Reframing Addictions

Is the Concept of “Heavy Use Over Time” also applicable to Gambling Disorders?

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Overview

- Short history of the classification of addiction
- Classification of gambling disorder as addictive disorder
  - Similarities and differences
- “Heavy use over time” as key criterion
- Public Health implications
  - Heavy users who do not qualify for addictive disorder
  - Clinical considerations
  - Stigma
- Discussion

Addition

Kettil Bruun

“Dependence is a rather useless term…..the term is often used in such a way that one assumes, on the basis of consequences, that dependence is at hand, which means that we generally have no indications on dependence which by definition are separate from the consequences. Therefore I will from here on principally disregard the concept of dependence” **(Bruun, 1973)**.

Addiction: short history of concepts

- Explanation of behaviour in terms of compulsion
  - "internal driving force" underlying the continuation of substance use **(Saunders, 2013)**
- From the beginning associated with the notion of "moral weakness"
- Disease concept of Jellinek **(Jellinek, 1952)**
- Psychological perspective: learning by reinforcement of positively evaluated situations **(Bandura, 1976)**
- Cognitive processes influence substance **(Marlat & Gordon, 1985)**
- Importance of the social environment (US Veterans of the Vietnam war) **(Robins, 1993)**

Addiction: current concepts

- Modern medical oriented conceptualizations (DSM, ICD)
  - Less monothematic
  - Multidimensional including biological, psychological and behavioural elements **(Edwards & Gross, 1976)**
- Suggesting a separation between symptom and consequences
  - some consequences are still kept, e.g. failure to fulfill role obligations; chasing losses)
- Recently, the notion of brain disease added; “chronic relapsing brain disease **(McLellan et al., 2000; Volkow et al., 2003, 2013)**
- Understanding of addiction is not stable, depends mainly on societal changes and insights from research

Addiction: conceptual changes

- Significant changes in the definition of addiction
- The WHO expert committee on addiction producing drugs **(WHO, 1957 pp. 9-10; ICD-7)** distinguished between
  - "the addiction producing illegal drugs with the characteristics of compulsion, tolerance, psychological and physiological dependence and detrimental effect on the individual and society",
  - "in contrast to the habit forming drugs, including alcohol and tobacco, with the characteristics of a desire to take a drug for individual well-being, little or no tendency to increase the dose, some degree of psychological but not physiological dependence and little or no (if any, they would be primarily on the individual) detrimental effects."

Addiction: recent conceptual changes

- In DSM-5 diagnosis abuse and dependence integrated into a one-dimensional concept
  - Factor analyses: highly correlated or a single factor
  - IRT analyses conform uni-dimensionality
  - It overcomes the problem of diagnostic orphans
- Exclusion of the criterion “legal problems”: poor fit with other criteria, little explanatory value. Craving added
- What was hoped with the new definition?
  - Reducing stigmatization **(Rhem & Roerecke, 2013)**
  - But added the difficulty to define the group of individuals in need of treatment (former dependence)
- Nicotine dependence aligned with the criteria and gambling disorder added: “Substance-related and Addictive Disorders”
- Note: prevalence and classification !

Addiction: recent conceptual changes

- Significant change in the conceptualization of gambling disorder
- Classification of pathological gambling
  - as an impulse control disorder suggesting an interpersonal difficulty to control one's actions (DSM-III and DSM-IV) **(APA, 1980)**
  - as nonsubstance related addictive disorder due to similarities to the phenomena of substance use disorders **(Hasin et al., 2013)**

Addiction: recent conceptual changes

- Similarities with addiction
  - Large overlap of symptoms **(Potenza et al., 2001)**
  - Negative social consequences **(Rehm et al., 2013)**
  - Neurological activation of the reward system **(Reuter et al., 2005)**
  - Genetic similarities **(Slutske et al., 2000)**
- Differences
  - Lack of ingestion of substance
  - “Chasing losses” without direct parallel in SUD
  - Direct negative impacts on health not as relevant in gambling as in substance use
- Disadvantage
  - Similarities with SUD and addiction may increase stigma in gamblers

Pathological Gambling: a short history

- Modifications from DSM-III to DSM-III-R
  - Substantial changes
  - Removal of chronic and progressive inability to resits gambling impulses
  - Reduction of emphasis on money, replaced by assessment of the impact of gambling on psychological functioning (preoccupation)
- Modifications from DSM-III-R to DSM-IV
  - Link between PG diagnosis and diagnosis of antisocial personality disorder was removed
  - Differential diagnosis of mood disorders: manic episodes were excluded

Pathological Gambling: a short history

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Criterion	Item number in versions		
	DSM-III	*DSM-III-R*	*DSM-IV*
Chronically unable to resist gambling impulses	Mandatory		
Arrests for (admits to*) illegal acts (forgery, fraud, embezzlement, etc.) to obtain gambling money	1	8*	
Fails to honor debts or other financial responsibilities	2		
Family or spouse relationship difficulties related to gambling	3		
Borrows money from illegal sources (e.g. loan sharks) to gamble	4		
Not able to account for money (extensive monetary losses or gains, if claimed)	5		
Absences from work because of gambling	6		
Relies on others to provide money for desperate financial situations		7	10
Preoccupied with gambling or with ways to obtain money to gamble		1	1
Gambles more money, or wagers over a longer period of time, than intended		2	
Needs to increase the amounts or frequency of gambling to obtain desired excitement		3	2
Feels restless or irritable if not able to gamble		4	4
Consistently losing money and going back again to try to win back losses ('chasing')		5	6
Tries repeatedly to reduce or stop gambling		6	3
Often gambles when expected to meet social or occupational obligations		7	
Sacrifices or jeopardizes important social, occupational or recreational activities to gamble		8	9
Continues gambling even though unable to pay debts, or regardless of social, occupational, or legal problems that the person knows to be exacerbated by gambling		9	
Gambles to escape from problems or to relieve negative moods			5
Lies to family members, therapist, or others to conceal the extent of involvement with gambling			7

(Petry, 2006)

Substance-related and Addictive Disorders

Substance Use Disorders	Pathological Gambling
Abuse	
Hazardous use	
Social/interpersonal problems related to use	Concealment of own gambling
Neglected major roles to use	
Legal Problems (excluded)	Illegal action to support gambling
Dependence	
Withdrawal	Withdrawal
Tolerance	Tolerance
Used larger amounts/longer	
Repeated attempts to quit/control use	Cessation attempts
Much time spent using	Preoccupation
Physical/psychological problems related to use	
Activities given up to use	Jeopardized or lost significant matters
Craving (added)	
Gambling specific	Relies on offers to be “bailed out”
	Chasing losses
	Escape negative moods

Addiction: alternative definition

"Almost all of what is currently conceptualized under the heading of addiction or use disorders is a consequence of heavy use over time"

(Rehm et al., 2013; 2014a,b)

The Concept of Heavy Use

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FOR DEBATE

Defining Substance Use Disorders: Do We Really Need More Than Heavy Use?

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The Concept of Heavy Use

Characterization of the relationship between heavy use over time (HUT), substance use disorder and consequences **(Rehm et al., 2013a)**

- HUT is responsible for changes in the brain and other physiological characteristics of substance use disorders
- HUT is responsible for the withdrawal and tolerance phenomena regarded as central to current definitions of addiction or dependence
- HUT is responsible for the main social consequences of substance use disorders, such as problems in fulfilling social roles (concealment, lying)
- HUT is responsible for the majority of the substance-attributable burden of disease and mortality
- HUT as a definition better fits the empirical data and may diminish stigmatization and avoids pointing attention away from highest-risk categories

The Concept of Heavy Use

Criteria of substance-related and addictive disorders and consequence

- Some criteria are linked to **physiological** consequences (tolerance, withdrawal)
- Some are linked to **psychological** consequences (craving, time spent, gambling to escape)
- Some are linked to **social and behavioural** consequences (concealing own gambling, jeopardizing and losing important matters)
- Some are linked to ***physical*** consequences *(disease, mortality (suicide))*

The Concept of Heavy Use

If we consider heavy use over time as the major risk factor of these consequences

- Risk factors are probabilistic
- HUT not necessary nor sufficient, i.e. not all smokers get cancer and not all patients are heavy smokers

Questions arising from that …

1) Are the consequences listed as criteria in the current definition of *substance-related and addictive disorders* linked to HUT ?
2) How close is the link between HUT and current definitions of *substance-related and addictive disorders ?*
3) Can there be *substance-related and addictive disorders* without HUT ?

The Concept of Heavy Use

(1) Does research support HUT as a diagnostic criterion?

- Heavy use clearly linked to consequences in the human brain, **(Nutt, 2012, Nutt & Nestor, 2013)**
- There are differences by substance on neurobiology (World Health Organization, 2004), but enough communalities to subsume the consequences under one unifying label of ”addictive brain disorders” **(Leshner, 1997, McLellan et al., 2000, Volkow et al., 2003, Baler & Volkow, 2006)**
- Disorder vs. heavy use: Based on the current literature any such distinction is impossible to make, because there are no studies on neural effects of substance dependence without prolonged heavy use **(Wiers et al., 2012)**
- The effects of heavy use identical with what is called “substance use disorder”

Heavy use, substance-related and addictive disorders, consequences

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Gambling Disorder

- Drug addicts have a deficient reward system and drug intake is an attempt to compensate for this deficiency **(Blum et al., 1996)**
- In analogy

  Pathological gambling has been found to be linked to a reduced activation of the reward system

  A reduction of ventral striatal and ventromedial prefrontal activity in pathological gamblers was negatively correlated with gambling severity **(Reuter et al., 2005; Romanczuk-Seiferth et al., 2014)**

- What is causing the effect? Pathology or HUT ?

The Concept of Heavy Use

(2) How close is the link between current criteria and amount consumed ?

- Close relationship for **alcohol** from the NESARC study **(Rehm et al., 2014)**
- Close relationship for **different substances** based on the German ESA study **(Kraus et al., 2013)**

Gambling Disorder

- Close relationship between **gambling frequency** and number of PG criteria based on the German ESA study **(Sassen, Kraus et al., 2011; Kraus et al., 2015)**

Heavy use, substance-related and addictive disorders, consequences

Table 1. Proportion of nicotine dependent persons by current quantity of cigarettes used per day

Cigarettes per day	Germany ESA, DSM 2009 (%)	Germany ESA, DSM 2006 (%)	ESA, FTND 2006 (%)	Switzerland AMIS, FTND 2011 (%)	UK APSM, FTND 2007 (%)
0–4	9.8	10.2	2.0	2.9	2.1
5–9	18.4	22.9	3.3	10.4	13.5
10–14	18.5	22.2	17.1	18.2	33.8
15–19	30.8	32.3	40.8	54.4	51.4
20–24	44.4	41.6	54.6	67.0	72.7
25–29	37.6	50.0	90.6	93.3	85.7
30+	51.5	50.9	95.4	93.2	96.4

Remarks: ESA 2006: Epidemiological Survey of Substance Abuse 2006 (Kraus and Baumeister, 2008). ESA 2009: Epidemiological Survey of Substance Abuse 2009 (Kraus and Pabst, 2010). AMIS 2011: Addiction Monitoring in Switzerland (Gmel *et al.*, 2012). APSM 2007: Adult Psychiatric Morbidity Survey (National Centre for Social Research and University of Leicester, 2011).

(Rehm et al., 2013)

Heavy use, substance-related and addictive disorders, consequences

Table 1. Average alcohol intake in grams per day by number of DSM-IV criteria fulfilled for alcohol dependence (last year), by whether treated in lifetime: from data of the US National Epidemiologic Survey on Alcohol and Related Conditions (NESARC)

	Number of criteria of DSM-IV for alcohol dependence							
Gender	0	1	2	3	4	5	6	7
For people who have never been in treatment								
Men	9.1	27.1	35.9	56.5	73.6	88.0	107.4	189.0
Women	4.1	13.6	19.8	23.6	48.5	56.7	108.8	114.5
Total	6.6	21.6	29.5	45.4	64.7	77.5	107.8	170.3
For people who have been in treatment in their lifetime								
Men	20.6	35.2	98.2	75.2	109.1	124.2	119.8	214.1
Women	10.1	20.3	23.5	19.8	37.9	55.5	275.1	230.4
Total	17.5	31.7	77.9	61.5	91.2	104.7	165.1	218.3

(Rehm et al., 2013)

Heavy use, substance-related and addictive disorders, consequences

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Table 1. Number of persons observed (n) and average consumption (mean and standard deviation (SD)) for cigarettes, alcohol, cannabis, and cocaine by number of DSM-IV criteria fulfilled for alcohol dependence (last year) and abuse and dependence combined - German Epidemiological Survey of Substance Abuse (ESA) (Kraus et al., 2013)

	Tobacco			Alcohol			Cannabis			Cocaine		
Number of Symptoms	Number of cigarettes/day			Pure alcohol in gram/day			Frequency of use/12 month			Frequency of use/12 month		
	N	Mean	(SD)	N	mean	(SD)	n	mean	(SD)	n	mean	(SD)
Dependence												
0	592	5.06	(8.76)	5890	8.01	(12.35)	337	17.32	(47.22)	31	4.50	(9.00)
1	493	11.06	(10.25)	1106	16.74	(18.53)	78	68.10	(79.84)	7	9.23	(12.79)
2	405	13.40	(9.55)	405	25.67	(29.49)	26	96.82	(85.32)	1	3.50	
3	300	14.90	(10.83)	149	28.98	(28.31)	18	140.13	(105.91)	3	4.37	(1.32)
4	198	16.37	(10.05)	58	54.20	(48.82)	11	153.30	(75.15)	-		
5	118	18.71	(7.53)	62	35.38	(43.65)	8	190.66	(77.39)	3	156.74	(70.87)
6	58	17.47	(9.04)	14	150.65	(178.88)	6	128.23	(95.25)	2	223.13	(66.13)
7	6	26.70	(7.35)	3	164.67	(77.01)	9	189.59	(68.89)	2	12.58	(10.76)
R^2		0.2369			0.2434			0.4596			0.8337	
Abuse/Dependence combined												
0				5833	7.88	(12.18)	319	12.11	(34.60)	31	4.50	(9.00)
1				1093	16.76	(18.62)	88	56.94	(71.31)	7	9.23	(12.79)
2				414	22.87	(21.16)	30	137.01	(96.74)	1	3.50	
3				166	28.45	(30.11)	15	113.42	(103.13)	2	3.50	(0.00)
4				82	44.43	(44.91)	12	140.58	(95.19)	1	7.50	
5				63	43.40	(53.72)	7	140.45	(64.13)	-		
6				22	60.66	(51.47)	5	149.98	(80.52)	1	7.50	
7				6	53.81	(49.04)	10	206.29	(66.30)	3	97.00	(102.88)
8				5	65.64	(64.29)	5	205.21	(62.64)	2	136.16	(33.54)
9				2	480.24	(188.85)	2	130.88	(89.57)	1	249.50	
10				1	240.05		-			-		
11				-			-			-		
R^2					0.2521			0.5148			0.8338	

Heavy use, substance-related and addictive disorders, consequences

		Hours per Months	
N of Symptoms:	n	Mean	SD
0	138	13,3	14,4
1	46	19,5	16,7
2	55	31,1	43,0
3	38	29,4	25,6
4	37	28,2	20,9
5	35	40,8	33,3
6	45	42,6	43,0
7	44	54,4	47,0
8	33	54,2	35,2
9	36	76,8	53,6
10	12	98,9	73,2

Pearson's r = 0.49

(Kraus et al., 2015)

Public Health Implications

(3) Can there be substance-related and addictive disorders without HUT and vice versa ?

- Regular (daily) gambler, but no diagnosis; given a dose-response relationship: frequency more important than diagnosis to stop or reduce gambling **(Rehm et al., 2014)**
- Low frequent gambler (1x/month) qualifying for GD; not without risks, risks are certainly lower than risks for someone gambling every day but not qualifying for GD
- The same holds true for cigarette smoking or alcohol consumption **(Rehm et al., 2014)**
- Most heavy users do not filfill AUD **(Esser et al., 2015)!** Risk of heavy smokers with and without diagnosis!

Public Health Implications

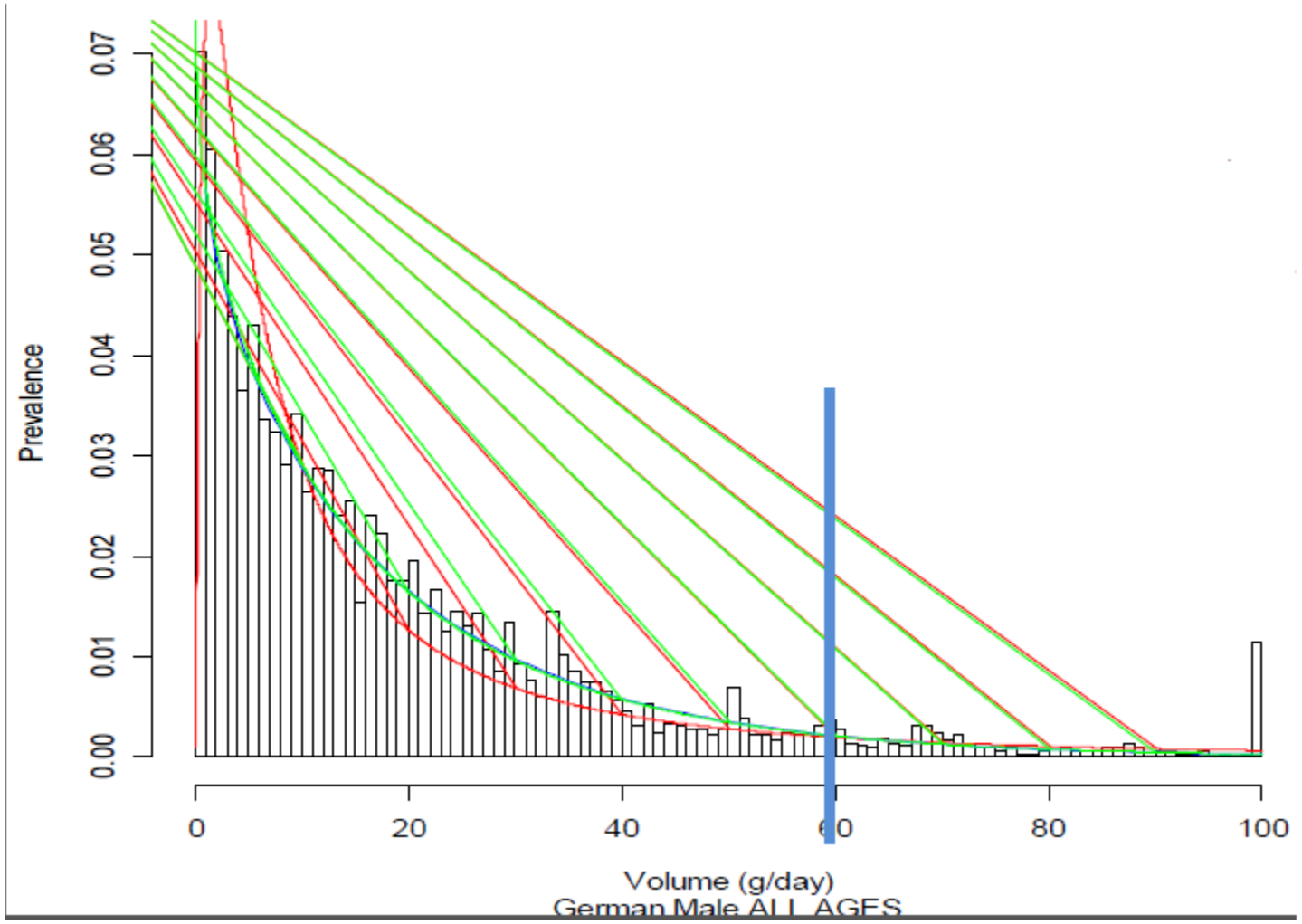
Another example: Alcohol use disorders and average level of alcohol consumption in gram ethanol

- Heavy drinking responsible for the vast majority of alcohol-attributable harm in Europe **(Rehm et al, 2013b)**
- The same reduction in level of consumption leads to considerable more reduction in harm if it is taken off from a higher level than from a lower level of consumption **(Rehm & Roehrecke, 2013; Nutt & Rehm, 2014)**

Public Health Implications

- It is more important to reduce alcohol consumption, especially at high levels of consumption, even if these people do not qualify for AUD
- Similarly, consumption reduction is more important, even if those who reduce do not change their “disorder status”; status does not matter!
- Similar arguments hold for other substances and gambling disorder

Public Health Implications



Clinical Considerations

- HUT commonly used as indicators of the course of the disorder, e.g. number of drinks per day, number of heavy drinking occasions **(Match Project; Babor, 1999)**
- Gambling: Number of days gambling; amount of money spent for gambling **(Rehm et al, 2013b)**
- Patterns of use (frequency, quantity) are measurable and can be properly followed for most substance- and nonsubstance-related behaviours (alcohol: AUDIT; tobacco: FTND; gambling)

Stigma

The usefulness of the new concept in reducing stigma

- Stigma is a major problem in all treatment of mental disorders, but particularly so with substance use disorders
- Dimensional aspects of disease may help reduce stigma
- Evidence: thresholds on an underlying continuum are associated with more positive emotional reactions and less desire for social distance
- Individuals above the threshold are harder to stigmatize as all people can be placed on the same continuum **(Schomerus, 2011)**

Stigma

The usefulness of the new concept in reducing stigma

- In a German representative survey, only 27% of respondents believed in a continuum for alcohol use disorders, less than for depression (42%) **(Schomerus et al., 2013);** massive campaigns!
- People with alcohol use disorders have the largest treatment gap of any mental disorder **(Alonso et al., 2004; Kohn et al., 2004; Rehm et al., 2013b)**
- Less than 10% of all people with AD are currently treated in the EU **(Rehm et al., 2012);** much lower for inpatient treatment!
- Treatment utilization in Germany: about 10 % of subjects with gambling disorder (GD) **(Bischof et al., 2012)**

Conclusions

- Almost all of what is currently conceptualized under the heading of addiction or use disorders is a consequence of heavy use over time
- Compared with other essentially dimensional concepts (number of DSM-5 criteria), heavy use over time is simpler to understand, not per se associated with psychiatric problems, and more suitable in reducing stigma than dimensional approaches
- Gambling disorder (GD) is included into the category of substance-related and addictive disorders
- What is currently defined as addictive gambling disorder can be captured by heavy gambling over time

Conclusions

- Close correlation between “heavy use over time” and the number of criteria in current classification systems incl. gambling
- In cases where the two concepts do not agree with each other
  - HUT seems to be more relevant for negative consequences, and thus for public health
- Opportunities to reconsider expansion of other non-substance use behaviours to the category of addictive disorders and avoid stigmatization
  - Excessive use of internet, television, work, exercise or chocolate
- Future aims
  - Aligning the definition of heavy use with those in other fields of medicine (e.g. high blood pressure, diabetes)
  - Integration of disorders into routine medical practice

Thank you for your attention

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