Preferences for simultaneous polydrug use:
a comparative study of young adults in England and Denmark

Abstract

Cross-national surveys of young adults' simultaneous polydrug use are rare, as measuring polydrug use requires multiple questions capturing the timing, sequence and dosage of mixing drugs. This study proposes a new way of measuring simultaneous polydrug use by examining how preferences for simultaneous polydrug use (PSPU) vary amongst club/bar-goers in two European countries, Denmark and England, typically cited as exemplars of the normalisation of illegal drug use. The study considers the utility of the normalisation thesis for understanding preferences for polydrug use in the European night time economy (NTE).

An *in situ* survey of 1,298 young adults (18-35) conducted in 50 bars, pubs and nightclubs in England and Denmark assessed socio-demographics, substance use patterns and personal preference(s) for mixing alcohol and drug use. Multinomial regression analyses examined the relative risk of PSPU categories amongst those reporting drug use, according to socio-demographics, alcohol intake, frequency of intoxication and smoking.

Illicit drug use was more prevalent amongst young adults in England than Denmark. The difference was smallest for cannabis use: lifetime cannabis use is 66% in England and 58% in Denmark. Lifetime cocaine use was 38% in England and 17 % in Denmark. In England, young adults with drug experience preferred to mix alcohol with cocaine (65%). In Denmark, young adults with drug experience preferred to mix alcohol with cannabis (78%). In multinominal regression, Danish young adults' educational level was associated with PSPU, whereas in England legal substance use was associated with PSPU.

This study calls for a more *differentiated* understanding of normalisation. Preferences for mixing alcohol and drug use varied significantly cross-nationally (alcohol/cocaine, England; alcohol/cannabis, Denmark). Different factors are associated with PSPU in each country. In England, not Denmark, drinking behaviours appear to shape preferences for mixing alcohol with cocaine, suggesting caution should be taken when replicating harm reduction interventions.

Keywords:

Polydrug use, alcohol, young adults, normalisation, night time economy, cross-national surveys

Introduction

The 1990s represented a radical breakpoint for sociological theories of drug use (Hammersley, 2011), which traditionally focused on drug use within 'deviant' subcultures (e.g. Young, 1971; Blackman, 2010). Initiated by British researchers (Measham et al., 1994; Parker et al., 1998; Measham et al., 2001; Williams & Parker, 2001; Parker et al., 2002), the 'normalisation thesis' was the first to recognise how the practice of recreational drug use had become *culturally accommodated* and spread widely throughout the youth population, and younger adults without family responsibilities, with fewer distinctions according to gender, ethnicity and socio-economic status. The drug normalisation thesis identified new patterns of 'sensible' illegal drug consumption and saw them as a "barometer of changes in social behaviour and cultural perspectives" at that time (Parker et al, 2002, p. 943).

In 2005, reflecting on the status of the drug normalisation thesis, Parker acknowledged how simultaneous increases in alcohol consumption also fuelled this process of normalisation via the "blurring of the distinction within the recreational scene between the licit and illicit in psycho-active menus" (Parker, 2005, p. 201). For example, in the seminal North West Longitudinal Study 78% of the 'current drug-user' group reported drinking alcohol when they last took an illegal drug (Parker et al., 1998). Later, Parker (2007) invented the 'ACCE' profile to emphasise how drug treatment programs should focus on the mixing of alcohol, cannabis, cocaine and ecstasy (i.e. abbreviated ACCE).

Clinical studies have documented the synergistic properties of drug combinations (for an overview, see Connor et al., 2014), such as the enhancement of one drug, or the suppression of unwanted effects of a drug (i.e. drug craving, anxiety and agitation) by combining it with another drug (e.g. reducing the depressant effects of alcohol by combining it with stimulants such as cocaine (Marshall, 2006)). Qualitative studies have documented that young people are often very knowledgeable about how to combine various substances to produce or enhance the desired feeling of intoxication, controlled release from everyday stress or to reduce withdrawal symptoms (Merchant & MacDonald, 1994; Forsyth, 1996; Boys et al., 1997; Bahora et

al., 2009; Quinteor, 2009; Fletcher, Bonell & Rhodes 2009; Pennay & Moore, 2010). Quantitative studies have, with exceptions (Collins et al., 1998; Midanik et al., 2007, Quek et al., 2013, McKetin et al. 2014), focused on concurrent polydrug use (Newcomb et al., 1986; Scheier et al., 1994; Olszewski et al., 2010; Snitzman et al., 2013; Hedden et al., 2010; EMCDDA, 2009). That is the use of more than one drug (licit or illicit) during a specific period (a month, a year, or lifetime) (Single et al., 1974, Collins et al. 1998). However, simultaneous polydrug use (SPU) (i.e. the use of two or more substances on the same occasion) remains an empirical blind spot (Collins et al., 1998; Ives & Ghelani, 2006), most likely because measuring SPU in survey studies is not straightforward. It involves multiple, detailed questions capturing the timing, sequence and dosage of mixing drugs in varied settings (Schensul, Convey, & Burkholder, 2005; Martin, 2008). As a result, most previous studies of simultaneous use have limited their focus to a small sample of recreational drug users (Jenkinson et al. 2015) or a single polydrug use combination. For example, the use of ecstasy in combination with either alcohol or other illegal drugs (Redhead, 1993; Boys et al., 1997; Tossmann et al., 2001; Winstock et al., 2001; Barrett et al., 2005; Pedersen & Skrondal, 1999); the use of alcohol with prescription drugs (McCabe et al,. 2006); or mixing alcohol with either cocaine (Grant & Harford, 1990) or with cannabis (Norten & Colliver, 1988; Pape et al., 2009; Brière et al., 2011).

However, recent studies conducted in the night-time economy (NTE) in Australia focused on how alcohol intoxication (during a night out) is related to illicit drug use. A large NTE-survey found that a small sub-group of young males (9%) were both highly intoxicated and using illegal drugs while going out (Peacock et al. 2015). Another study in Australia showed that those young adults who had used illicit drugs had a higher blood alcohol level, as they were both more likely to pre-drink and because drug use was associated with prolonging their night out and thus their drinking (Pennay et al. 2014, Miller et al 2015). However, these studies did not distinguish between how different types of illicit drugs were used in combination with alcohol. Furthermore, they did not include a comparative perspective on how alcohol is used in combination with different types of illegal drugs in different countries.

In both England and Denmark drinking to intoxication has become normalised amongst both young people and young adults (Järvinen & Room, 2007). In a number of international surveys over the last 15 years, Denmark has had the highest number of young people reporting heavy episodic drinking, closely followed by young people in England (Hibell et al. 2012). Thus both countries face major harm reduction and health care system challenges (Rehm et al., 2003; Rehm et al., 2013). Furthermore, according to the most recent data from the European Monitoring Centre for Drugs and Drug Addiction (EMCDDA 2015, 2014), Denmark and United Kingdom (UK) are ranked amongst the top 10 countries on a list of lifetime cannabis and cocaine use in 27 European countries. In Denmark 46% of 15-34 year-olds (second highest in Europe), and in the UK 35% of those aged 15-34, report lifetime cannabis use, and in each country 10% and 13% respectively report lifetime cocaine use. Furthermore, in both countries amongst young adults (EMCDDA 2009) illicit drug use is strongly associated drinking heavily and overall lifetime polydrug use is reported by approximately one fifth of the adult population (Hoara & Moon, 2010, Armour et al. 2014). England and Denmark are – with their similar legal and illegal drugs trends – two interesting countries to compare to address a major gap in the normalisation literature, which is that cross-national survey data is rarely used.

To capture how *culturally accommodated* mixing alcohol with illegal drugs are, we have employed a new methodology for measuring SPU, capturing young people's *subjective interest* (Martin, 2008) in combining alcohol with different illegal drugs on the same occasion, which is a perspective much overlooked in quantitative studies of substance use amongst bar-and club-goers (Hunt, Moloney, & Evans, 2009). Thus, this study provides new insights regarding a large-sample of young English and Danish adults' varied subjective preferences for mixing alcohol and illegal drugs on the same occasion and this new knowledge contributes to a more complete sociology of 'normal substance use' (Hammersley, 2011). Before describing this methodology in more detail, we first outline the key concepts underpinning the drug normalisation thesis, and recent criticisms (Shildrick, 2002; 2008; MacDonald and Marsh, 2002), to contextualise and theorise patterns and preferences of polydrug use, and how these can vary across different groups of young adults nationally and cross-nationally.

The normalisation thesis and its critics

Key dimensions of the 'normalisation' of recreational drug use are that: (1) drugs are now widely available; (2) young people are normally 'drugwise', irrespective of drug-trying; (3) experimentation begins during the early teenage years; (4) pathways into regular, recreational drug use are now common amongst young people from a wide range of social backgrounds; (5) there has been a process of *cultural accommodation* into wider society (Measham et al., 1994; Parker et al., 1998; Parker et al, 2002); and most recently, (6) globalisation, means that similar processes and use of illegal drugs reinforce each other across different post-industrial countries (Parker, 2005). These processes were closely linked with the rise of the British dance/rave scene (Redhead, 1993) and as the dance and rave scene also spread to other Western countries, the drug normalisation thesis has come to dominate sociological studies of young people's recreational drug use outside the UK (Tossmann et al., 2001; Calafat et al., 2001; Duff, 2003; Duff, 2005; Sznitman, 2007; Järvinen, Demant, & Østergaard, 2010; Ravn, 2012; Fitzgerald, Mazerolle, & Mazerolle, 2013), particularly in countries with high prevalence rates of alcohol and illegal drug use (Sznitman et al., 2013).

Even in the early days of the normalisation thesis, critiques questioned whether the original arguments over-exaggerate the extent of drug use by young people and its pervasiveness in the NTE, particularly those studies citing crude increases in lifetime prevalence of illicit drug (Shiner & Newburn, 1997; Ramsay & Partridge, 1999). The counter-argument was that the *majority* of young people in the UK were refraining from using any illegal drugs and public attitudes towards drugs were certainly not unequivocally liberal or permissive, including amongst young drug-users themselves (Shiner & Newburn, 1997), and illicit drug use remained unusual and exceptional according to large-scale national studies, such as the British Crime Survey (Ramsey and Patridge 1999).

More recently, Shildrick (2002, 2008) and MacDonald and Marsh (2002) have argued that the use of such crude measures also ignores how different drugs are more or less normalized across different social groups,

concluding that a more *differentiated* understanding of 'normalisation' is required in order to unmask potential social and structural drivers of drug use and drug-related harms. Thus a *differentiated drug normalisation thesis* acknowledges that 'different sorts of drugs might be normalized for different groups of young people' (Shildrick, 2008, p. 181), and that structural inequality is still important in explaining why some groups of young people become involved in experimenting with particular types of illegal drugs. Hammersley (2011, p. 413) has subsequently called for a more comprehensive sociology of recreational drug use, arguing: "That drugs are more prevalent, commonplace and tolerated than they were does not mean that they are normalised anywhere, anytime". Similarly, Blackman (2004) has argued that normalisation is an 'untidy concept' often leading to over-generalisation and unable to distinguish between different types of drug use and potentially perpetuating the 'ambitious distinction between soft and hard drugs' (Blackman, 2004, p. 147). Duff (2011) describes this as the failure to recognize the importance of *cultural contexts* in shaping risk associated with drug taking and thus how some drugs become normalised.

In this study, our point of departure is that a *differentiated* understanding of normalisation is needed when examining, how preferences for *mixing illegal drugs with alcohol* varies in two European countries – England and Denmark – known for young people and young adults reporting very high rates of frequent intoxication and lifetime illegal drug use (EMCDDA, 2009; EMCDDA, 2014). The study is building on the methodological approach of previous *in situ* surveys undertaken in clubs and bars in England (Measham, Moore, & Østergaard, 2011) and Denmark (Ravn, 2012; Østergaard & Andrade, 2014, 2013; Østergaard & Skov 2014). First, the paper provides a cross-national comparison of the prevalence of young adults' preferences for combining, or not combining, alcohol with various illicit drugs. Secondly, by applying a multinomial regression analyses, it examines whether young adults' socio-economic status, frequent intoxication and/or regular smoking is associated with these preferences. Of particular interest is whether young adults who have tried an illicit drug but express they do not like to combine it with alcohol are different from those who either express they like to combine alcohol with cannabis only and/or from those who prefer to combine alcohol with other illegal drugs such as cocaine, ecstasy and amphetamine. This

interest springs from the argument of a differentiated understanding of normalisation, the need to distinguish between softer and harder drugs in order to reduce harms more effectively (Blackman 2004), and recent findings that stimulant use, but not cannabis use, is associated with heavy alcohol consumption amongst young people (McKetin et al 2014).

Methods

Procedure and Participants

Surveys were conducted in 50 licensed bars, pubs and clubs in England (26 venues) and Denmark (24 venues) during September and October 2011. In each country four types of cities/towns were purposively sampled for capturing potential variation in young adults' drinking patterns: (1) London and Copenhagen as capital cities; (2) a city where university students dominate the NTE; (3) a town where a military base influences the NTE; and, (4) a seaside town popular for drinking during holiday periods. In each city/town approximately six pubs, bars and clubs were contacted and the bar owners/managers were promised full anonymity, including no mention of their city/town (with the exception of the capital cities). The venues were chosen to represent a variety of drinking places: traditional pubs; upmarket drinking locations (often with a dance floor); mainstream nightclubs; and corporately-owned chain pubs/bars targeting younger people by offering cheap alcohol deals, such as a 'happy hour' and/or 'all you can drink for £10' (Chatterton & Hollands, 2002; Meier, 2011).

Two venues were unwilling to accommodate the interviews, and six venues were unable to accommodate them in an enclosed (often smoking) area. For the first two cases, two other venues with a similar profile agreed to participate. In the latter cases, with the owner/manager's approval, the survey was conducted outside the establishment and thus these refusals are unlikely to introduce substantial sample bias.

The survey was conducted by six trained researchers on Friday and Saturday nights between 9:00 p.m. and 5:00 a.m. Young adults who appeared to be between the ages of 18-35 were approached, informed of the

study and told that their participation was voluntary and that any information they gave would be treated with the highest confidentiality. The study was approved by the committee of the Danish Council for Independent Research and reported to the Danish Data Protection Agency.

A total of 1298 respondents were surveyed. In England, researchers approached 628 people and in Denmark, 670 people, with a refusal rate of 6% in both countries. The final analytical sample was 473 respondents from England and 546 from Denmark, as respondents were excluded if they were younger than 18 and older than 35 (20 in England and 29 in Denmark) and if they were too intoxicated, did not drink or had incomplete answers (in total 99 in the England and 56 in Denmark)..

Measures

The *in situ* survey included socio-demographic questions on age, gender and occupation, which were adapted from Lancashire Drug and Alcohol Action Team (LDAAT) NTE survey items, as these had been piloted and field-tested extensively in this context (Measham, Moore, & Østergaard, 2011). In addition, our survey asked about the young adults' average monthly income before tax using the following response categories: under £1200; £1200-1799; £ 1800-3000; more than £3000; 'Don't know'; or 'Don't want to answer' (these categories were converted into Danish currency in Denmark). The survey also included an item on respondents' highest level of education (including current courses) using the following response options: secondary school (e.g. GCSE); further education college (e.g. A/AS Level); university diploma/degree (e.g. BA); or higher Degree (e.g. MA, PhD, etc.).

Questions on alcohol consumption, cigarette smoking and drug use were also based on the Lancashire DAAT items as they have been found to be acceptable and reliable in the context of NTE surveys (Measham, Moore, & Østergaard, 2011). Total alcohol consumption on the night of the interview was assessed by asking the respondents to list the size, brand, number and type of alcoholic beverages (e.g. beer, wine, hard cider or spirits) they had been drinking at the time of interview. The respondents' total units

consumption was then calculated using the UK standard of one unit containing 8 grams of pure alcohol (i.e. using the website drinkaware.co.uk). Outliers were defined as persons who had consumed more than 60 units of alcohol. Few respondents (0.8% in England and 0.5% in Denmark) reported drinking more than the maximum of 60 units. Another measurement for alcohol consumption was also asked. Frequency of alcohol intoxication in the last 30 days was assessed using an open response category. The item on cigarette smoking used three self-report response categories: regular smoker (i.e. smoking daily), non-regular smoker (i.e. smoking at only parties/social events), non-smoker.

To examine patterns of drug use, respondents were asked about lifetime, past year, and past month drug use, as well as potential drug use on the night of the interview. These questions on illicit drug use listed 14 different illegal/illicit substances (cannabis/skunk, cocaine, ecstasy pills, MDMA powder/crystal, ketamine, amphetamine, GBH/GBL, mephedrone, heroin, mushrooms, LSD, steroids, methamphetamine, other). Preferences for simultaneous polydrug use (PSPU) were identified by asking respondents reporting prior drug use an additional question in which they were asked to list all the drugs they *most* liked to combine with drinking alcohol. The question emphasised no order or limit of PSPU only that combining drinking and taking the drug(s) should be something they had a subjective interest in doing. They also had the option of answering 'I don't mix illegal drugs and alcohol'.

Statistical Analyses

Descriptive analyses were first conducted to examine cross-national differences and similarities in young adults' socio-economic status and substance use patterns, including the country specific prevalence of PSPU for young adults with previous illicit drug experience. To assess how drug-consuming young adults' PSPU profile was associated with socio-demographic differences and previous licit drug use (alcohol and cigarette smoking) we conducted a multinomial logistic model using Stata. To examine differences between the group of young adults who identified with PSPU with those who had taken illicit drugs but did not express a desire to mix alcohol and drug use simultaneously, we constructed a three category dependent variable with the

category (a) as the 'baseline'. The categories were: (a) used drugs but did not identify with PSPU (i.e. they preferred not to mix drugs and alcohol); (b) used drugs and liked to combine drinking alcohol with cannabis *only*; (c) used drugs and liked to combine drinking alcohol with drugs other than cannabis, such as cocaine, ecstasy and amphetamine. We chose a researcher-driven typology as opposed to an empirically-driven categorisation (i.e. latent class analysis, e.g. Quek et al. 2013) because we are particularly interested in examining the characteristics of young adults who prefer mixing alcohol and cannabis *only* (Duff et al. 2012). This was due to the empirical finding (see below), that preferences for combing alcohol and cannabis were more common in Denmark than England, but also because a more differentiated understanding of normalisation calls for the need to elaborate on preferences for specific drug combinations.

We fitted separate multinomial models for England and Denmark (Table 5 & 6) using cluster-robust standard errors because the data have a hierarchical structure with individuals clustered within locations (clubs and bars). This allowed us to take the contextual effect of the venue into account without making further parametric assumptions.

Results

In both countries participants' mean age was 23 years. However, in England men were more likely to participate and significant educational, occupational and income differences between the two countries were also apparent (see Table 1). The latter most likely due to different educational systems contexts in each country, as young people in Denmark finish school at a later age and higher education usually involves full-time continuation until mid-/late-twenties and completion of a Master's degree (McIntosh & Munk, 2009). Smoking cigarettes and drinking to intoxication within the previous 30 days was more prevalent amongst the young adults in England than in Denmark. However, club- and bar-goers in England and Denmark had on average consumed the same amount of alcohol (14 units).

TABLE 1 ABOUT HERE

Overall, lifetime drug use was more prevalent in the English compared to the Danish sample (70% vs 61%). Cannabis was the most widely used drug, with lifetime prevalence slightly higher in England (66%) compared to Denmark (58%); cocaine was the second most common drug used, but the proportion reporting use was twice as high in England (38%) than Denmark (17%). In England, the third and fourth most widely used drugs were MDMA (27%) and ecstasy pills (26%), respectively. In Denmark the third most widely reported drug was amphetamine (15%), whereas MDMA and ecstasy had a lifetime prevalence of only 8% and 10%, respectively. The country differences in past year drug use resemble differences in lifetime drug use. In both countries cannabis was the most widely used drug. Except for amphetamine, overall past-year drug use was more prevalent in England.

<div align="center">TABLE 2 ABOUT HERE</div>

The following analyses of PSPU in Denmark and England was based on the subsample of drug-consuming young adults (i.e. those reporting lifetime illicit drug use); 330 (70%) young adults in England and 332 (61%) young adults in Denmark. However, before we fitted the separate multinomial models for PSPU, we examined what characterised those who reported illegal drug use in Denmark and England respectively. This logistic regression analysis (not shown, but can be downloaded at http://www.sfi.dk/media/2414/appendix-a.pdf) revealed that in both countries being male, older, frequently drinking to intoxication and smoking (both regular and non-regular smoking) increased the likelihood of using illegal drugs. However in Denmark young adults with a degree (a B.A.) were less likely to experiment with illegal drugs compared to those with a secondary/upper secondary degree. In England, using illegal drugs was not associated with young people's education level. In Denmark, living in Copenhagen was strongly associated with young adults reporting illicit drug use. In England, however, the geographic pattern was less clear, as young adults who lived in a seaside town were less likely to report never having tried a drug than young adults living in London.

PSPU, shown in Table 2, revealed that amongst young adults who have tried any illegal drug, more than half in both England and Denmark reported no interest in using drugs when drinking (i.e. no PSPU). The most striking cross-national difference was in the choice of preferred drug amongst those reporting PSPU: in Denmark there was a fairly equal distribution between those preferring to mix alcohol and cannabis only (19%) and those preferring to mix alcohol and other drugs such as cocaine, ecstasy and amphetamines (23%); in England, the prevalence of preferring to mix alcohol with drugs such as cocaine, ecstasy and amphetamines was 39% – more than 5 times higher than the prevalence of those reporting a preference to mix alcohol and cannabis only (7%). Country-specific differences in illicit drug use preferences are presented in more detail in Table 3 and 4. Table 3 shows the PSPU prevalence for specific drugs amongst young adults who had used illegal drugs and who responded that they liked to combine drinking alcohol with taking illicit drugs.

TABLE 3 & 4

In England, cocaine (65%) was the most popular illicit drug to mix simultaneously with alcohol drinking; significantly more popular than amongst drug-consuming club- and bar-goers in Denmark (42%). In contrast, in Denmark mixing alcohol and cannabis use was much more popular amongst young adults with drug experience (78% vs 52%). Furthermore, MDMA was found to be a relatively popular drug to combine with alcohol in England (29%) compared with Denmark (13%). Amphetamines were the third most popular drug used in combination with alcohol in Denmark (30%), but relatively unpopular in England (13%).

To account for lifetime drug use and PSPU, Table 4 shows the cross-national comparisons of specific lifetime drug use and related-PSPU. Among lifetime users of specific drugs, the prevalence of mixing cocaine, cannabis, amphetamine and ketamine with alcohol was significantly greater in Denmark than England. Prevalence of mixing MDMA, ecstasy and mephadrone with alcohol were not significantly different between countries.

TABLE 5 & 6

Table 5 and 6 shows the result of the multinomial logistic regression for each country with those respondents who had tried illicit drugs but did not identify with PSPU forming the baseline category. For each model, *adjusted* relative risk ratios (RRRs) are presented along with confidence intervals. In England, the subjective interest in mixing alcohol with other illicit drugs than cannabis increased with being male, with age, with frequent intoxication during the previous 30 days and with regular smoking. Likewise in Denmark we find that being male and of older age increased the likelihood of reporting a preference for mixing alcohol with drugs other than cannabis. But we also found that young adults' educational background was statistical significant. Thus students compared to non-students were significantly more likely to prefer to combine drinking alcohol with cannabis use or to combine alcohol with drugs other than cannabis. Respondents with only either a secondary/upper secondary degree as their highest degree level of education were more likely to prefer to combine alcohol with illicit drugs other than cannabis compared to those with a BA or MA. In England none of the measures of socio-economic status (SES) and education were significantly associated with PSPU. Finally, preferences for mixing alcohol with cannabis and/or other drugs did not vary by place *within either country*, which further suggests the presence of *national level distinctions*.

Discussion

England and Denmark are nations characterised by high levels of alcohol and illicit drug consumption and where the normalization thesis has dominated the sociological study of recreational substance use (Parker et al., 1998; Aldridge, Measham, & Williams, 2011; Järvinen, Demant & Østergaard, 2010; Järvinen & Demant, 2011). To approach and understand young people's polydrug use in a cross-national perspective,s these two countries are more comparable than any of the other European countries, including the other Scandinavian countries that Denmark is often compared to.

In this large-scale survey of club- and bar-goers, we illustrate some cross-national similarities but also the need for more differentiated understandings of normalisation due to significant differences in patterns and preferences for polysubstance use. Overall, our study revealed that the prevalence of PSPU was high in this population in both countries: we found that, amongst those who had tried illegal drugs, 46% of participants in England and 43% in Denmark explicitly expressed that they like to simultaneously combine drinking alcohol with other drug use. Thus, if there is sufficient illicit supply and these young adults were to act on their subjective interest, almost half of them would intentionally mix alcohol and drugs on a night out. These data are supported by the more well-established research examining the effects of positive expectations on behaviour, particularly how positive alcohol expectations are associated with earlier initiation and more frequent and heavy alcohol consumption (Hull & Bond, 1986; Aarons et al. 2001). Although our PSPU measurement is not as sophisticated as larger expectancies scales, validated effect expectancies scales for drug use are still in their infancy and under-developed (Aarons et al. 2007) and may not be feasible to include within an NTE-study of polysubstance use. Thus expressing a subjective interest in combining alcohol with illegal drugs can be approached as a simple measurement of positive expectations, which is embedded in past illicit drug use, but also relates to present licit drug use and future intentions.

Our findings suggest the need for an even stronger focus on the mixing of multiple licit and illicit substances within public health strategies in such contexts. Many drug prevention and harm reduction initiatives still often concentrate on single substances, ignoring the increased health harms associated with simultaneous use of alcohol and other drugs (Starmer & Bird, 1984; Hearn et al., 1991; Wozniak & Linnoila, 1992; Pennings et al., 2001). In particular, alcohol and cocaine, which appear to be the combination of choice amongst drug-consuming club- and bar-goers in England, are associated with more acute behavioural and cardiac risks when mixed (Higgins et al., 1993). For example, they each elevate extra neuronal dopamine and serotonin levels and this may lead to more uncontrolled and violent behaviour (Dornbusch et al., 1999). Thus a more detailed knowledge about young adults' preferences for polydrug use can also guide harm reductions strategies to focus on how the role of alcohol intoxication both effects potential illegal drug-taking decisions,

shapes potential harms, and produces cross-tolerance and/or more unpredictable, additive effects (Norton & Colliver, 1988; Collins et al., 1998).

This study also found respondents in England reported more experience of drug use and mixed a wider range of drugs, which is consistent with previous exploratory research (Measham & Moore, 2009). Overall, polydrug use patterns and preferences reported in these two countries varied in several ways, which suggests that claims of globalised processes of normalisation may be overstated (Parker, 2005) – with England potentially entering a period of *post-normalisation* beyond what previous relatively 'sensible' patterns of drug use within the NTE. In England, club- and bar-goers reporting PSPU most commonly preferred to mix alcohol with cocaine (65%, as opposed to 42% in Denmark). This strong preference for mixing alcohol and cocaine use, rather than cannabis or other drug use, within the English NTE represents a departure from the original theory of drug normalisation developed in the 1990s, which:

> "Refers only to the use of certain drugs, primarily cannabis but also nitrites, amphetamines and equivocally LSD and ecstasy. Heroin and cocaine are not included in the thesis. Similarly chaotic combination drug use and dependent 'daily' drug use form no part of our conceptualization" (Parker et al., 1998, p. 152).

This study also suggests that mixing alcohol with cocaine use is much more widespread and *culturally accommodated* in some countries, such as the UK – a finding supported by other, cruder, studies of concurrent poly-substance use (EMCDDA, 2009; Smith et al., 2011). That young Danes in our study also expressed much less interest in combining alcohol with cocaine could be linked to lower levels of experimentation due to differences in price and availability between Denmark and the UK. Cocaine is, according to the EMCDDA (2015), more expensive in Denmark than England, but so is cannabis. Likewise, an equal percentage of people liked to combine alcohol with MDMA or ecstasy with alcohol, even though lifetime drug use of both drugs were also very different in the two countries. Not only does this highlight

the need for a more nuanced version of the normalization thesis, which is quantified and differentiated *cross-nationally*, but it also highlights the dynamic nature of normalization *within countries over time*: for example, our study suggests a trend in the interest amongst young club- and bar-goers in England towards mixing heavy alcohol use with cocaine in the NTE rather that alcohol and ecstasy use, which dominated previous studies of the dance and rave scene (Tossmann et al., 2001; Winstock et al., 2001; Carlson et al., 2005).

While this study does not question the extent and pervasiveness of drug use in the NTE in these contexts (Shiner & Newburn, 1997; Ramsay & Patridge, 1999), it does support more recent concerns that the uncritical use of the normalization may sometimes lead us to ignore important differences in the extent and pervasiveness of drug use across different social groups or contexts (MacDonald & Marsh, 2002; Shildrick, 2002; Shildrick, 2008). First, in our study in both countries females were less likely to report illegal drug use so the concept of normalization irrespective of gender may also be premature within this population of club- and bar-goers aged 18-35 (Parker et al., 1998; Measham et al., 2001). Second, while the normalisation thesis suggests that few distinctions in recreational drug use remain intact according to SES and level of education (Measham et al., 1994; Parker et al., 1998; Measham et al., 2001; Williams & Parker, 2001; Parker et al., 2002), this study suggests that, while this may remain the case in England, this does not appear to hold in Denmark. In Denmark, attending either secondary/upper secondary schools increased the likelihood of trying drugs, but also having a preference for mixing alcohol with 'harder' drugs. This finding was not replicated in England, where lifetime use and PSPU of harder drugs was only associated with excessive drinking and smoking. Thus, in both countries increased legal drug use (alcohol and cigarette smoking) made a difference in whether the young Danes were ever engaged in illegal drug use. But in England young adults' subjective interest in mixing drugs was only associated with a high level of smoking and drinking.

However in both countries, young adults who prefer to mix alcohol with 'harder' drugs were the most distinguished group. The group who prefer to mix alcohol and cannabis resemble those young adults who do

not identify with PSPU, but have tried drugs. The small sample size, particularly in England, might be one reason why the group who preferred to combine alcohol and cannabis were not notably different from those with no-PSPU. However, the results for the group who preferred to mix alcohol with other drugs supports the need to distinguish between what types of illegal drugs are combined with alcohol and thus the need for a more differentiated normalisation approach to polydrug use.

While this new method to measure young adults' PSPU is a strength in this study, we acknowledge that a limitation is the uncertainty regarding whether they can and do act on their preference(s). However, this short but detailed question on young adults' subjective interest in which licit and illicit drugs they like to use in combination is feasible to ask within NTE *in situ survey* and also addresses a major gap in the evidence to date. We suggest that our PSPU measurement is replicated to capture future trends in simultaneous polydrug use patterns, which may also help to provide valuable 'early warnings' if certain 'high risk' new drug combinations (such as for instance combing alcohol with GHB/GBL) become of interest amongst young adults in a number of different European countries (EMCDDA, 2009). Future *in situ* NTE surveys would also benefit from being extended to examine the association between expressing a preference for mixing alcohol with illegal drugs and actual mixing of alcohol with illegal drugs, including the timing and sequence of mixing and the relationship between the dose of drugs and quantity of alcohol consumption (Schensul, Convey, & Burkholder, 2005; Ives & Ghelani, 2006; Wibberley & Price, 2000). Unfortunately, such questions could not be measured in this survey with the resources available. Concepts measured via these questions, such as drinking episodes and preferences for polydrug, may also be culturally sensitive and therefore interpreted differently in different counties, which could explain some of the variations observed.

Another methodological limitation is the purposive, rather than random, sample of cities/town and NTE venues used to identity club- and bar-goers. The cross-national differences and associations observed are not therefore necessarily representative or generalizable to the wider population of young adults in either country. Nonetheless, our sampling method ensured diversity in location of recruitment and allowed us to

make meaningful cross-national comparisons to demonstrate major country-specific differences in the preferences and characteristics of drug-experienced young adults. The study also addresses the limitations of previous qualitative studies (Forsyth, 1996; Boys et al., 1997; Bahora et al., 2009; Quinteor, 2009; Pennay & Moore, 2010), which cannot estimate the overall prevalence and associations of polysubstance.

To our knowledge, the analyses provide the most detailed, quantitative picture of preferences for simultaneous polydrug use in NTE in both England and Denmark to date. However, the absence of qualitative data decontextualizes lived experience of drug use in these contexts (Rhodes, 2009), and thus to make up for this limitation, we recommend that future cross-national, comparative research in this area includes a mix of methods to both quantify and contextualise the differentiated and dynamic nature of 'normalisation'. For example, future cross-national surveys would benefit from integrated comparative qualitative studies to understand the meaning and cultural context of why cannabis is so popular to mix with alcohol in Denmark, while less so in England. The danger is that otherwise, by relying on only quantitative data of simultaneous polydrug use, future empirical studies perpetuate the view that 'normalisation' is a purely epidemiological phenomenon based on quantifiable 'tipping points' (Shiner & Newburn, 1997). Drawing on qualitative data would also enable exploration of how the role of macro-level societal factors, such as the price and availability of different drugs, may impact on polydrug use preferences and patterns in different national contexts.

Conclusion

This study suggests the need for a new 'differentiated normalisation' thesis of drug use, particularly when conducting cross-national studies, for three reasons. First, there are major cross-national variations observed in lifetime prevalence of cannabis, cocaine, and ecstasy use. Second, the significant country-specific differences in what drugs young adults like to combine with alcohol. Third, the country-specific differences in what factors are associated with mixing alcohol and drugs. In England, our data largely confirm the thesis that preferences for polydrug use has spread into all sections of this population of 18-35 club- and bar-goers

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in terms of SES and education and as such "differences between some population sub-groups are becoming less polarized and more subtle" (Measham et al., 1994, p. 309), although gender may still be a significant protective factor against the most harmful patterns of polydrug use. In Denmark, socio-economic and educational background remain associated with club- and bar-goers subjective interests in mixing alcohol and illicit drugs: preferences for combining cannabis with alcohol is mainly limited to student populations, whereas preferences for combing alcohol with cocaine and other drugs is associated with lower educational levels. These data suggest multiple cultural sociologies of recreational drug use are required to inform national drug policies, rather than standardised cross-national version of 'normalisation' (Sznitman et al., 2013) and caution should be taken when replicating targeted NTE harm reduction interventions internationally.

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Table 1: Characteristics of survey respondents.

	England (n = 473)	Denmark (n = 546)
Categorical variables		
	%.	*%*
Gender*		
Female	42.3	49.3
Male	57.7	50.7
Occupation***		
Student	23.3	55.5
Not at student	76.7	44.5
Education***		
Secondary/upper secondary	36.2	52.9
Diploma/Bachelor degree	48.0	23.1
Graduate degree	15.9	24.0
Income***		
Less than £1200	40.0	46.2
£1200-1799	25.8	18.7
£1800-3000	23.7	18.5
Above £3000	10.6	16.7
Regional area***		
Capital	43.6	53.1
University city	19.7	23.1
Seaside town	19.7	12.5
Military town	17.1	11.4
Smoke*		
Non-smoker	37.4	45.1
Non-regular smoker	20.7	17.0
Regular smoking	41.9	37.9
Drug use		
*Lifetime drug**	69.8	60.8
*Lifetime: Cannabis**	66.2	58.3
*Lifetime: Cocaine***	37.5	17.1
*Lifetime: MDMA***	27.3	8.1
*Lifetime: Ecstasy***	26.2	9.5
*Lifetime: Ketamine***	18.0	4.6
*Lifetime: Mushrooms***	16.3	8.3
Lifetime: Amphetamine	14.6	15.4
*Past year***	49.9	39.4
Past year: Cannabis	40.1	35.7
*Past year: Cocaine***	26.0	9.0
*Past year: MDMA***	19.2	4.2
*Past year: Ecstasy***	14.8	2.0
*Past year: Ketamine***	7.8	0.7
*Past year: Mushrooms***	5.0	1.8
Past year: Amphetamine	5.2	7.0

Continuous variables										
	Mean	Median	Std. Dev.	Min	Max	Mean	Median	Std. Dev.	Min	Max
Age	23.3	23	0.2	18	35	22.9	22	0.2	18	35
Times intoxicated last 30 days***	4.9	4	0.2	0	11	3.3	2	0.2	0	11
Total number of units# on night	14.1	11.9	0.5	0	60	13.7	12.1	0.5	0	60

Note: *** P < 0.001, ** P < 0.01; * P < 0.05. The difference between the two countries on the categorical variables has been tested using a chi-square test. The difference between the two countries on the continuous variables has been tested using both a t-test and non –parametric test (Kruskal Wallis rank test). #Units are defined as a UK unit containing 8 grams of pure alcohol.

Table 2. Measurement for preferences for simultaneous polydrug use (PSPU)

	England		Denmark	
	%	*n*	*%*	*n*
PSPU profile***				
(a) Used drugs, but does not mix drugs and alcohol	53.9	(178)	57.5	(191)
(b) Preference for combining alcohol and cannabis	6.7	(22)	19.3	(64)
(c) Preference for combining alcohol and other illicit drugs (e.g. cocaine, MDMA, ecstasy, etc.)	39.4	(130)	23.2	(77)
Total	100	(330)	100	332

Note: *** $P < 0.001$, ** $P < 0.01$; * $P < 0.05$. The difference between the two countries on the categorical variables has been tested using a chi-square test.

Table 3: Ten most prevalent PSPU amongst young adults with a preference for combining alcohol and illicit drug use, amongst drug-consuming club/bar-goers (ranked according to England)

Preference for mixing alcohol with:	England (n = 152) %	Denmark (n = 141) %
1. Cocaine***	64.5	41.8
2. Cannabis***	52.0	78.0
3. MDMA***	36.8	12.8
4. Ecstasy***	28.9	12.8
5. Mephedrone***	15.1	3.5
6. Amphetamine***	12.5	29.8
7. Ketamin***	11.8	6.4
8. Other drugs (e.g. Bubble, Legal herbal high & Party pills)**	9.2	2.1
9. LSD	7.9	7.1
10. Mushrooms	6.6	7.8
11. Other illegal drugs (e.g. GHB/, GBL, Methamphetamine, steriods and heroin)#	5.3	7.3

Note: *** P < 0.001, ** P < 0.01; * P < 0.05. The difference between the two countries has been tested using chi-square test.
preferred PSPU drug types <5%

Table 4: Lifetime drug use and PSPU#

Lifetime specific drug use and preference for mixing that illicit drug with alcohol:	England (n = 152) %	Denmark (n = 141) %
1. Cocaine lifetime drug use and preference for alcohol+cocaine*	75.0	90,2
2. Cannabis lifetime drug use and preference for alcohol+cannabis ***	55.2	82.1
3. MDMA lifetime drug use and preference for alcohol+MDMA	54.9	54.6
4. Ecstasy lifetime drug use and preference for alcohol+ecstasy	48.3	48.6
5. Mephedrone lifetime drug use and preference for alcohol+mephedrone	43.0	83.1
6. Amphetamine lifetime drug use and preference for alcohol+amp***	32.1	67.0
7. Ketamin lifetime drug use and preference for alcohol+ketamin**	26.9	47.4

Note: *** P < 0.001, ** P < 0.01; * P < 0.05. The difference between the two countries has been tested using chi-square test.
preferred PSPU drug types <10%

Table 5: Multinomial logistic regression results for preference for simultaneous polydrug use, amongst drug-consuming club/bar-goers in England

	No preference (n=178)	Preference for combining alcohol and only cannabis (n=22)		Preference for combining alcohol with also other illicit drugs (n=130)	
	Baseline	RRR	(95% CI)	RRR	(95% CI)
Gender					
Female	-	Ref	-	Ref	-
Male	-	1.65	(0.54-4.98)	2.20**	(1.32-3.66)
Age	-	0.88	(0.77-1.00)	1.09**	(1.02-1.16)
Occupation					
Not a student	-	Ref	-	Ref	-
Student	-	1.06	(0.50-2.25)	0.59	(0.29-1.91)
Education					
Secondary/upper secondary	-	Ref	-	Ref	-
Diploma/Degree BA	-	1.47	(0.59-3.30)	1.04	(0.59-1.84)
MA	-	0.58	(0.11-2.84)	0.72	(0.28-1.67)
Income					
Less than £1200	-	Ref	-	Ref	-
£1200-£1799	-	2.06	(0.85-4.96)	0.88	(0.42-1.86)
£1800-£3000	-	1.35	(0.56-3.14)	0.60	(0.27-1.34)
More than £3000	-	1.47	(0.22 -9.98)	0.74	(0.30-1.81)
Times intoxicated last 30 days	-	0.98	(0.84-1.11)	1.15***	(1.07-1.23)
Smoking					
Non-smoker	-	Ref	-	Ref	-
Non-regular smoker	-	0.45	(0.11-2.06)	1.33	(0.62-2.90)
Regular smoker	-	0.69	(0.28-1.68)	2.08*	(1.04-4.18)
City					
Capital	-	Ref	-	Ref	-
University city	-	0.53	(0.16-1.71)	1.04	(0.43-2.47)
Seaside town	-	0.54	(0.23-1.31)	0.98	(0.53-1.81)
Military town	-	0.44	(0.17-1.19)	0.74	(0.33-1.65)
Constant		2.52	(0.08-78.19)	0.02	(0.00-0.20)

Pseudo R^2: 0.09

Obs. n= 330

Note: *** $P < 0.001$, ** $P < 0.01$; * $P < 0.05$

Table 6: Multinomial logistic regression results for preference for simultaneous polydrug use, amongst drug-consuming club/bar-goers in Denmark

Denmark	No preference (n = 191)	Preference for combining alcohol and only cannabis (n = 64)		Preference for combining alcohol with also other illicit drugs (n = 77)	
	Baseline	RRR	(95% CI)	RRR	(95% CI)
Gender					
Female	-	Ref	-	Ref	-
Male	-	1.32	(0.74-2.38)	2.09*	(1.09-4.02)
Age	-	1.03	(0.97-1.11)	1.09*	(1.01-1.18)
Occupation					
Not a student	-	Ref	-	Ref	-
Student	-	2.37*	(1.16-4.84)	2.67*	(1.04-6.87)
Education					
Secondary/upper secondary	-	Ref	-	Ref	-
Diploma/Degree BA	-	0.51	(0.22-1.18)	0.31**	(0.13-0.76)
MA	-	0.68	(0.29-1.58)	0.25**	(0.08-0.80)
Income					
Less than £1200	-	Ref	-	Ref	-
£1200-£1799	-	1.21	(0.59-2.47)	1.69	(0.81-3.50)
£1800-£3000	-	0.65	(0.23-1.78)	1.47	(0.76-2.84)
More than £3000	-	0.78	(0.30-2.05)	2.26	(0.64-7.94)
Times intoxicated last 30 days	-	0.97	(0.88-1.08)	1.01	(0.88-1.15)
Smoking					
Non-smoker	-	Ref	-	Ref	-
Non-regular smoker	-	0.72	(0.31-1.64)	0.67	(0.26-1.70)
Regular smoker	-	1.04	(0.62-1.78)	1.11	(0.53-1.98)
City					
Capital	-	Ref	-	Ref	-
University city	-	1.22	(0.45-3.31)	1.81	(0.67-4.94)
Seaside town	-	1.95	(0.77-4.93)	1.02	(0.38-2.73)
Military town	-	0.62	(0.20-1.90)	1.15	(0.45-2.93)
Constant		0.12	(0.01-1.03)	0.02	(0.00-0.50)

Pseudo R^2: 0.06

Obs. n = 332

Note: *** P < 0.001, ** P < 0.01; * P < 0.05