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(Re)conceptualizing “polydrug use”: Capturing the complexity of combining substances.

Pekka Hakkarainen¹, Aileen O’Gorman², Francois Lamy³, and Kati Kataja⁴

¹ Alcohol, Drugs and Addictions Unit, National Institute for Health and Welfare, Helsinki, Finland.

² School of Education and Social Sciences, University of the West of Scotland, UK

³ Faculty of Social Sciences and Humanities, Mahidol University, Thailand

⁴ Faculty of Social Sciences, University of Lapland, Finland

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Abstract

The use of multiple psychoactive substances is a widespread phenomenon among people who use drugs. Yet, the concept of polydrug use is poorly defined in the social sciences aside from some vague acknowledgment of the type of substances taken and the timing of their ingestion. As a result, theoretical and empirical knowledge of polydrug use is underdeveloped; approaches to measuring polydrug use are inconsistent; and understanding the cultural meanings of combining substances is limited.

This article is based on a collaborative synthesis of three qualitative case studies of polydrug use from four countries: Australia and France, Finland, and Ireland. These studies explored the practice of substance combination, or ‘combos’, using the lens of intentionality, functionality, and social and structural influences. In addition, the studies shared a common concern with teasing out the

rationale and controls used to balance pleasures with risks, beyond the simple physiological or sensory effects of substances.

Our analysis leads us to recommend a standard definition of polydrug use be adopted for future social science research—that is, the ingestion of two or more substances in combination, at the same time or in temporal proximity, so that the effects of different substances overlap. For analytical purposes, we suggest two sub-categories: simultaneous and sequential intake.

Moreover, we contend that it is the intention, meaning and socio-structural context underpinning the use of substance combinations that is central to understanding polydrug use. We suggest the adaptation of Zinberg's (1984) concept of 'drug, set and setting' as a useful framework for in-depth analyses of these influential factors—drug combos (the effects of using substances together or in sequence within a short time frame); set (agency, rational choice, and expectations); and setting (social bonds in use sessions, and broader social and structural environmental contexts).

Keywords

Polydrug use; substance combinations; drug, set and setting; drug-using repertoires; qualitative research, situated context

Introduction

The number of academic publications on the topic of "polydrug use has increased considerably in the past two decades. A Web of Science search conducted at the end of 2017 (using terms such as 'polydrug*', 'polysubstance*', 'multiple drug*', and 'mixed drug*') found that the volume of publications had grown tenfold since the 1970s and 1980s (Kataja, Tigerstedt & Hakkarainen, 2018b). Currently, around 200 articles are published annually on this theme. While a majority of these studies originate from the natural sciences, such as toxicology, pharmacy, neurosciences, and

psychiatry, a growing interest in polydrug use is evident in the social sciences (e.g., Tomczyk, Isensee & Haanewinkel, 2016).

Current practice in social science makes a distinction between two types of polydrug use based on the timing of the ingestion of multiple substances. The term 'concurrent polydrug use' refers to the use of two or more substances within a given period of time (e.g., a month or year), whereas 'simultaneous polydrug use' is used to describe the ingestion of two or more substances in combination at the same time or in temporal proximity (Martin, 2008). This sounds clear, but, in fact, this temporal dichotomy of polydrug use creates much perplexity in the research field. As noted by Schensul, Convey and Burkholder (2005, p. 571), 'existing approaches to measure polydrug use are confusing and inconsistent.' Consequently, theoretical and empirical knowledge of polydrug use remains scarce and underdeveloped. Moreover, our understanding of users' intentions, their drug use controls, and the social and cultural meanings of substance combinations is limited (Quintero, 2009). Neither do we know the mechanisms or situational factors leading to polydrug use (Hakkarainen & Metso, 2009).

In fact, polydrug use is a complex and nebulous phenomenon that is challenging to define unambiguously. Indeed, though the use of multiple psychoactive substances (including illicit drugs, alcohol, psycho-pharmaceutical medicines and non-controlled substances) is a widespread and increasingly acknowledged practice, the concept of polydrug use, as it is applied by the scientific community, is poorly defined. In this article, we propose a new concept and definition of polydrug use to provide a solid foundation for future drugs research. Based on our individual empirical research studies (conducted in Australia and France, Finland, and Ireland), we contend that it is the intention, meaning and socio-structural context underpinning the use of substance combinations that is central to understanding polydrug use.

Current conceptual difficulties with polydrug use

Most of the current research on polydrug use focuses on listing the substances used within a given time period without any deeper exploration of the specific characteristics of the phenomenon (Boeri, Sterk, Bahora & Elifson, 2008; Tomczyk et al., 2016). In the field of quantitative research, Smith, Farrell, Bunting, Houston & Shevlin (2011) developed three categories of analysis based on the number of substances used and the frequency of use: wide range polydrug use, moderate range polydrug use, and no polydrug use. Alternatively, Font-Mayolas et al. (2013) based their categorizations on substance repertoires: alcohol and tobacco; cannabis, alcohol and tobacco; and cannabis, alcohol, tobacco with one of the following—ecstasy, cocaine, amphetamine, LSD, or heroin. These kinds of lists, often based on Latent Class Analysis, are also used to categorize the people using these drugs. One basic problem with these lists is that the repertoires, or combinations of substances people are using, may vary from one situation to another (e.g., Boys et al., 1999; Boys, Marsden & Strang, 2001). A further problem arises when tobacco is included, as polydrug use appears to be decreasing due to the downward trend of smoking in contrast to when it is excluded (Karjalainen, Kuussaari, Kataja, Tigerstedt, & Hakkarainen, 2017).

Another conceptual difficulty lies in the broad variation of timespans used in existing definitions, especially with regard to concurrent polydrug use. Concurrent polydrug use has provided a practical analytical tool for drug prevalence studies that measure the use of separate substances. These studies estimate polydrug use by calculating how many survey respondents have used more than one substance within a given time period. However, the time period used in these measurements may vary from lifetime prevalence to last year, last month and last two weeks prevalence (see Tomczyk et al., 2016). These large variations in timespan create large variations in the results of polydrug prevalence. Moreover, since there is no established practice of how to measure polydrug use, the results from different studies are barely comparable, and therefore the overall picture of

the prevalence of polydrug use remains vague (Karjalainen et al., 2017). Similarly, the comparability of the results of different studies across countries remains weak.

Furthermore, the concurrent polydrug use approach does not address *the concept* of polydrug use. From our point of view, the rationale for the study of polydrug use as a separate phenomenon is that it induces both particular pleasures and particular risks. The occasional concurrent use of two or more substances captured by the concept of concurrent polydrug use in drug prevalence studies (for example, using cannabis once or twice and trying ecstasy at a party in addition to some weekend drinking during a year), does not add to our understanding of the intended pleasures or possible harms of the use of multiple substances.

Despite the acknowledgement of these difficulties with the measurement and conceptualization of polydrug use by many scholars (see Boeri et al., 2008; Hunt, Evans, Moloney & Bailey, 2009; Ives & Ghelani, 2006; Lamy, 2014; Quintero, 2009; Shensul et al., 2005), and the constant and significant increase in the volume of publications dealing with polydrug use (Kataja et al., 2018b), there has been no clarification of conceptual issues, and no concrete proposals to resolve the situation. Hence, in order to develop a better research practice for improving our understanding of the phenomenon, the concept of polydrug use needs to be re-defined and applied in a more consistent way. This is important also because the negative and stigmatizing connotations typically attached to the term (e.g., Quintero, 2009; Savonen, Hakkarainen, Kataja, Sakki & Tigerstedt, 2018) expose it to a political use (Hunt et al., 2009; Klein, 2018). And, a loose definition of the concept facilitates different problematisations of the phenomenon in policy discussions (Bacchi, 2009). Indeed, it is difficult to estimate even the scale of the problem when the range of the concept is not properly defined.

Capturing the pleasures and risks of polydrug use

Zinberg's (1984) seminal theory of drug use (drug, set and setting) provides a useful framework for analyzing polydrug use in terms of its emphasis on the importance of social context, and the interaction between the three elements of drug, set and setting. This approach has been adopted and adapted widely in social science studies of drug use. For example, Dwyer and colleagues state that drug effects 'are produced through the interaction of pharmacology, subjectivity, micro-contexts (e.g., social relationships, symbolic meanings), and macro-contexts (i.e., broader social, cultural, political, economic and historical contexts)' (Dwyer et al., 2012, p. 56). Duff, in a similar vein, argues that 'drug use ought to be understood as a complex and heterogeneous assemblage of risks, conscious and unconscious choices and decisions, physical and psychical sensations, affects, corporeal processes, structural and contextual forces' (Duff, 2008, p. 385). Wording of the precise terms may vary between researchers, but the principle of the interaction between different pharmacological, subjective and social and structural elements is generally consistent with Zinberg's framework.

By replacing the word 'drug' with 'drug combos' to reflect the use of a combination of different substances, Zinberg's concept can be used to explore influential factors such as: drug influences (the effects of using substances together or in sequence within a short time frame); set influences (agency, rational choice and expectations); and setting influences (environmental and socio-structural). Accordingly, combining different substances can be understood as a meaningful and contextual behavior that is guided by the intentions of the users and their different situational and structural contexts. This goes far beyond simple physiological or sensory effects of substances. Indeed, as Duff (2008) argues, pleasures of drug use should be seen to include both immediate physiological effects and more performative pleasures related to those activities and practices that are facilitated by the use of drugs.

In the literature, many kinds of social harms and health risks are associated with polydrug use (Connor, Gullo, White & Kelly, 2014). A special risk of polydrug use can be attributed to difficulties in dosing and unpredictable cross-effects of substance combinations. In the worst cases, they can lead to an overdose or other detrimental consequences (Coffin et al., 2003). Polydrug users, then, negotiate those risks in anticipation of achievable pleasures, regardless of the harms that risk-taking inevitably involves (Parker & Stanworth, 2005). However, this does not mean that they would not seek to control those risks for control is an essential part of polydrug use, as it is in risk-taking behavior in general (Lupton & Tulloch, 2002). Measham (2002), for example, uses the concept of 'controlled loss of control' to describe the role of control in drug taking. Quintero (2009) noted that polydrug use provided both 'control and release' for college students coping with the obligations and practices of the student community. In practice, people apply different control techniques that allow them to adjust their use to their personal standards, social commitments and daily obligations (Hunt et al., 2009; Lamy, 2014; O'Gorman, Driscoll, Moore & Roantree, 2016; Zinberg, 1984). However, the level of control varies from person to person and from situation to situation, and in the case of polydrug use a key element lies in the control of substance combinations.

Substance combining has been addressed in qualitative research studies, especially those conducted in dance and club scenes. Grov and colleagues, for instance, found a large variation of specific combinations of substances (numbering 1,670 in total), among club-goers in New York City (Grov, Kelly & Parsons, 2009). Studies also indicate that different drugs and combinations are popular in different phases of a club night, like in the 'pregame' setting prior to arrival at the club, in the dance event itself, and in the after-dance period and 'chilling out' (Boys, Lenton & Norcross, 1997). These kinds of conscious and strategic chemical manipulations of users' mental and bodily dispositions through different substance combinations seem to be a general characteristic of polydrug use in general (Lamy, 2014). Indeed, studies exploring reasons and intentions of mixing substances have shown that people combining substances are familiar with the basic interactions and outcomes of

different combinations. Hunt et al. (2009), for instance, report that their research subjects in the San Francisco Bay Area identified three major types of beneficial effects of combining different substances—extension (to extend or prolong the effects), enhancement (to intensify the effects of others or create a new effect), and reduction (to reduce the inconvenient effects). Categorizations of users' intentions are reported similarly elsewhere (Groves et al., 2009; Lamy, 2014; Martin, 2008; Schensul et al., 2005).

According to these qualitative studies, the purposes and practices of mixing different substances seems to be core to understanding polydrug use. In this paper, we explore this issue further, though we are interested in studying intentions beyond immediate and pure technical effects. Our main focus lies with the more general issue of concept definition. Consequently, our main aim in this article is to provide an empirically based definition and conceptualization of polydrug use to facilitate future research and reach a more in-depth understanding of this global phenomenon.

Method

This article is based on three individual studies of polydrug use conducted independently in four different countries — Australia and France, Finland, and Ireland. Each study employed a similar interpretivist methodology which sought to explore the meaning of polydrug use through in-depth interviews and ethnography with experienced polydrug users. The details of these research studies are summarized in Table 1 below.

The findings of these studies were presented as keynote papers at an expert seminar on polydrug use held at the National Institute for Health and Welfare (THL), Helsinki, Finland in August 2017. Though the studies were conducted separately, we found our conclusions pointed in the same direction: the need to develop a standard concept of polydrug use. Consequently, we have

collaborated on a retrospective analysis of our studies to reach a synergistic understanding of the polydrug use phenomenon.

These individual studies act as case studies illustrating different aspects of the complexity of polydrug use behaviors. The fundamental aim of a case study is to elicit the function and the uniqueness of one particular case. In this sense, the strength of case studies lies in their ability to provide a deep understanding of a chosen phenomenon. However, as case studies capture the specificities of a social phenomenon *in situ*, generalizing the findings can be challenging (Stake, 1995), especially when these case studies originate from different countries (Burgess, 2000).

Reconciling single case studies from four countries with different drug policies, drug using patterns, attitudes and drug availability, requires critical reflection. Moreover, in our approach, the differences take place not only at a country level but the cases also differ from each other in terms of the aims, sample populations and social and (sub)cultural contexts of polydrug use: the Australia and France study focuses on the logic of mixing substances in sequential intakes, the Finnish study draws a typology of polydrug intentions and controls, and the Irish study situates polydrug use intentions within the social context of a marginalised neighbourhood.

According to Burgess (2000), integrating single case studies across different cultures is possible at the macro level. Cross-national case studies are generally undertaken to observe similarities and/or differences in the characteristics of social phenomena across different nations. They are considered to be challenging due to language barriers and limited possibilities to achieve sufficient sampling size (Mangen, 1999). For the present article, the researchers involved in all case studies were fluent in the language(s) in which the data collection was conducted and over 120 participants were interviewed through in-depth qualitative interviews, focus groups, or conversation during ethnographic fieldwork. Building on Broadfoot's (2000) claim that within the same country cultures are becoming even more global while they simultaneously become even more fragmented, we argue

that though the polydrug use patterns in our three case studies are certainly context-dependent, something global may be extracted from them. Namely, that even though drug use cultures reside in the margins of the mainstream cultures, they are, however, very international in nature.

In the sections that follow, we present these three case studies individually, noting the recurring theme in each study that positions substance combinations as core to the meaning of polydrug use.

In our conclusion, we propose our concept of polydrug use and illustrate how its adoption as a standardized and shared conceptualization might allow social science research internationally to develop better understanding and measurement of this phenomenon. Since the data cover several countries, our results are not limited to a local community but refer to cross-cultural, if not universal, features of the phenomenon.

"(Table 1) about here."

Case study 1: Patterns of sequential intakes (Australia and France)

The Australia and France study explored the functions and rationale for polydrug use through in-depth interviews with 40 people who engaged in recreational polydrug use – see Table 1 and also Lamy (2014) for a full description of the methodology. The findings of this study identified three interdependent characteristics of polydrug use: *intentionality*, *function*, and pattern of *sequential intake*.

Firstly, participants demonstrated their intentionality by, at least partially, planning their use with expectations of the effects they wished to experience:

The more you know drugs, the more you have experiences with them, the more you know how you react, because you react differently to all drugs. And so you know when you should take them and why you are taking them [...] in my perspective, it is very rational, I take drugs to achieve an effect. (Male, 27 years)

Secondly, and inherent to intentionality, the participants consumed particular drugs to achieve specific functions, such as:

- The Social Function—to enable conversation and socializing.
- The Relax Function— to chill out and help get to sleep.
- The Energy Function—to stay awake and motivated.
- The Intoxication Function—to disconnect and forget.
- The Hallucination Function—to explore and heal.

Thirdly, the study identified four types of polydrug use—*controlling*; *changing*; *enhancing*; and *pilling up*—based on the sequential intake of a combination of substances to produce particular effects and achieve two or more of the aforementioned functions.

Controlling

Participants sequentially combined substances to control long-lasting effects, for example, by taking depressants after a session of stimulant drug use to reduce their excitatory effects and limit the side effects of the comedown. This was the most frequently cited type of sequential intake, where participants sought an Energy-Relax function and used depressant drugs as a kind of ‘parachute’ to ease the pain and discomfort of the stimulant comedown and/or to help sleep:

After a big night and you start coming down and you just feel like absolute crap. I've definitely felt a few times like I really want this to stop. I really want to sort this out. So usually what I'll do is I'll smoke a lot of weed so then I start feeling stoned instead of feeling like I'm coming down. [... it's like] a parachute. (Male, 29)

Valium, alcohol or marijuana, but not when I'm high but later when I'm coming down. I need it as a – to help me go to sleep. I find with most stimulants, if I have coke or I have speed or ecstasy, I have very, very, very much trouble sleeping. So I'll need something like that just to make sure I get a good night's rest and that makes the day after a whole lot easier, if you've had a good seven, eight hours sleep. (Male, 25, single)

Changing

Participants used substances to counteract or palliate the effects of substance(s) previously taken, frequently for the purpose of continuing their drug use session, albeit with a different function in mind. The most common form of changing consisted of the consumption of a stimulant drug after alcohol to counteract drunkenness and prolong a night out:

I drank a lot before and [...] I took speed and suddenly, I was fine. It was the recipe for a good night out and for forgetting nothing. I drank alcohol to be good, in the early evening, while driving we drank, we arrived on the parking lot of the club, we snorted some speed and it was good for the whole night. Until 5am, I was okay. (Female, 21)

This form of sequential intake covered both the consumption of stimulant drugs followed by depressant drug(s), or conversely, a 'downer' followed by an 'upper'. The former counterbalanced the excess of energy and alertness, while the latter allowed the participants to re-engage in social interaction. In terms of functions, the former corresponds to the Energy-Relax function, and the latter to Relax-Energy or Intoxicated-Energy. The study found changing to be distinct from controlling because change is intended during the session and not used to palliate the effects of stimulants at the end of the session.

Enhancing

Participants reported using one or more substances to enhance and increase the effects of one drug and/or its duration and intensify or extend the duration of a specific function, as illustrated in the excerpts below:

It also allows you to get smashed faster. The mixture of the alcohol and cannabis accelerated it. It also multiplies the effects, if you smoke a joint after three or four beers, you'll be three times more hammered than if you had just three or four beers. (Male, 28)

My little weakness was what I call the three As, that is to say, the three anaesthetics, cocaine, GHB and ketamine [...] a cocktail that smashes you hard [laughs ...], but GHB and ketamine allow you to take more cocaine, to go further into it. (Male, 34)

Pilling up

For experienced polydrug users (confident in their knowledge of substances, their combinations, and the potential for physiological reactions), pilling up combined several distinct functions or a combination of as least two forms of sequential intake—controlling, changing, or enhancing—with the objective of experiencing a large variety of effects during the same session, such as a succession of the Social-Energy-Relax functions, or the Intoxicated-Hallucinated function. In the former case, substances are used conjointly to enjoy the social aspect of a night out for a longer period with stimulant use followed by a depressant to relax and ease the comedown at the end of a session. In the latter case, hallucinogens are consumed in combination with either stimulant or depressant, depending on the intensity and desired duration of the session. Overall, the pilling up mode of sequential intake was found to be practiced by recreational users who wish to experience a palette of effects through the consumption of a variety of psychoactive substances:

I always see it as jumping off a stratum of consciousness to another. [...] We are well prepared and in good shape, and we go for an interesting and spiritual journey. I really carefully think of what I want, of the state I currently am, and what I'm looking for in this party, with the people I am with. [...] It is always calculated the drugs we take. The way we consume them now, because we know these substances more or less, we know the effect that they will have on us, we know when we are going to take them, we know what to do. It's not a reckless excess. (Male, 19)

This type of polydrug use requires a higher level of mastery and knowledge regarding the substances, their combinations, and the potential physiological reactions so as to avoid any adverse consequences related to the large amount of substances consumed.

Overall then, the Australia and France case study demonstrates that recreational polydrug users intentionally and functionally exploit different properties of different substances by combining them sequentially to achieve specific effects – see Figure 1 below.

"(Figure 1) about here."

Case study 2: Polydrug use sessions (Finland)

The Finland case study explored the variation in consumption patterns and intentions in different drug-using sessions of polydrug users – see Table 1 and also Kataja, Hakkarainen & Väyrynen (2018a) for a full description of the methodology.

This study developed a typology of polydrug use situations by cross-tabulating two dimensions: the *intention* of use and the *control* of use (see Figure 2 below). The control dimension of the grid can be seen as a continuum ranging from *controlled use*, to *volatile control*, to a *total loss of control* (see Zinberg, 1984). The other dimension of the grid, the intention of use, is divided into four performative categories:

- Experimenting/exploring—includes exploring and testing the effects of substance interactions from the first polydrug use experience to more advanced chemical soul-searching with the help of pharmacological mixtures (see Shulgin & Shulgin, 1991);
- Enhancing abilities or pleasures—relates to the pursuit of reinforcing the prevailing physical, cognitive, or mental state (whether this is relaxing, having fun, physical or cognitive performance, or other activity) with the help of combining substances (e.g., Iszaj et al., 2012);
- Healing and reducing pain—covers different kinds of tendencies to relieve either physical or mental discomforts, complaints and pain. Substances are then co-consumed as a means of self-medication (e.g., Adams, 2012); and
- Getting smashed—indicates the intention to achieve a massive intoxication as an intrinsic goal without any other purposes linked to it (e.g., Demant, 2010).

"(Figure 2) about here."

Experimenting/exploring

In the experimenting/exploring category, participants reported exploring the effects of substance combinations, particularly if they are trying the combination for the first time. In these cases, curiosity was found to be a clear driving force for experimentation. However, for some users exploring how different substance combinations operate and what kind of experiences those cross-

effects can produce was a more systematized, ideological, and intellectual project, often connected to a personal mission of self-discovery (Kataja et al., 2018a). One of the interviewees, for instance, related how she used to record her experiences with various combinations in an *Excel* spreadsheet. For these participants, descriptions of experiences were often rather analytical, as shown in this quotation about so-called ‘candy flipping’:

When I used MDMA and LSD together, that was very positive. MDMA makes you feel kind of purely positive, open and euphoric in many ways. And also, on an emotional level, it makes you love the world and other people. And then, if you combine it with a psychedelic, it removes all the negative effects that are to do with the beginning of the trip before it really kicks off. In a sense, it’s easier to guide the trip towards a more pleasant direction. (Male, 21 years)

The intention of experimenting and exploring was to find new, combination-specific experiences as illustrated in the above quotation. These combinations were often tested several times. For those interested in systematic experimentation, the settings of use were well-planned and controlled. For more casual experimenters, control over the effects tended to be more volatile, especially when a participant had no prior knowledge about expected effects.

Enhancing abilities or pleasures

A basic motivation for drug use was to strive to enhance something (e.g., relaxing, socializing, having fun, partying, or performing at work), with the help of a chemical boost. Combining different substances provided the participants with more options to satisfy these intentions. The next three quotations exemplify variation in the management of settings from controlled use, to volatile control, to compulsory use:

Well, you do it when you have a good company. Usually when we play cards or Trivial Pursuit or something, and drink beer. And if someone has cannabis, we smoke. But there’s no need to hunt high and low for it. We smoke only if we happen to have it. (Male, 44 years)

When you use ten different drugs during one night, you could frankly call it polydrug use. Ecstasy, MDMA, LSD, mushrooms, anything. All of them mixed up suited me fine. The more wasted the better, when crazy partying is going on. (Male, 32 years)

This morning about an hour ago I jacked up some Subutex [buprenorphine] and popped a couple of Xanors [alprazolam]. Feels like I can't even get up without them. (Male, 43 years)

The first account describes a social situation where combining cannabis smoking with drinking enhances relaxation and enjoyment, and perhaps also feelings of togetherness. This session is relaxed and controlled since cannabis is mixed with alcohol only when it is available. In the second example, combinations of several kinds of drugs are used to enhance partying. Even though the interviewee seeks to create an impression that he is used to performing polydrug use and mixing numerous substances ('anything') in a party scene, his account displays elements of volatile control over drug use. In contrast, the third quotation describes a compulsory habit where the intention is to be able to get up and start a day.

Healing and reducing pain

Medicinal use of different kinds of substances is an established and well-known phenomenon. This holds also for polydrug use where different substances can be combined for healing and reducing pain. In the next account, a young male informant describes how he is trying to control his use of various combos to ease mental pain and problems:

For example, yesterday I took heroin and some anxiolytics. Some days I could have taken some benzos. However, I adjust it so that the doses are smaller when two drugs are used together than when taken separately because I don't like being intoxicated or muddled. The drugs ease the mental pain and problems. Sometimes, even the smallest moment of relief is worth it. It's hard to explain, it's like someone holds you and that makes you feel safe and calm. (Male, 21 years)

The boundary between volatile control over use and compulsory use is a thin line, as can be seen in the next quotation. Here, the participant explains his search for balance, but this can lead to topping up one drug with another to an overdose level:

Everyone of us looks for the balance, when they're feeling good, but they never find it. That leads to an endless regulating: I take 0.2 mg amphetamine and 50 mg benzos. And if I fail to meet expectations, I decide to add some methadone, which in fact is a massive dose already. But because I didn't reach the balance yet, I should still do some amphetamine. And

whoops, that wasn't fitting but overdosed a bit and because I feel messy now, I have to take some more benzos. (Male, 45 years)

Getting smashed

It is difficult to identify a category of controlled use, even of a controlled loss of control, associated with the intention of getting smashed where the aim is to abandon all control. Participants used a variety of expressions to describe this intention, such as getting 'mangled', 'totally wrecked', 'utterly wasted', 'completely zoned out', 'out of one's head', or 'totally Brahms and Liszt'. Mixing a variety of substances offers an especially suitable means for achieving this aim. This is explained in the following quote from a middle-aged man who seeks, every now and then, to 'reset himself'. For some interviewees, this intention was similar to a compulsory habit, while for others, such as the participant below, this was a temporary regulated practice that depicted volatile control over their use:

Usually it begins with beer. But when it feels that the beer is not enough, you must sniff some Subutex [buprenorphine] and then, smoke some pot and then take some pills. It is such a chaos. When you let it slip it starts to roll by itself and then nothing's enough anymore. [...] So, a couple of beers and then a bit to top it off and at last you're out for the count. [...] You don't need to worry anymore about everyday woes. In a way you reset yourself. [...] In a way you give yourself the go-ahead to relax a bit, when you've been sober long enough. (Male, 41 years)

The findings in this case study highlight the crucial role of intentions in polydrug use. These findings reinforce results from an earlier population survey conducted in Finland in 2014, which included questions on the simultaneous use of substances (Kataja, Karjalainen, Savonen, Hakkarainen & Hautala, 2019). The survey found the most popular reasons for combining substances were *enhancing abilities or pleasures* (45%); *healing and reducing pain* (32%); *getting smashed* (31%); and *experimenting/exploring* the co-effects of different substances (29%). Only a small minority (13%) of the respondents reported that their polydrug use happened by chance and for no particular reason.

Overall then, the Finland case study shows that the pleasures and risks of substance combinations are guided by intentions, personal control and different kinds of settings. In the next case study, we will examine these issues from a wider contextual perspective.

Case study 3: The situated nature of polydrug use (Ireland)

The Ireland case study is based on data from two community research studies which explored *inter alia* how issues of structure and agency interact and shape young people's drug consumption choices and combinations in the context of their marginalised and precarious social position—see Table 1 and also O'Gorman et al. (2013) and O'Gorman et al. (2016) for a full description of the methodology.

Patterns of drug consumption and combinations: agency and structure

The study found that the participants' drug choices and combinations were shaped by the drugs repertoire available to them. This included a number of core substances that were accessible, affordable, and culturally accommodated within their peer group. Here, the legal drug alcohol was their first drug of choice, mainly cans of cheap beer during the week and cheap spirits such as vodka at the weekend. In addition to alcohol, herbal cannabis (weed) and 'tablets'¹ (mainly benzodiazepines and the so-called 'Z drugs'—Zimovane, Zopiclone etc.) formed the baseline of their consumption. At weekends and festive occasions, stimulants (ecstasy, cocaine, amphetamine, and/or cathinones such as mephedrone) and/or hallucinogens (such as ketamine, psilocybin) were added to their repertoire. Despite their openness to drug experimentation, and the availability of heroin and crack cocaine in their neighbourhood, they were fiercely opposed to heroin, crack cocaine, or intravenous drug use. For this group, by and large, the desired intention was 'coming up'.

¹ The term 'tablets' was used to describe an assortment of medication prescribed largely for the treatment of insomnia and anxiety such as the benzodiazepines alprazolam/xanax®, diazepam/valium®, flurazepam/dalmane®, temazepam/Restoril® etc. and the 'Z drugs' such as zolpidem/stilnox®, zopiclone/zimovane®.

Within this drugs repertoire, polydrug use was the norm with different combinations used simultaneously (at the same time) and sequentially (within a short time frame) to achieve the desired effects. Patterns of polydrug use were found to be shaped by a number of structural, spatial and temporal factors. The young participants favored drugs that were available and accessible in the local drugs market and were reluctant to travel outside of their neighbourhood to purchase drugs. This was mainly a finance issue as they had little disposable income and the drugs available locally were more affordable and often they could negotiate a good price. The perceived quality of different stimulants also influenced their choices and combinations; and avoiding or minimizing the effect of a bad 'come down' was a major concern. Consequently, pills with a poor reputation were avoided. Drug choices were also influenced by the responsibilities they had for that day (such as housework, caring responsibilities, odd jobs, and welfare appointments) with a further differentiation between drug use they regarded as appropriate or functional for weekdays or weekends. Different drug intentions required different physical settings. Weekday drug use (cannabis, tablets and alcohol) took place mainly at home, in a park, or on the street with a few mates. Weekend drug use, focused on stimulant use, required a house party with music.

Within these contexts, drug choices and combinations were situated. Four categories of intention were identified along a continuum, with each intention embedded in a set of polydrug combinations to achieve the desired effect (see also Figure 3 below):

- Chillin—a combination of one or more of cannabis, alcohol and tablets;
- Buzzin—alcohol with ecstasy, cocaine and/or NPS;
- Getting mangled—entailed a higher level of polysubstance use mixing larger quantities of stimulants and hallucinogens; and
- Coming down—was eased with combinations of herbal cannabis and tablets.

"(Figure 3) about here."

Chillin

During the week, a significant part of the young people's daily life was spent 'hanging out' in their friendship group in one of their homes, in the local park, or on the streets. In this context, their drug-taking intention was to relax and chill. This was achieved by the simultaneous use of alcohol and tablets to increase the intensity of the 'tins' [cans of beer], or combining cannabis with 'tablets' to reduce the hallucinatory effects of 'the weed', as described by these young male participants:

Weed and tablets [...] a lovely mix.

From Monday to Thursday it's just the weed and tablets.

A few roche [Diazepam] and a bit of hash, just all day have a lovely buzz.

Buzzin

As the weekend approached, the focus on extra pleasure became a more collective group activity. This was accompanied by a shift in drug consumption practices with some form of stimulants being added to the mix. The intention now was to create a good mood and a buzz of excitement with a focus on 'coming up' and having a good time by combining alcohol with ecstasy, cocaine and/or cathinones. Small groups of people would meet in someone's home for a few 'tins' or 'shots' [of spirits]: 'you'd have to get a few [drinks] into you before you'd go out'. Hectic social media communication would begin as the evening progressed and plans developed. Lynne described how they would start texting and 'facebooking' each other to ask, 'are you getting a few bomboms [ecstasy pills]?'

Eventually everybody just meets up—at the end of the night they all end up with each other and out of their heads.

For the older male participants, alcohol and cocaine (snorted or swallowed in a wrap) was the classic combination for 'buzzin' in social settings such as a pub, club or house party as they felt cocaine

mitigated the effects of alcohol (acting as ‘a straightner’), and enabled them to continue drinking, enjoy the craic (fun), and engage in banter with added confidence:

In the pub a few darts [lines of coke], few yokes [E], a few games of pool.

I’m a man for me coke like if I’m going to the pub I need a 50[€] bag or something.

When you get too sloppy it [coke] brings you back alive.

Getting mangled

The young participants reported that every couple of weeks their weekend ‘buzzin’ escalated to a higher level and they would go on ‘a mad bender’ and get ‘completely out of it’ with sessions lasting from Thursday night to Monday morning. These sessions entailed higher levels of polydrug use mixing larger quantities of stimulants and hallucinogens. This intention required a different physical setting—a house party or an isolated park or field where music and dancing would enhance the experience, as Anna described:

We would do E, sniff [cocaine], and speed—the three of them together—it’s a lethal [brilliant] buzz.

In this context, rational action regarding drug choices and combinations lessened in the face of pleasure, as KK described: ‘I haven’t a clue what’s in them but I don’t care [...] I just liked the effect of getting out of it’.

Coming down

The participants’ focus on pleasure seeking and having a good time was balanced by their desire to avoid a severe ‘come down’ afterwards. In this respect, feelings of ‘the fear’ and depression in the aftermath of a session of stimulant use were eased with combinations of herbal cannabis and tablets. In this context, a similar drug combination to those used to achieve ‘chillin’ produced a recuperative effect to help the young people come down from their high.

Overall, the findings from the Dublin case study demonstrate the need to go beyond pharmacentric explanations of the effects of drugs and focus on drug intentions within contextual settings. The studies found that young people who use drugs make (mainly) rational consumption choices, calculate cost-benefits (monetary, as well as health and well-being), and seek pleasure and fun from their polydrug use. However, these young people's choices and intentions do not exist in isolation from their social, economic and policy contexts, or from the influence of demand and supply in the drugs market and its effect on the availability, accessibility and affordability of substances.

Overall analysis of case studies: Focus on 'combos'

Based on the analysis of these three case studies, it appears that patterns of polydrug use do not vary characteristically from one nation or subcultural context to another, but belong to drugs culture in the global sense. Despite the contextual differences of these case studies, 'shared cultural tools' (see Broadfoot, 2000) of polydrug use can be captured. Taken together, all the case studies in this article demonstrate that polydrug use is best understood, primarily, as the practice of combining multiple substances. In other words, the essence of polydrug use lies in 'combos'. In this respect, in the contemporary polydrug culture, 'combos' describes the mixing of substances for attaining additional and desired effects (Kataja, Törrönen, Hakkarainen & Tigerstedt, 2018c). Consequently, we propose that the term *polydrug use* should be applied only to cases where: *the ingestion of two or more psychoactive substances occurs in combination, at the same time or in temporal proximity, so that the effects of different substances are overlapping*. This would give a more accurate and consistent basis for the study of (the pleasures and risks of) polydrug use than is the practice currently. This definition would also provide a solid foundation for comparative studies across countries and cultures. Furthermore, since the interactions between different substances generate both particular pleasures and particular harms, a focus on combos would justify also research on polydrug use as a distinctive subject in the field of social drug research. Indeed, as substance interactions lie at the heart of studies in natural sciences (e.g., Mohamed, Hamida, Cassel, de

Vasconcelos & Jones, 2011), a focus on combos would facilitate interdisciplinary research across the natural and social sciences.

In addition, based on our analysis of these three case studies, we suggest that for analytic purposes the concept of polydrug use be split in two sub-categories: *simultaneous intake* and *sequential intake*. The first sub-category refers to a mixing of two or more substances at the same time, while the latter covers polydrug using sessions within a given time frame (e.g., a night, or, as in some cases, a longer episode of use) where substances can have overlapping effects. In most cases, the duration of the drug taking session has a clear cut off point, but in some contexts such as, multi-day festivals, raves or 'chem sex' parties, sessions may last an uncertain time. Also, in the life of a person using drugs on a daily basis, distinguishing one drug using episode from another may be difficult (Kataja et al., 2018a). And, in all these cases, combining substances with different half-lives will give rise to different effects over the time frame. Therefore, we suggest that the 'temporal proximity' inherent to sequential intakes should be limited to the moment when all psychoactive effects of the combined substances have disappeared. This clearer definition would further our understanding of the dynamics of polydrug use considerably.

For consistency, we propose that the confusing term 'concurrent polydrug use' should be replaced by an umbrella concept that would capture the varieties of drug use over the life-course and which would be distinctively different from the concept of polydrug use we propose above. For example, Boys et al.'s (1999) concept of '*drug-using repertoires*' could be usefully employed in prevalence surveys reporting lifetime, past year or past month prevalence of different substances in a target population. A distinctive concept for lifetime, past year or past month drug-using repertoires would describe this phenomenon more precisely than the present conceptual practice. Consequently, measuring the prevalence of polydrug use in population surveys would then require new types of

questions to identify simultaneous/sequential combinations of different substances (Kataja et al., 2019; Martin, 2008).

Discussion and Conclusion

In this article, we suggest that in order to develop more valid research practice, and improve our understanding of polydrug use, a more robust definition of the concept is needed. Furthermore, we have suggested a redefinition of the current concept of polydrug use to one based on simultaneous/sequential intakes of different substances with overlapping effects. This concept of polydrug use would facilitate interdisciplinary scholarship across the social and natural sciences. However, a study program in social sciences has a context of its own. We have proposed that in social sciences, polydrug use can be studied within a reformulated framework of Zinberg's (1984) 'drug [combo], set and setting'. In addition to the immediate physiological effects of a drug, interactions between substances create a special setting for performative pleasures (Duff, 2008) and risks to be controlled. We propose that these be studied in relation to set influences (such as agency, rational choice, expectations) and wider social contexts (such as settings and social bonds in use sessions, environmental and structural impacts). The three case studies presented in the article have provided some illustrations of the logic of mixing substances in sequential intakes, the variety of intentions and control in use sessions, and the situated nature of polydrug use.

One notable characteristic of polydrug use is the degree of knowledge people must develop in order to properly combine and enjoy substances. This knowledge does not only concern the different effects obtained through the combinations, but also the 'right dosage', the 'right moment' and the 'right setting' in order to avoid being in an undesired state. The necessary 'substance knowledge' about the interaction of substances is gradually obtained throughout experiences of consumption (Lamy, 2014). Although people who use drugs are sharing their experiences of different substance combinations on the internet (Kataja et al., 2018c), it is also important that accurate, independent

and research-based information on possible interactions and cross-effects between different substances be made easily available to the public (see e.g., Downsides, 2019). This is even more important considering that the contents and strength of substances sold in illegal drug markets remain unknown, and therefore require appropriate drug-checking services for harm reduction purposes (Measham, 2019). An important research project would be to study the knowledge building of polydrug users in more detail.

Another characteristic is the almost constant presence of alcohol in the different forms of polysubstance use, confirming its centrality (Fontaine et al., 2001; Parker & Williams, 2003). Indeed, the majority of the respondents consider the legal drug alcohol as the ‘foundation’ or as ‘essential’ for their consumption and consequently the majority of the polydrug combinations contain alcohol (Lamy, 2014; O’Gorman et al., 2016). Since polydrug use takes place at the crossroad of three different kinds of control regimes—alcohol policy, drug policy and the policy controlling pharmaceutical drugs—this most probably reflects different cultural positions and dissimilarities in the control and affordability of substances. In modern western societies, alcohol is widely available and embedded deeply in the practices of everyday life. Furthermore, while individuals generally orient their choices intentionally, alcohol has a role as a polydrug ‘inducer’ as it plays a major part in the unintentional or unplanned consumption of other psychoactive substances (Parker et al., 1998; Lamy, 2014). Consequently, the role of alcohol in polydrug use patterns merits additional study.

Finally, regarding social setting as macro-context in terms of the wider social and cultural milieu (Moore, 1993), our data analyses show that drug use can be understood as a *usage of "integrative" drugs*, in the sense developed by Ehrenberg (2010, 2012) in that it allows people to respond, adapt and/or cope with contemporary social norms. This point echoes also the conclusion of Hautefeuille (2009), who considers the consumption of psychoactive substances as being ‘techniques of daily

doping' through which people can increase their performance, adapt to a new social environment, control their sleep, cope with stress, palliate anxiety, or sustain an acceptable mood (see also Fontaine & Fontana, 2004). Based on this understanding, polydrug use could be considered as a responsive multi-functional chemical manipulation of mind and body to optimize the user's mindset, pleasure and performance. In our time, due to the increased availability and production of a great variety of different substances (such as the innumerable number of NPS), the possibilities for this are greater than ever. Hence, rigorous, valid, and comparable knowledge on the range and patterns of polydrug use is of great importance.

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Table 1: Details of the three polydrug case studies

Author(s)	Date of study	Location of study	Research aim(s)	Methodology and Research Population
Lamy, (2014)	2010-2011	Australia & France.	Explored the functions associated with polydrug use, and to capture users' rationale for consumption.	<p>Qualitative in-depth interviews.</p> <p>40 recreational polydrug users. Fourteen females and twenty-six males with a mean age of 25.</p> <p>Participants in 18-24 age group were mainly students and in part-time employment. Older participants had completed high school or post-secondary education and were in full-time employment.</p>
Kataja, Hakkarainen & Väyrynen, (2017)	2012 - 2014	Finland - multi city study.	Explored the variation in patterns of consumption use and intentions in different drug-using sessions.	<p>Semi-structured thematic interviews with 56 polydrug users. 20 females and 36 males between the ages of 20 and 57.</p> <p>Participant had a broad range of drug using experience including recreational users, occasional users, dependent users and people in opiate substitute treatment.</p>
O'Gorman, A. et al. (2013). and O'Gorman, A., et al. (2016)	2012-13 and 2015-16	Dublin, Ireland - two community studies.	Explored drug choices, combinations and intentions and the role and meaning of drugs in the everyday lives of a young people in risk environments.	<p>Critical interpretivist methodology using individual and focus groups interviews, and ethnographic observations and conversations in the drug users' natural locations.</p> <p>Participants were mainly young males aged between 17-24 years. Most were out of education and out of work. Many involved in the local drugs economy.</p>

Figure 1: A typology of polydrug use sessions: sequential use by function (Australia & France case study)

	Energy	Relax	Intoxication	Social	Hallucination
Controlling long-lasting effects	X	X			X
Changing	X	X	X		
Enhancing	X	X	X	X	
Pilling up	X	X	X	X	X

Figure 2: A typology of polydrug use sessions: Control of use by intention (Finland case study)

		Intention of use			
		Experimenting/ exploring	Enhancing abilities or pleasures	Healing and reducing pain	Getting smashed
Control of use	Controlled use	X	X	X	
	Volatile control over use	X	X	X	X
	Compulsory use		X	X	X

Figure 3: A typology of polydrug use sessions: Intention by drug use combinations (Ireland case study)

	Cannabis (Herbal)	'Tablets'	Ecstasy	NPS (Cathinones)	Cocaine powder	Ketamine	Alcohol
Chillin	X	X					X
Buzzin			X	X	X		X
Getting Mangled			X	X	X	X	
Coming Down	X	X					

(Source: O’Gorman et al., 2016, p. 251)