

Harry Potter and the end of the road: Parallels with addiction

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Abstract

The term addiction involves aspects of salience, withdrawal, and conflict or interference with everyday functioning. The present series of studies examined whether high levels of engagement with the Harry Potter (HP) phenomenon could qualify as an addiction. Through use of three surveys posted online, we established that a sizeable portion (though not a majority) of self-described HP fans demonstrated craving for the release of the final book in the series, and experienced some withdrawal symptoms upon finishing the book. HP fandom also produced a disruptive influence on day to day functioning of some fans in a 6 month follow-up. In sum, we found parallels between criteria used to diagnose traditional forms of addiction or dependence and some people's attachment to a phenomenon in popular culture.

Keywords: *Addiction, dependence, withdrawal, craving, depression*

Introduction

The term “addiction”, long associated with compulsive and problematic drug use, has recently been applied to behaviors as diverse as shopping, eating, sex, gambling, work, television shows or even certain authors. In such instances, it is not clear if the label is being used in a literal or metaphorical sense.

One candidate for the study of such an ‘addiction’ is the attachment some people have to the Harry Potter (HP) phenomenon, a seven book series by J. K. Rowling that tells the coming of age story of a boy wizard. The first six installments, released between 1997 and 2005, sold over 325 million copies and have been translated into 64 languages (http://www.usatoday.com/life/books/news/2007-02-04-harry-potter_x.htm). Spin-offs to this phenomenon thus far include five highly grossing movies, hundreds of HP-themed websites hosting information of news, plot theories, chat rooms, fan fiction and art, several

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hundred “wizard rock” bands, and plans to open a HP-based theme park in Orlando Florida in 2009. The release of the seventh and final installment titled *Harry Potter and the Deathly Hallows* in July 2007 provided the perfect opportunity to study HP-fandom from the perspective of addictions. Questions raised in earlier installments would be answered, and anticipation of the released would be followed by the finality of knowing the series was over. For a fan addicted to Harry’s story, this could be akin to anticipating a high dose of a desired drug and receiving it, with the concomitant realization of no future dosages (with the exception of future movies, conferences, theme park, etc.).

One difficulty in describing someone as ‘addicted’ to something is the lack of consensus on what being addicted really means (Walters and Gilbert 2000). Indeed, many researchers and practitioners eschew the word, preferring pathological or problematic use, dependence, or abuse. Still, the term does have good heuristic value. Most definitions involve several components: (1) craving, which is a compulsion to seek and use the drug, (2) withdrawal, which can vary from agent to agent but often includes changes in sleep, appetite, mood and anxiety, irritability, and concentration (e.g. Petursson and Lader 1981; Budney et al. 2003; Etter 2005), and (3) a problematic impact upon one’s social relationships, job, or alternative recreational activities. While there is debate regarding whether behavioral addictions should be considered identical to drug-related ones, the overlap in behaviors and psychophysiological changes in both groups has led many researchers to see qualitative if not quantitative overlap (Holden 2001).

Griffiths (1996) suggested several useful criteria for assessing behavioral addictions. These are succinctly summarized by Charlton and Danforth (2007) as consisting as salience – domination of one’s life; euphoria – a high degree of reinforcement; tolerance – the need to engage in the behavior to a greater extent to attain the same ‘high’; withdrawal – unpleasant effects following cessation of the behavior; relapse – reinstatement of the behavior after attempts to curtail it; and conflict – presentation of problems in one’s personal or professional life. Charlton and Danforth also point out that that care should be taken in distinguishing between addiction and high levels of engagement in a behavior occurring not accompanied by negative consequences. They present a situation where two people with similarly high degrees of computer use “might be described pathological or non-pathological, depending upon the impact that this has upon their life” (p. 1533).

In the present series of studies, we set out to examine whether self-described fans of the HP series met any or all of Griffiths’ components of addiction. If they did, it would provide evidence that phenomena in popular culture could be added to the growing list of behavioral addictions. Part I, done in the two weeks before the release of *Harry Potter and the Deathly Hallows*, allowed us to address salience, euphoria, tolerance, and (indirectly) conflict. Part II, done shortly after completion of the book, allowed us to address withdrawal. Finally, Part III, done 6 months after the book release, allowed an examination of the persistence of the phenomenon. Moreover, since we did not include items to directly assess conflict in Parts I and II, we explicitly measured it in Part III.

Part I: Pre-book survey

Participants

Seven Hundred and Seventy-Nine participants filled out an online survey. Despite clear indications that the survey was not meant for minors, 187 participants were below the age of 18 (or did not indicate their age) and were excluded from data analysis, as were

16 participants who indicated formal psychological diagnoses in a comments section. This resulted in a valid sample of 586 participants (557 women, 29 men) with an average age of 22.1 (SD = 6.9, range = 18–60 years). Participants came from 28 different countries (59% the United States, 10% Canada, 6% England).

Materials and procedure

After reading about informed consent, participants filled out an online survey with multiple parts, hosted by Zoomerang.com. Participants answered 18 questions about HP-related online and offline behavior (Appendix 1) and chose between “not at all”, “once a week or less”, “several times a week”, “daily”, and “multiple times daily”. Participants were also asked to approximate the total time they typically spent each day how much time they spent doing HP-related activities, along with the number of times they read each installment of the series. Participants were also asked about changes in behavior as the book release drew near. Specifically, participants responded to five questions about online behavior and three questions about offline behavior on a 5 point Likert-type scale (anchors 1 = much less than usual to 5 = much more than usual).

Craving was addressed by choosing 12 items from Tiffany and Drobes’ (1991) *Questionnaire of Smoking Urges* and modifying the wording to reflect the HP novel in place of smoking (Appendix 2). Questions were scored on a 1–7 scale (anchors 1 = strongly disagree to 7 = strongly agree).

Changes in basic motivational processes were assessed by first asking participants to rate their amount of sleep, appetite, physical activity, enjoyment of other reinforcers, and irritability on a 1–5 scale (1 = much less than normal, 3 = typical, 5 = much more than normal). Participants also provided demographic information, and were given the option of adding comments.

The link to the survey was posted 2 weeks before the book release, and disseminated through posts on a HP-related Facebook group, as well as several HP-related websites (e.g., HPANA.com, Darkmark.com, Fictionalley.com). The call for participants also encouraged the forwarding of the link to other interested parties.

Salience was inferred by the composite score on the craving inventory, and by total time spent on HP-related activities. Euphoria was inferred from Questions 5 (“Reading *The Deathly Hallows* would make me feel very good right now”) and 8 (“Reading *The Deathly Hallows* would be energizing”) on the craving survey. Moreover, Question 7 (“If I were reading *The Deathly Hallows* this minute I would feel less bored”) and 9 (“My thoughts would be more focused right now if I could read *The Deathly Hallows*”) were used to infer negative reinforcement. Tolerance was inferred through reported increases in HP-related behaviors, and conflict can be indirectly inferred by the question on HP-related thoughts at inappropriate times (i.e., thought intrusion), as well as disruptions in motivated behavior such as sleep or appetite with the anticipated book release.

Results and discussion

Our sample was very well versed in the HP saga. Slightly more than half of them reported reading each book in the series at least 4 times, 25% of did so at least 8 and 10% at least 15 times. One-third (33.7%) of our participants reported spending “zero to half an hour” a day engaged in HP-related activity, while 21.3% spent an average of 30 min to 1 h/day, 21.1% 1–2 h, 12.4% 2–3 h, 4.8% 3–4 h, and 6.7% more than 4 h/day. Frequencies of specific

HP-related behaviors are summarized in Table I: approximately one-fifth of our participants visited HP-related websites multiple times daily, and one-fourth reported high frequencies of HP-related thought intrusions at inopportune times.

Time spent on HP-related activities increased with the anticipated book release (Table II, Panel A). Specifically, more time was spent visiting HP-themed web sites and forums, engaging in online predictions (theorizing), having more offline discussions with friends about the book, reading or re-reading HP-related books, and having more HP-related thought intrusion. Such increases parallel the increases seen with the development of drug tolerance.

High levels of craving for *The Deathly Hallows* was found on the modified Questionnaire on Smoking Urges (QSU) ($M=5.46$ on a 1–7 scale, $SD=1.32$, Kolmogorov–Smirnov $Z=2.94, p<0.001$). Using Spearman’s correlations, craving scores were found to be correlated with increased time spent in specific HP-related activities (Table II, Panel A), as well as with total time spent on HP-activities on a typical day ($r=0.17, p<0.001$). In most instances, distributions were negatively skewed, indicating that many more participants showed increased (as opposed to decreased) their HP-related behaviors. Time spent in HP-

Table I. Percentages of participants who engage in specific HP-related behaviors on at least a quotidian basis.

	% doing at least once daily	% doing multiple times daily
Online behaviors		
Visiting websites	36	19.5
Reading fan-fiction	19.9	10.4
Viewing fan-art	11.5	4.5
Online role-playing	5.4	2.9
Online theory discussion	20.5	10
Offline behaviors		
Discuss theories with friends	36.9	13.7
Inopportune thought intrusion	42.9	23.6
Read books or related items	35.3	15.8
Playing games	6.2	2.8

Table II. Percentages of participants who engaged in the same, more, or less HP-related behaviors or who showed changes in basic motivational processes as the book release approached.

	Less	Same	More	Mean	SD	Skewness	r with craving
Panel A: HP-related behaviors							
Time on web	5.8	20.3	73.9	3.95	0.94	6.27**	0.34**
Theorizing	11.0	33.8	55.2	3.61	1.13	4.56**	0.23**
Offline discussions	3.1	10.4	86.5	4.37	0.86	7.85**	0.33**
Preoccupation	3.6	15.5	80.9	4.23	0.91	6.73**	0.46**
Reading	3.7	14.2	82.1	4.31	0.93	7.79**	0.31**
Panel B: General motivation							
Sleep	29.3	64.5	6.2	2.74	0.66	8.56**	-0.26**
appetite	18.5	73.7	7.9	2.88	0.56	9.51**	-0.16**
activity	18.5	64.5	17.0	2.98	0.72	7.80**	-0.09*
irritability	9.4	58.8	31.8	3.28	0.73	7.82**	0.29**

Notes: Skewness assessed with Kolmogorov–Smirnov Z ; Correlations done using Spearman’s ρ . * $p<0.05$; ** $p<0.01$.

activities was also found to have significant but very small Spearman's correlations with disruptions in sleep ($r=0.12, p=0.006$), appetite ($r=0.09, p=0.03$), and increased irritability ($r=0.09$). Finally, the modified SUCQ had high internal consistency (Chronbach's $\alpha = 0.925$).

Although most participants reported no changes in general motivation, a sizeable number reported disruptions in sleep and appetite, and increases in feelings of irritability, all of which were correlated with craving scores. (Table II, Panel B). Again, these distributions tended to be negatively skewed.

Participants indicated a high level of agreement with the two items on the modified SUCQ that asked about positive reinforcement ($M=6.01, SD=1.29$, Kolmogorov–Smirnov $Z=6.20, p<0.001$), and general agreement with the items used to infer negative reinforcement, ($M=5.21, SD=1.66$, Kolmogorov–Smirnov $Z=4.53, p<0.001$). Once again, responses for both were negatively skewed.

In sum, anticipation of the release of *The Deathly Hallows* was accompanied by a high degree of focus on the book (craving), increased levels of HP-related behavior (tolerance), reports of anticipated euphoria, and thought intrusion and motivational disruptions (possible conflict). However, these apparent parallels with some aspects of addiction might simply reflect common thoughts and behaviors associated with a high degree of anticipation for an event or object. Thus, Parts II and III addressed elements of withdrawal and conflict to strengthen the case.

Part II. Post-book reaction

When we began this study, we expected to do a repeated measures design, matching participants' responses before and after reading *Harry Potter and the Deathly Hallows*. Participants in the Pre-book study were asked to choose a code name or word that they would use on both pre- and post-book surveys. However, only 71 participants remembered or re-used the same designators. This necessitated our analyzing the surveys separately.

Participants

A total of 2367 participants filled out the post-book survey. We eliminated 563 respondents for being minors or omitting their age, and 11 for revealing diagnosed psychological disorders. Of the remaining 1793 valid participants, 1570 were female and 221 male (2 left the item blank). Participants had a mean age of 20.54 ($SD=4.47$, range = 18–60) and represented 48 different countries (76% the United States, 8% Canada, 7% England). Instructions on the survey requested that participants revisit the link for a second time after a little time has passed. Seventy-one participants took the post-book survey more than once and did use proper identifiers, permitting tracking of changes in depression and motivation over time.

Materials and procedure

Information about links to the post-book survey was disseminated similarly to Part I, as well as through direct e-mail to participants who voluntarily provided their addresses in the first survey. Those participants had been informed that providing their e-mail addresses would compromise their anonymity). The recruitment e-mails, posting, and instructions on the

survey specified that it should not be filled out until 1 day had passed since completing *The Deathly Hallows*. After reading about informed consent, participants were asked how long it took to finish the book, how much time had passed since finishing, whether they were satisfied with the book (7 point Likert-type scale ranging from 1 = “definitely no” to 7 = “definitely yes”) and its ending (7 point Likert-type scale ranging from 1 = “not at all” to 7 = “couldn’t have been better”), if they believed an eighth book is necessary book (7 point Likert-type scale ranging from 1 = definitely no to 7 = “definitely yes”), and time spent in over the past 24 h in HP-related online and offline activity (2 separate questions using a 7 point Likert-type scale with anchors 1 = none at all to 4 = same as usual to 7 = almost all my waking hours). Participants were also asked questions about basic motivation similar to questions asked in Part 1 (e.g., sleep, appetite), and given the 4-item *Brief Screen for Depression* (BSD, Hakstian and McLean 1989).

Scores on the BSD can range from 7 to 52. Hakstian and McLean (1989) report survey norms for their “normal” subjects as 13.27 (SD = 5.2) and 33.86 (SD = 6.6) for their clinically depressed sample, with a cutting score of 21 to distinguish clinical from non-clinical subjects and 24 to distinguish depressed from other psychiatric subjects. Participants were also asked various demographic questions, and given the opportunity to provide comments.

Withdrawal was inferred through motivational changes, scores in the BSD, and participants’ comments. Since Hakstian and McLean’s original sample had a mean age of 39 years (while ours was 20.5), we also examined scores on the BSD separately for different age groups, making sure to have a group that matched their norm. We found that if we analyzed our participants who were 30 years or older, their average age was 38.1 (SD = 7.9).

Results and discussion

On average, participants filled out the survey of 2.6 days after completing the book. Most participants reported spending greater amounts of time in both solitary (re-reading books, checking websites) and social (e.g., chat rooms, discussions) HP-related behaviors (Table III). The median score for behavior involving interaction with other fans (e.g., chat rooms, face to face discussions) was “More than normal”, as was the median for solo HP-related behaviors (e.g., rereading books, watching movies).

As was the case with the pre-book survey, most participants did not report changes in basic motivation. However, the distribution of changes in sleep, appetite, and activity did

Table III. Percentages of participants who showed changes in basic motivational processes and general HP-related activity in the days after finishing *The Deathly Hallows*.

	Less	Same	More	Mean	SD	Skewness	Time since finishing
Panel A: HP-related activities							
Solitary	18.2	21.1	60.7	4.62	1.72	8.60**	-0.07**
Social	23.3	16.2	60.5	4.38	1.79	10.51**	-0.15**
Panel B: Motivational processes							
Sleep	44.3	46.5	9.2	2.54	0.853	11.66**	0.26**
Appetite	27.9	62.9	9.2	2.77	0.701	15.34**	0.15**
Activity	34.6	56.4	9.0	2.68	0.774	14.15**	0.23**
Irritability	19.1	54.8	26.1	3.05	0.831	12.51**	0.05*

Notes: Skewness assessed with Kolmogorov–Smirnov Z ; Correlations done using Spearman’s ρ . * $p < 0.05$; ** $p < 0.01$.

reveal a significant negative skew, indicating a sizeable number of participants who did show motivational changes (Table III). Table III also has small but significant negative correlations between sleep, activity, and appetite with the passage of time since completing *The Deathly Hallows*.

Inferences of post-Potter depression were a bit more difficult due to the lack of pre-test data. This necessitated making comparisons between our sample and Hakstian and Mclean's norms. We can infer depression through several different analyses and comparisons. First, the mean depression score for our participants was 19.82 (SD = 8.36), and 43.9% scored above Hakstian and McLean's cutting score. Table IV shows the percentage of participants' scores relative to the published norms. Most markedly, 34.3% of participants 30 years or older (whose mean age matched that of those norms) fell above the cutting score.

A more powerful examination of the progression of any 'withdrawal' syndrome involving depression was provided by the participants who filled out the post-book survey twice, allowing for comparisons of scores using paired-sample *t*-tests. Drug-related withdrawal syndromes typically decrease with the passage of time. For instance, morphine withdrawal typically peaks at 36–48 h, and then diminishes, disappearing within 7–10 days (Meyer and Quenzer 2005). As such, we predicted that depression scores and motivational disruptions would diminish with time as well. In the present study, participants who retook the survey within a two day period ($n = 19$) had their depression scores decrease from an average of 22.81 (SD = 10.12) to 20.42 (SD = 7.79), a small but significant decrease ($t(19) = 2.30$, $p = 0.03$, $d = 0.27$). Participants who waited for 2–4 days ($n = 51$) to re-take the survey showed BSD decreases from 23.04 (SD = 8.89) to 18.29 (SD = 8.65), a decrease with twice the effect size ($t(51) = 3.87$, $p < 0.001$, $d = 0.54$). Moreover, basic measures of motivation stayed depressed in the former but not the latter group. For instance, disruptions in sleep ($t(51) = 6.55$, $p < 0.001$, $d = 1.10$), appetite ($t(51) = 2.43$, $p = 0.02$, $d = 0.44$), and physical activity ($t(51) = 4.99$, $p < 0.001$, $d = 0.93$) were reversed in participants who waited 2–4 days to re-take the survey, but were not significantly attenuated in participants who retook the survey after only 1–2 days. Differences between these two groups were also observed in comparisons of the percentage of participants falling above Hakstian and McLean's cutting scores. Whereas the initial scores were higher in the participants who waited 2–4 days (63.5% above the cutting score) than those who retook the survey earlier (57.9%), they dropped more precipitously in the former group (to 36.5%) than in the latter one (to 47.4%).

Overall depression scores were not different between men ($M = 19.59$, $SD = 7.83$) or women ($M = 19.79$, $SD = 8.47$). Moreover, similar percentages of men (41.6%) and women (40.3%) scored above the Hakstian and McLean's cutting score. There were also no sex differences with respect to sleep, appetite, or activity, although women did report a very slight increase in irritability relative to men ($t(1913) = 2.80$, $p = 0.003$, $d = 0.20$).

Table IV. Average BDS scores and percentage scoring above Hakstain and McLeans' cutting score (21) for participants grouped according to age.

Age	N	Mean	SD	1–20	21–23	24+	% above cutting score
18–21	1475	19.89	8.31	55.8	11.9	32.2	44.1
22–29	349	20.00	8.62	55.2	12.7	32.1	44.8
>30	95	17.83	8.22	65.7	12.9	21.4	34.3
Total	1919	19.82	8.36	56.1	12.2	31.6	43.8

Examination of the entire sample's depression scores did reveal small but significant correlations with happiness with the book ($r = -0.22, p < 0.001$), and a wish for an eighth book ($r = 0.11, p < 0.001$). Finally, the internal consistency for the BSD was good ($\alpha = 0.752$).

Some dramatic evidence of post-Potter depression along with some insights as to its etiology was provided by individual participants in their comments (Table V). Moreover, of the 67 participants whose comments described a sense of loss, the average BSD score was 28.21 ($SD = 7.45$), with 86.6% of them falling above the cutting score and 56.7% of them within one SD of the depressed norm mean.

Because 71 participants provided identifying information allowing us to compare their pre- and post-book surveys, we were able to examine the relationship between pre-book craving and post-book depression. We found a small but significant correlation between craving score (Survey 1) and BSD score (Survey 2) ($r(71) = 0.23, p < 0.05$).

In sum, after finishing *The Deathly Hallows*, a sizeable percentage of participants reported elevated scores on a screen for depression along with disruptions in various motivated behaviors, suggesting withdrawal. Additionally, HP-oriented behavior increased in the majority of our participants, suggesting relapse/reinstatement.

Part III: 6 month follow-up

According to the DSM-IV, a maladaptive pattern of substance use must occur over an extended period of time for it to be considered abuse or dependence (American Psychiatric Association 2000). Part III of this study was done 6 months after book release to see if HP-related disruptions in behavior also showed persistence. Also, part III attempted to correct a major flaw in Parts I and II. Specifically, conflict/disruption was only peripherally measured through motivational changes or thought intrusion. Many studies on behavioral addictions consider disruption to be a core element in addiction. For example, in describing Internet addiction, Shapira et al. (2003) suggest that preoccupation and excessive use of the internet should result in significant distress or social, occupational, or other important impairment for it to be considered 'addiction'. Accordingly, we added direct measures of conflict and disruption in Part III.

Participants

Participants in Parts I and II were given the opportunity to provide their e-mail addresses so that they could receive updates on the study and further solicitations for related research. We sent them out the survey link, with the additional request that they forward it to interested parties.

Six hundred and ninety-three participants filled out the survey in the first 3 weeks it was posted. Seventy-eight indicated they were below the age of 18 (or did not indicate their age) and were excluded from data analysis. This resulted in a valid sample of 615 participants (552 women, 61 men, 1 omitted their sex) with an average age of 22.78 ($SD = 7.24$, range = 18–60 years). Participants came from 33 different countries (74.9% the United States, 8.5% Canada, 4.2% England).

Table V. Selected comments from participants who indicated a “sense of loss” after finishing “The Deathly Hallows”.

Sex	Age	Comment
F	29	Spent some time crying over the end of HP. I feel very lonely.
F	20	I want Mrs. Rowling to know that I hate her . . . Because I have nothing to live for now that there is no more HP . . .
M	18	I simply feel empty inside as a result of the acknowledgment that an entire chapter of my life (that being the HP series) has ended forever.
F	18	I feel completely depressed and genuinely hollow since I finished the seventh book. I feel like a huge happiness that has filled my life for so many years has been ripped out. I feel lost and hopeless. It’s pathetic, but it’s true.
F	19	Honestly I was nervous about finishing the last book. I was upset, stressed, depressed, and happy throughout reading the whole book. Then when I finished it and had some time to think about it I seriously felt very alone and empty inside . . .
F	18	It is emotionally painful to say the least. The fact that the series is over is harsh yet needed. People need to move on but its hard because we want it to keep going so we can be part of a magical life we will never have.
F	18	HP was such an immense part of my life/childhood, that even though I was satisfied with the last book, I feel dissatisfied and somewhat empty now that I know it is all over.
M	18	I would like to make it clear that the thought of never reading HP for the first time ever again for the rest of my life makes me INCREDIBLY sad. I can’t believe it’s over.
F	24	Post-Potter depression is real!
F	19	Whenever I look at the book, I feel a sense of sadness and depression.
F	18	Finishing this story was some what depressing for me. It is the end of an era and definitely goes along with my growing up as well and moving on with my life.
F	21	One thing that has greatly changed since I have finished the book, is that I can barely talk about it without crying, because every time I do, I realize the series is really, truly over.
F	19	Coming to terms with the absolute end of the story was very difficult for me, as well as reading the epilogue, which broke me to sobs. During the last few days, nearly every spare moment is spent contemplating the book.
F	19	Simply put: thinking about the end of the series leaves me feeling a bit lost, so I avoid doing that. Sometimes, though, you just can’t help it . . . it’s a big deal that there are no more books. This has been, you know, my childhood.
F	22	I had trouble getting out of bed Monday morning. I was depressed and had nightmares all night long. I dreamed I was being attacked by Lucius Malfoy and Fenrir Greyback and didn’t have a wand because I was muggle born.
F	19	The best way I’ve come up with to describe my feelings to the end of this series is “mourning.”
F	18	I’ve had the feeling that my childhood has ended. I grew up with Harry Potter and this sense of loss distracts me somewhat. To grow up in the short period it takes to read a book makes one go through some sort of a shock.
F	18	I felt so weary after reading the book. Like I’d fought the whole battle. And now I keep getting distracted by the story while I’m trying to do my own things.
F	18	I’ve cried a lot. I feel like a huge part of my life is just . . . over. I’m very sad.
F	20	I am more upset at the fact that the series is over and the magic is gone and all I have left is my real life.
F	31	I have been very weepy, and can’t talk about the book without breaking down – so I have been avoiding all the online discussions about it. I feel like someone close to me has died.
F	18	When I finished the book. All that I could do was cry.

Notes: M: male; F: female.

Materials and procedure

We modified the Internet Addiction Test (IAT, Young 1998), a 20-item questionnaire on which participants rate items on a 5 point Likert-type scale (never, rarely, sometimes, frequently, very frequently) by altering the words “internet” or “online” to be appropriate for HP-related behaviors, creating the HP Addiction Test (HPAT). Items address the degree to which HP-related behaviors affect daily routines, social life, productivity, feelings, and motivated behaviors. Scores can range from 20 to 100, and Young suggests that scores between 40 and 69 indicate frequent problems (for internet usage) and those above 70 reflect significant problems, although these cutoffs have not been empirically validated. In one study, the IAT was found to consist of six factors (Widyanto and McMurrin 2004) including salience, excess use, neglecting work, anticipation, lack of self-control, and neglecting social life. While the validity of the test and factor structure of the IAT raises questions based on the sampling techniques used in its development and testing, the individual items clearly do address issues of engagement and conflict/disruption.

After reading about informed consent, participants answered questions about HP-related behaviors (same as Appendix 1), took the HPAT, and estimated the amount of time currently spent on HP-related activity on a “typical day”, as well as time spent on such activity in the months leading up to the release of *The Deathly Hallows*. Participants then provided demographic information and were given the opportunity to provide comments.

As before, the survey was disseminated through Zoomerang.com

Results and discussion

A paired samples *t*-test indicates that HP-related behavior was reported to be significantly lower after 6 months after the release of *The Deathly Hallows* ($t(615) = 15.66$, $p < 0.001$, $d = 0.61$). Despite this, many participants still reported high typical levels of HP activity, with 32 (5.2%) of our participants still spending more than 4 h a day engaged in HP-related activity, 30 (4.9%) between 3 and 4 h, 36 (5.9%) between 2 and 3 h, and 68 (11.1%) between 1 and 2 h daily. Additionally, 70 participants (11.4%) participants spent between 0.5 and 1 h on a typical day, 83 (13.5%) between 16 and 30 min, 174 (28.4%) between 1 and 15 min, and 120 (19.6%) reported typically not doing anything HP-related on any given day.

The mean score on the HPAT was 43.5 (SD = 17.5), with 21.0% of participants scoring above 60 (i.e., mean score corresponding to “sometimes”) and 8.6% above 70 (Young’s arbitrary score on the IAT suggesting significant problems with internet addiction).

Since the IAT is reported to consist of several factors, we ran a principal components analysis on the HPAT. When first done on our entire sample, we found only two factors, 18 items loading on the first and only two on the second. We repeated the procedure on the eliminating the 120 participants who reported that typically do not spend time engaged in any HP-related activity (i.e., on the ‘active fans’). A principal components analysis revealed 3 factors with eigenvalues greater than 1, accounting for 59.8% of the variance. The appropriateness of this solution was confirmed with a scree test, and factor loadings were rotated orthogonally using the varimax criterion. Using a stringent cut-off for factor loadings of 0.5 indicates that these three factors can best be described as “disruption” (e.g., “does your work suffer i.e., postponing things, not meeting deadlines, etc, because of time spent on HP?”; “do you try to cut down on the amount of time spent on HP activity and fail?”), “engagement (e.g., “do you find yourself anticipating engaging in HP-related

Table VI. Factor structure of the HPAT.

Item	Factor			
	Communality	Disruption	Engagement	Shame
HP activity longer than intended	0.600	0.751	0.184	0.053
Neglected chores due to HP	0.694	0.771	0.292	0.123
Prefer HP to interpersonal intimacy	0.495	0.373	0.594	0.053
Form relationships with HP fans	0.378	0.469	0.374	-0.137
Others complain about HP activity	0.566	0.529	0.500	0.177
Work suffers because of HP activity	0.613	0.682	0.228	0.309
Prioritize HP over other activities	0.522	0.662	0.246	0.151
HP interferes with job productivity	0.597	0.650	0.182	0.375
Secrecy	0.759	0.220	0.286	0.793
HP is a soothing escape	0.624	0.223	0.720	0.237
Anticipate future HP activity	0.523	0.494	0.501	0.167
Life would be joyless without HP	0.641	0.127	0.788	0.066
Snap/yell when interrupted	0.590	0.275	0.672	0.251
Sleep loss due to HP activity	0.553	0.552	0.467	0.174
Preoccupation with HP thoughts	0.666	0.479	0.615	0.241
Say “one more minute”	0.642	0.651	0.402	0.237
Unsuccessful quitting	0.588	0.607	0.299	0.362
Hide HP activity	0.797	0.174	0.106	0.869
Prefer HP to other interactions	0.535	0.588	0.382	0.206
Depression lifts with HP activities	0.572	0.412	0.605	0.191

activities again?”; “do you fear that life without HP would be boring, empty and joyless?”), and “shame” (e.g., “do you become defensive or secretive when asked about doing a HP-related activity?”). The factor analysis is summarized in Table VI. The three factors showed fairly high intercorrelations: disruption correlated with engagement ($r(612) = 0.83$, $p < 0.001$) and shame ($r = 0.59$, $p < 0.001$), while engagement and shame were also significantly correlated ($r = 0.55$, $p < 0.001$).

Figure 1 summarizes the amount of time typically spent on HP-activities and the percentage of participants scoring above a mean value corresponding to the value of “sometimes” (i.e., 3.0) or to Young’s “significant problem” criterion (i.e., 3.5) for each of the three principle components. Very few participants spending less than 1 h per day on HP-related activities had overall scores above the 3.0 or 3.5 cutoffs. For participants spending more than 1 h per day on HP-activities, the percentages scoring above those cutoffs was positively related to time, reaching 36.8% (3.0) and 17.6% (3.5) for the 1–2 h group, 65.9% (3.0) and 27.8% (3.5) for the 2–3 h group, 56.3% (3.0) and 36.7% (3.5) for the 3–4 h group, and 68.7% (3.0) and 43.7% (3.5) for the “more than 4 h” group.

Total HPAT scores were significantly correlated with time spent in HP-activity ($r(612) = 0.61$, $p < 0.001$). The factors of disruption ($r = 0.65$), engagement ($r = 0.56$) and shame ($r = 0.38$, $p < 0.001$) were also significantly correlated. Both total HPAT and the disruption factor were also correlated with participants’ age ($r(612) = -0.12$, $p = 0.003$, and $r = -0.094$, $p = 0.02$, respectively), although these correlations were very small.

Female participants scored higher than male participants on overall HPAT scores ($M = 44.13$, $SD = 17.53$ versus $M = 38.03$, $SD = 16.62$, $t(610) = 2.59$, $p = 0.01$, $d = 0.36$) and the disruption factor ($M = 2.33$, $SD = 0.97$ versus $M = 1.98$, $SD = 0.86$, $t(610) = 2.73$, $p = 0.006$, $d = 0.39$). Men and women did not differ in terms of how much time they spent on HP-related activities.

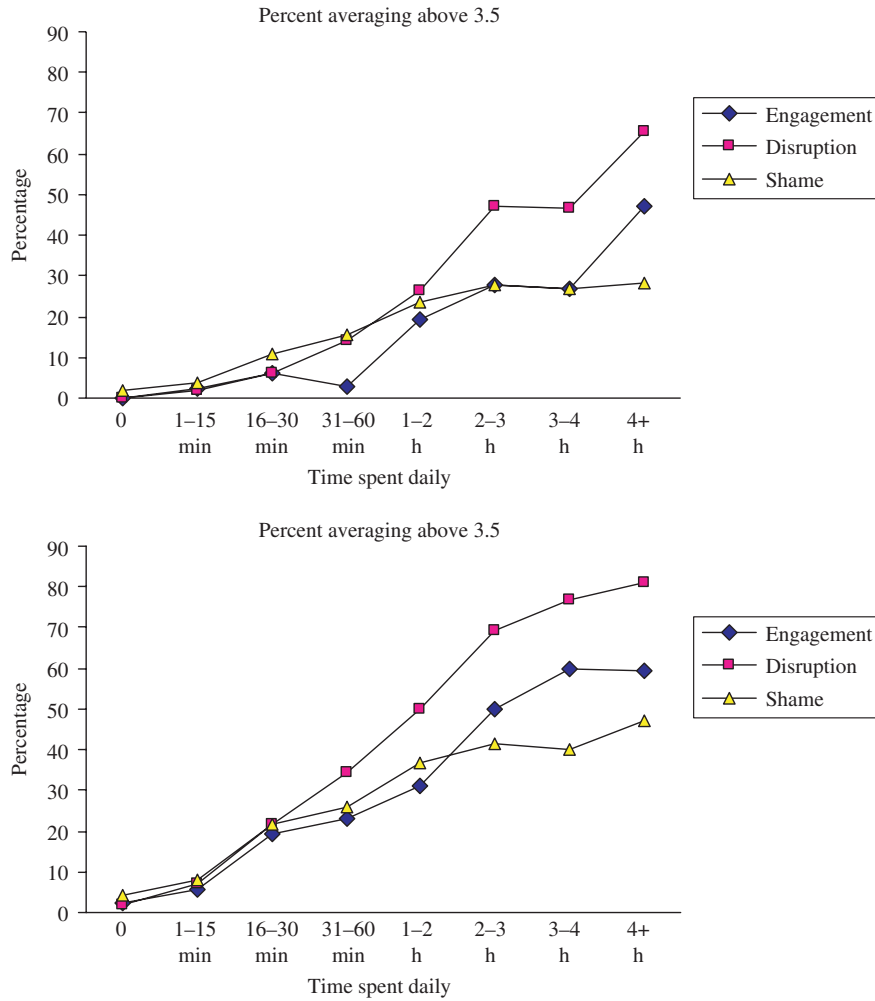


Figure 1. Percentage of participants scoring above a mean value corresponding to the value of “sometimes” (i.e., 3.0) or to Young’s “significant problem” criterion (i.e., 3.5) as a function of time spent on a typical day on HP-activities.

Finally, many of our participants voluntarily provided us with e-mail addresses, which allowed us to match their responses on Part III with Parts I and II. HPAT scores were significantly correlated with participants’ scores for pre-book craving ($r(120) = 0.390$, $p < 0.001$), as well as their scores on the post-book brief depression survey ($r(299) = 0.334$, $p < 0.001$). Post-book BDS scores were also correlated with participants’ estimates of time spent on HP-activity at the 6 month follow-up ($r(300) = 0.200$, $p = 0.001$).

In sum, the 6 month follow-up demonstrated that even 6 months after the formal ending of the series, the ancillary HP-phenomenon still supported a high level of engagement with many participants. Moreover, a sizeable number of participants who reported spending more than an hour a day involved in HP-related activities indicated that such activities are disruptive and produce conflict in their lives, issues considered to be core components of an addiction.

General discussion

Self-identified fans of the HP series reported experiencing many of the behavioral correlates of addiction. Anticipation of the final book in the series was accompanied by high levels of craving and thought intrusion (salience), as well as increases in HP-related behaviors (tolerance), and disruptions in sleep and appetite (conflict). Several survey items also suggested that they anticipated high levels of pleasure while reading the final installment (euphoria). Upon finishing the book, a substantial percentage of participants experienced mild depression and motivational disturbances (withdrawal) that, similar to drug withdrawal, seemed to diminish over time. This was accompanied by an increase in the amount of time spent in other HP activities such as reading earlier installments of the series, and comments from some participants that they had been unsuccessful in cutting back on HP-activities (relapse-reinstatement, later verified by the HPAT). High levels of engagement accompanied by behavioral and lifestyle disruptions were still evident in a sizeable portion of participants (conflict) six months after completing *The Deathly Hallows*.

According to the DSM-IV (American Psychiatric Association, 2000), the criteria for substance dependence involve meeting at least three of the following criteria: (1) tolerance; (2) Withdrawal; (3) a loss of control over amount of the substance consumed; (4) unsuccessful attempts to cut down; (5) significant amount of time spent trying to procure the drug or to recover from its effects; (6) choosing drug use over social, occupational, or recreational activities; and (7) continued use despite recognition that such use is problematic. While most participants in the present study do not meet this threshold, there are a sizeable number of participants who meet multiple criteria, suggesting a parallel with drug dependence. The DSM-IV includes additional criteria in diagnosing substance abuse, including failure to fulfill major obligations, repeated use under hazardous conditions, substance-related legal problems, and persistent social problems. Very few participants in the present study met these additional criteria, suggesting that HP-fandom rarely meets the level of "HP abuse".

A core aspect of addiction is withdrawal following removal of the addicting agent. In the current study, the strongest evidence of HP-related withdrawal comes from participants' elevated scores on the BSD, found in a considerable portion of participants in Part II. We also observed an age difference in BSD scores. Post-Potter depression levels were more likely to be found in younger than older participants. Approximately 44% of respondents under the age of 30 scored above the cutting score on the BSD compared with 34% of those over 30 years old. This pattern contrasts with lifetime incidence of major depression, which has been found to be fairly low below the age of 30 years, peak between 30 and 45 years, and decrease again afterwards (Robbins and Regier 1991, as cited in Barlow and Durand 2005). One possible explanation for this difference lies in the emotional impact the end of a coming of age story has on people of different ages. To quote one 18-year-old participant (Table V), "Finishing this story was somewhat depressing for me. It is the end of an era and definitely goes along with my growing up as well and moving on with my life". Unlike scores on the BSD, there was a minimal relationship between age and scores on the HPAT taken 6 months after finishing the book.

Inferences of depression in the present study were done with respect to Hakstain and McLean's norms. Ideally, we would have been able to compare participants' scores against their own baselines. It is possible that HP fans are more depressed than the general population. However, there are indications that some depression is indeed attributable to the ending of the series. Depression scores diminished over time, just as drug-withdrawal

symptoms do. In addition, many participants commented directly on their depression being induced by finishing the last installment.

Some of the reported depression scores may have also reflected an acknowledgement of some participants' transition between adolescence and adulthood. Indeed, several of the comments summarized in Table V reflect such sentiments (e.g., "I have the feeling that my childhood has ended."). Many developmental psychologists have suggested that adolescence may now extend to ages 25–28 years, thus making the majority of our participants adolescents. Major life changes such as moving from childhood through adolescence into adulthood commonly involve an element of mourning, the closing of a chapter so to speak. As one participant wrote: "To grow up in the short period of time it takes to read a book makes one go through some kind of shock". Finishing the HP series may have privately marked a point where participants realized that their childhood/adolescence was now over, and such a realization could elicit some depressive symptoms in its own right. The relatively higher percentage of participants below the age of 30 years scoring above critical depression cutoffs on the BDS may in part reflect this additional transitional sense of mourning and loss. However, the finding that one-third of our participants above the age of 30 years scored above the BDS cutting score suggests that affected participants self-reported depression is not solely attributable to the mourning the loss of childhood or adolescence.

Research on the incidence of other behavioral addictions often reveals sex differences. For instance, men make up the overwhelming majority of sex addicts, and have double the rates of gambling and substance abuse. Conversely, the majority of shopping addicts or kleptomaniacs are women (Holden 2001). Internet addiction has shown no clear pattern, with early studies suggesting that the typical addict is a young, solitary male, but later studies casting doubt on that conclusion (Chou et al. 2005). In the present study, we did not find large sex differences in HP-linked indices of possible addiction. While the vast majority of our participants were female, there were sufficient numbers of men to make comparisons. No sex differences were found on craving, BSD scores, and engagement, although women did score higher than men on behavioral disruption as assessed by the HPAT.

As mentioned above, sizeable numbers of participants did show characteristics of addiction, but the majority did not. The "user-addict" distinction is found elsewhere. For instance, Compton (2004) reported that rates of marijuana-related disorders are found in just over one third of marijuana smokers. Similarly, the Office of Applied Studies of the US Department of Health and Human Services (2006) found that while 61.9% of 18–25-year-olds reported consuming alcohol during the most recent month surveyed, heavy use or binging was found in only 15.6% of them. (<http://www.oas.samhsa.gov/NSDUH/2k6NSDUH/tabs/Sect2peTabs43to84.htm#Tab2.44>). Discrepancies between use and addiction can be found for so-called behavioral addictions as well. For instance, while most college students use the Internet, Scherer (1997) found that only 13% reported that Internet use had interfered with their academic, professional, or social lives.

The distinction between the use and abuse was further developed by Charlton (2002) and Charlton and Danforth (2007). In examining computer-related addictions, they drew a distinction between addiction and high levels of engagement. Whereas engagement might involve a high degree of usage, pathological usage requires negative consequences for an individual. Thus, two people might spend equivalent time using the Internet, but may differ on pathology depending upon the impact such usage has on their life. Furthermore, Charlton (2002) suggests that 'core' addiction criteria are related to behaviors demonstrating conflict, relapse, withdrawal and reinstatement, while behaviors linked to tolerance and euphoria are more descriptive of engagement. Similarly, Beard and Wolf (2001) argue that preoccupations and tolerance are not necessarily characteristics of addiction.

Participants' responses on the HPAT also suggest a distinction between conflict/disruption-related behaviors and engagement-related ones. However, participants' scores on these factors were strongly correlated with each other, suggesting an interrelationship between engagement and disruption for HP dependence that is not necessarily seen in computer-related addiction. Still, the fact that approximately two thirds of participants spending between 1 and 3 h a day on HP-related activities score below possible "addiction" thresholds on the HPAT does reveal a distinction between high levels of engagement (and inferred simply by time) and conflict.

Many participants wrote comments about the perceived benefits of their HP-related activities, particularly with respect to social interactions and creative outlets. These comments parallel past research on compulsive Internet use. Chou and Hsiao (2000) point out that despite causing possible problems with time management, heavy internet use it can provide people with different the opportunity to meet new people and create and share new topics for discussion. Many HP fans wrote similar comments. In a review of the literature on internet addiction, Chou et al. (2005) conclude that "it is difficult to draw the conclusion that heavy use of the Internet results in an overall negative impact on addicts' lives" (p. 370), with the only conclusive negative impact for the vast majority of users being time disruptions interfering with daily responsibilities. The same can be said to be true for many of the participants in the present study.

Several limitations limit present problems for the validity and generalizability of these set of studies. First, there are issues with the selection of participants, who were self-selected. This can produce selection bias (Azar 2000), and we did not have a control group of fans for comparison. As with all self-report research, not all participants might have answered truthfully, and we did not include a "lie" scale. We also faced several challenges linked to survey administration. There was no standardization of how participants took the survey, likely increasing the variability of responses. Participants may have also misinterpreted or failed to understand certain questions. For instance, when filling out Part III we received an e-mail asking whether the survey should be filled out in terms of current or past behavior. Some of the responses may have also been affected by due to social desirability or demand characteristics. For example, one website advertised Part III of the study by posting "*Are you an HP addict? Chances are, if you're visiting a HP fansite, you're a proud, obsessed HP fan. Well, if you're a HP fan with a couple spare minutes and over the age of 18, why not take a short survey?*" and including a hyperlink to the survey (<http://www.darkmark.com/c.c?l=home>, retrieved 2008 January 25). Such appeals can serve to encourage participants to exaggerate their behaviors and experiences, although this concern is mitigated somewhat by participant comments indicating surprise at their own answers. For instance, after filling out the HPAT one participant wrote "You probably aren't going to want to hear this, but you actually alerted me to things I didn't know about", and another wrote "I hope to God people don't answer more than never or rarely to most of those questions". Finally, the disparity in number of males-females also poses problems for external validity, although sex differences were typically not observed in our data.

Because of these methodological concerns, none of the present results should be used to infer that the casual fan who greatly enjoys reading J. K. Rowling's novels is likely to be addicted to the series and experience inter and intrapersonal conflict as a result. The present study makes no claims regarding the general prevalence of HP-related addiction. If anything, most of our participants (who are likely to be motivated fans if they took the time to fill out these surveys) find the series to be like any other "good book". However, this should not obscure the point that some readers can become so engaged in the series and the ancillary

world that grew out of it that they report behaviors that truly fit definitions of addiction or dependence.

There is disagreement on whether all compulsive behaviors can be classified as “addictions”. This ontological fuzziness is reflected in the inclusion of addictions, obsessions and compulsions in many different areas of the DSM-IV, including substance-related disorders, caring disorders, sexual disorders, anxiety disorders, and impulse-control disorders not otherwise specified (Holden 2001). One way to draw parallels between different forms of putative addictions is to show behavioral and physiological commonalities. For instance, Potenza et al. (2003) report that in men with problem gambling (behavioral addiction), watching videos of people gambling elicits gambling urges and leads to changes in brain function similar to that seen when cocaine addicts (chemical addiction) see videos relating to cocaine administration. Even if the notion of behavioral addictions is not universally accepted (Holden 2001), similar patterns of behaviors and physiological reactions suggests at least some overlap. The present study extends these similarities to events that capture the public imagination to become popular culture phenomena. In three separate studies, we found evidence linking some people’s connection to the HP phenomenon to salience/craving, withdrawal, and disruption/conflict, demonstrating a parallel to other forms of addiction.

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Appendix A: Fandom behaviors

Online behaviors

1. Visited HP-related news websites
2. Visited JKRowling.com
3. Read HP fan fiction
4. Written HP fan fiction
5. Viewed HP fan art
6. Created HP fan art
7. Engaged in HP online role-play
8. Posted in a HP online journal
9. Engaged in online theorizing
10. Viewed HP-related parodies (e.g., Youtube videos)

Offline behaviors

11. Discussed HP theories with friends
12. Dressed up in HP-related clothing
13. Were pre-occupied with HP-related thoughts at inappropriate times.
14. Engaged in HP Live Action Role Plays
15. Purchased something HP related
16. Read something HP related
17. Attempted to create HP-related foods/beverages.
18. Played HP games.

Appendix B: Modified Craving Scale

1. All I want right now is to read *The Deathly Hallows*.
2. My desire to read *The Deathly Hallows* seems overpowering.
3. I crave *The Deathly Hallows* right now.
4. Nothing would be better than reading *The Deathly Hallows* right now.
5. Reading *The Deathly Hallows* would make me feel very good right now.
6. I would be less irritable now if I could read *The Deathly Hallows*.
7. If I were reading *The Deathly Hallows* this minute I would feel less bored.
8. Reading *The Deathly Hallows* would be energizing.
9. My thoughts would be more focused right now if I could read *The Deathly Hallows*.
10. I will read *The Deathly Hallows* as soon as I get the chance.
11. If I were offered a copy of *The Deathly Hallows*, I would read it immediately.
12. I would do almost anything for a copy of *The Deathly Hallows* right now.

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