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RESEARCH PAPER

Addiction chronicity: are all addictions the same?

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ABSTRACT

Background: All addictions have a recurring nature, but their comparative chronicity has never been directly investigated. The purpose of this study is to undertake this investigation.

Method: A secondary analysis was conducted on two large scale 5-year Canadian adult cohort studies. A subset of 1,088 individuals were assessed as having either substance use disorder, gambling disorder, excessive behaviors (e.g. shopping, sex/pornography), or two or more of these designations ('multiple addictions') during the course of these studies. Within each dataset comparisons were made between these four groups concerning the number of waves they had their condition; likelihood of having their condition in two or more consecutive waves; and likelihood of relapse following remission.

Results: Multiple addictions had significantly greater chronicity on all measures compared to single addictions. People with an excessive behavior designation had significantly lower chronicity compared to people with gambling disorder and a tendency toward lower chronicity compared to substance use disorder. Gambling disorder had equivalent chronicity to substance use disorder in one dataset but greater chronicity in the other. However, this latter difference is likely an artifact of the different time frames utilized.

Conclusions: Having multiple addictions represents a more pervasive condition that is persistent for most individuals. Substance use disorder and gambling disorder have intermediate and roughly equivalent levels of chronicity, but considerable individual variability, transient for some, but more chronic for others. In contrast, excessive behaviors such as compulsive shopping are transient for most, and their comparatively lower levels of chronicity questions their designations as 'addictions'.

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Introduction

Substance use disorder, gambling disorder, and other excessive behaviors share much in common in terms of their epidemiology and neurobiology (Marlatt et al. 1988; Shaffer et al. 2004; Grant et al. 2006; Karim and Chaudhri 2012; MacKillop and Ray 2018; Sussman et al. 2017). Their phenomenology is also very similar, sharing the common core components of preoccupation, mood enhancement, tolerance, withdrawal, inter and intrapersonal conflict, and relapse (Griffiths 2005). Following on this, some authors have proposed that all addictions are part of a single underlying syndrome with different expressions (Shaffer et al. 2004).

Central to all addictions is a pattern of persistent and reoccurring behavior, referred to as chronicity. Indeed, DSM-5 criteria for substance use disorder and gambling disorder both emphasize continued use despite adverse consequences and repeated attempts to control, reduce, or stop (American Psychiatric Association 2013). The chronicity of substance use disorders is well documented in longitudinal research (e.g. Vaillant 1983; Perkonigg et al. 2008; Tuithof et al. 2013). These same studies have also shown that while the condition tends to be enduring for most people, there is variability between individuals, with some having an unremitting course, others having repeated cycles of abstinence and relapse, and some being able to achieve sustained abstinence. While less well studied, there also appears to be considerable similarity in the relative chronicity of different addictive substances (e.g. Hunt et al. 1971; Kozlowski et al. 1989; Henningfield et al. 1991), which may be related to their high co-occurrence (McCabe et al. 2017; Bailey et al. 2019).

The chronicity of gambling disorder is somewhat less well established. Historically, it was also thought to be unremitting and enduring, as evidenced by its designation as 'pathological gambling' in DSM-III and DSM-IV (pathological meaning 'disease-like'), and its essential feature being described as 'persistent and recurrent maladaptive gambling behavior' (American Psychiatric Association 1994). Gamblers Anonymous uses the term 'compulsive gambling', with their website stating, 'compulsive gambling is an illness, progressive in its nature, which can never be cured…' (Gamblers Anonymous 2021). However, contrary to this conventional wisdom, longitudinal investigations in the early 2000s found evidence of considerable instability over time and some cases of long-term remission (Slutske et al. 2003; LaPlante et al. 2008). More recent large scale longitudinal studies have largely confirmed these findings (Billi et al.

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2014; El-Guebaly et al. 2015; Williams et al. 2015; Abbott et al. 2018; MAGIC Research Team 2021).

Beyond gambling, a series of other behavioral addictions have been proposed, though none are official recognized by the DSM-5 (American Psychiatric Association 2013). These proposed behavioral addictions include compulsive shopping, excessive exercise, sex addiction, etc. (Petry 2015). Compared to substance use disorder and gambling disorder, very little is known about the course of these excessive behaviors. Of the few longitudinal investigations, one found them to be fairly transient, with the large majority having these conditions only in a single assessment period (Konkolÿ Thege et al. 2015). Another study found similar trajectories for excessive sexual behavior, compulsive buying, problem gambling, eating disorders, and excessive videogame use over a 12-month period (Montourcy et al. 2018). Specific studies of problematic video gaming have also found low stability and high rates of remission (King et al. 2013; Scharkow et al. 2014). The apparent high rate of remission highlights an important issue in the conceptualization of these disorders. Billieux et al. (2015) point out that many everyday activities done in excess are now being routinely labeled as addictive, such as tanning addiction (Petit et al. 2014), tango addiction (Targhetta et al. 2013), and fortune-telling addiction (Grall-Bronnec et al. 2015). Thus, there needs to be some theoretical basis for distinguishing between excessive behavior and addiction. It may be that the relative chronicity of the condition may help in this demarcation.

The above literature suggests there may be differences in chronicity between various addictive-like disorders. Such a conclusion, however, is limited by the absence of a direct, head-to-head comparison. It is quite possible that any differences may be due to different instruments used for assessment and/or different thresholds for clinical identification. The purpose of the present investigation is to create a 'level playing field' for this evaluation. More specifically, DSM-IV criteria using a 3+ threshold for clinical identification were used to assess the chronicity of gambling disorder compared to substance use disorder in a large-scale five-year cohort study. A different well-validated instrument (Problem and Pathological Gambling Measure and its analogues) was used to assess the relative chronicity of gambling disorder, substance use disorder, and other excessive behaviors in a separate large-scale five-year study. Utilization of a single instrument with the same clinical threshold to measure these different entities in one population, and a separate instrument to measure these entities in another population allows for corroboration of findings and potentially more robust conclusions.

Method

Design

The present study is a secondary analysis of two Canadian longitudinal studies conducted between 2006 and 2011: The Quinte Longitudinal Study (QLS; Williams et al. 2015) and the Leisure, Lifestyle, & Lifecycle Project (LLLP; El-Guebaly et al. 2015). Although both studies had a primary focus on gambling and gambling disorder, they also comprehensively assessed physical health, personality, stress, mental disorders, substance use, social functioning, intelligence, and demographics. The primary variable of interest in the present analysis was the number of waves in which an addiction (substance use disorder, gambling disorder, or other excessive behaviors) was identified during the course of the study among participants.

Participants

The QLS cohort consisted of 4,121 individuals recruited through random digit telephone dialing within a 70-kilometers of the city of Belleville, Ontario. Two subsamples were included: a 'general population' sample ($n = 3,065$), and a 'higher-risk' sample ($n = 1,056$). Inclusion in the general population sample required individuals be 18 years or older and fill an empty age × gender cell. Criteria for inclusion in the higher-risk sample required spending $10 or more a month on gambling in the past year; participating in horse race or slot machines betting; or expressing an intent to gamble at the new racino. QLS response rate was 21.3% and the retention rate was 93.9% (Williams et al. 2015).

The LLLP consisted of 1,808 individuals recruited from the Albertan municipalities of Calgary, Edmonton, Lethbridge and Grand Prairie and the rural areas surrounding Lethbridge ('rural south') and Grande Prairie ('rural north'). There was a 'general population' sample ($n = 1,284$), and a 'higher-risk' sample ($n = 524$). Recruitment primarily occurred via random digit dialing. To be eligible, participants had to reside in one of the four geographic target areas and belong to one of five age categories: 13–15, 18–20, 23–25, 43–45, or 63–65 years old. Higher-risk participants had to have an aggregate past year gambling expenditure and frequency above the 70th percentile for the general population sample. LLLP response rate was 5.4% and the retention rate was 74.3% (El-Guebaly et al. 2015). (Note: participants lost to attrition did not differ in the type of addiction they had in either the LLLP or QLS).

Inclusion in the present analysis required participants be 18 or older at baseline, to have completed all assessments (5/5 in the QLS; 4/4 in the LLLP) and to have received an addiction designation in at least one of the waves (substance use disorder, gambling disorder, or 'other excessive behavior'). This resulted in 808 participants from QLS and 280 from LLLP.

Measures

Both studies employed a large and comprehensive battery of self-administered online or paper assessments. (Note: Except that Wave 1 in LLLP was a telephone plus face-to-face interview rather than a self-administered survey). Each study used a different, but well accepted assessment system for identification of addictions:

The LLLP used criteria based on the DSM – IV (American Psychiatric Association 1994):

- *Gambling disorder* was assessed with the Composite International Diagnostic Interview's – Gambling Module

(CIDI-GM; World Health Organization 1997), which uses DSM-IV criteria for pathological gambling (American Psychiatric Association 1994). Anyone who participated in any type of gambling in the past 12 months was administered the CIDI-GM. The DSM-IV normally requires a score of five or higher to receive a pathological gambling designation. However, to facilitate direct comparisons to alcohol and substance use disorder in the present study, this threshold was lowered to three or higher.

- *Substance use disorder* was assessed with the World Mental Health version of the Composite International Diagnostic Interview's Alcohol Use and Illicit Substance Use modules (WMH-CIDI; Kessler et al. 2004), which is based on DSM-IV diagnostic criteria. Respondents who reported drinking five or more drinks on a single occasion at least once a month in the past 12 months were administered the Alcohol Module. Individuals who then endorsed three or more items from this module in the past 12 months were designated alcohol dependent. Respondents who used any illicit drug at least monthly in the past 12 months were administered the Illicit Substance Use module. Respondents who endorsed three of more items from this module in the past 12 months were designated illicit drug dependent. Both of these designations were recategorized in the present study as substance use disorder.
- *Other excessive behaviors (e.g. shopping, sex, exercise, videogaming)* were not assessed in the LLLP.

The QLS used the Problem and Pathological Gambling Measure (PPGM; Williams and Volberg 2010, 2014) along with its analogues, to assess gambling disorder, substance use disorder, and behavioral addiction:

- *Gambling disorder* was assessed with the PPGM, which classifies individuals into non-gambler, recreational gambler, at-risk gambler, problem gambler, and pathological gambler using a past 12-month time frame (Williams and Volberg 2010, 2014). The PPGM has good internal consistency (Cronbach's alpha = 0.76–0.81) and one month test-retest reliability ($r = 0.78$) (Williams and Volberg 2010, 2014). It also has superior construct validity (Christensen et al. 2019), as well as better sensitivity, positive predictive power, diagnostic efficiency, and overall classification accuracy in the population assessment of problem gambling compared to other instruments (Williams and Volberg 2010, 2014). Individuals who gambled three or more days in typical month and/or spent at least $10/month gambling in the past 12 months were administered the problem gambling questions. To be identified as a problem gambler, the PPGM requires a pattern of symptom endorsement indicating a) impaired control, and b) significant negative consequences deriving from this impaired control (financial, relationship, mental health, physical health, work/school, or legal). Pathological gambling requires meeting problem gambling criteria as well as having a total symptomatology score of five or higher. Individuals with either a problem or pathological gambling designation were recategorized in the present study as having gambling disorder.
- *Substance use disorder* was assessed using an analogue of the PPGM. Individuals were asked which substances they had used in the past 12 months and with what frequency. Individuals who used any substance on a weekly basis were then asked a series of questions concerning a) whether their substance use had resulted in any significant negative consequences for them (financial, relationship, mental health, physical health, work/school, or legal) in the past 12 months, and b) whether they had any symptoms of impaired control (i.e. unsuccessful attempts to cut down, control or stop using; using larger amounts and/or for longer periods of time than intended). To receive a substance use disorder designation, participants had to endorse questions indicative of one or more negative consequences as well as impaired control. (Unlike the LLLP the QLS allowed for a substance use disorder designation for nicotine/tobacco use, whereas the LLLP only considered alcohol and illegal substances).
- *Other excessive behavior* was assessed with the Behavioral Addictions Measure (BAM) (Sanders and Williams 2016, 2019), which is also an analogue of the PPGM. Following the substance use/abuse section, a screening question asked participants whether there were 'other activities that you engage in where your over-involvement has caused significant problems in the last 12 months'? If they indicated 'yes', they were asked to identify the specific type (sex or pornography, exercise, shopping, Internet chat lines, video or Internet gaming, or other) and administered a series of questions about impaired control and negative consequences in the past 12 months that were analogous to the questions asked for gambling disorder and substance use disorder. The BAM has very good internal consistency (Cronbach's alpha = 0.87), good test-retest reliability (tau b = 0.73, $p < .01$), and strong criterion and construct validity for problematic video-gaming (Sanders and Williams 2016, 2019).

Analysis

Individuals were divided into independent groups based on the addiction designations they had received. In the QLS, these were (1) gambling disorder, (2) substance use disorder, (3) other excessive behaviors, and (4) multiple addictions; and in the LLLP these were (1) gambling disorder, (2) substance use disorder, and (3) multiple addictions. People with 'multiple addictions' were individuals having more than one type of addiction during the course of the study, either during the same wave or in a different wave. Three analyses were conducted:

First, each individual in each group was given a score from 1 to 5 in QLS and 1 to 4 in LLLP indicating the number of waves they had spent in an addictive state. A one-way analysis of variance (ANOVA) for each dataset examined

whether there was any difference in the average length of time spent in an addictive state between the groups.

Second, the percentage of people in each group who met addiction criteria in *two or more consecutive waves* was calculated and a z-test of column proportions then applied.

Third, the percentage of people in each group who relapsed in the wave following a wave of remission was calculated and a *z*-test of column proportions applied.

Results

Table 1 contains the descriptive statistics for the QLS and Table 2 contains the same information for the LLLP.

The quinte longitudinal study

ANOVA was used to assess whether there were any differences between groups in the number of waves in which people met addiction criteria. A Brown-Forsythe *F* statistic was utilized due to significant within group differences in variance. The ANOVA was significant, $F(3,579.29)=64.65$, $p < .0001$, indicating that differences did exist. Follow-up pairwise tests using Dunnett's C test determined that multiple addictions was significantly more chronic than gambling disorder, substance use disorder, and other excessive behaviors ($p<.001$). Gambling disorder was also found to be significantly more chronic than other excessive behaviors ($p=.008$), but not different from substance use disorder ($p=.117$). There was no difference between substance use disorder and other excessive behaviors ($p=.588$). The analysis was rerun with the exclusion of nicotine/tobacco from the substance use disorder assessment, but the ANOVA remained significant, and all pairwise results were unchanged.

Z-tests of column proportions ($p<.05$) found a similar pattern when comparing the percentage of people meeting addiction criteria in two or more consecutive waves, with multiple addictions significantly more likely to have this compared to all other groups; substance use disorder and gambling disorder more likely to have this compared to other excessive behaviors; and there being no difference between substance use disorder and gambling disorder.

Z-tests of column proportions ($p<.05$) established that the relapse rates in the wave following remission were significantly higher for multiple addictions relative to all other groups, and also higher for gambling disorder relative to other excessive behaviors, but that there was no difference between gambling disorder and substance use disorder. Relapse rates within two waves of remission had the same pattern, with the exception that relapse rates were also higher for gambling disorder relative to substance use disorder.

The leisure, lifestyle, & lifecycle project

ANOVA was again used to assess whether there were any differences between groups in terms of the number of waves in which people met addiction criteria. The Brown-Forsythe *F* statistic was utilized due to significant within group differences in variance. The ANOVA was significant, $F(2,105.39)=24.07$ ($p <.001$), indicating differences existed between the groups. Follow-up pairwise tests using Dunnett's C determined that multiple addictions were again significantly more chronic than both gambling disorder ($p=.002$) and substance use disorder ($p<.001$). Unlike the QLS, gambling disorder was found to be significantly more chronic than substance use disorder ($p<.001$).

Z-tests of column proportions established a similar pattern of findings for episode duration, with multiple addictions and gambling disorder more likely to have two or more consecutive waves compared to substance use disorder, but there being no difference between multiple addictions and gambling disorder.

Z-tests of column proportions established that relapse rates in the wave following remission were significantly higher for multiple addictions and gambling disorder relative to substance use disorder, but there being no difference between gambling disorder and multiple addictions. Relapse rates within two waves of remission had the same pattern.

Supplemental analyses

Four supplemental analyses were conducted to determine the impact of varying some of the analytic parameters.

The first was the impact of *removing the subsample of people recruited because of their higher levels of gambling involvement*. When this is done, all of the results remain the same with the exception that gambling disorder in the QLS no longer has a significantly higher average number of waves in an addictive state compared to other excessive behaviors ($p=.16$), due to a smaller sample as well as a slight decline in the gambling disorder average from 1.89 to 1.73.

The second was *analyzing the relative chronicity of alcohol use disorder compared to illicit drug use disorder* in the LLLP. No significant differences in chronicity were found between alcohol use disorder, illicit drug use disorder, or the co-occurrence of alcohol and illicit drug use disorders. Furthermore, gambling disorder remained significantly more chronic than both alcohol use disorder and illicit drug use disorder, but not significantly different than the co-occurrence of alcohol and illicit drug use disorders ($p=.779$).

The third was the impact of *using the standard DSM-IV cut point for gambling disorder* (i.e. 5/10 criteria rather than 3/10) in the LLLP, as an argument could be made that meeting 5/10 criteria for gambling disorder is equivalent to the 3/7 needed for substance use disorder. When the 5+ criteria is utilized all the results are the same except that gambling disorder no longer has a significantly higher average number of waves in an addictive state compared to substance use disorder ($p=.081$) due to a decline in the gambling disorder sample size (65–30) and in the average from 1.94 to 1.90.

The fourth was analyzing the subset of individuals who *manifested two or more addictions within the same wave as the criterion for* 'multiple addictions'. In QLS of the 164 individuals with more than one type of addiction during the course of the study (i.e. the original criterion) there were 117 who had two or more co-occurring addictions within at

Table 1. Chronicity of addictions in the Quinte longitudinal study ($n = 808$).

	Other excessive behavior ($N = 223$)		Substance use disorder ($N = 283$)		Gambling disorder ($N = 138$)		Multiple addictions ($N = 164$)	
	n/N	%	*n/N*	%	*n/N*	%	*n/N*	%
Met criteria in 1/5 waves	157/223	70.4	177/283	62.5	75/138	54.4	20/164	12.2
Met criteria in 2/5 waves	39/223	17.5	57/283	20.1	31/138	22.5	51/164	31.1
Met criteria in 3/5 waves	12/223	5.4	30/283	10.6	12/138	8.7	34/164	20.7
Met criteria in 4/5 waves	9/223	4.0	13/283	4.6	12/138	8.7	24/164	14.6
Met criteria in 5/5 waves	6/223	2.7	6/283	2.1	8/138	5.8	35/164	21.3
Met criteria in 2 or more consecutive waves	42/223	18.8	75/283	26.5	43/138	31.2	120/164	73.2
Relapsed in wave following remission	16/163	9.8	28/197	14.2	18/91	19.8	38/95	40.0
Relapsed within 2 waves following remission	26/134	19.4	40/156	25.6	27/66	40.9	49/78	62.8
Average # waves met criteria (SD)	1.51 (0.96)		1.64 (0.99)		1.89 (1.22)		3.02 (1.35)	

Table 2. Chronicity of addictions in the leisure, lifestyle, and lifecycle project ($n = 280$).

	Other excessive behavior		Substance use disorder ($N = 176$)		Gambling disorder ($N = 65$)		Multiple addictions ($N = 39$)	
	n/N	%	*n/N*	%	*n/N*	%	*n/N*	%
Met criteria in 1/4 waves	NA		131/176	74.4	28/65	43.1	8/39	20.5
Met criteria in 2/4 waves	NA		27/176	15.3	20/65	30.8	13/39	33.3
Met criteria in 3/4 waves	NA		16/176	9.1	10/65	15.4	8/39	20.5
Met criteria in 4/4 waves	NA		2/176	1.1	7/65	10.8	10/39	25.6
Met criteria in 2 or more consecutive waves	NA		43/176	24.4	32/65	49.2	22/39	56.4
Relapsed in wave following remission	NA		4/124	3.2	7/16	43.8	9/16	56.3
Relapsed within 2 waves following remission	NA		4/90	4.4	7/12	58.3	11/16	68.8
Average # waves met criteria (SD)	NA		1.37 (0.70)		1.94 (1.01)		2.51 (1.10)	

Note: meeting substance use disorder criteria in 1.37/4 waves in LLLP is equivalent to 1.71/5 waves, which is very close to the 1.64/5 obtained in QLS. Similarly, 2.51/4 for multiple addictions in LLLP is equivalent to 3.14/5, also very close to the 3.02/5 in QLS. In contrast, the 1.94/4 LLLP gambling disorder ratio is equivalent to 2.43/5, which is divergent from the 1.89/5 in QLS.

least one wave (92 in just one wave and 25 in two or more waves). For this group of 117, the average number of waves in which they met addiction criteria in any wave was much higher than the original average (3.62 versus 3.02) although the average number of waves that these individuals only manifested co-occurring addictions was much lower (1.45 versus 3.02). In the LLLP of the 39 individuals with more than one type of addiction during the course of the study there were 27 people who had two or more co-occurring addictions within at least one wave (18 in just one wave and 9 in two or more waves). For this group of 27, the average number of waves in which they met addiction criteria in any wave was higher than the original average (3.33 versus 2.51) although the average number of waves that these individuals only manifested co-occurring addictions was much lower (1.50 versus 2.51).

Discussion

To our knowledge, the present study is the first well-controlled, head-to-head comparison evaluating the relative chronicity of various addictions. In both datasets and analyses those with multiple addictions had increased chronicity compared to those with single addictions in terms of number of waves in which people met addiction criteria, being more likely to have two or more consecutive waves of addiction and having a higher probability of relapse. In addition, we found evidence that excessive behaviors such as compulsive shopping, sex/pornography, videogaming, and exercise were, on average, less enduring than gambling disorder in the one dataset that allowed this comparison. There was inconsistent evidence concerning the relative chronicity of gambling disorder compared to substance use disorder, with gambling disorder being more chronic in the LLLP but having equivalent chronicity in the QLS.

The greater chronicity of multiple addictions makes sense theoretically. If for no other reason, the chances of having *either* gambling disorder, substance use disorder, or excessive behavior will always be higher than the chances of having just one of them. The results also showed that having two or more concurrent addictions within the same wave predicts even higher levels of chronicity, although the likelihood of *only* having concurrent addictions in subsequent waves is roughly equivalent to the chronicity of single addictions. In sum, it is clear that having multiple addictions represents a more pervasive condition with lower potential for total recovery. This is consistent with prior research demonstrating poorer outcomes for individuals displaying addiction substitution (Sussman and Black 2008; Kim et al. 2021) and/or any type of mental health comorbidity (Sinha et al. 2001; Najt et al. 2011).

Other excessive behavior tended to be more transient than gambling disorder, with 70.4% of individuals only manifesting the condition in a single time period. This is consistent with the few other studies that have examined the course of these excessive behaviors (King et al. 2013; Scharkow et al. 2014). The reasons for this lower chronicity are unknown but may be related to the diversity of excessive behaviors assessed (41.0% of the sample reported shopping, 15.3% exercise; 11.1% sex or pornography, 8.3% Internet chat lines; 6.9% video or Internet gaming; 10.4% 'other'; and 6.9% with two or more). It is possible there is less

chronicity in certain types that decreased the overall average (this possibility is supported by the fact that gambling disorder is also a type of behavioral addiction and it is more chronic). In any case, the transient nature of these conditions raises a question about their characterization as addictions (Karim & Chaudhri 2012; Rosenberg & Feder 2014). While it is clear that people can become excessively involved in these behaviors, the term 'addiction' implies a degree of chronicity somewhat inconsistent with the large majority of people only manifesting the problem in a single time period.

The inconsistent results concerning the chronicity of gambling disorder relative to substance use disorder is probably an artifact of the different time frames utilized within the LLLP. The QLS utilized a 12-month time frame for both gambling disorder and substance use disorder and found no significant differences in chronicity. In contrast, LLLP found substance use disorder to be less chronic than gambling disorder likely because a 12-month time frame was utilized for DSM-IV substance use disorder but there was no time frame specified for DSM-IV pathological gambling (a 12-month time frame was not introduced in DSM until DSM-5). That said, many of the DSM-IV gambling questions imply a lifetime frame (e.g. 'did you ever', 'was there ever a time when'). Thus, taking everything into account (including the non-significant differences in LLLP when the standard 5+ rather than 3+ criterion is used for gambling disorder), it seems likely that gambling disorder and substance use disorder have similar levels of chronicity. If nothing else, the present findings counter the possibility raised by the recent longitudinal gambling studies (mentioned in the Introduction) that gambling disorder may be *less* chronic than substance use disorder. However, by the same token, the present results reaffirm the findings of these longitudinal gambling studies, showing that addictions are not always chronic and unremitting. Rather, both substance use disorder and gambling disorder were shown to have quite variable trajectories with fairly high rates of remission, relapse, as well as continuation.

There are two important limitations to this study. For one, the present analysis focused on the chronicity of addiction as opposed to the chronicity of problems or harm. It is unknown whether the same results would be obtained for individuals with lower levels of severity. For another, there were some differences in the threshold for administering the addiction questions both within and between datasets. All of these thresholds are very low to ensure all actual cases of addiction are assessed. Hence, the differing thresholds should only result in higher or lower rates of people being identified as non-addictive, but the actual impact is uncertain.

Concluding remarks

The chronicity of different addictions has important implications both from a treatment and theoretical perspective. The present results confirm that having more than one addiction represents a more chronic condition meriting more intensive intervention. The present results also show that gambling disorder has intermediate levels of chronicity equivalent to that observed for substance use disorder. In contrast, excessive behaviors such as compulsive shopping appear to be more transient, and their comparatively lower levels of chronicity questions whether 'addiction' is an appropriate term to characterize their nature.

Ethical approval

As this was a secondary analysis of publicly available data, informed consent and ethical approval was not sought.

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