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The Alcohol Dependence Syndrome: a concept as stimulus to enquiry*

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Summary

A 'provisional description' of the alcohol dependence syndrome was first given in 1976. An outline is provided of the historical background to the syndrome formulation. Ideas emanating from the Maudsley campus were important but so was the international input from a WHO Scientific Group. Since its original delineation the syndrome idea has attracted discussion and has become a focus for research. Studies which bear on the measurement and validity of the syndrome concept are summarized and criteria for the establishment of validity discussed. Understanding of the nature of this condition is still incomplete but research has now reached a stage where it is legitimate to go beyond the question as to whether a dimensional syndrome exists, to an exploration of theoretical questions relating to its scientific basis. Further elucidation will require contributions from many different disciplines. The syndrome can offer part of the explanation of why some people continue to drink too much in the face of negative consequences but measurement and conceptualization of this one dimension should help toward the design of more powerful, multidimensional and interactive models. A plea is made for a spirit of openess and interdisciplinary enquiry rather than perseveration with the unproductive rhetoric of the 'disease' debate.

Introduction

Why do some people continue to drink excessively in the face of disaprobation and manifest personal suffering? Alcohol studies attempt to answer that question and advise on how the individual may be treated and drinking problems prevented. The answers which will be given will be coloured by the habits of thought and the knowledge available to any particular historical epoch. Take for instance this passage from Henry Maudsley's *Body and Will*[1] which was published in 1883:

> "It is not enough to say that passion is strengthened and will weakened by indulgence, as a moral effect: that is so no doubt, but beneath that effect there lies the deeper fact of a physical deterioration of the nerve element . . . Moreover, the tissues have sometimes had the congenital misfortune to begin with the original taint of a depraved tone: they have inherited the proclivity to drink, it is ingrained in their nature; and once the craving is stirred it is kindled quickly into uncontrollable desire".

Maudsley did not however leave matters simply at this neuronal level of explanation. He also saw drinking as being rooted in the human wish to reach a higher state of consciousness:

> "This eager use running headlong into abuse is evidence of the longing that there is in human nature for the ideal; for an elation of feeling, an expansion of sympathy, a freedom of mental power, an exaltation of the whole nature, mental

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and bodily, are obtained thereby which are denied to it by the real . . .".

Intertwined with these physiological and philosophical conjectures as to the nature of alcoholism was a strand of heavy moralism. There were references to 'damnable predicament', 'besetting vice' and 'miserable specimen of degradation of moral feeling'.

Aubrey Lewis attempted to trace some of the complex interplay of influence's which shaped Maudsleys' writings.[2] We cannot though doubt that we have here an instance of a brilliant mind shaped, inspired and limited in its view of alcoholism by the fund of ideas contemporarily available. As ever with the literature on drinking and drinking problems it is easy to find confirmation of the tired belief that there is nothing new under the sun—alcoholism biologized, alcoholism philosophized, alcoholism moralized, or all three together. Indeed, one of the most constant problems with our attempts to understand the nature of alcoholism is the feeling that we go around in circles, that inebriety, the disease theory, gamma alcoholism, call it what you will, are lost and rediscovered, 'socially constructed', dismembered and put together again.[3–6]

The present paper, written in the mid 1980's, takes as its subject the alcohol dependence syndrome. We can be sure that this concept is limited by the ideas and knowledge available to our own time. The idea was originally put forward in terms of a 'provisional description',[7] and our understanding of the boundaries, the nature and the significance of this syndrome are still incomplete. It is a construct which only deals with one corner of the whole big question of why some people continue to drink self-destructively in the face of negative consequences and there are a host of other social, cultural and personal reasons to be taken into the equation. Those who study dependence and argue for the clinical utility of the dependence concept should make sure that an idea does not become an over-valued idea, or themselves the victims of an *idée fixe*. There are for instance other pointers besides degree of dependence that may be relevant to the choice of treatment goal.[8]

Given that any concept in this or any other field is likely to be time-bound, there is still the question of how well (even if only ephemerally) an idea serves its times. Such a concept is recognizable as one which helps to bring us out of a tired circling around old ideas—a perseverative concern with the 'disease concept', for instance. A 'useful concept' may in retrospect be seen as wrong in important aspects but if it has led to better debate, acted as catalyst to good research, brought bright people into the field, bred new doubts, it has served its time-bound purpose reasonably well.

What we will argue in the present paper is that, with all due warnings about limitation and time-boundedness born in mind (and the word 'provisional' again underlined), the alcohol dependence syndrome has the potential to act as a much needed stimulus to jolt us out of a bored and unconstructive circling around old positions, that sense of 'nothing new under the sun' to which we have already referred. We will go on to take matters in the following sequence. The essentials of the concept will be summarized and an account given of the origins of its formulation. We will then move directly to an account of the research which has so far been conducted around measurement and validation.

The Concept and its Origins

The concepts of the alcohol dependence syndrome has been described in detail elsewhere,[7, 9–13] but it may be useful briefly to recapitulate the essential postulates:

(i) The syndrome may be recognized by the clustering of certain elements. Not all elements need always be present or present in the same degree, but with mounting intensity the syndrome is likely to show increasing coherence.

(ii) The syndrome is not all-or-none, but occurs with graded intensity.

(iii) Its presentation will be shaped by the pathoplastic influence of personality and culture.

(iv) A bi-axial concept is introduced, with the dependence syndrome constituting one axis and alcohol-related problems the other.

It is to be noted that this formulation carried with it no assumptions as to whether the syndrome was progressive or irreversible, and no assumption as to the nature of any 'pathology', although Edwards & Gross suggested in 1976[7] that learning explanations were likely to be important. It was in the first instance an empirical formulation.

The meaning to be given to the term 'syndrome' deserves some attention at this point.[14] There is no universally accepted definition but what is essentially implied is a co-occurrence, with some coherence. There may be sensitivities about a word

which is seen as having medical overtones, but it is in fact a concept which bridges medical and social science approaches—it is not far removed from the social science concept of empirical typology. A tension may be detected between the categorical implications of a syndrome and the continuous nature of a dimension[15] but here again the contradiction may be more apparent than real: the syndrome is that which allows us to identify a dimension. Where the question of continuity versus discontinuity does however become real, is around the issue of whether the normal and clinical populations lie along the dimension as a single distribution: depressive illness raises exactly the same problem. Whatever the answer to that question a syndrome formulation which focusses on that segment of the dependence distribution which contributes to the clinical presentation may still be useful.

Let us return to the question of whether the syndrome idea constitutes anything new. It has been suggested by Shaw[16] that the dependence syndrome was promulgated as a formulation which would replace a discredited disease concept of alcoholism, while itself being little more than a reintroduction of the disease concept by stealth:

> "it was an attempt to create a particular kind of substitute concept—one which coped with all the critiques of the disease theory of alcoholism, yet which retained all its major assumptions and implications".

Shaw saw the syndrome formulation as an instrument designed to retain medical hegemony—its purpose was to "discriminate against the ability of non-medical personnel to recognize and understand the effects of alcohol." Shaw's analysis is provocative, but needs to be tested against a more complete historical analysis.

Without taking a too parochial view it is evident that ideas emanating from the Maudsley campus contributed to the formulation of the dependence syndrome concept, and it is relevant therefore to trace the influences which may have stemmed from that affiliation. The Maudsley Hospital in the 1960's provided a meeting point between psychology and psychiatry, with the work of Rachman, Gelder and Marks exemplifying the application of psychological theory to behavioural treatments.[17] In the atmosphere which the Maudsley provided it was natural to look for a psychological and learning—theory basis for the understanding of drinking behaviour and Wikler's contributions[18, 19] seemed especially relevant and helpful. A paper[20] which was published in 1971 from the Addiction Research Unit put forward a theoretical position in the following terms:

> "Whatever the potency of the straight forward euphorogenic effects of alcohol as a reinforcer of alcohol-seeking behaviour, its reinforcing property will (it could be argued) become vastly more potent when it has not only a primary psychotropic property, but now also the secondary property of relieving withdrawal distress ... withdrawal symptoms are not envisaged as being-and-essence of dependence, but as providing mechanism which allows the building of much stronger operant conditioning than can usually come from primary euphoria alone. Dependence is not then seen as an all-or-none phenomenon: the severity of dependence is to be judged by the strength of a conditioning process".

Here was the origin of a dimensional view. On the basis of this formulation a simple five-point scale was designed to measure the intensity of dependence, and found to have some predictive validity.[20, 21].

If one factor in the genesis of the dependence syndrome concept had been an interest in the application of learning theories, a second and important influence bearing on those of us who worked at the Maudsley at that time was likely to have been clinical experience and the influence of a clinical training which encouraged exact observation: the trial-by-ordeal of a case presentation to Aubrey Lewis made one aware of the extraordinary intellectual challenge which lies in marshalling and interpreting case material. During the ensuing years, three different clinical trials on the treatment of alcoholics were mounted,[22-24] which between them entailed the intensive assessment and follow-up of a total of 180 alcoholic patients, and the Addiction Research Unit was continuously involved in clinical observation sharpened by the research demand. This intimate involvement with the assessment of patterns of drinking behaviour led both to a belief in the inadequacies of the then current formulations and to the conjecture that a syndrome was clinically recognizable which was of greater complexity than that captured by our five-point scale. Warnings against the bias inherent in the clinical eye must be heeded,[25] but history also demonstrates that clinical intuition has on occa-

sions been the fertile source of concepts later to be tested, refined and given their scientific basis.

The bi-axial formulation which was put forward by a WHO scientific group in 1977,[9] though receiving and debating the British input, was the product of an international exercise and it sought both to be sensitive to different cultural experiences and national traditions, and to reflect the best possible international consensus judgement as to what at that time could be said about the outlines of the dependence syndrome. In particular it attempted to find a meeting-point between the traditionally very different Anglo Saxon and French views on these issues. A full analysis of the complex historical background to this formulation has still to be given but even this necessarily brief sketch may suggest that such issues cannot be adequately understood by the perservative rhetoric of the 'disease' debate. The projection of old conflicts about the disease concept onto the dependence formulation is unlikely to be helpful.

So much for history. Let us now turn to a review of the recent literature that has developed around the issue of the measurement and validation of the alcohol dependence syndrome. The extent and quality of the literature is impressive. Reviews and critical comments have been provided by a number of authors.[15, 16, 26–31] We can here do no more than attempt an outline summary of the main features of this output.

Measuring Instruments and their Factor Structure

There have been reports on the factor structure of a number of different instruments which seek to measure the alcohol dependence syndrome. Before summarizing the findings which have to date emerged it is necessary to consider the general importance of the question being asked and the nature and limitation of the methods which have been employed.

If, as postulated, the elements in the syndrome more or less hang together, then a variety of statistical approaches should be able to demonstrate this coherence. The statistical technique which has so far been favoured is the application of factor analysis. Identification of a factor which loads on appropriate items might be taken as validation of the syndrome concept, and the failure of any element to load on this dimension might suggest that it is not part of the syndrome. It is not the *size* of the factor (the proportion of variance accounted for) which is of prime importance, for this will depend on what is initially put into the item pool and on the heterogeneity of the sample.

Some elements in the syndrome postulate are more easily operationalized than others, and no instrument has so far attempted to embrace every one of the proposed elements. Difficulties in operationalization must be expected to introduce a certain amount of noise into the system. If data are put into the item pool which are not conceptually 'pure', this will be reflected in the factor structure which emerges.

1. *The Severity of Alcohol Dependence Questionnaire*[32]

The SADQ as originally described comprised a total of 35 questions placed within five sections dealing respectively with physical withdrawal symptoms, affective symptoms of withdrawal, relief drinking, level of alcohol consumption, and rapidity of reinstatement after withdrawal. With a sample of 104 patients a factor analysis of pooled 'revised' items gave an appropriate first factor accounting for 53% of the variance. Scores for the five individual scales correlated between 0.69 and 0.80 with the total SADQ scores. The authors concluded that the SADQ "fulfills the requirements of the concept of alcohol dependence with respect to its internal structure". A further exploration of the factor structure of the SADQ has recently been reported by Meehan and his colleagues.[33] Excluding items dealing with level of drinking, they obtained a first factor accounting for 45% of the variance and with factor loadings of between 0.56 and 0.78 for individual items relevant to the syndrome's definition.

2. *The Edinburgh Alcohol Dependence Scale*[34, 35]

A structured interview schedule was administered to 109 men attending an alcoholism treatment unit. There were 21 items dealing with 'recent' drinking which were taken to reflect the alcohol dependence syndrome, and these were subjected to a principal components analysis. The first factor accounted for 24.6 of the variance and was labelled 'Withdrawal/Need/Salience': further small factors were identified as 'Impaired Control', 'Narrowed Repertoire' and 'Salience'. After considering the results of additional analysis Chick concluded that "if a unidimensional syndrome exists, it comprises Withdrawal; Subjective Need; aspects of Salience;

and probably Relief Drinking and Increased Tolerance". He believed that Impaired Control "formed a dimension in its own right" and was not part of the core syndrome.

3. *The Alcohol Dependence Scale*[36]

Skinner[26] administered the Alcohol Use Inventory which had been developed by Horn *et al.*[37] to 274 clinic patients. This inventory contains 16 scales which cover between them many aspects of drinking behaviour—it is not intended as a 'pure' measure of dependence. Skinner extracted a first factor which he identified as 'Alcohol Dependence' and which accounted for 28.04% of the variance. He concluded that "loss of behavioural control, frequent withdrawal symptoms, previous use of external supports to stop drinking, and a preoccupation or compulsion with drinking are all consistent with the core dependence syndrome". The 29-item Alcohol Dependence Scale[38], which derives from the Alcohol Use Inventory has now been fully described[39, 40] in a User's Guide which details measurement properties of the instrument.

4. *Last 6 Months of Drinking Questionnaire*

This questionnaire designed by Hesselbrock and his colleagues[41] trawled the three area of recent drinking experience and consequences, 'motivational supports for drinking', and quantity and frequency of recent drinking. It was administered to 114 patients undergoing treatment for alcoholism. When the 62 items were submitted to a factor analysis a first factor was found which accounted for 22.9% of the variance. This factor was labelled 'dependence symptoms' and loaded on such variables as "salience of drink-seeking behaviour ... increase tolerance to alcohol ... repeated withdrawal symptoms ... relief-avoidance of withdrawal ... and compulsion to drink ..." The authors concluded that "the alcohol dependence symptom cluster identified in the present study appears to be distributed along a continuum of severity".

5. *The Alcohol Dependence Data Schedule*

This questionnaire has been developed by Raistrick and his colleagues[42] both in terms of a long (39 questions) and short (15 questions) form. It was intended to cover a wide spectrum of dependence intensity, and was administered to 41 'regular drinkers', 30 'psychiatric patients' and 173 'alcoholics'. For the short-form, data are presented on correlation of scores on individual items and total scale scores: correlations ranged between 0.47 and 0.81 with only three items giving a correlation of less than 0.6, a finding which might be taken as fair evidence of internal homogeneity. This questionnaire has also been adapted as an interview schedule in a Brazilian study.[43]

6. *The Rand Report*[44]

The study which we are considering here is relevant to present concerns, although it stands on a rather different footing. Polich and his colleagues did not employ a preconstructed dependence questionnaire but subsequently carried out a principal component analysis on a group of six items which they believed to reflect dependence symptomatology. This analysis gave a first component accounting for 52% of the total variance, and with item loadings of between 0.53 and 0.75. An overall dependence scale was then constructed based on frequency of symptom experience, and giving a range of 0–40. They concluded that their analysis lent support to a 'unidimensional interpretation'.

What in summary are we to make of the findings on these various instruments or scales? It seems reasonable to conclude that much of the evidence is pointing in rather the same direction—the syndrome probably does have a certain coherence as judged by the repeated demonstration of a factor which loads an appropriate item. What is certainly already evident even at this point is that the syndrome formulation has stimulated a quantity of research. Chick's conjecture[34] that 'loss of control' may not align with the other elements is exactly the sort of good question which one would hope to see emerge.

Measuring Instruments and their Reliability

To date we have data on the reliability of four of the instruments discussed above. The SADQ when given to 45 subjects after a 2-week interval was found to have a 0.85 overall reliability.[45] Chick[34] explored the inter-rater reliability of the Edinburgh Schedule and 40 of 44 items yielded a Kappa significant at $<.001$. Estimates above 0.90 have been provided for the reliability of the Alcohol Dependence Scale.[39] Raistrick and his colleagues[42]

demonstrated a satisfactory split-half reliability for their schedule (0.87).

Principles of Syndrome Validation

The language in which the business of syndrome validation is discussed has borrowed from and adapted the language of psychological test validation. In this process different authors have tended to use terms in a far from uniform fashion, but it could probably be agreed that in this arena we are dealing basically with five different types of validity:

(i) Internal validation or validation of the internal homogeneity of the syndrome. This issue has been discussed above.

(ii) Concurrent validity or demonstration that a test measure correlates with a measure of syndrome intensity which can be considered an 'anchor' criterion of the same concept and possessed of face validity. Under this heading we may note that Stockwell and his colleagues[32] showed that the SADQ gave a biserial correlation of 0.84 with clinical ratings of syndrome intensity. Meehan[33] has also demonstrated an agreement between the SADQ and clinical ratings.

(iii) 'Spatial' separation of the postulated syndrome from other syndromes or from normal population characteristics, as determined by the methods of numerical taxonomy.[46] This approach has not as yet been applied to the alcohol dependence syndrome.

(iv) Construct validity, or the correlation of the given measure of the syndrome with other items which may be supposed to lie within the syndrome but which are not embraced by that measuring instrument. We will discuss evidence on this aspect of validity below, in relation to three different elements.

(v) External or predictive validation. An accumulation of research can now be seen as bearing on construct or external validation of the alcohol dependence syndrome and we will try below to give shape to the mosaic of evidence.

Construct Validity: a summary of the research

Relationship Between Dependence Severity and 'Subjective Changes'

One of the elements which has been postulated as contributing to the alcohol dependence syndrome is that of 'subjective awareness of compulsion to drink'.[7] There are difficulties in giving operational definition to elusive subjective experiences. Heather and his colleagues[47] have though reported a scale which seeks to measure these subjective aspects, and which asked such questions as "Do you consider yourself to be addicted to alcohol?" and "At the present time, after one drink could you stop if you wanted to?". When the authors administered both the SADQ and the Subjective Dependence rating to 50 hospital treated alcoholics the correlation between the two scales was highly significant (Kendall's coefficient 0.39 $p<.001$).

Narrowing of Repertoire

The SADQ does not contain any elements referring directly to 'narrowing of repertoire', although this was postulated as one of the elements contributing to the dependence syndrome.[7] What is implied here is that as the syndrome increases in intensity the individual will drink in an increasingly stereotyped fashion—one day's drinking will become much like another's. Stockwell and his colleagues[45] devised a 'Drinking Patterns Interview' which they administered to 73 alcoholic men undergoing hospital treatment. Using multiple analysis of variance with SADQ as dependent variable, narrowness both in terms of limited variability *between* and *within* heavy drinking days contributed significantly to the variance ($p<.001$) in each instance. Further analysis showed at the 2.5% significance level that "both 'mainly continuous' and 'mainly binge' drinkers tended to have higher SADQ scores than 'occasional abstainers'".

Speed of Reinstatement

Here again we are dealing with construct validity. In the original description of the syndrome,[7] the suggestion was made that one of the elements within this syndrome was the phenomenon of reinstatement. It was postulated that when a patient began to drink again after a period of abstinence, the syndrome would be likely to be reinstated with a rapidity which reflected the original degree of dependence. Speed of reinstatement has been investigated in a prospective study conducted by Topham.[48] At base-point she administered the SADQ to 48 patients undergoing treatment for alcoholism. Six months later 19 of these patients had by their own definition relapsed. The speed of first appearance after relapse of

sweating, shaking and craving were related to degree of dependence at <.001 significance level, and speed of return to taking a morning drink at <.01 significance.

Predictive Validity: the research evidence

The degree to which the evidence arrayed below bears on validity varies between the different subheadings. Strictly speaking evidence should perhaps only be accepted as legitimate if a hypothesis is *prospectively* set-up that a particular external construct will correlate with dependence. There are though other instances in which a correlation is established but the heuristic significance of the finding becomes apparent only *retrospectively*, and this sort of evidence clearly deserves less weight. For purposes of the present review it seems useful to gather all the evidence together in one section, and let the discriminating critic form his or her own judgement on the significance to be accorded any particular line of evidence.

Degree of Dependence as Predictor of Response to a Challenge Dose of Alcohol

The last few years have seen the evolution of a considerable programme of experimental work on the response of alcoholic patients with different degrees of alcohol dependence to challenge doses of alcohol. This work builds on an important and previously established line of investigation.[49–51] The advances which more recent workers have been able to make in this area have come precisely from the ability to operationalize and quantify the dependence concept.[15] The detail and complexity of this research output inevitably sets difficulties for the reviewer who would do it justice, and the following paragraphs can provide only the barest outline of the many findings.

A methodological paper[52] has shown a significant relationship between subjective, physiological and behavioural (speed of drinking) measures of craving. In a crucial experiment Hodgson and his colleagues[53] went on to demonstrate a significant relationship between clinically rated degree of dependence and response to a challenge dose of alcohol given 3 h after either a high or low priming dose of alcohol, or without priming. The subjects were 20 hospitalized alcoholics, 11 of whom were rated as severely and 9 as moderately dependent. Ignoring the priming dose conditions, "The severely dependent group reported greater desire for a drink ($p<.03$), they consumed significantly more alcohol during the behaviour test ($p<.01$) and consumed the first drink more quickly ($p<.05$)". There was also a relationship between priming dose conditions and severity of dependence. In a high priming condition the severely dependent subjects tended to show an increase in speed of drinking over their behaviour in the other two conditions, while the less severely dependent subjects tended to show a decrease in rate of drinking with heavier priming (two statistical treatments are offered, each revealing a significant interaction effect).

Using the same research approach Rankin *et al.*[54] employed speed of drinking as an unobtrusive measure with 11 patients clinically rated as severely dependent and 11 rated as moderately dependent, but without in this instance any previous priming with alcohol. To drink 150 ml vodka, the severely dependent subjects took a mean of 23 s while the other group drank this dose in an average of 45 s ($p<.01$).

This work was then taken significantly further when Stockwell *et al.*[55] explored the influence on the priming effect of whether the subject believed that the drink he was taking contained alcohol. Clinical ratings of dependence were again employed, with 10 subjects assessed as severely and ten as moderately dependent. There were four priming conditions: the drink either contained 60 ml of vodka in heavy dilution or was a placebo (elaborate precautions were taken to ensure that alcoholic and placebo drinks could not be differentiated by taste), and in each of these conditions the subjects were led to believe either that the drink did or did not contain alcohol.

> "The results suggest that severely alcohol dependent subjects were more disposed to drink 60 minutes after consuming alcoholic drinks than after soft drinks, regardless of whether they believed that the priming drinks contained alcohol. Cognitive factors assumed greater importance for the drinking behaviour of less dependent subjects".

For the statistical treatment of this complex experiment it is necessary to refer to the original text.

A rather similar line of investigation has now also been pursued by a group of American workers.[56] They studied response to an alcohol or placebo challenge by 16 male alcoholics and 16

controls. Alcoholics given alcohol showed a greater desire to drink than subjects in the other groups ($p<.05$). Furthermore, choice of beer as a reward after a second challenge showed a relationship at $<.05$ with a score of withdrawal symptoms experienced over the previous 30 days.

Perception of Cues for Drinking

Rankin and his colleagues[57] reported a study in which a sample of 131 alcoholic patients were given a self-completion questionnaire which provided four-point ratings on items relating to possible cues for drinking. Subjects were at the same time rated independently by a clinician on a 0–2 scale for degree of dependence. On 25 of the 33 'cue' items there were significant differences ($p<.05$ to $<.0001$) between the moderate ($n=59$) and severely dependent ($n=73$) patient subgroups. As would be expected by the way in which the two groups were operationally defined, the severely dependent group endorsed withdrawal symptoms as a cue significantly more often than the less dependent drinkers. They also however showed significantly increased endorsement rate ($p<.01$) for the item 'immediately after a stiff drink' which is not an element inherent in the initial group separation. The authors point out the possible relevance of these findings to ideas on 'loss of control'.

Personal Choice of Drinking Goal

Using the Alcohol Dependence Scale as a measure of dependence, Skinner & Allan[38] found a significant relationship between the variable choice of drinking goal, and self perception as an 'alcoholic':

> "When clients were asked if they thought that cutting down to a few drinks a day was possible, the majority at low levels of dependence responded 'yes' whereas almost all clients at the upper quartile said 'no' ($x=45.0$, $p<.0001$) ... This perception coincided with self-identification as an alcoholic ($x=28.8$, $p<.0001$): indeed, all clients in the upper quadrant of the Alcohol Dependence Scale considered themselves to be alcoholic".

The User's Guide for The Alcohol Dependence Scale[39] reports further data on personal choice of drinking goal which points much in the same direction.

Detoxification Experience

Stockwell *et al.*[45] administered the SADQ to 53 patients undergoing withdrawal from alcohol. These patients received medication in terms of the usual ward treatment regime. SADQ scores were found to correlate significantly with medication given (0.29, $p<.03$). In that these patients received medication to ameliorate withdrawal symptoms, it might be expected that any relationship between withdrawal symptoms and dependence scores would be attenuated: even so, SADQ showed small but borderline significant correlations with patients' rating of craving (0.29, $p<.03$), and with a clinician's rating of tremor (0.23, $p<.05$) and of sweating (0.22, $p<.06$).

Personality Studies

Rankin *et al.*[58] administered the Eysenck Personality Inventory,[59] to alcoholics who were independently rated clinically either as moderately dependent (36 men and 20 women) or severely dependent (65 men and 16 women). The severely dependent men scored significantly higher on P and N and lower on E than age-related norms, while moderately dependent men showed similar differences as against norms in relation to N and E. Both severely and moderately dependent women were significantly higher on N that the normal controls. In a recent study on the relationship between alcoholism and neurosis in twins, Mullan *et al.*[60] found that among 23 male alcoholics there was a 0.59 correlation ($p<.01$) between SADQ and E P Q–N and 0.50 between SADQ and E P Q–E: for the smaller female sub-group correlations were near zero. Neuroticism scores were significantly higher for alcoholic twins of either sex as compared with their normal co-twins ($p<.001$). Furthermore, intrapair differences in neuroticism were significantly correlated with differences in SADQ ($p<.001$).

Psychopathology

Skinner & Allen[38] reported significant relationships ($p<.05$ to $p<.001$) between scores on the Alcohol Dependence Scale and "thinking disorder, hypochondriasis, persecutory ideas, self-depreciation, anxiety, depression and impulsiveness" as measured on the Basic Personality Inventory.[6] Two studies[62, 63] have been published which explore the relationship between dependence (as measured on the SADQ) and phobic anxiety

symptoms. The first of these studies took as its base 63 alcoholics, 32 (53%) of whom were found to be phobic in some degree. Comparisons were made between non-phobic, mildly phobic and severely phobic subgroups. No differences were found among females, but among the men "the three groups differed significantly in their degree of alcohol dependence, with the non-phobic group being the least dependent and the severely phobic group the most dependent" ($p<.05$ by analysis of variance). The second of these studies took 42 hospitalized alcoholics who were currently suffering from phobic anxiety and a careful retrospective analysis was made of the co-variation over time between intensity of dependence (SADQ) on the one hand, and intensity of phobic symptoms on the other. Four positive findings emerged: those who said 'yes' to the question "Do your fears get worse after a period of heavy drinking?" had higher mean SADQ's than the remainder ($p<.005$); experience of 'dry shakes' was related to SADQ ($<.01$); retrospectively and across nominated periods an increase in SADQ of more than 15 points led to an increase in phobic scores ($p<.01$); finally, a similar reduction in SADQ by 15 points was related to a decrease in phobic scores ($p<.01$).

Alcohol Dependence and the Ordering of Symptoms

It would be of great interest to obtain close or continuous follow-up data on a patient cohort in relation to fluctuations in dependence intensity over time and the sequential emergence of symptoms. Such a general line of investigation has its antecedents in earlier literature,[64-68] but Chick & Duffy[69] using a retrospective design reported an attempt to apply the dependence syndrome concept to an investigation of the sequential ordering of symptoms. With careful attention to issues of reliability they employed a card-sort technique with 38 hospital-treated alcoholics. Statistical analysis revealed a recognizable modal sequence of symptom-ordering with 'loss of control' appearing very early, and with some individuals deviating from this modal phasing. The theoretical implications of symptoms following any particular sequence need to be analyzed.

Outcome Studies

A number of authors have reported a relationship between dependence measures and outcome in groups of treated patients. Outcome is of course a complex and multidimensional concept: some of these reports have concentrated specifically on the 'return to normal drinking' question while others have been concerned with outcome in a more holistic sense. Orford *et al.*[70] examined the factors which predicted 'abstinence' versus 'control' at a 2-year follow up of men who had been treated for alcoholism. All 10 of the 'controlled drinkers' had originally been rated as 'non-gamma' alcoholics, while of the abstainers 6 were gamma alcoholics and 4 'non-gamma'. The authors noted though that "use of the Jellinek system for sub-classifying excessive drinkers is undoubtedly an operation of very imperfect reliability". It would be wrong therefore to interpret these findings as being more than suggestive.

Polich and his colleagues[44] in their analysis of the Rand follow-up data were able to pursue the question of the relationship between dependence and likelihood of 'controlled drinking' rather further, while at the same time taking certain predictive factors other than dependence into the equation. They found a number of complex interactions but concluded that:

> "our results are consistent with Edwards' emphasis on alcohol dependence, suggesting that the ability to maintain non-problem drinking decreases as the severity of dependence increases".

Polich and his co-workers also considered the relationship between dependence and overall outcome. Here their conclusions were as follows:

> "... the longitudinal data clearly indicated that alcohol dependence symptoms after treatment portend an unfavourable prognosis. People with dependence symptoms at 18 months, even those with low levels, were much more likely than others to experience later adverse effects of drinking, including continued dependence, negative consequences of drinking, and alcohol-related death. This finding supports the view of the recent World Health Organization Committee ... in suggesting that alcohol dependence is of great importance in understanding the persistence of damaging drinking among alcoholics".

A follow-up investigation on a much smaller scale than the Rand Report has been described by Öjesjö[71] but this Swedish project is important for its non-clinical basis and its long-term perspective. Öjesjö conducted a follow-up of 72 alcoholics out of an original 96 who had been identified 15 years

previously in a community sample. He defined 'addicts' in terms of their having experienced two or more of a list of dependence symptoms. This relatively crude measure was shown to have considerable predictive power: 51% of 'abusers' but only 14% of 'addicts' were in remission. He concluded that "Alcoholism as a dependency-syndrome is confirmed to be a valid working model for medical and epidemiological use".

A further long-term study has recently been reported on an 11-year interview follow-up of hospital-treated alcoholics.[72] Subjects completed the SADQ as relating to maximum intensity of dependence ever experienced: 8 patients out of the original 99 were identified as having returned to an established pattern of social drinking, and 7 of these scored less than 30 on the SADQ. A detailed analysis of a single case history[73] shows the extraordinary complexity of the interacting influences which may bear on the amelioration of drinking behaviour, and suggests in particular that dependence must be seen as an experience which may over time evolve or regress in relation to many situational, dynamic and cognitive factors.

Lastly but importantly, a finding which seems to go against the drift of other evidence and which suggests that SADQ ratings have no predictive power, has been reported by Heather *et al.*[47] This study focussed on a 6-month follow-up of 50 hospital-treated alcoholics. Forty-one of these 50 patients were placed in one of five follow-up categories. A subjective measure of dependence gave some significant predictions of outcome category distributions while the SADQ was of no predictive value in this regard.

Dependence and Differential Interaction with Treatment

One approach to syndrome validation is the demonstration that the putative syndrome is selectively responsive to a particular treatment, while the 'non-syndrome' is not thus responsive. The suggestion therefore that gamma alcoholics are differentially likely to respond to 'treatment' while non-gamma alcoholics are differentially responsive to 'advice',[70] has been interpreted as an interesting instance of this sought-after but rarely actualized type of validation. Given the probable unreliability of any classification which is based on Jellinek's alpha-gamma typology[74] it would be wise at present to regard the findings reported by Orford and his colleagues as only very tentative and in need of confirmation.

Dependence and Pathways to Treatment

Wodak and his colleagues[75] obtained SADQ ratings on 193 patients with alcoholic liver disease. Of these subjects 63% showed no or minimal dependence (SADQ<15), 20% moderate dependence (SADQ 15–30) and 17% severe dependence SADQ<30). The authors suggested that these results support the hypothesis "that patients who escape florid symptoms of alcohol dependence are at greater risk of developing liver damage because they are able to sustain a continual consumption of alcohol for many years".

In another study of liver clinic patients Saunders *et al.*[76] found that among male subjects ($n=99$), those who had ever been 'advised to reduce consumption' had a higher mean SADQ score than the remainder ($p<.001$), with group differences also being found in the same direction for 'Previous hospital treatment for alcohol problems' ($p<.02$), and 'Previous counselling for alcohol problems' ($p<.01$).

Skinner & Allen[38] described a treatment programme in which patients with drinking problems were assessed and then assigned either to outpatient, inpatient or primary care. Taking the three treatment modalities together ($n=213$) 'failure to show' correlated at $p<.02$ with degree of dependence as rated on the Alcohol Dependence Scale—the relationship was similar for all three sub-groups but only reached significance ($p<.05$) for the outpatients.

Dependence: the way the evidence begins to point

Having considered all the evidence arrayed above, what can we fairly (but provisionally) conclude? With all proper reservations as to the imperfection of instruments, shortcomings in statistical methods, sampling bias and difficulties with this or that individual piece of research, it would require a certain amount of boldness to dismiss the alcohol dependence syndrome as no more than a chimera. A number of approaches to operationalization and measurement of the syndrome have been devised. Across a range of instruments there is accumulating evidence for internal validity—evidence for the coherence of the syndrome's elements. Whether

some elements are more central than others or deserve more weight is still an open question. Concurrent validity has been established for the SADQ. The different lines of research support the argument for construct validity. And we have reviewed under no less than 10 subheadings evidence of varying cogency bearing on predictive validity.

The research which we have summarized shows that over the last few years the syndrome concept has catalyzed a range of productive contributions coming from many different centres. The syndrome formulation begins to look like a 'useful idea'.

The original formulation of the syndrome was purposely case in empirical terms—the question at that time was not how the syndrome was to be explained but whether it in any sense existed. We would seem now to have reached a stage where it is legitimate and indeed vital to start addressing the theoretical issues. What are the processes and mechanisms which lead to the establishment of this condition, maintain its dynamic once it is established, lead to its easy reinstatement after a period of abstinence, or sometimes allow its reversal or extinction? The advantage of the syndrome concept is that it invites the multidisciplinary exploration of this range of questions whereas essentially arbituary classificatory systems such as that offered by DSM III cannot have the same heuristic significance.

Within the limits of this paper it is clearly impossible to take the debate on the theoretical underpinning of the dependence syndrome any further but that is the direction in which analysis now has to move, with a carefully drawn and theoretically derived set of testable hypotheses. Theory will furthermore have to cross old disciplinary boundaries. The dependence syndrome is a concept which is rooted in psychological, biological and socio-cultural constructs, and which therefore invites no one 'level of explanation' nor the hegemony of any scientific discipline. As stressed earlier (p. 172) the syndrome concept can only contribute a part to the needed total explanation of why some people continue to drink excessively, but better understanding of the contribution made by this one dimension in due time may lead onto the possibility of more powerful multidimensional and interactive models.[77] If we are truly to be freed from the perseverations of the past and find a way forward, we need to be guided by that vision of scientific modesty and broad and tolerant enquiry which was so brilliantly characterized by none other than Henry Maudsley:[78]

> "I conclude that man as a whole is a grander and more mysterious complex than any single method of minute inquiry—be it chemical, physical, pathological, microscopical, or psychophysical—will ever unfold... There is work enough for as many methods of study of mind as are rationally based... but know that in the end they must bring, and knowing, strive to bring their results into harmony".

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