individuals are just more likely to play Pokémon Go, or that individuals for whom Pokémon is important tend to be more nostalgia-prone. Instead, we argue that Pokémon Go can transport players of the game back to their childhood, and arouse many of the meaningful and familiar feelings and memories associated with that time.

Analyzes of well-being also showed that nostalgia has an indirect effect on PWB mediated by eudaimonic entertainment experiences. These findings are in line with the connections proposed in the MINCoW model (Wulf, Rieger et al., 2018) and particularly insightful, because previous studies did not account for nostalgia elicited by everyday media use (e.g., Bonus et al., 2018). The present study therefore contributes novel insight regarding the role of nostalgia in promoting positive media experiences and individual well-being, and offers various avenues for future research.

7. General discussion

This research provides converging evidence that nostalgia is a considerable factor in media use and well-being. In Study 1, meaningfulness of Pokémon was a crucial predictor for the intention to play Pokémon Go, through its influence on anticipated nostalgia. Nostalgia was an even stronger predictor of intention to play than trait hedonic and eudaimonic media preferences. In Study 2, nostalgia was a potent driver of entertainment experiences, and indirectly contributed to PWB of players.

This study is the first to test the assumptions stated by the MINCoW model (Wulf, Rieger et al., 2018) altogether in a single model. Overall, our findings support those assumptions and highlight that nostalgia is a considerable factor for a) the intention to use certain media (video game) content, b) the hedonic and eudaimonic entertainment experiences arising when using media (video game) content, and c) well-being outcomes of the players. As far as we know, this is the first study to provide evidence that media-induced nostalgia can impact how people experience media content they are familiar with from their past, and how it may

contribute to their well-being. However, we did not find a direct impact of media-induced nostalgia on well-being outcomes as assumed by the MINCoW model; rather, we only found an indirect impact of nostalgia on PWB through eudaimonic entertainment experiences. While these findings are in line with research on nostalgia being a fundamental psychological resource (Routledge et al., 2013; Vess et al., 2012) that contributes to PWB (Sedikides et al., 2015b), the explained variance of well-being (SWB: $R^2 = .04$; PWB: $R^2 = .05$) was fairly small. Given that we used well-being scales assessing trait rather than state well-being, these findings imply that the impact of a game such as Pokémon Go likely has a rather low impact on long-term well-being compared to other variables. Also, because we only measured one component of SWB (subjective life-satisfaction), it is difficult to generalize our findings for other components of SWB such as overall positive affect. Thus, although our data supports many of the assumptions predicted in the MINCoW model, our data also indicates that nostalgia as elicited by a casual video game may have more impact on state entertainment experiences than trait well-being outcomes.

Because we targeted one specific game and used convenience samples of people likely to play the game (Study 1) or who already play the game (Study 2) further research will be necessary to both differentiate and substantiate these findings. Nevertheless, these findings suggest an answer to the question of whether playing a popular game such as Pokémon Go is beneficial or harmful to well-being. While others (e.g. Althoff, White, & Horvitz, 2016) found that an augmented reality game such as Pokémon Go may motivate people to go outside increasing physical activity, our findings indicate that due to nostalgia associated with playing the game, nostalgia while playing may also hold positive consequences for both player's entertainment experiences and (psychological) well-being.

In this context, it should also be noted that our well-being measure may have been blurred by high multicollinearity, as PWB and SWB correlated highly ($r = .75$). As research has found both hedonic and eudaimonic media experiences contribute to particular well-being dimensions (Oliver et al., 2015; Reinecke et al., 2011; Rieger, Reinecke et al., 2014), future research should take a closer look at the indirect impact of media-induced nostalgia on several well-being outcomes that have been found in the literature on nostalgia (e.g. self-continuity, self-esteem, and social connectedness, Sedikides et al., 2015b). Gaining more clarity on the unique well-being functions of media-induced nostalgia would be an important goal of future research.

Our findings are also in line with research demonstrating nostalgia to be elicited by media content: Besides music (Barrett et al., 2010), film- and video game trailers (Natterer, 2014), and reminiscences of media used in the past (Wulf, Bowman et al., 2018, Wulf & Rieger, 2018), the current study provides evidence that actual video game play can elicit nostalgia. This finding suggests that nostalgia elicited by anticipating game play, as well as actual game play, is associated with personal meaning. However, the measures of meaningfulness of Pokémon and nostalgia were highly correlated (see Tables S1 and S3 in the Supplementary File). Given that personal meaningfulness is part of the prototype conception of nostalgia as identified by Hepper et al. (2012) it could be that these concepts as meas-

ured in our Study are not completely distinct from another. To account for this possibility, future research might be interested in experimentally manipulating the meaningfulness of a media experience and then observing this manipulation's impact on nostalgia.

Still, it is noteworthy that even a video game as modern and "futuristic" as the augmented reality smartphone app Pokémon Go that at a first glance may appear as particularly driving hedonic entertainment experiences can induce nostalgia, as it suggests that even as technology progresses at high speeds, people can use such technology to stay rooted in time, potentially satisfying needs for self-continuity via nostalgia (Lasaleta & Loveland, 2019; Sedikides et al., 2015a). As shown in Study 2, nostalgia contributes to hedonic and eudaimonic entertainment and we found indirect associations between the perception of Pokémon as companions in life and the experience of eudaimonic entertainment. This is in line with research showing that eudaimonic entertainment experiences can be influenced by proximity to a user's biography (Khoo, 2016). Our findings substantiate this condition of eudaimonic entertainment experiences: The personal background that makes media experiences meaningful. Research focusing on *why* entertainment can be meaningful to people should consider personal backgrounds, for example, whether one has experienced a trauma similar to one depicted in a film, or the extent of one's parasocial relationships with media characters before media exposure (e.g. Eyal & Cohen, 2006; Wulf & Rieger, 2018).

It should also be noted that Pokémon Go is an outlier in the attention it gained in the public discourse, and that the hype has diminished considerably since its release. Despite this fact, there are still a large number of current users. Future research might be interested in the question of nostalgia's role for people still playing, or whether a similar hype might be repeatable with other games that have a strong and meaningful connection to the past. For example, the recently published *Harry Potter – Wizards Unite* smartphone application may allow an entire generation of people to *live* the nostalgic world of Harry Potter when before they could only imagine it (see e.g. Plagge, 2019). Future research might be interested in using such popular releases to extend and replicate findings found in the current research.

Though we have addressed some limitations by comparing insights across two studies, there still are some issues regarding the methods we used that we want to address briefly. First, we used an unestablished measure of nostalgia in both studies. Though this measure showed good internal consistency, the first sample scored relatively high on the items due to the self-selected sample of Pokémon fans. Future research therefore should use this measure in combination with other measures, for example those used as manipulation check in Wildschut et al. (2006).

Regarding our data analyses, we used structural equation modeling to investigate the relations between nostalgia, its prerequisites, and outcomes. Overall, our models showed an acceptable model fit. However, we cannot reason about the causal relations among our variables. Though our findings are theoretically reasonable, they will have to be substantiated by further experimental research or longitudinal designs.

Finally, as our focus was on nostalgia and its contribution to media use and well-being, we did not account for all possible motives and experiences leading to or induced by the game. We cannot rule out that nostalgia shares covariance with other motives and audience responses that we did not control for in our studies. Therefore, future research will be needed to estimate the effects of nostalgia on motivation and media experiences, and well-being in relation to already established motives and audience responses.

8. Summary and conclusion

In conclusion, the current study bridges the gap between research on (interactive) media usage and research on nostalgia by highlighting both a) the prerequisites for nostalgia on the media user's side and b) consequences of media-induced nostalgia (intention to use media content, entertainment gratifications, and well-being contributions). Coming back to the introductory quotation, nostalgia was speculated to be a reason that people joined the fight with hundreds of little creatures on their smartphones; and a possible cause of many other 'hypes' that connect people to narratives of their childhood. Ironically, it may be the technology of the future that takes people back to being a kid again, and in doing so, promote a happier and healthier world.

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