This paper outlines the development, design and findings of a Revised Complexity Index tool to measure the risk profiles of young substance misusers. The tool is specifically designed to identify the needs and usage in clinical sub-groups of young people to assist in commissioning and needs analysis of young people's services.

The Complexity Index (Revised)

Measuring Young Peoples Substance Related Needs and Trajectories of Change

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Contents

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Introduction

It is widely recognised in the field of addictions that young people are not adults. Within this statement carries the assumption that young people's needs differ from those of adults, that a wider range of complex inter-related policy applies to their treatment, and that the treatment process itself should differ from that of adults to account for developmental differences. Whilst these assumptions have been widely accepted in the field, it has not translated into comprehensive 'youth specific' services. At the same time, research into adolescent substance use treatment outcomes is more limited in comparison to that on adults. A strong evidence base has emerged in the last ten years that identified very clear pathways in and out of addiction for young people, but this research has not been adopted by the field or utilised to inform social policy. This research has profound implications for the effectiveness of youth treatment and offers considerable insight into the specific needs of young people. This paper outlines the essence of this compelling and robust research and offers an opportunity to translate it into more practical approaches to the identification, assessment and treatment pathways of young people in order to optimise treatment outcomes.

The paper outlines the development, design and findings of a complexity index tool (revised) that profiles young people's needs. Within this profile, the tool is designed to identify sub-groups of young people who share similar clinical features of presenting needs and treatment responsiveness. This tool offers the opportunity to analyse not simply the numbers of young people in treatment services but the type of complexity that they bring. This would assist commissioning and service providers in a number of ways:

- Assist needs analysis by establishing the numbers of young people in services and the range and severity of the problems that they address.
- Identify what types of complexity are currently being addressed in which services.
- Offer screening and referral to appropriate levels of services.
- Assist agencies in the development of more effective treatment pathways and interventions based on the sub-populations that they manage.
- Complexity levels may be benchmarked to outcomes allowing closer monitoring of the treatment progress of the more complex cases that could be 'masked' by the outcomes of normative consumption.

Background

The Complexity Index (Revised) was developed in response to a number of service developments in England and Wales. Currently the National Treatment Agency has been developing a proto-type Complexity Index that could profile the range of risk factors that young people bring into treatment services. Trial results were included in the Needs Assessment Data released end of August 2010. It is designed to be an on-going piece of work if deemed useful

The tool developed by the NTA is a short questionnaire where the young person presenting to services is rated on 12 risk factors of complexity. They receive 1 point for each risk factor that applies to them. In addition, the young person is also scored on what type of drugs they are currently using. They receive an additional score of 1 for alcohol, 2 for cannabis and 3 points for heroin and crack cocaine use. This could lead to a total score of 15 points (See table 1).

- ❑ Involved in Offending at Treatment Start
- ❑ Involved in Sexual Exploitation at Treatment Start
- ❑ Involved in Unsafe Sex at Treatment Start
- ❑ Involved in Unsafe Drug Use at Treatment Start
- ❑ Involved in Self Harm at Treatment Start
- ❑ In Contact with Mental Health Services at Treatment Start
- ❑ In Contact with YOT at Treatment Start
- ❑ YP has Lead Professional
- ❑ YP is Pregnant
- ❑ YP is a Looked After Child
- ❑ YP is a Parent
- ❑ YP has a Dual Diagnosis

- ❑ AND by assigning a score to the drug use of each individual:

- ❑ Opiates and/or Crack = 3 points
- ❑ Cocaine, Amphetamines and / or Ecstasy = 2 points
- ❑ Cannabis and Alcohol = 1 points

Table 1: NTA Complexity Index 2010

The tool was piloted across nine different areas of England with young people accessing treatment services. Completed index results were averaged to offer an indication of the complexity being addressed. At a regional level, the national average score was just under 2.5. The highest range was 2.9 in the Midlands and the lowest occurred in London scoring an average of just under 2 pts. Considerable variation was found in specific sites, ranging in scores from 0.5-6.9. Complexity also varied by age, with younger people showing the lowest complexity scores and the older age range demonstrating the highest level of complexity.

The complexity index and its findings were then sent out for consultation from a range of providers, the author included. The author offered feedback into the proposed Complexity Index and how it could be adapted. At the same time, the author and associates were involved in the development of services for young people in two counties in South Wales. This included a Needs Analysis and the development of commissioned services. Reviewing the National Treatment Agencies Complexity Index offered an opportunity to develop this tool further and implement some of the recommendations in a revised version.

Whilst the NTA tool was seen as immensely valuable, it was felt that the Complexity Index could demonstrate even greater utility if its structure was re-defined to account for robust research findings in young people's drug and alcohol use. As a Needs Analysis was being initiated across two counties in Wales it was seen as an ideal opportunity to refine the tool and trial it over a wide range of services operating in the same locality. Local commissioners agreed to pilot a revised Complexity Index, which would build upon the NTA prototype.

Review of the Complexity Index

Reviewing the proto-type Complexity Index offered an opportunity to reflect upon and learn from the pilot study. Reviewing the NTA model highlighted some weaknesses in the approach. Firstly, the NTA's Index attributed points to young people for key areas of risk as well as for their level of service involvement. For example, a young person may receive one point for self-harming, but receive another point if they were in contact with mental health services. Whilst the level of service involvement does offer insight into the complexity of young people's needs, from a risk profile standpoint it may artificially increase the scores of young people who live in areas with a wide range of services. Two young people could share the same risk profile, but the young person who lives in an area with developed services may score more highly than their counterpart simply because more services are available to them.

A second limitation of the NTA Complexity Tool was the range of risks that were identified. All the lifestyle risks that are included are very relevant but only towards the most chaotic, high risk group of young people. This meant that the Complexity Index was weighted too heavily towards one sub-group of young people. Whilst this sub-group are the most complex and least treatment responsive, the tool could underscore young people with less complex needs but high treatment requirements. In short, it would not capture the whole population of young people presenting for help, even though it would capture the most difficult cases. Hence, some young people seeking help might score 0 on the Index , even though they had needs that required treatment.

A third consideration was the weighting of points by substance. Young people were scored more highly for crack / heroin use as opposed to alcohol or cannabis. Whilst the weighting of crack / heroin with higher scores makes intuitive sense due to the reputation of these substances, it also presents limits. It supposes that these drug cause more problems than others and is then weighted accordingly. However, this may not be the case. For example, whilst heroin and crack are undoubtedly problematic for young people, any drug or alcohol can have a devastating effect on a young person's life. Furthermore, young people who took crack or heroin would tend to score more highly across the whole range of the Index as a whole anyway. Therefore, it felt unnecessary to add yet more points to those young people who

would already be scoring highly across the range. Furthermore, in contrast to adult's daily consumption patterns, young people's use is opportunistic and sporadic. Therefore, having taken a Class A drug does not necessarily mean that a young person is a regular user of Class A drugs. Poly-use is more of an issue for young people and brings higher levels of complexity. The current weighting makes it difficult to account for the range of poly-drug use and the problems that this brings.

Finally, young people's patterns of consumption vary enormously. Many young people will have limited exposure to drugs and alcohol and age out of this behaviour. Only a minority of young people are likely to advance to a problematic stage. Thus young people's drug and alcohol use can be characterised by a large non-chronic population of users who are liable to naturally remit, and a smaller chronic problem population who are unlikely to desist from use. This much smaller population of young people are more likely to progress into heavier consumption and carry this into their adult lives. This presents a problem when dealing with broad average figures. The large non-chronic population's use is liable to swamp any whole population average, lowering the overall scores. This will mask the higher complexity of the most problematic minority who cause the most personal and social harm. Whilst average figures give an overall picture of consumption, from a treatment perspective, it may fail to clearly identify those who are in most need of treatment.

Despite these limitations, the concept of a Complexity Index for young people was a very important advancement in the current commissioning landscape. The NTA pilot demonstrated that a Complexity Index was sensitive enough to detect regional and local variation and establish a critical base line of need amongst young people.

Complexity Index Revised

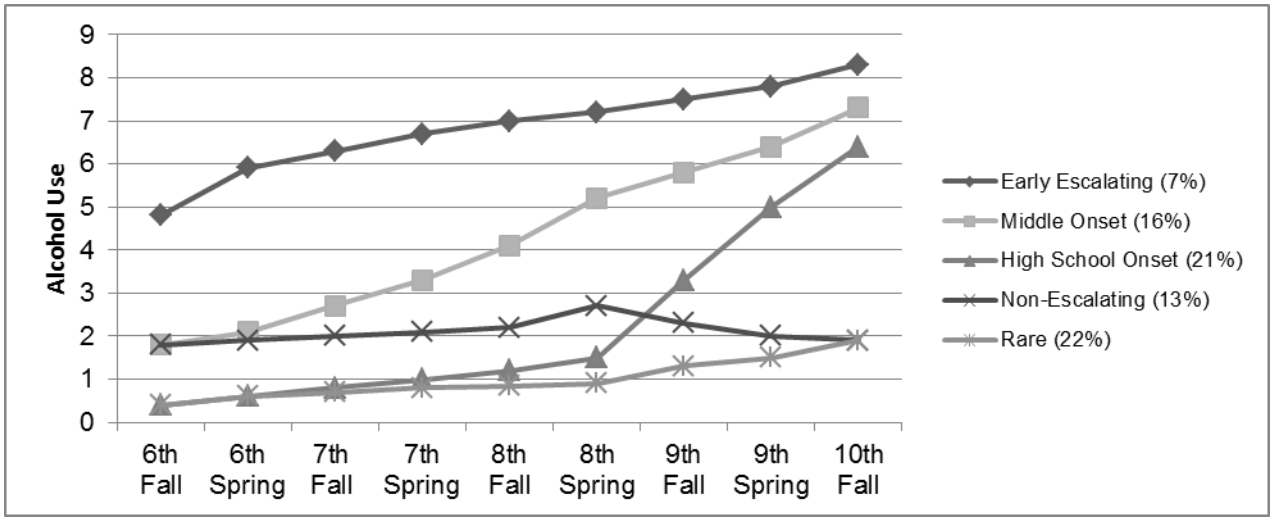
Revising the Complexity Index resulted in making key changes to the NTA tool. The same format would be retained, producing a questionnaire that would score young people's needs from 0-15. However, the first change to be made was remove any item entries which scored young people simply for service involvement. It was decided that the tool should address the presenting complexity of the young person rather than score them by virtue of local accessibility to services.

A second key change to the tool was to include an age of onset question. In a range of studies, age of initiation appears to be the single biggest predictor of future problems with drug and alcohol during adolescence and early adulthood (Robins & Przybeck 1985; Humphrey & Friedman 1986). The cut off point for early initiation varies between use before 13 (Gruber et al 1996) before 14 (Muthen & Muthen 2000) or 15 (Chou & Pickering 1992). Categorisation on age tends to predict that initiation of use prior to 14 substantially increases risk in later adolescence (Grant et al 2001) with risk at its greatest when consumption starts very early at 11 (Dawson

2000). In US studies, despite considerable variation in drinking laws, the age of initiation and subsequent problems remains remarkably similar and the pattern appears to hold true in all Western countries (Ferri et al 2003; Vega et al 2002). This demonstrates a stratified initiation into use commencing with the onset of alcohol and tobacco. In one study, Kandel & Yamaguchi (2002) found that heroin users had initiated smoking at 12.6 years old on average; cocaine but non-heroin users started smoking at average age of 14; individuals who went on to use cannabis but no other drug started smoking at 14.6; whilst individuals that went on to only drink alcohol commenced smoking at aged 15.8 on average. Therefore initiation before the age of 14 was used as a key variable in separating early onset use with the most severe incumbent needs of later onset.

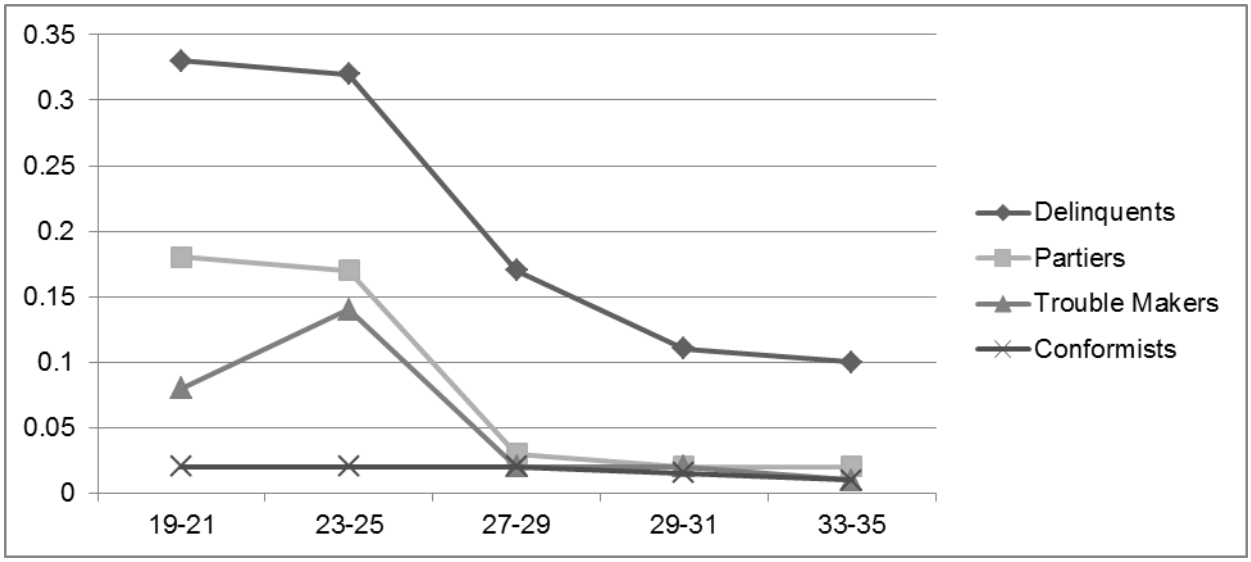
A third key change was a revision of the risk factors identified in the Complexity Index. As stated previously, these risk factors were stacked towards the most complex pattern of consumption and might miss important but lower levels of need. Longitudinal and multi-panel wave research has begun to identify that young people are not a homogenous group. Within a population of young people who use drugs and alcohol there are clear sub-populations who share the same probable trajectories of consumption across the life course. This has clarified why some individuals appear resilient to use, why others succumb at a divergent range of ages; and how some youth populations remit from use whilst others continue into adulthood (Jessor, Donovon & Costa 1991). It is important to distinguish sub groups because many young people will naturally remit from use without professional assistance, whilst others are unlikely to do so and are liable to extend their problem using careers into adulthood.

Using data from the large scale Alcohol Misuse Prevention Study, Schulenberg (2001) identified five trajectories of alcohol use in young people. This included early escalators, middle onset, high school onset, non-escalating and rare (no pattern) groups, all initiating use at different ages and each with a specific trajectory of consumption. Steinman and Schulenberg (1999) found that vulnerability to peer pressure could distinguish alcohol use prior to divergence in sub-populations. Expectancies of alcohol were important in all patterns, especially prior to and following heavy drinking. Low self-efficacy at 18 predicted chronic alcohol use, and high self-efficacy predicted decreasing use trajectories in young adults, Schulenberg et al (1996). (See graph 1)



Graph 1: Alcohol Trajectories in Young people (Schulenberg et al, 1996)

Similar trajectories have been found in substance using groups. For example, Hamil-Luker et al (2004) study of cocaine users identified several sub-populations by cluster analysis (see graph 2). Followed since 1979 for over a 19 year period, distinct sub-groups were identified by assessing key indicators of offending and drug taking behaviour. These included delinquents, partiers, trouble makers and conformists who demonstrated similar profiles. Delinquents demonstrated high anti-social behaviour in adolescence, the older members of this sub-group in 1979 were more likely to be peak adult users. Partiers displayed anti-social behaviour between the ages of 14-16 and showed negligible use in their twenties, particularly if they married. Trouble makers, who were identified by teenage anti-social related behaviour, demonstrated a surge in use that again subsided. Those that had dropped out of school and smoked marijuana were more likely to desist due to engagement in the labour market, but there were significant ethnic and gender variables influencing their outcome too. Conformist identified low anti-social behaviour in the teenage years; whilst their overall risk was low, their peak in use coincided with their college years (67 per cent attended college). Disruptions in employment tended to increase this groups risk.



Graph 2: Predicated probability of cocaine use by youth misbehaviour latent cluster membership (Hamil-Luker et al 2004)

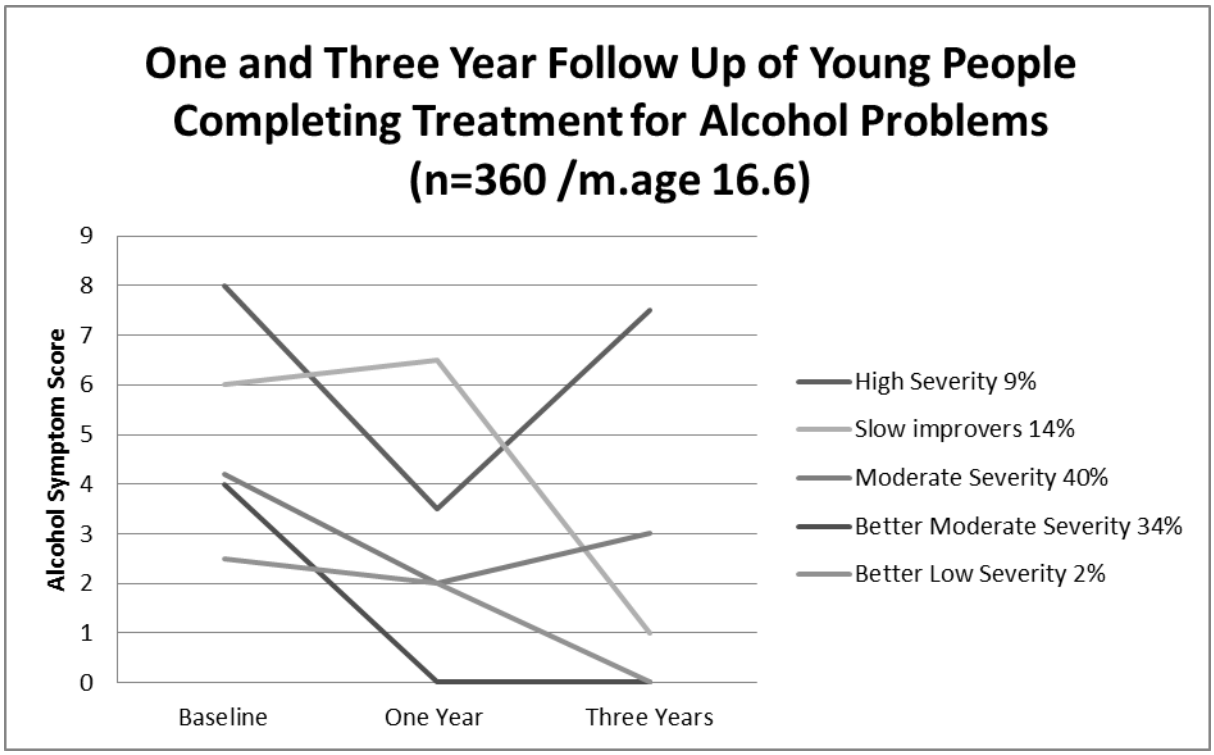
A similar study conducted on opiate users over a 33 year period revealed similar patterns of sub-trajectories (Hser et al 2007). All subjects average age of onset of cannabis use and first arrest was at aged 15. However, the late de-accelerating (32%) and stable high users (59%) reported an earlier age of initiation into cannabis use and heroin than early quitters, and had more extensive treatment histories. This was the single biggest predictor of future trajectory. Again, these sub-population trajectories coincide at several points but show very different subsequent pathways in future use and cessation. Research for other substances has demonstrated the same trajectories that are typically predicted by the age of onset and intensity of consumption.

Therefore, rather than weighting the risk factors towards the most chaotic end of consumption, it was felt that the complexity index tool could improve its utility by the adoption of subscales that could detect risk factors for each group of young substance misusers. For example, the most at risk youth and those who are likely to follow the highest trajectories of use have been identified as what might be determined 'multiple-problem youth.' Research demonstrates that young people most prone to problematic youth experience a wide range of concurrent problems. Primary amongst this is poverty. In a Youth Lifestyles Study (Gouldon & Sondi 2001) showed that as exclusion from school, truancy, offending, homeless, running away increased, so did substance misuse, particularly Class A use. These groups also reported easier access to substances. Psychiatric disorders in young people also have a correlation with high substance misuse problems, particularly in ADD / ADHD, depression and anxiety. Kuperman et al (2001) studied the relationship between psychiatric problems (ADD/ ADHD, Oppositional Defiance Disorder, and conduct disorder) and the development of alcohol dependence in 13-17 year olds.

This research concluded that psychiatric disorders are initiated first, followed by misuse of all classes of drugs.

The Complexity Index therefore had to measure a range of distinct risk factors that were salient to identified sub-groups. These sub-scales were based on research by Brown et al (2005) who identified three trajectories. Brown's research model was selected as these three groups appeared to encompass the trajectories identified by other researchers, and also it offered a small number of sub-populations to track. Brown et al (2005) identified these three groups as normative, internalised and externalised youth. Normative risk is embedded in experimental and recreational use that may become chronic. Personality / temperament risk (externalised) begins prior to exposure to use and originates in high sensation seeking, behaviour dis-inhibition, low impulse control, and hyperactive traits that make young people more susceptible to risk and increasingly defiant to conformity. This is indicative of externalised problems in young people. Finally internalised disorders in the form of significant mental illness appears to influence initiation and the rate in which problems are acquired. Therefore, at the most chronic end of young people's substance misuse are adolescents with multiple problems; whilst the other end is transient and liable to remit with age.

Having chosen three sub-groups, a literature review was completed to identify the specific risk factors for each group. It was important to identify, as much as possible, the risk factors that were specific alone to the relevant subgroup. Personality / temperament appeared to be characterised by an early onset and an externalised range of behavioural difficulties such ADHD, conduct disorders, offending and persistent truancy. Pathological disorders tend to be defined by internalised mental health problems such as depression, self-harm and suicidal thinking. The most difficult sub-group to isolate was the normative group. Externalised and internalised users were likely to pass through normative consumption patterns as their use escalated. Externalised and internalised users were much more likely to use in isolation, and identifying then whether a young person only used in a peer setting was liable to be a clear indication of a normative pattern of use. A second 'loaded' question was used asking whether the young person had recently abandoned pro-social activities in favour of use. This question was based on the ICD classification for drug or alcohol abuse as opposed to dependence. It was loaded in that it assumes that the young person has been involved in pro-social activity until recently which may be less likely to occur in externalised or internalised populations. Based on these research findings the Revised Complexity Index was then weighted: externalised problems are the least treatment responsive; followed by internalised use; later onset normative use demonstrates the highest level of treatment response.



Graph 3: One and Three Year Follow Up of Young People Completing Treatment for Alcohol Problems (Chung et al 2003)

Therefore, in the revised tool, externalised disorders cover four items, internalised use covers three items and normative use covers two items. In this way, it was hoped that the tool would reflect the higher levels of complexity that occurred in the least treatment responsive group. (See graph 3)

In terms of substance misuse, all drugs were weighted the same. The revised complexity tool assumed that the poly-use would be indicative of higher levels of need in young people. Therefore, all substance use would be weighted the same with each young person scoring one point for each type of substance that they used. The total score for the substances sub-scales would therefore render the overall complexity of their needs as opposed to stacking one substance as potentially more problematic than another. The classification of substances was based on Alcohol, Class C, Class B, Class A and Other, including solvents, legal highs etc. This meant that the young person could score a maximum of five points if they were poly-users of all types. This lead to the formulation of the following tool, with sub-scales identified in table 2.

Item	Sub-Scale	Points
1. Did they initiate regular drug or alcohol use before the age of 14?	Early Onset	1
2. Did they have a history of offending prior to treatment entry?	Externalised	1
3. Have they been diagnosed with ADHD, Defiance or Conduct Disorder, or were they statemented?	Externalised	1
4. Have they had social work involvement prior to treatment?	Externalised	1
5. Do they have, or report a history of low commitment to school through persistent truancy?	Externalised	
6. Do they have, or report, a history of depression or anxiety?	Internalised	1
7. Do they have, or report, a history of self-harm prior to treatment?	Internalised	1
8. Do they have, or report, a history of feeling suicidal?	Internalised	1
9. Do they report that previous pro-social activities they once enjoyed are no longer interesting?	Normative	1
10. Do they report only using drugs or alcohol with peers or partners?	Normative	1
11. This young person does not fit any of these criteria	Screening	Not Scored
12. Do they use Alcohol?	Substance	1
13. Do they use Class C Drugs? (Benzos, GHB, Ketamine etc.)	Substance	1
14. Do they use Class B Drugs? (Cannabis, Ecstasy, Amphetamine etc.)	Substance	1
15. Do they use Class A Drugs? (Heroin, Cocaine, Crack etc)	Substance	1
16. Do they use Steroids \ Solvents \ Other Non-Classified (Legal Highs, OTC, Prescriptions Drugs etc)	Substance	1

Table 2: The Complexity Index (Revised) Depicted with Sub-Scales and Scoring

A final question asked whether the young person did not fit any of the previous risk factors. This was not scored. This question was used to ensure that all young people in service were being accounted for by the risk profile. Should any practitioner score the young person for this item, it would trigger a follow-up response, asking the practitioner to identify any clinical features of this young person that the Complexity Index had missed. Thus highlighting any amendments needed to ensure the index was salient to the whole population of young people presenting

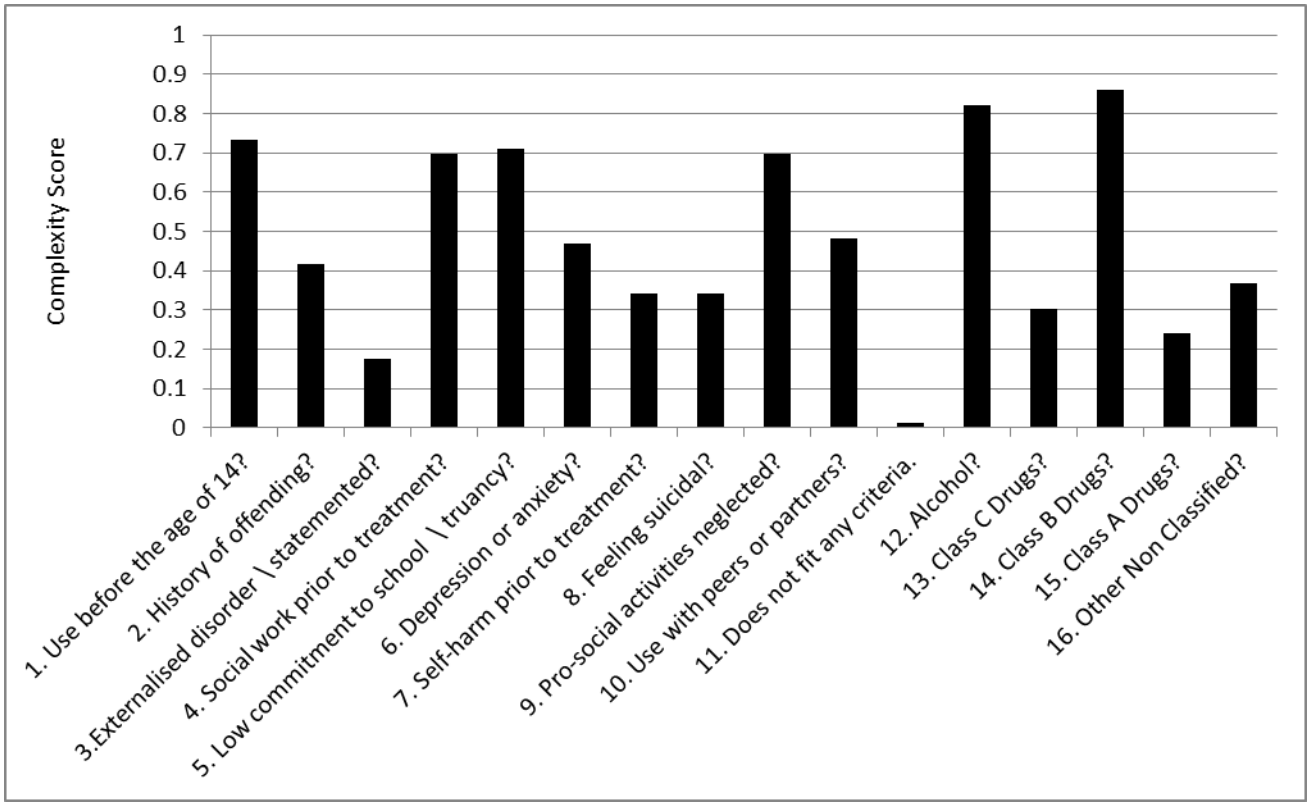
for treatment. The final Revised Complexity Index was then piloted in England amongst a sample of youth workers to ensure consistency and ease of use. Once the tool appeared to be easy to complete with little disagreement on scoring it was then trialled across two counties in South Wales as part of a larger needs analysis.

The Study

The Complexity Index was piloted within a wide range of youth services in two counties in South Wales during October 2010. Some were dedicated substance misuse agencies and others, for comparative purposes, were more generalised youth services that worked with young people with higher support needs. The purpose of the Complexity Index was to assist the needs analysis in identifying not simply how many young people were in services but establish the range of complexity within each service. The aim of the Complexity Index was to:

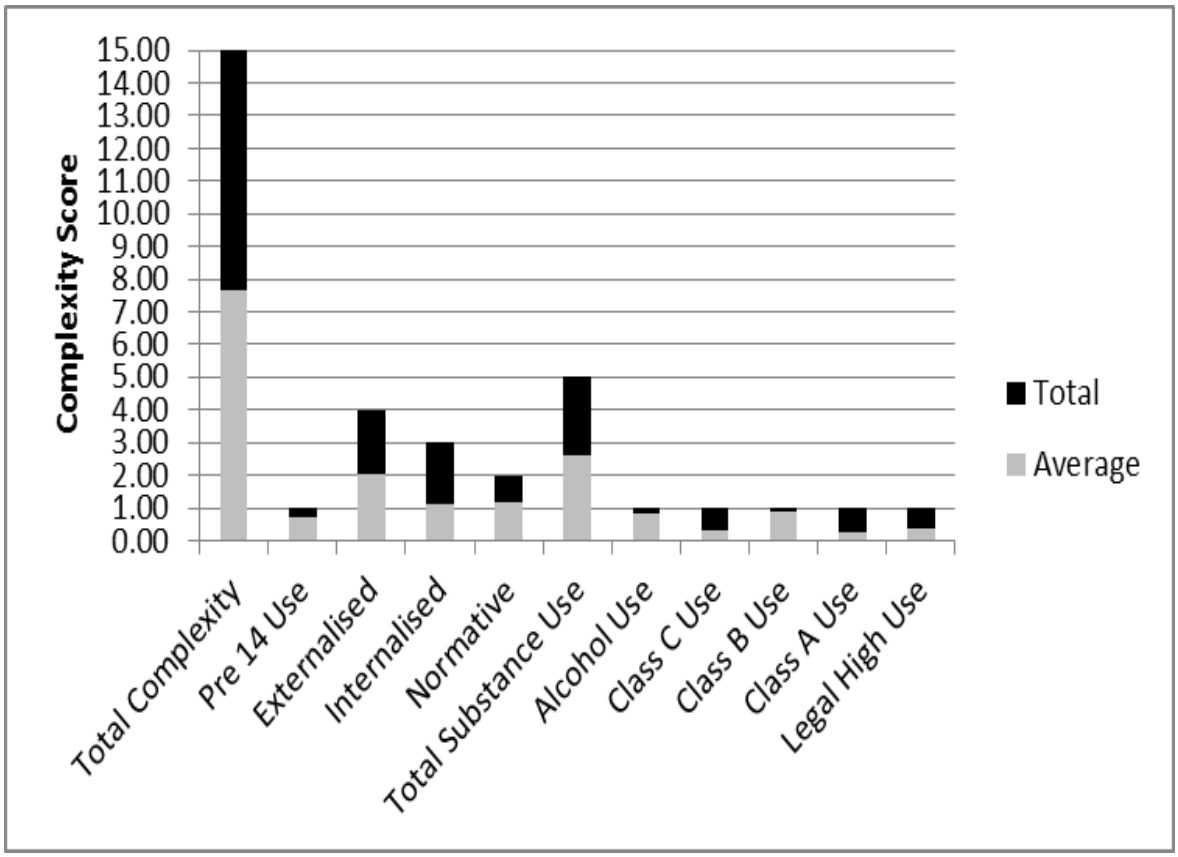
- Identify different sub populations of young people and their likely patterns of substance misuse and needs
- Inform commissioners and providers to ensure treatment is tailored to those young people appropriately
- Inform managers of the complexity of caseloads held by practitioners

No formal training was supplied with the use of the index. The principle reason for this was to assess the ease of application across a range of services. The response rate was high, with each major treatment agency providing information on their current client group. The total number of young people in the sample is 81. Feedback on the use of the tool was positive with workers reporting that the tool was easy and straightforward to use. The one dummy variable in the Complexity Index, 'the client does not fit any of these criteria,' only identified one false positive. The client who had received a positive score on this item also had a positive score in the normative sub-scale rendering it redundant. This suggests that the range of risk factors in the Complexity Index were very salient to the treatment population of young people sampled. The average results for the total sample by variable are illustrated in graph 4.



Graph 4: Average scores in each item in the Complexity Index

The Complexity Index can demonstrate a maximum score of 15 – one point is allocated to a yes answer on each question with the exception of the dummy question (number 11). The vertical axis in Graph 4 shows the level of complexity. Overall, the two counties demonstrated an average level of total complexity of 7.67. This score demonstrates high levels of presenting needs suggesting services are reaching complex cases. However, as suggested, this raw total is constructed by several sub-scales. These sub-scales describe the complexity of the underlying trajectories of consumption identified in clinical research. The sub-scales are weighted to reflect the complexities in presenting needs, with externalised behaviours often showing the most complex range of problems and poor treatment prognosis, followed by internalised consumption and normative use. Hence the sub-scale for externalised behaviour contained four items, internalised sub-scale included three items and normative use was based on two items. In addition, substance use and alcohol was included in sub-scales as well, both in a combined total and in a separate axis. The results of all agencies were averaged in order to create a baseline of presenting needs across both counties in graph 6. Please note, the black bar represents the total range for each sub-scale whilst the grey bar represents the actual range scored.



Graph 5: Average Complexity Index Rating of all Agencies. Total identifies the full range for each subscale. The Average scores show the actual scores achieved in each subscale.

Significant in the results, were those who had initiated consumption of drugs or alcohol prior to the age of 14. This Index identified that 77 per cent of the population had initiated drug or alcohol use prior to the age of 14. Early onset of use is a strong indicator of future problem use and length of the using career. It is unsurprising that this more complex group are the most likely to present to treatment agencies. It also suggests that specific efforts may be needed to address the susceptibility of young people in the two counties to reduce the frequency of early initiation.

The Complexity Index also found high levels of externalised problems in the young people presenting for help. In total, 40% of the young people sampled demonstrated externalised behaviours including offending, truancy, significant social work involvement prior to treatment or receiving a diagnosis of an externalised disorder (ADHD, Conduct disorder etc.) The percentage who had received a formal external diagnosis was 17.2%. The rate of internalised disorders depression / anxiety was higher accounting for 46.9% of the young people. At the most extreme end of the spectrum 33% per cent were identified as having or have had suicidal thoughts. Whilst there was little difference in the percentage of young people presenting with externalised or internalised disorders, the weighting of the Complexity Index did elevate the needs of the externalised disorders as higher than the internalised problems by approximately one third. Externalised disorders were rated as a complexity index of 1.58 versus 1.1 for internalised problems. In comparison,

normative ratings (given up pro-social activities or uses with partners and friends) scored at 58%. Although a significant higher percentage of young people scored in the normative range, the Complexity Index rated their needs higher than the internalised group at 1.6. This higher percentage may be reflective of a higher range of non-chronic problems or, more likely, that the variables used for normative use were not distinct enough to isolate this population. Therefore externalised and internalised use could also be positively associated with these normative variables.

In terms of substance use, alcohol (81%) and Class B drugs, mostly cannabis, (86%) were the most frequently cited substances that agencies worked with. Even where poly use or Class A use was indicated, alcohol and cannabis figured highly in young people's scores. This suggests that the training strategies and staff skills base should be directed at interventions that address these substances as a matter of priority. A significant proportion of the sample reported Class A use at 23.4% of the sample. Class A use was strongly associated with mental health problems. Amongst the 19 young people reporting Class A use, just under a third (31%) were positive for having received an externalised disorder diagnosis. Furthermore, 63% of Class A use scored positively on depression and anxiety. Class A use was also associated with earlier onset in 73% of cases. This score is close to the overall average suggesting this age range might need to be lowered to offer better distinction between cases liable to be more complex. High rates of poly-drug use were also found with 16% of the sample being recorded as having tried every classification of drug. These populations were again correlated with high rates of depression in particular. Amongst the 13 poly drug users, 10 also scored on the depression and anxiety item (76.9%) and 11 initiated use under the age of 14 (84%).

In contradiction to this, individuals who used only one substance demonstrated less complex needs. They were more likely to score in the normative ranges. A sample of 17% of young people reported only using one substance. Amongst the single substance users, 85% had a later onset, initiating use after the age of 14. Furthermore, none of the group had a diagnosis of externalised disorders, whilst only 42% demonstrated signs of depression or anxiety. This offers a strong suggestion that weighting substance use with 1 point per classification of substance by classification does offer a reliable indication of complexity in use. Poly users are more likely to have more complex behavioural, emotional or mental health needs than those that use only one substance.

Comparing the complexity within agencies, drug and alcohol services demonstrated remarkably similar outcomes as well as some key differences in the cases that they held. In general, agencies scored in a similar range. The highest overall complexity scores were in the Vulnerable Young People's Support Service (VYPSS) (9.83) and the lowest was in the Youth Offending Service (YOS) (6.75). The VYPSS offers support to young people in the care system, NEETS and other at risk youth and this

increased vulnerability may be reflected in the higher total complexity score. YOS scores may have been reduced by those on their deterrence programme who had not yet entered into more chaotic lifestyles. The young person's direct access Street Agency demonstrated notably high externalised scores (2.38) as did the young people's Housing Provider (2.46) and Group work Programme (2.4) and all reported significantly lower rates of internalised consumption. This suggests that they are working with complex behavioural problems as opposed mental illness. Young People's Specialist NHS Substance Misuse Services demonstrated higher scores for mental illness (1.09). Again, this was to be expected due to their close working relationship with CAMHS. However, YOS also showed very high incidence of mental health. VYPSS was unusual in reporting high levels of external and internalised consumption. This reflects the direct access nature of this service, where the most at risk young people present in crises with multiple needs. The rate of normative use was lower in all agencies and was highly consistent across all agencies, scoring in the range of 1-1.2 points across all providers. (See table 1)

	Street Agency	**NHS**	**Group Work**	**VYPPS**	**YOS**	**Housing Provider**
Total Complexity	8.375	7.6	7.6	9.83	6.75	7.4
Under 14	1	0.77	1	0.3	0.68	0.66
Externalised	2.375	1.58	2.4	2.5	1.93	2.46
Internalised	0.75	1.09	0.6	2.5	1.37	0.8
Normative	1	1.16	1.2	1.5	1.125	1.2
Total Substance Score	3.25	3	2.4	3	1.625	2.2
Alcohol	0.875	0.96	0.8	0.83	0.68	0.6
Class C	0.5	0.419	0.2	0.33	0.0625	0.26
Class B	1	0.955	0.8	1	0.625	0.86
Class A	0.375	0.354	0.2	0.16	0.0625	0.13
Legal Highs \ solvents	0.5	0.387	0.4	0.66	0.1875	0.33

Table 3: Average Complexity Index Scores by Agency

This suggests the needs of young people in different agencies may require different treatment responses. Some agencies may need greater emphasis on understanding

and treatment of behavioural disorders whilst others may require a greater understanding of mental illness and young people. The fact that all agencies reported, to some degree, significant levels of externalised or internalised problems in the young people they worked with may also suggest that there may be a lack of treatment pathways to assist young people into the most relevant service for their needs. Instead, services may have evolved as a 'jack of all trades' approach, where specialisms have not been maximised.

In terms of substance use, the Street Agency population showed the highest range of use at 3.35. NHS and VYPSS were the next highest scoring range with 3 points. As such, it appears that the drug specific services are capturing the most chaotic drug and alcohol using young people even if there is no clear filtration into specialist agencies. VYPSS also showed a high level of usage in its client population. The very high self-presentation rate at VYPSS amongst poly-using young people may also suggest that there may be a reservoir of undetected high end users in the area. Again, cannabis (Class B drug) and alcohol, scored highly in all agencies with the exception of YOS and the Housing Provider whose alcohol consumption was significantly lower. Class A use was more likely to occur in NHS, Street Agency and Group Work Agency respectively, suggesting that the more complex cases are entering into the substance use-dedicated services.

Over all, the Complexity Index has revealed a consistent pattern of consumption across agencies in two counties. All agencies scored in a similar range suggesting an internal consistency in the application of the tool. Variation occurred within these total scores which could be accounted for according to the client base of the service. The most complex drug and alcohol cases did appear in dedicated services. The Street Agency, YOS, and Group Work Agency tended to work with higher levels of externalised behaviour whilst the NHS addressed more mental illness. However, the VYPSS scores suggest that a population of vulnerable young people may be experiencing drug or alcohol problems but remain outside of the current range of specialist substance misuse provision. Reviewing the treatment modalities deployed across the counties made little reference to these sub-populations. The international Cochran meta-analytic reviews offer insight into variations in treatment responses to specific disorders (See table 7). This range of services is not currently provided systematically across the two counties and should inform commissioning.

	Disorder	Treatment
Externalised Disorders	ADD \ ADHD	• Parent Training • Behaviour Therapy
	ODD \ CD (Children)	• Behavioural Parent Training • Webster-Stratton Parent Training • Non-Behavioural Family Therapy • Social Skills • CBT poorer outcomes
	ODD \ CD (Adolescent)	• Family Behavioural Therapy • MST Family Therapy and CBT low outcomes • A-CRA \ MET Promising
	Externalised Disorders and SUDs	• Individual Cognitive Problem Solving • Family Behavioural Treatment
Internalised Disorders	Anxiety Disorders	• CBT
	PTSD	• CBT-Modest Effect • Parent Involved CBT
	Depression	• Cognitive Behavioural Therapy • Social Skills-Modest effect • Family Therapy • Interpersonal Therapy Promising
	Eating Disorders	• Maudsley Model of Family Therapy • CBT • MET Promising
Normative*	Non-Pathological Consumption	• MI • Psycho-education for Parents • Cognitive and Behavioural Therapy • Family Therapies • A-CRA

Table 4: Evidence Based Interventions by Disorder Based on Corcoran, J. (2011)

*** Based On NICE (2007)**

Reviewing the Complexity Index offers insight for future refinements where greater separation between trajectories of use can be achieved. However, the Complexity Index appears to achieve its primary function in mapping the levels of complexity residing in each service. With the implementation of integrated treatment pathways for young people and improved planning through the Children and Young Peoples Partnership, follow-up studies may reveal the impact of these changes on the young person's treatment journey. This will help ensure that young people are receiving the most appropriate services from the most appropriate agencies.

Methodological Considerations

This sample also raises issues regarding the future development of the Complexity Index. The Index was trialled in England prior to its use in Wales in order to assess how ergonomic the tool was. In the small English sample there was considerably less overlap between externalised and internalised problems. This clearer divide between these two types of disorder was expected in the Welsh sample but greater cross over occurred. It is difficult to assess exactly why these two samples differed. In England, a range of senior practitioners were asked to complete the forms without direct instruction. Their length of service and role may have meant that they had a better understanding of key diagnosis and terms leading to greater refinement in the completion of the Index. Greater distinction may have been made for example between depression as a clinical disorder rather than low mood. Alternatively, although the Complexity Index was to form a central role in the Needs Analysis, it occurred in parallel with re-commissioning of young people's substance misuse services in the region. This may have generated some bias in scoring. Alternatively, the sample from the two counties in South Wales may represent a more complex sample population than those conducted in England. Re-sampling post commissioning and additional training may lead to improved clarity between externalised and internalised disorders or might confirm the additional complexity of young people's needs in the area.

There was some bleed between externalised and internalised use with normative items. Isolating normative scores is difficult, and those with complex problems operate on a high end of spectrum that is liable to cross lower order problems as they develop. This means that more chaotic users are likely to meet the criteria for less problematic consumption as well highly problematic consumption. The two normative items in the question could be strengthened with greater qualification in terms of 'ONLY ever uses with peers or partner' and 'Abandoned pro-social activities in the LAST month.' Deeper statistical analysis of the data may offer greater insight into the patterns within the sample. It might also identify which items in the questions offer the greatest degree of predictability that might reduce the number of items or adjust the current weighting.

Whilst smoking at aged 11 is a strong predictor of problem use, ages of onset can vary between alcohol use (age 13) and less problematic cannabis use (age 14.6). The age 14 cut off was chosen as an average of these two key ages. Whilst this age range was a good predictor of singular drug or alcohol use and a normative pattern of consumption, it did not identify those most likely to use Class A drugs. This sample suggests that age 14 may be too high a cut-off point. Future Complexity Index may set this age lower or conduct the Index on age bands.

Youth services were not trained in the use of the tool. The main reason for this was to avoid biasing the sample results. Training in adolescent development and substance misuse strongly suggests that young people follow fairly predictable trajectories in consumption. This research may be novel to the work force and further training may clarify future data collection.

Conclusion

Over all, the Complexity Index (Revised) has revealed a consistent pattern of consumption across agencies in two counties in South Wales. All agencies scored in a similar range suggesting an internal consistency in the application of the tool. Variation occurred within these total scores which could be accounted for according to the client base of the service. The most complex drug and alcohol cases did appear in dedicated services. The Street Agency, YOS, and Group Work Agency tended to work with higher level of externalised behaviour whilst the Young People's Specialist NHS Substance Misuse Services addressed more mental illness. However, the direct access VYPSS scores suggest that a large population of vulnerable young people may be experiencing drug or alcohol problems but remain outside of the current range of provision. Reviewing the Complexity Index offers insight for future refinements where greater separation between trajectories of use can be achieved. However, the Complexity Index appears to achieve its primary function in mapping the levels of complexity residing in each service. With the implementation of integrated treatment pathways for young people and improved planning through the Children and Young Peoples Partnership, follow-up studies may reveal the impact of these changes on the young person's treatment journey. This will help ensure that young people are receiving the most appropriate services from the most appropriate agencies.

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