Toward an integrative model for alcohol use and dependence

Serge Combaluzier

Department of Psychology, University of Rouen, Rouen, France
Email: Serge.combaluzier@univ-rouen.fr

ABSTRACT

Background: If the alcohol use and dependence disorders are differentiated by the pharmaco-dependence, they share complex relationships with other clinical disorders and personality disorders. The purpose of this paper is to produce a model that reflects its relations both among users than among addicts. Method: Data from questionnaires measuring key variables selected for this study have been collected from people with alcohol misuse (n = 83) and alcohol-dependent (n = 81) in rehab. A model of drug dependence has been produced from these data that gives complete satisfaction to the criteria of SEM. Discussion: This model reflects the shift from abuse to a dependent consumption by the presence of feedbacks involving pharmaco-dependence, disturbance of the alcohol consumption by psychological distress and depressive traits. To further guarantee its validity, however it should be tested by collecting data from other surveys.

Keywords: Structural Equation Modelling; Alcohol Abuse; Alcohol Dependence

1. INTRODUCTION

Several decades of studies on alcohol related disorders have collected much evidence of their interactions with clinical features, especially anxious or depressive (Hall, Degenhardt and Tesson, 2009 [1]; Schukit et al., 2009 [2]; Allan, 1995 [3]; Schuckit et al., 1994 [4]; Brady & Lydiard, 1993 [5]; Turbull & Gomberg, 1990 [6]; Helzer & Pryzbeck, 1990 [7]) or personality features (Dejong et al., 1993 [8]; Movalli et al., 1996 [9]) on alcohol use disorders. There are two concurrent interpretations for these co-morbidities. For some authors the mental disorders are primary to this addiction, for some others they are secondary that means induced by the alcoholism (F10.8).

Alcoholic behaviours have been studied through the motives for drinking. They are implied in the disturbance of the alcoholic behaviours and can lead, as Goldsmith, Tran, Smith and How (2009) [10] have explained recently to major problems in alcohol drinking among younger people. Of course, other motives for drinking have been identified according to Pelc (1978) [11]: Search for social contacts, taste for alcohol, psychological problems, sensation seeking, and pharmaco-dependency. This last factor is one of the main differential diagnostic between alcohol use (F10.1) and alcohol dependence (F10.2.x).

The aim of this study is to produce a model of this main symptom that includes both the alcoholic behaviours and their components, clinical and personality features, and that can explain these among people with alcohol abusing or depending disorders.

2. METHOD

To measure the disturbance of alcoholic behaviour and the motives for drinking, we have used the Questionnaire of the Habits of Alcoholic Drink, devised by Pelc [11]. This self-questionnaire explores 5 dimensions of the motives for drinking, as described above, and provides a score for the disturbance of the alcoholic behaviour. According to Pelc, a score higher than 24 reflects an abnormal drinking behaviour. To measure the intensity of the clinical features we have used the French version (Pariente and Guelfi, 1998 [12]) of Derogatis's Symptoms Check List 90r [13] that estimates the intensity of such clinical features as somatisation, obsession, sensitivity, hostility, anxiety, depression phobia, psychosis or paranoia. Finally, for to estimate the personality disorders we have used the French version (Cottraux et al., 1985 [14]) of the Dysfunction Attitude Scale (DAS) by Weisman and Beck (1978) [15].

Then, we have presented these questionnaires to a large sample (n = 81) of persons in detoxification for their alcohol-dependencies and to a large sample (n = 83) of people who drink alcohol in public houses, bars or night clubs. After randomization, we kept 40 protocols of the first group and 52 of the second one.

The data were processed using statistical software, SPSS® and the step by step regressions method led us to a model of the pharmaco-dependency that we have computed in a structural equation modelling software (Amos®), following Arbuckle's criteria [16] for validation of structural model: non significant chi-square; GFI and CFI closed to 1, RMSEA closed to 0.

3. RESULTS

The global outcomes are summed up in the following table (**Table 1**):

Since the distribution of the outcomes on the DAS of Weisman and Beck is not normal, the intensity of the personality disorders could not be computed to our model. Regarding the comparison of those groups, one can note that, apart the item "drinking for searching social contact", all the variables are significantly different between the persons with an alcohol dependence and the alcohol users whose the mean of the disturbance of the alcoholic behaviours is higher than 24. This suggests a problem with alcohol drinking (alcohol abuse) among this sample. If we focus on the results for pharmaco-dependence (48.33 versus 0.44), it is clearly higher among the alcohol-dependent persons than among the alcohol abusers, that confirms what we expected.

If we follow the step by step regression method from the score of pharmaco-dependency, one can see that the level of the disturbance of the alcoholic behaviour is at first implied in the two groups, then if we continue, one can see that "drinking for sensation seeking" is implied in the score of pharmaco-dependency. Eliminating this variable leads us to a non-significant result for the both groups. Then, if we study the "disturbance of the alcoholic behaviour", three variables are implied in the groups: Sensation seeking and anxious and depressive features. The "sensation seeking" is explained by anxious features which are themselves influenced by the depressive features. The study of the depressive features leads to an effect of "drinking because of psychological problems" that is explained first by the "disturbance of the alcoholic behaviour" and secondly by the "pharmaco-dependence".

Thus, we arrive at the following model (**Schema 1**) which provides for the two groups the conditions of the validity of a structural equation model: non-significant χ^2, GFI and CFI closed to 1, RMSEA closed to 0.

Table 1. Global outcomes of this study.

	People with alcohol dependency	Alcohol users
Pelc's questionnaire		
Disturbance of the alcoholic behaviour	70.13	35.65
Consumption of alcohol searching for social contacts[b]	49.20	42.46
Drinking alcohol for it taste	54.25	39.67
Drinking alcohol because of psychological difficulties	57.55	18.37
Drinking alcohol for sensation seeking	43.25	12.44
Drinking alcohol because of pharmaco-dependency	48.33	0.44
SCL 90r		
GSI	1.31	0.59
PST	62.18	32.17
PSDI[b]	1.83	1.58
Somatisation	14.80	6.67
Obsession	15.13	6.77
Sensitivity	11.78	6.15
Depression	17.90	8.83
Anxiety	12.78	5.02
Hostility	7.20	3.25
Phobia	7.73	2.25
Paranoia	8.30	4.37
Psychosis	11.63	4.02
Non specific	11.50	6.44
Dysfonction Attitude Scale[a]	142.00	75.00
N	40	52

[a]Abnormal distribution (Z by Kolmogorov-Smirnof); [b]Non-signiticant differences (p > 0.05).
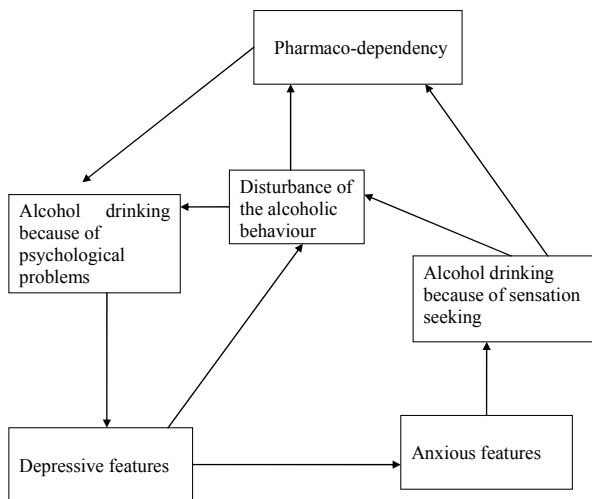
Schema 1. Model of the intensity of pharmacodependency among persons with alcohol abusing or dependency disorders. Alcohol dependent: x2 = 4.8, df = 6, p = 0.565, GFI = 0.961, CFI = 1, RMSEA = 0; Alcohol abusers: x2 = 6.85, df = 7, p = 0.335, GFI = 0.957, CFI = 0.995, RMSEA = 0.053.

Also we can argue that to differentiate abusers of alcohol and dependent persons the intensity of the variables is more important than their combinations. But if the differences between alcohol using and dependency are a matter of intensity how one can explain that the abusing turns to dependency?

According to our outcomes, the sequence "pharmaco-dependence", "drinking alcohol because of psychological problems", "depressive features" and "disturbance of the alcoholic behaviour" is a retroaction that may explain the shift from a mean score of 0.44 among heavy drinkers in a score of 48.33 recorded in alcohol-dependent individuals (cf. **Table 1**). Another retroaction can be drawn that implies "anxious features" and "sensation seeking" that also can increase the pharmaco-dependence.

4. DISCUSSION

This model needs to be validated against other data with larger groups or other questionnaires. Therefore, if we test it with the data of the two groups that we left because of the initial randomization, the criteria of validity are still significant.

According to the model, there is a transition from alcohol abuse to alcohol dependency, or in other words, dependency is a form of alcohol abusing that does not need more variables, or factors, to explain.

If we focus on the relationships between alcoholic behaviours and depressive features the feed-back in this model lets us answer to the question of the primary or secondary depressive syndromes among alcoholic people. Depression is primary to disturbance of alcoholic behaviours and has direct and indirect (mediated by anxiety and sensation seeking) to the disturbance of the alcoholic behaviour; on the other hand, through the mediation of the drinking because of psychological problems, the depressives features are induced by the alcoholic behaviours and appear as secondary to alcohol related problems. Therefore, the depressive features are not the central basis of this model. If we control their intensity by using the partial correlation method, the correlations implied in this model keep their significance.

The model that can be constructed from our data leads us to the conclusion that the intensity of pharmaco-dependence depends on the intensity of two main variables: level of the disturbance of alcohol relationship and consumption of alcohol for sensation seeking. The feedback from the "disturbance of the alcohol relationship" to depressive features (mediated by the consumption of alcohol because of psychological problems) that involves the disturbance of the alcoholic behaviour directly and indirectly contributes to increasing pharmaco-dependence.

But how does alcohol abuse turn to dependence? This model let us understand the transition from an abusing drinking (m = 35.65) to a dependent consumption of alcohol (n = 70.32) thanks to the indirect incidence of the "alcohol drinking because of psychological problems" on the pharmaco-dependence (0.44 among the groups of alcohol users against 48.3 in the alcohol dependent group) and the retroaction of pharmaco-dependence on "alcohol drinking because of psychological problems".

Finally, the data confirm the incidence of the disturbance of the alcoholic behaviour on the alcohol-dependency. If we focus on the persons whose score of alcohol problems is higher than 24, our model becomes non-significant. Therefore the size of this sample (n = 21) does not allow us to get further. Also it would be interesting to look for the critical point where disturbance of the alcoholic behaviour turns a "normal drinking" into dependant alcoholism.

Other works especially using specific questionnaires for each factor should confirm this study. Such a data collect would let us re-test the validity of this integrative model which deals with both majors forms of alcoholic disorder: abusing and dependency.

REFERENCES

[1] Hall, W., Degenhardt, L. and Tesson, M. (2009) Understanding comorbidity between substance use, anxiety and affective disorders: Broadening the research base. *Addictive Behaviors*, **34**, 526-530. doi:10.1016/j.addbeh.2009.03.010

[2] Schukit, M.A., Smith, T.L. and Chacko, Y. (2009) Evaluation of depression-related model of alcohol problems in 430 probands from the San Diego prospective study. *Drug and Alcohol Depend*, **82**, 194-203. doi:10.1016/j.drugalcdep.2005.09.006

[3]   Allan, C.A. (1995) Alcohol problems and anxiety disorders—A critical review. *Alco Alcoholism*, **30**, 145-151.

[4]   Schuckit, M.A. (1994) The relationship between alcohol problems, substance abuse and psychiatric syndromes. *American Psychiatric Association*, **1**, 1994, 45-66.

[5]   Brady, K.T. and Lydiard, B. (1993) The association of alcoholism and anxiety. *Psychiatric Quarterly*, **30**, 135-149. doi:10.1007/BF01065866

[6]   Turnbull, J.E. and Gomberg, E.S.L. (1990) The structure of depression in alcoholic women. *Journal of Studies on Alcohol and Drugs*, **51**, 549-555.

[7]   Helzer, J.E. and Prysbeck, T.R. (1988) The co-occurrence of alcoholism and other psychiatric disorders in the general population and its impact on treatment. *Journal of Studies on alcohol*, **49**, 219-224

[8]   DeJong, C.A., Van der Brink, W., Harteveld, F.M. and Van der Wielen, G.M. (1993) Personality disorders in alcoholics and drug addicts. *Comprehensive Psychiatric*, **34**, 87-94. doi:10.1016/0010-440X(93)90052-6

[9]   Movalli, M.G., Madeddu, F., Fossati, A. and Maffei, C. (1996) Personality disorders (DSM III-r, DSM IV): Prevalence in alcoholics and influence on droup out from treatment, *Alcoologia*, **8**, 47-52.

[10] Goldsmith, A.A., Tran, G.Q., Smith, J.P. and Howe, S.R. (2009) Alcohol expectancies and drinking motives in college drinkers: Mediating effects on the relationship between generalized anxiety and heavy drinking in negative-affect situations. *Addictive Behaviors*, **34**, 503-513. doi:10.1016/j.addbeh.2009.01.003

[11] Pelc, I. (1978) Contribution to the abnormal psychology of the chronic alcoholism. Ph.D. Thesis, Université libre de Bruxelles, Brussels.

[12] Pariente, P. and Guelfi, J.-D. (1990) Self-assessment inventories of psychopathology in adults, Part 1: Multidimensional inventories. *Psychiatr Psychobiol*, **5**, 49-63.

[13] DeRogatis, L.R. (1977) SCL-90r (revised) version manual I. clinical psychometrics research unit. John Hoppkinks University School of Medicine, Baltimore.

[14] Cottraux, J., Bouvard, M. and Legeron, P. (1985) Methods and behavior rating scales. Psychological Editions and Applications, Paris.

[15] Weissman, A. and Beck, A.T. (1978) Development and validation of the dysfunctional attitude scale. Paper presented at the annual meeting of the Association for Advancement of Behavior Therapy, Chicago.

[16] Arbuckle, J.L. (2003) Amos 5.0. Smallwaters Corps, Chicago.