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Moritz Berning¹ and Anita Hardon¹

Abstract

This study examines how experimentation with *designer drugs* is mediated by the Internet. We selected a popular drug forum that presents reports on self-experimentation with little or even completely unexplored designer drugs to examine: (1) how participants report their “trying out” of new compounds and (2) how participants reduce the pharmacological uncertainty associated with using these substances. Our methods included passive observation online, engaging more actively with the online community using an avatar, and off-line interviews with key interlocutors to validate our online findings. This article reflects on how forum participants experiment with designer drugs, their trust in suppliers and the testimonials of others, the use of ethno-scientific techniques that involve numerical weighing, “allergy dosing,” and the use of standardized trip reports. We suggest that these techniques contribute to a sense of control in the face of the possible toxicity of unknown or little-known designer drugs. The online reporting of effects allows users to experience not only the thrill of a new kind of high but also connection with others in the self-experimenting drug community.

Keywords

ethnography, harm reduction, drugs and the Internet, experimentation, uncertainty, edgework

Introduction

Since the beginning of the new millennium, *designer drugs*, or *novel psychoactive substances* (NPS), have been raising concerns among policy makers, law enforcement, and biomedical professionals alike

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(Corazza et al., 2011; European Monitoring Centre for Drugs and Drug Addiction [EMCDDA], 2014, 2015a, 2015b; Hillebrand, Olszewski, & Sedefov, 2010; Rolles & Kushlick, 2014; United Nations Office on Drugs and Crime [UNODC], 2014). The EMCDDA defines a NPS as “a new narcotic or psychotropic drug, in pure form or in preparation, that is not controlled by the United Nations drug conventions, but which may pose a public health threat comparable to that posed by substances listed in these conventions” (EMCDDA, 2016).¹ They are rapidly appearing on global and European drug markets and competing with established drugs such as LSD and MDMA; the EMCDDA today monitors no less than 450 such chemicals (EMCDDA, 2015a, 2015b; UNODC, 2014). As designer drugs are generally not used as medication,² most have not been subjected to clinical trials. As a result, there is very limited information available on their effects and toxicology (Langlitz, 2009; Móró, 2014; Soussan & Kjellgren, 2014).

Experiences with designer drugs are shared on a wide variety of online fora and websites with user-generated content. The European Union-funded *Psychonaut Web Mapping* project, which ran between January 2008 and December 2009, found 203 key online resources providing information and detailing user experiences on 414 different substances (Deluca et al., 2012). In the beginning of their life cycles, these substances are only used by a few. But they can grow to become very popular, as was the case with 2,5-dimethoxy-4-bromophenethylamine (2C-B) (Jenkins, 1999). First synthesized by Alexander Shulgin in the 1970s (see Shulgin & Shulgin, 1991), 2C-B in many European countries has become one of the most commonly used designer drugs; in some countries, it is listed among the 20 most popular drugs overall (Global Drug Survey, 2014).

Users experiment with designer drugs for a wide variety of reasons (Global Drug Survey, 2014; Van Amsterdam, Nabben, Keiman, Haanschoten, & Korf, 2015): to explore altered states of consciousness, and to increase empathy, libido, or stamina (EMCDDA, 2015b; Rolles & Kushlick, 2014), but also in order to discover their yet unknown effects (Boyer, Lapen, Macalino, & Hibberd, 2007; Boyer, Shannon, & Hibberd, 2005; Soussan & Kjellgren, 2014). Our study explores how participants of one online forum, containing reports on self-experimentation with little or even completely unexplored designer drugs, navigate the uncertainties associated with using them. Unlike regular “psychonauts,”³ our online informants seemed more interested in exploring chemicals with no or very little history of (human) use than in more generally exploring altered states of consciousness (Revonsuo, Kallio, & Sikka, 2009). Khan, an experienced user and key informant in our study, described these experimenters as follows:

The people that are kind of already experimenting with the new chemicals before the drug actually becomes popular—they do not really care what the background of a substance is, psychedelic, stimulant, aphrodisiac, sedative or dissociative, they just like to try new stuff and explore these different states of mind, new experiences. (Interviewed March 2015)

In experimenting with “new stuff,” they are pursuing “edgework”—a concept originally coined by Lyng (1990) and applied by Quintero and Nichter to young people’s recreational use of psychoactive drugs. A drug-using edgeworker, Quintero and Nichter (2011) write, “is at once attracted by the sensation of being on the edge as an intense form of pleasure, and the accomplishment of being able to avoid a bad or disastrous effect” (p. 347; cf. Hunt, Evan, & Kares, 2007). How do edgeworkers avoid disastrous effects in the face of the *pharmacological uncertainty* involved in ingesting novel substances for which there is no or scant information on their toxicology and effects?

This study examines how the virtual space of a drug forum helps to reduce pharmacological uncertainty. More specifically, we examine (1) how participants report their trying out of unexplored designer drugs online and (2) how participants reduce the pharmacological uncertainty associated with using them. Our use of the concept of “pharmacological uncertainty” is inspired by Zinn (2008), who argues that people “working on the edge” such as jet pilots and base jumpers use a variety of strategies to cope with high levels of uncertainty and risk. Zinn argues that strategies may be *rational*,



Figure 1. Novel psychoactive substances: packaged and delivered.

nonrational, or *in-between* and that all play important roles. *Rational* strategies Zinn suggests include the weighing of options and the numeric calculation of chances. *In-between* strategies can be based on trust, emotions, or intuition, while *nonrational* strategies rely on faith, belief, or hope. In the collaborative online experimentation that we studied, we found *in-between* strategies—involving trust in the testimonials of others and in the suppliers of chemicals—to be crucial, alongside more rational strategies that involve numerical weighing and dosing.

Methods

Our case study focuses on a website whose users engage in risky behavior, in that they are among the first human subjects to try out novel chemical compounds before they can become the objects of surveillance or monitoring. Most of the drugs reported by this online research population were not yet available on the online and off-line “legal highs” market with its consumer-oriented packaging and marketing. They must be ordered at custom laboratories or chemical supply companies often but not exclusively located in China. Instead of the colorful packaging often seen in smart shops and outlets of the *legal highs* market (Hillebrand et al., 2010), the chemicals used by our informants come in functional industrial sealing as seen in Figure 1.

We selected this particular website in large part due to its popularity: It counts over 40,000 registered users and 120,000 visitors per month according to www.similarweb.com. If a new chemical compound is deemed to have a positive risk-benefit ratio on this site, its leading participants could well be pioneers in setting broader drug use trends, as was the case with 2C-B (cf. Boyer et al., 2007). A further reason for selecting this site is the richness of the qualitative data it contains, in the form of both trip reports describing the effects of new and unknown chemicals and the detailed guidance provided on how to conduct “experiments.”

The online forum that we studied enables discussions in the form of text, video, audio, and shared links. It is organized into several sections including an introduction to designer drugs, a harm reduction section, relevant legislation in various countries, discussions about different types of designer drugs such as psychedelics and stimulants, drug sources/vendors, and trip reports. English is the forum’s main language, with a small German-speaking section.

The site includes information on a wide range of designer drugs or synthetic NPS (but not organic NPS). The sections contain discussion threads moderated by the forum’s administrators which focus on topics such as “how to perform an allergy test” or “introduction to opioids.” Below these operator-defined threads are user-initiated ones that usually begin with a statement in the form of text that can also include pictures, videos, or audio material. These statements, or posts, allow for user-

initiated communication within the forum. The discussions are not time limited: User-initiated threads can last from days to years and are open-ended.

Our research employed *netnography*, a form of explorative virtual participatory research (Kozinets, 2010). Although we complemented our online observations with off-line interviews to triangulate our findings, the virtual interactions remain our focus. Nevertheless, this kind of online drug research has limitations. We learn little about who or where the participants are or about their everyday lives—and can verify even less. Alongside (at times) their gender and information relevant to drug efficacy such as body weight and prior experience with drugs, we can only glean limited information about the social configurations in which drugs are used and who gets involved when something goes wrong.

The research took place between February and April 2015 and involved ongoing iterative communication on the forum. We used the following methods:

- (1) *Lurking* or passive observation. This form of virtual observation, which is both covert and nonparticipatory, raises ethical questions, mainly about informed consent (Rodham & Gavin, 2006, p. 95). Mendelson (2007) advises asking website administrators for permission to post in the forum but also to form a partnership between administrators, participants, and researchers, a principle to which we adhered. We contacted the administrators as gatekeepers of the forum about our status and intentions as researchers via a private message. After our access was verified, we posted an informational post on the public message board to create a level of informed consent with the other informants (Rodham & Gavin, 2006). We also attached the same information to our user avatar in the forum, so that anyone who looked at our profile could see that we were participating in the forum as researchers with specific interests. We conducted passive observation approximately 7 hr per week for 3 months (a total of 90 hr).
- (2) Using an avatar to conduct participant observation in the forum. The avatar permitted us to interact with other forum participants, to ask and answer questions, to feel out how it is to be an active member of the forum, and to use the technology that permits forum communications, mainly threads, posts, and private messages. Interaction with the avatar was irregular and depended on whether people reacted to comments made by the avatar. We participated in 20 threads of communication through the avatar.
- (3) Conducting off-line face-to-face interviews in order to triangulate the findings of our online research. Interviews were conducted with forum members (via Skype and in public places, adhering to complete anonymity) and designer drug experimenters not actively part of the forum but engaged in similar practices. We held such in-depth interviews with seven interlocutors (five men and two women) to gain insight into how the online forum mediates drug experimentation and how drug experimenters use the online space to minimize harm. All of our interlocutors were university graduates; two were unemployed and five had regular stable jobs.

Protecting Our Informants

The current study is part of the European Research Council–funded ChemicalYouth project based at the University of Amsterdam. The project's standard operating procedures require that we ensure the anonymity of informants who may be engaging in illegal activities. All users in the forum used pseudonyms, which we changed again for this article. Even so, we wrestled with the question of anonymity and how to quote online material, as some of the quotes could be traced via Google and other search engines. As anthropologists we want to give voice to online drug use reporters, but how to do so while protecting their anonymity?

We considered the two following positions:

- (1) *Online spaces are public spaces*: Public message boards (forums) have overwhelmingly been seen as public domain by authors who have conducted similar research (e.g., Bassett &

O’Riordan, 2002; Finn & Lavitt, 1994; Mann & Stewart, 2000; Rodham & Gavin, 2006; Riley, Rodham, & Gavin, 2009; Salem, Bogat, & Reid, 1997; Seale, Charteris-Black, MacFarlane, & McPherson, 2010; Sharf, 1997). Basset and O’Riordan (2002), for instance, argue, based on the distinction between space and text, that “the dialogue you have [online] is a text, it’s in the public domain, and therefore, aside from considerations of copyright, it is available for reproduction” (p. 239). Mann and Stewart (2000) similarly argue that in posting a message there is “implied license to read or even archive the information it contains” (p. 46). Rodham and Gavin (2006) on the other hand build their argument on the concept of an online space in which “individual contributions to the message board can . . . be considered in the same way as individual naturalistic observations in a public space” (p. 94). Soussan and Kjellgren, who conducted research similar to ours, agree with the naturalistic view of online data in which “the information available was . . . considered to be an observation of public behavior online” (2014, p. 3). They thus mention the names of the forums they study.

- (2) *Participants think that they are communicating in private:* On the other side of the debate are “some [other] writers on research ethics [who] take the view that, in spite of clear notices about the public visibility of postings, participants nevertheless take a subjective view that their communications are ‘private’ (Waskul & Douglas, 1996)” (Seale et al., 2010, p. 598). Cavanagh (1999) summarizes our dilemma: “research has indicated that the use of public forums for ‘private’ engagements is widespread, with individuals often ‘breaking off’ to form enclaves of private conversation. So how do we, as researchers, distinguish between interactions which are intended for the entire community of Net users, to which we might with validity be said to belong?” (p. 4).

Taking the privacy concerns of Cavanagh (1999) and Waskul and Douglas (1996) into account, we developed an additional protocol for our online research that balances the protection of informants with the knowledge gained from learning from their experiences. Our procedure involves the following five safeguards:

- (1) We do not include the name of the forum in our publications and other reports.
- (2) We give all informants new pseudonyms and do not give the URL of the quotes.
- (3) We modified the quotes, making minor changes that make them untraceable by search engines, without changing the meaning or the language style used in the text.
- (4) We searched for the modified quotes and ensured that the source of the quotes could not be found using multiple search engines.
- (5) We do not report which terms we modified in the quotes so that they cannot be traced.

By not mentioning the name of the forum and by ensuring that the quotes from the forum cannot be traced with the use of search engines, our study is consistent with our commitment to anonymity.⁴

Online Harm Reduction

Whereas biomedical researchers have focused on the risks of this online interactive engagement with drugs (Bogenschutz, 2000; Halpern & Pope, 2001; Micke, 1996; Wax, 2002), a handful of recent studies have also highlighted the role that online drug forums can play in “drug user-led harm reduction” (e.g., Boyer et al., 2007; Corazza et al., 2011; Móró, 2014; Móró & Rácz, 2013; Soussan & Kjellgren, 2014, 2015; Van Hout & Hearne, 2015).

The use of designer drugs comes with particular risks rooted in their unexplored nature. The lack of information on toxicology, side effects, dosages, and drug interactions accompanies the difficulty in visually distinguishing between substances that usually come in the form of bulk powders (Measham, Moore, & Østergaard, 2011; Móró, 2014). Forum participants order chemicals directly from international chemical suppliers, custom laboratories, and specialized vendors, and to reduce

pharmacological uncertainty, systematically report on the reliability of sources and product quality. The following two reviews of vendors are anonymized examples of such quality control:

Vendor name:	[xxx] ⁵
Website:	[xxx]
Product:	6-(2-aminopropyl)benzofuran (6-APB) ⁶
CAS number:	286834-85-3
Price:	36.00 € for 1 gram
Appearance:	Fine tan off-white powder
Quantity received:	1 gram
Delivery time:	4 days (to Spain)—Vendor ships products using Royal Mail's AirSure [®] service so delivery is faster than usual. A tracking number is provided which enables detailed tracking to abroad.
Packaging:	Padded envelope which contained a white sealed plastic bag containing a baggy on which the chemical name, CAS number and weight were printed.
Dose tested:	275 mg
Positive:	This vendor is to be trusted. Packaging is good. The vendor ships fast and uses AirSure which is faster than regular mail, especially when sending to outside of the UK. The product is pure and of outstanding quality.
Negative:	There aren't many negative points we can think of when it comes to this vendor and their 6-APB. They do what they say, they ship fast and reply to mails fast and their communication is clear. The only thing we can think of here is that the price of this particular product is on the high end of the scale compared to some other vendors.
Comments:	A professional and reliable vendor that ships fast.
Verdict:	8/10
	(retrieved March 2015)
Vendor name:	[xxx]
Website:	[xxx]
Product:	5-(2-Aminopropyl)indole (5-IT/5-API)
CAS number:	3784-30-3
Price:	€ 20 for 750 mg + £0.90 for 1st class delivery
Appearance:	Light brown sandy powder
Quantity received:	750 mg
Delivery time:	1 day
Packaging:	Discrete bubble envelope, with another shiny metal blue envelope which contained a plastic bag. On the bag was the name of the drug and the quantity. Inside the bag was another bag with the drug in.
Marquis test ⁷ results:	Not tested
Dose tested:	110 mg
Quality report:	
HIGH =	Stimulating yet mellow. Euphoria and chattiness without anything being too overbearing. Very little strain on the body.
COME UP & DOWN =	Approx. 60 mins to fully come up. Come down was very gentle and unnoticeable
DURATION =	long, 6 + hours.
POSITIVE =	This vendor has excellent communications, is very speedy, and the product is always top notch. You can pay by bank transfer for a slight discount

NEGATIVE = Charges €1.20 fee for credit card payments
 COMMENT: Pure 5-IT from reliable vendor
 Verdict: 9/10

Because counterfeit and mislabeled products are key concerns (cf. Measham et al., 2011), forum participants rely on the Chemical Abstracts Service (CAS) number to identify substances. They also provide the chemical formulas of compounds online.

The informants interviewed off-line by the first author asserted that pharmacological uncertainty is diminished by ordering chemicals with the same CAS number from known vendors. When the material arrives, they inspect the product's packaging, color, and tactile properties to ensure it is not mislabeled or counterfeit. Some even make use of microscopes to more closely examine the crystalline structure. The senses, however, can only go so far as products often have a similar appearance and determining their chemical structure requires laboratory equipment (cf. Martin, 2006). Feedback on chemicals that appear counterfeit, mislabeled, or toxic are posted on the forum, a crucial feature of the online trying out of chemicals. Without such feedback, users would be on their own in trying out unknown substances.

The collective examining, evaluating, and reporting give experimenters a sense of control over the risks they are taking. In conducting these experiments, they seem unworried about the integrity of the online reporting of others whom they have generally never met face-to-face; nor do they seem concerned about the chemical stability of substances ordered from faraway places which at times take more than a week to arrive. Instead, they trust that the online spaces where information is exchanged can reduce the likelihood of harm. This mix of rational evaluation and trust can be characterized as an in-between strategy (Zinn, 2008) for addressing uncertainty.

Weighing and Dosing

Forum participants further sought to confront pharmacological uncertainty through careful measuring to determine correct or optimal dosages. Users of recreational drugs that come in powder form such as amphetamine and cocaine usually measure dosage through visual estimation, a process referred to as "eyeballing." For common recreational drugs, there are sources on the web such as www.erowid.org that provide guidance on doses for producing a good high with minimal side effects. But a key feature of designer drugs is that their potency is generally not yet known. Website administrators and visitors emphasize the need to use professional scales to weigh the initial dose carefully. When such scales are unavailable, users must improvise. Louie posted his experience with a self-developed method of measuring potentially potent drug materials that makes use of iteration:

Caution!!!!

Please if you are going to research buy some good scales for your lab . . .

Do not try this with chems where a few mg [difference] means life or death

I did this in a hurry at a celebration lately with good results so I think I should post it with its practical use:

Measured on my weed scale and I have 2 grams of butylone.⁸ How do I dose? Best is mix it with water in order to know exactly the dose to ingest. Like for milligrams in milliliter. But what if you are outside or in the forest, celebrating away from your home laboratory?

Just put all two grams on a mirror or something, then split it into quarters. When you look now, you can probably see that one pile is larger than the others. Mix the largest and smallest pile and re-split them. Do the same with the two others. Now we should have four "even" piles. Split each of them again, looking for the biggest and smallest, and repeat. Do this each time that you split the piles and keep something to write with you in order to note the milligrams.

So back to my case: I got the two grams of butylone which I have divided into 32 piles (also at the last split, repeat the re-division for four more times! Now each of them should have 62.5 milligrams. Usually I would

take a dosage of around 150 milligrams but in these emergency situations it is better to go for the smaller dose, wait how you react and then maybe take more after a while. So do not approach your normal dosage with this method! A little less. My example test here was made at the laboratory which enabled me to measure the 32 piles after my split experiment. Each should have 62.5 milligrams but in fact they ranged from 51 to 86 mg. This method is not eyeballing but it's also not a really good measurement, but something in between.

Stay safe, get professional scales people! Stay healthy, much love
(Louie, retrieved February 2015)

Experimenters also warn of the ever-present risk of potential allergies, as a dose that works for one user may cause a toxic immune response in another. To reduce risks, forum participants follow a practice used by Albert Hofmann (2009) in his first trial of LSD in 1943: begin with the smallest possible amount that still has an effect. The guidelines written by the forum's administrators explain the practice of allergy dosing:

Measure out approximately 5 mg of your material . . . Dissolve your 5 mg in 1 liter of distilled water and allow to go into solution. Your solution should now have a concentration of approximately 5 µg/ml. Measure out 1 ml of water and hold it in your mouth for 5-10 minutes to see if any reaction occurs. (Guidelines, retrieved March 2015)

By using this method, our informants work with dosages significantly lower than the effective dose of any known substance or substance group, including hormones that can be effective at doses as low as 12 µg (Lee & Zhu, 2013, p. 9–10).

Hathi, a senior member of the forum, posted a tale of caution with what he thought was the now popular compound 1-phenyl-2-(1-pyrrolidiny)-1-pentanone (A-PVP),⁹ which he ordered from a custom laboratory. It shows a possible outcome of skipping over “allergy testing”:

I sampled approximately 2 mg of this substance and I nearly died! I went to the hospital with kidney failure and believe I may also have suffered a heart attack. I think the drug was actually Bromodragonfly.¹⁰ So far I can only guess but I investigated the substance and especially poisoning cases. Given my extremely delusional thinking and confused state, both of which lasted for 2 weeks, I think bromodragonfly is an educated guess. During that state when I was completely delusional and half-dead, I also lost the tracking number of the package ☹. (Hathi, thread, retrieved April 2015)

Had Hathi not destroyed the packaging with its tracking number in his delusional state, he would have shared it to warn participants on the forum. Instead, he had to speculate about the identity of the substance. Educated guesses are part of the in-between approach of experimenters to pharmacological uncertainty. Hathi contributes to the collective sense of control by warning others about the vendor further down in the discussion thread.

Trip Reports

Trip reports are found in most drug-related online forums and databases (Bogenschutz, 2000; Móró & Rácz, 2013; Wax, 2002) and are a key means to generate experience-based knowledge of a substance for other (potential) users, who are then able to determine whether a drug may be of interest to them or not. Trip reports generally provide detailed accounts of what substances do to users' bodies and minds, how long the effects last, what a sufficient and safe dosage might be, and how (the administration of) products can be tinkered with to enhance the effects. Some trip reports focus on the personal journey—the sensory alterations induced by the drugs—and are impressionistic perspectives similar to those contained in Huxley's *The Doors of Perception* (Huxley, 1954/2004) or De Quincey's *Confessions of an English Opium Eater* (De Quincey & Milligan, 1821/2003). Other trip reports are presented in a

more formal format and contain objective data such as dates, time lines, dosages in milligrams, body weight, and pulse readings. The forum's guidelines state:

No one of these styles is "right" or "wrong" and each serves to communicate different information about compounds. Some sort of hybrid report usually does a very good job of communicating the relevant objective and subjective data as well as "the story." (Guidelines, retrieved in March 2015)

The trip report format suggested by the web administrators resembles the experience reports of Alexander Shulgin in *PiKHAL* (1991) and *TiHKAL* (1997) which list the several hundred compounds he produced and experimented with. Below are two examples from the online forum. Note that reports need not be of "successful intoxications." Negative reports have their own value for the online community as well:

Date: 28-12-2014
Dosage: 40 mg
ROA:¹¹ oral in water, started with 20 mg, later I did twice 10 mg. I have the feeling that this has some activity on the dopamine receptors. The whole time I had the feeling as if I wanted to use something else, because this isn't working. I tried listening some music, it didn't do a lot to me. But the feeling that something should happen when it did not, and wanting to do something else, like something stimulating was actually annoying. So again, nothing special for this compound.
(Kaa, thread, retrieved March 2015)

So first a little chemical info about 4-Methylethcathinone¹² including pics which I made with a digital microscope.

Chemical Data

Full Chemical Name: 4-Methylethcathinone (aka 4-MEC)
Systematic Name: (RS)-2-ethylamino-1-(4-methylphenyl)propan-1-one
CAS Number: 1225617-18-4 and 1266688-86-1 (hydrochloride)
Molecular Formula: C₁₂H₁₇NO
Molecular Mass: 191.27 g/mol

I ordered that batch from [name of the laboratory]. I got it as crystals which look like this under the microscope on 250×



Delicious! These crystals look good, right?

The dose that I took was around 200 mg and after I had crushed the crystals to powder, I took it intranasal. The stuff hurt a little in my nose, maybe it is already used to chemicals. I say this because some reports say that it is supposed to burn a lot when snorted! It took around 15mins to come up and I could say immediately that this was going to be my favorite stimulant for a while at least, one that I would like to test more. After some time, I visited a friend at his home and didn't have any problems with being social, even with random strangers on the street. However the effects of the substance . . . It is def a really good amphetamine, with a strong euphoric kick plus it only lasts around two or three hours. So you can go to sleep without the help of others like benzos [benzodiazepine] or weed [cannabis]. It's no problem to be awake for a whole night if you want even to party. In my experience, it also made music sound better than while being sober. (Akela, thread, retrieved February 2015)

Akela's trip report contains detailed information—the different names for 4-MEC, the CAS identification number, its molecular mass, and the source—while the attached image gives those in the know a hint about the quality. Akela then details how much 4-MEC he ingested and how. He then evaluates its efficacy for socializing, which seems to work for him at the dosage used.

The next two examples represent the most common form of trip report. The shorter, more casual versions work via accumulation: The more the people post their results with specific dosages and so on, the more detailed the picture of a new compound becomes. The following is a report on a new kind of opioid called U-47700.¹³

Vaping: tastes too god awful on foil to continue, takes a long time to heat up and finish a small dose so effects were very light.

Insufflation: incredible. At the perfect dose, euphoria is up there with some of the best opiates. It is very slightly dissociative and affects vision pretty intensely, it also affects balance which are all effects i haven't experienced previously on other opioids. Lasts about 2–3 hours with the peak being from 30–90 minutes. Also slightly changes my voice, another first. Pinpoint pupils as usual.

In conclusion, u-47700 exceeded my expectations. A wonderful compound at that.

Be safe everyone, cheers! (Bagheera, thread, retrieved April 2015)

Bagheera's report illustrates how forum participants, even in short communications, share information on how substances were administered, the effects they experienced, and the time at which effects occurred and waned. The trip report becomes a means to collectively generate understanding of the pharmacokinetic trajectory of specific designer drugs.

In the following report on 25i-NBOH,¹⁴ Balu shares his negative experience because little is known about it in "high doses." The monitoring of blood pressure adds a quantified biomedical dimension to his experience:

Hello all,

I made a post few days ago in which I have experimented with 25i-NBOH. I did around 1500 micrograms and mixed half a gram of weed in there.

Yesterday tested it again which resulted in a really bad trip.

I'm still a little bit exhausted, so I'm going make it quick:

T+00: took two blotters of 25i-NBOH, each 1000 micrograms

T+60: felt really uncomfortable, I decided to ignore that and spent next hour smoking cigars mixed with weed (approx. 320 milligrams)

T+120: the trip took a wrong turn. The visuals disappeared, and I started vomiting like crazy!

Note that this was only during the first two hours, the next 4 to 6 hours I was just trying to keep my fluids/meds while trying to sleep.

On the trip my blood pressure went up to 158/96 mmHg

Conclusion: maybe this could be inaccurate, but I really believe that the cannabis has caused the negative effects of the drug! I put the post here because I saw that there is not much about 25i-NBOH, in general but also not in these higher dosages. (Balu, thread, retrieved April 2015)

These trip reports highlight the experimental nature of the activities reported on the forum, with participants not only pursuing good highs but collectively seeking to make sense of a whole range of desired and adverse effects. Our findings echo those of Soussan and Kjellgren (2014), who, on the basis of content analysis of over 13,000 reports on three popular online drug forums, argued that designer drug users are not only seeking pleasurable experiences. For some, just experiencing *something* is enough, while negative experiences do not necessarily mean that they will reduce or stop their use. Soussan and Kjellgren suggest that curiosity is a driving force behind the experimentation, a point usually ignored in analyses of the NPS phenomenon (Rolles & Kushlick, 2014). Indeed, a simple keyword analysis of the trip reports section of the forum revealed the 50 most frequently used terms, with words such as *result*, *report*, *mg [milligram]*, *test*, and *research* pointing to a common theme: research.

Collectively, the trip reports point to the emergent nature of the knowledge generated on the forum—combining available pharmacological, anecdotal, and user-generated information, and based on dialogue, interest, and care within the online community. Our key informant Khan is sanguine about the limits of this knowledge:

We can kind of estimate what will be a risk and what not, we can look at the molecular structure and we can hypothesize what it will do to our body but, ehm, there is a level of uncertainty, you just said it's sort of a clinical trial, which we do not have. And we do not have a sort of medical facility for our use that we can really look at the blood levels and stuff like this, ehm, and I, I think that many people who experiment with research chemicals also already took so many compounds that it will be very difficult to say like this is probably due to your 2c-b-whatever use. (Khan, interviewed March 2015)

Conclusion

Experimenting with psychoactive substances is hardly a new phenomenon. Ethnobotanists and pharmacologists have detailed how all kinds of plants have long been used to reach altered states of consciousness in religious rituals and “traditional” modes of healing (e.g., Schultes, Hofmann, & Rätsch, 2001; Siegel, 2005). Depending on the society, priests or shamans controlled the preparation of concoctions and guided their users (e.g., Furst, 1990; Grob, 2002; Hart & Ksir, 2013; Labate & Cavnar, 2014; Wasson, Hofmann, & Ruck, 2008). In medieval Europe, pharmacological experimentation was associated with witches and herbal healers (Spinella, 2001) before it gradually became the preserve of scientists beginning in the 17th century (Rheinberger, 1992).

As described by sociologist Howard Becker, this structure of scientific authority was challenged in the 1950s and 1960s by informal social networks experimenting with cannabis and LSD (Becker, 1967, 1973). Founding figures of the designer drug phenomenon—including the chemists Alexander Shulgin (Jenkins, 1999) and Nick Sand (Stafford & Bigwood, 1992)—were a part of such networks, developing new drugs, self-experimenting, and sharing their experiences and knowledge (Doyle, 2011; Shulgin & Shulgin, 1991, 1997). Doyle, for example, describes how 2c-1¹⁵ was “researched by an amateur network of worldwide psychonauts who synthesize the compound with the help of clandestine online chemistry sites and of internet-mediated providers of research chemicals” (2011, p. 46).

Whereas the web was initially used to provide “expert-based” information to drug users (Bogenschutz, 2000; Boyer et al., 2005; Wax, 2002), today it mediates more active forms of collaboration and experimentation (e.g., Doyle, 2011). The proliferation of Internet drug forums over the past decade has led to a largely unseen dispersion of experimenting with new designer drugs and drug

combinations (Davey, Schifano, Corazza, & Deluca, 2012; Deluca et al., 2012; Móró, 2014; Móró & Rácz, 2013; Soussan & Kjellgren, 2014; Van Hout & Hearne, 2015). The participants of the online forum that we studied were not only seeking good highs. They were clearly enjoying being part of the collaborative experimentation on their own bodies and minds—with the online forum providing them an interactive platform where their experimentation, observation, analysis, and positive and negative trip reports acquire value.

One could argue that this avant-garde experimentation, although different in form, has a similar function to clinical trials in mainstream medicine, where the safety and efficacy of new drugs are assessed in small groups of research subjects before being used by larger populations. By adhering to established reporting scales and formats, by systematically checking and exchanging specific data such as CAS numbers, by inspecting packages and substances with microscopes, and by applying rigorous methods for measuring and dosing, forum participants experience, we argue, a sense of control in the face of pharmacological uncertainty. Harm reduction strategies and biomedical interpretations of efficacy are presented as rational experimental procedures. Compared to Shulgin's earlier experiments, the online discussion threads allow users to conduct larger and more interactive collective experiments and to rapidly disseminate their findings, thereby "lifting the curtain" on pharmacological uncertainty.

Our findings also show how online forums allow the self-experimenting community to rapidly adapt to the challenges posed by the appearance of new compounds, for instance, in the form of substance warnings and immediate, practical peer support for members experiencing problems. The international character of the forum and the large number of members means that there are always people online to help. These "micro-social forms of collective self-protection by drug users and their social networks" (Friedman et al., 2007, p. 115) are only thinkable in a world constantly connected by the Internet. As a technology, the Internet creates new forms of social interaction by enabling users to experiment in ways that are highly synchronized and complementary.

But in conducting these experiments, leaps of faith are as important as more rational approaches. Our informants need to rely on the trip reports of others whom they have never met and the quality assurance procedures of chemical labs in faraway countries. However rigorous their strategies of measurement may be, and however intense their interactions online, uncertainty can never be removed due to the novelty of the substances and lack of formal quality control. If substances are mislabeled or provoke toxic reactions, even small amounts can have disastrous effects, as some of the reports we highlighted demonstrate.

Between 2011 and 2014, Eurobarometer studies found that lifetime use of NPS (both synthetic and organic) in the European Union had increased from 5% to 8%, with the Internet being the leading source of information on NPS (European Commission, 2014). However, an off-line study among experienced drug users in the Netherlands found that personal experiences with NPS were preferably shared with friends, face-to-face. The same study also found that NPS were usually obtained from friends rather than on the Internet (Van Amsterdam et al., 2015). More off-line research among designer drug users is needed to better understand the links between collaborative and global online experimentation, off-line drug use, and national phenomena like *smart shops*.

While policy makers are understandably concerned about how online drug forums contribute to the uncontrollability of the NPS phenomenon (Corazza et al., 2011), our study of user-led harm reduction strategies on one such forum confirms previous research (e.g., Soussan & Kjellgren, 2014) that online forums can also be vehicles for reducing harm. Projects such as NEPTUNE¹⁶ that aim to increase "the competence of clinicians in detection, assessment and management of NPS users" (Home Office UK, 2014, p. 18) can and should, in our view, make more systematic use of user reports, aided by new virtual data analysis tools (e.g., Rogers, 2013; Helmond, 2015) that enable the rapid analysis of numerous online reports and the identification of the most influential participants of select drug forums. Our findings suggest that the participants of our designer drug forum view reducing harm

among their drug-using peers as an intrinsic part of their collective experimentation. Active online reporters may thus be willing to work with researchers to analyze reports and share the findings online, although such collaboration will likely raise concerns of encouraging further experimentation with designer drugs with high-risk toxicological profiles.

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Notes

1. The terms “designer drugs” and “NPS” are often used interchangeably. We privilege the former, as this was the term most often used by our informants, and because it emphasizes the “human-made” aspect of synthetic novel psychoactive substances (NPS), as opposed to organic NPS which can include traditionally used substances such as *Khat* and even *Ayahuasaca*. The term designer drug first appeared in the 1980s (Jenkins, 1999).
2. *Ketamine* today is widely used as a medicine and is regarded as a drug in its own right (EMCDDA, 2015b). It was previously listed as a designer drug (Jenkins, 1999).
3. Deriving from the Greek ψυχή (psyche) = “soul,” “spirit,” or “mind” and ναύτης (naútēs) = “sailor” or “navigator.”
4. This study was conducted with support from the European Advanced Grant ChemicalYouth (ERC-AdG-323646), which is led by Professor Anita Hardon of the Amsterdam Institute for Social Science Research. Research for the ChemicalYouth project was approved by the Ethics Committee of the Faculty of Social and Behavioral Sciences of the University of Amsterdam (4th December 2012). The outlined approach to ensuring anonymity for online sources was endorsed by the independent ethics advisor for the project as well as by the Ethics Committee of the Faculty of Social and Behavioral Sciences.
5. Anonymized by the authors and slightly edited for grammar.
6. Also known under its brand name, *Benzo Fury*, as a legal high. It creates effects similar to *MDMA* but has long been legal in many countries (<http://drugsinfoteam.nl/drugsinfo/research-chemicals/benzofury>).
7. A test kit that makes use of a spot test to identify chemical compounds, recommended for harm reduction by organizations such as *DanceSafe* (www.dancesafe.org). None of our research participants had used it.
8. A *phenethylamine* that has reported entactogenic, psychedelic, and stimulant qualities (http://www.softox.org/drug_monographs).
9. A relatively popular synthetic stimulant, also known as *Flakka* (<http://www.drugabuse.gov/drugs-abuse/emerging-trends>).
10. One of the rare toxic hallucinogens that has led to several fatalities (Corazza et al., 2011). Due to its potency, user-driven websites like *Erowid* warn users to take extreme caution when dosing with this substance (https://www.erowid.org/chemicals/bromo_dragonfly/bromo_dragonfly_dose.shtml).
11. ROA = Route of Administration.

12. A synthetic stimulant with an “extremely short history of human use” (https://www.erowid.org/chemicals/4_methylethcathinone).
13. While writing this article, we found a new Wikipedia page about this drug, which seems to have no history of human use prior to 2015/2016: https://en.wikipedia.org/wiki/U-47700#cite_note-18 (visited February 4, 2016).
14. A potent synthetic psychedelic that is said to have “no history of human use prior to 2010” (https://www.erowid.org/chemicals/2cc_nbome/).
15. A short-acting synthetic psychedelic that appeared in 2001 (<https://www.erowid.org/chemicals/2ci/>).
16. *Novel Psychoactive Treatment: UK Network* (NEPTUNE; <http://neptune-clinical-guidance.co.uk>).

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