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Research paper

The users of Novel Psychoactive Substances: Online survey about their characteristics, attitudes and motivations

Christophe Soussan *, Anette Kjellgren

Dept. of Psychology, Karlstad University, 651 88 Karlstad, Sweden

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ABSTRACT

Background: The increasing number of Novel Psychoactive Substances (NPS) constitutes a challenge for public health agencies and researchers worldwide. Scientific studies about NPS and their users are limited and there is a need to explore the general motivations for NPS use but also to examine if and how the motivations differ between substances from separate effect classes. The aim of the present study was to investigate the characteristics, including attitudes and motivations, of a self-selected sample of international NPS users.

Methods: An online survey containing questions about drug use history, attitudes, motivations for use, and WHO-5 Wellbeing Index was promoted at the drug discussion forum bluelight.org. The data was analysed using SPSS.

Results: The sample consisted of 619 international NPS users with overall good emotional well-being despite extensive experience of both traditional and novel drugs. The main incentive for use of NPS in general was pleasure and enjoyment. However, going beyond the general approach to NPS revealed significant variations between drug groups. For example, the use of hallucinogens was substantially motivated by self-exploration and spiritual attainment and showed very low levels of addiction potential while the use of opioids and especially GABA activating substances was mainly motivated by coping and showed much higher levels of addiction potential. Synthetic cannabinoids were the least appreciated and least likely to be used again, and were mainly motivated by circumstances such as availability and legality.

Conclusion: Understanding the different motivations for NPS use in terms of drug groups could enable more effective prevention and consequently a reduction in harm.

Background

The umbrella term Novel Psychoactive Substances (NPS) refers to a multitude of progressively increasing compounds that are marketed as legally ambiguous alternatives to traditional drugs such as amphetamine, heroin, LSD and cannabis. In 2014, the European Monitoring Centre for Drugs and Drug Addiction (EMCDDA, 2015) identified 101 novel substances in Europe, which brought the total number of monitored NPS to a staggering 450. Clandestine vendors continuously adapt to regulatory actions by introducing abandoned medical research chemicals or yet new and molecularly altered NPS with mostly undocumented and erratic effects (EMCDDA, 2015; Johnson, Johnson, & Portier, 2013). Further attempts to evade legal controls include the use of Internet as an arena for the open sale of NPS that are often surreptitiously labeled "bath salt", "plant food", or "not for human consumption" (Gibbons, 2012). Besides the apparent harm potential, the speed at which this cat and mouse game advances constitutes a challenge for public health agencies and researchers worldwide (EMCDDA, 2015). Primary literature about side-effects, addiction potential, toxicological risks, or possible contraindications regarding the increasing number of NPS is limited (Gibbons, 2012; Wood & Dargan, 2012). Also, knowledge pertaining to the use of NPS and its community of users is scarce or contradictory. The prevalence-of-use rates are uncertain since scientific studies are limited and based on different populations or substances. A Eurobarometer (2014) survey showed that, on average, 8% of youth in Europe had experience of NPS, which differed considerably from the 65.8% among a targeted population of nightclub visitors in the UK (Wood, Hunter, Measham, & Dargan, 2012). The typical NPS user has primarily been depicted as a young male (Vardakou, Pistos, & Spiliopoulou, 2010; Werse & Morgenstern, 2012)

* Corresponding author. Tel.: +46 547002285.
E-mail address: Christophe.Soussan@kau.se (C. Soussan).

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although middle-aged users have been acknowledged as well (Barratt, Cakic, & Lenton, 2013). Some NPS users are also known to be well-informed, knowledgeable, and experienced with drugs in general (Davey, Schifano, Corazza, & Deluca, 2012; Soussan & Kjellgren, 2014; Werse & Morgenstern, 2012).

Little knowledge exists about the motivations for NPS use and additional research is needed to further explore these reasons (Moore, Dargan, Wood, & Measham, 2013). The vast array of different NPS presumably entails several intentions for using them. Some sources have emphasized that the motivation for using NPS revolves around external circumstances such as price, legal status, availability or non-detectability in screening tests. Other findings suggest that users are driven mainly by curiosity, the enjoyable effects, or enhancement of social situations (Corazza, Simonato, Corkery, Trincas, & Shifano, 2014; Measham, Moore, Newcombe, & Welch, 2010; Werse & Morgenstern, 2012; Winstock, Lawn, Deluca, & Borschmann, 2015). It is also likely that the motivations for using NPS overlap with the motivations for using traditional drugs. A review of the literature on motivations for drug use exposed several other recurring incentives such as pleasure, enhancement, coping, self-assertion, habit and addiction, and self-exploration (e.g. Boys, Marsden, & Strang, 2001; Nicholson, Duncan, & White, 2002; Novacek, Raskin, & Hogan, 1991). Many of these motives have appeared inductively in our previous research about different NPS. For example, the use of the novel stimulant ethylphenidate was characterized by salient addiction potential and sought-after effects such as self-confidence, social facilitation and cognitive enhancement (Soussan & Kjellgren, 2015). In addition, our investigation into the experiences induced by the novel hallucinogen 4-HO-MET showed that the main reason for use was curiosity and self-exploration while experiences of addiction were absent (Kjellgren & Soussan, 2011). This supports the notion that traditional drug use motives to some extent applies to NPS as well, but it also indicates that the motivations for NPS use might vary between substances from different effect-classes, as in the case of the hallucinogen and the stimulant described above. The assumption of NPS specific motivations is further substantiated by the fact that legality constituted a major incentive for the use of synthetic cannabinoids (Werse & Morgenstern, 2012) while the appeal of the novel stimulant mephedrone was found to be uninfluenced by legal status (Moore et al., 2013). Hence, approaching the motivations from a broad and all-encompassing perspective of NPS in general will occasionally be unrefined, especially considering that a more nuanced understanding of the different pathways to drug use is assumed to be essential in enabling effective treatment, prevention and consequently a reduction in harm (Adams et al., 2003). Therefore it is important not only to study the motivations for NPS use in general but also to examine more fully if and how the motivational characteristics of each group of NPS differentiate.

The aim of the present study was to investigate the characteristics, including attitudes and motivations, of a self-selected sample of international NPS users.

Methods

Data collection

The data were collected through an online survey, which was promoted at the international drug discussion forum bluelight.org. The survey consisted of three parts. The first part concerned background data including age, gender, country of residence, traditional drug use history, and number of different NPS used within the last five years.

The second part of the survey contained a set of NPS specific questions including substance name, way of acquisition, and 11 visual analogue scale (VAS) items with end points 0 (“Not at all”) to 100 (“Highly appreciated/motivated”), etc. The first three items investigated the extent to which the participants (1) *appreciated the effects*, (2) *planned on using the substance again*, and (3) *estimated the addictive potential*. The next eight VAS items concerned the motivation for using the specified NPS. The participants were asked to evaluate the extent to which they were motivated by (1) *pleasure and enjoyment*, (2) *facilitation of social situations*, (3) *enhanced mental or physical abilities*, (4) *coping with pain, boredom, emotions and problems like anxiety and sleep deprivation*, (5) *self-assertion or self-confidence*, (6) *habit or addiction*, (7) *self-exploration or spiritual attainment*, and (8) *circumstances such as price, legal status, availability or non-detectability in screening tests*. The eight motives were abstracted from the literature on motivations for drug use (see Background section). The NPS specific set of questions was repeated for (and limited to) each of every participant’s three most recent and distinct NPS experiences. The survey software ensured that the initially stated number of used NPS determined the number of repetitions, meaning that every participant reported between one and three cases of NPS use. This part of the survey also included an open-ended question regarding the reasons for using NPS that will be analysed and published elsewhere.

In the third part of the survey the respondents were asked to fill out the World Health Organization (WHO) Wellbeing Index (WHO-5), which is a well validated five-item questionnaire for assessing the subjective and psychological well-being (Topp, Østergaard, & Søndergaard, 2015). The well-being index ranges from 0, “complete absence of well-being”, to 100, “the highest imaginable level of well-being”. A score of 50 or lower suggests poor emotional well-being.

The survey was online between November 2014 and February 2015 and yielded 1551 cases of NPS use reported by 619 participants. No questions were left unanswered since all fields were compulsory. Uncompleted survey attempts were removed automatically by the survey software.

Analysis

Each case of NPS use was categorized according to one of the following effect classes: hallucinogen, stimulant, dissociative, GABA activating drugs (henceforth GABA), synthetic cannabinoid, opioid and other-than-NPS. We categorized the following as other-than-NPS: (1) cases involving a combination of drugs, or (2) cases based on one of the following substances: alcohol, nicotine, cannabis, cocaine, LSD, amphetamine, heroin, psilocybin, and mescaline. According to Corazza, Demetrovics, van den Brink, and Schifano (2013), “novel” does not necessarily mean new but also incorporates long-existing substances “which have recently become popular in the drug market”. Therefore, a few grey-zone cases were categorized as novel if they were frequently reported.

Next, the data were analyzed using common statistical procedures in SPSS (descriptives and frequencies). A one-way-ANOVA was used to analyze if the motivation for using NPS was significantly different between drug groups.

Ethical considerations

The participants were informed about the study and its purpose before participating. They were also informed that participation was completely voluntary, and that they could withdraw from the study at any time without specifying why, as long as the survey was uncompleted. In addition, participation was anonymous and no questions about identity were asked. In order to participate the users had to verify being 18 years or older and that their latest use of NPS took place less than two years ago. The collected data

have been carefully handled throughout to protect individual privacy so no unauthorized people can access it. The study was ethically approved by Karlstad University Ethical Review Board, dnr C2014/419.

Results

The sample

A total of 619 persons (517 males, 102 females) completed the survey. Their mean age was 27.6 years (*SD* = 9.47, *median* = 25 years) and the range was 18–75 years. The mode age was 18 years for both genders. There was a significant difference in age between males and females (independent samples *t*-test, $t_{(618)} = 2.66$, $p = 0.008$), where the males were slightly younger (*mean* = 27.1, *SD* = 9.30) than the females (*mean* = 29.8, *SD* = 10.0). The sample consisted of respondents from 42 different countries, and the ten most frequently occurring countries were: USA (48.9%), United Kingdom (14.2%), Canada (7.3%), Sweden (5.5%), Holland (3.7%), Australia (3.4%), Germany (2.9%), Finland (1.0%), France (1.0%), and Poland (1.0%). The WHO-5 Well-being questionnaire had high reliability (Cronbach's $\alpha = .86$), and the mean index for all respondents was 57.9 (*SD* = 20.2). The mean consumption of pure alcohol in an average month (wine, beer and spirits) was 504 ml (*SD* = 900). The sample contained 322 cigarette users (52%) for whom the mean consumption during an average month was 170 cigarettes (*SD* = 219).

Traditional drug use

Lifetime experience of at least one illicit and traditional drug was 99%. More specifically, 98.2% of the respondents had taken cannabis, 84.5% a hallucinogen (LSD or psilocybin), 80% a stimulant (amphetamine or cocaine), and 42.3% an opiate (heroin or morphine). Past year use of cannabis was reported by 88% of the respondents, and they had used it on average 239 times (*SD* = 392) during the period. The equivalent numbers for hallucinogens was 61% prevalence (*mean* = 7.5 times, *SD* = 14.6), while past year use of stimulants was reported by 57% (*mean* = 45.1 times, *SD* = 110). Opiate use was less common but more frequently used (*prevalence* = 27.3%, *mean* = 82.5, *SD* = 173).

Table 1
The frequency distribution for each substance group among the 1551 cases.

Substance group	Number of cases	Percent
Hallucinogens	629	40.5
Stimulants	355	22.9
Dissociatives	156	10.1
GABA	106	6.9
Synthetic cannabinoids	90	5.9
Opioids	53	3.3
NPS total	1388	89.5
Other than NPS	163	11.8
Total	1551	100.0

NPS use

The number of different NPS experienced by each respondent during the last five years varied; 29.6% had used nine or more NPS, 16% two NPS, 15% one NPS, 11.8% three NPS, 8.7% five NPS, 7.6% four NPS, 5.8% six NPS, 2.9% seven NPS, and 2.6% eight NPS. The three most recent NPS exposures for every respondent were queried specifically and in more detail (see Methods section). The total number of drug cases reported by the 619 respondents amounted to 1551, of which 409 (66.2%) reported three cases, 112 (18.1%) two cases and 98 (15.8%) one case. Respondents with experience of more than one NPS ($n = 521$) were inclined to use substances from different drug groups; only 24% reported all cases within the same group.

The most frequently occurring substance groups were hallucinogens (40.5%), stimulants (22.9%), and dissociatives (10.1%) (Table 1). In total, the use of 177 different NPS was reported. The three most common NPS were methoxetamine (110 cases), 25i-NBOMe (66 cases), and 4-AcO-DMT (65 cases) (Table 2).

The most common way of acquiring NPS was through the Internet (60.4%), while other means were friends (17.8%), dealer (9.5%), physical shop (5.1%), free sample (2.7%), other such as "rather not say" (2.6%), and self-made (1.9%).

Attitudes and motivation for using NPS

The primary motivation for using NPS in general, regardless of drug group, was pleasure and enjoyment (*mean* = 70.8, *SD* = 29.2).

Table 2
The 20 most frequently used substances among the 1551 cases of NPS and the average extent to which the respondents (1) appreciated the effects, (2) planned on using the same substance again, and (3) estimated the addictive potential.

NPS	Number of cases	Drug group	Appreciation	Plan on reuse	Addictiveness
Methoxetamine	110	Dissociative	81.8	72.4	55.9
25i-NBOMe	66	Hallucinogen	66.9	33.9	9.5
4-AcO-DMT	65	Hallucinogen	81.7	77.2	5.6
2C-B	60	Hallucinogen	75.2	65.7	13.4
Etizolam	55	GABA	77.7	75.7	74.7
Al-LAD	53	Hallucinogen	87.6	85.9	4.6
4-HO-DET	44	Hallucinogen	81.7	72.9	7.7
Ethylphenidate	44	Stimulant	56.6	59.3	55.98
Kratom	30	Opioid	70.8	74.3	52.0
Methylone	29	Stimulant	65.5	49.1	49.3
MDMA	29	Stimulant	86.9	80.1	37.8
4-Fluoroamphetamine	28	Stimulant	73.4	71.3	45.2
Mephedrone	27	Stimulant	78.8	52.8	69.8
5-MeO-MiPT	25	Hallucinogen	71.5	63.7	19.4
AMT	25	Stimulant	82.8	63.0	13.6
25c-NBOMe	24	Hallucinogen	62.2	39.0	14.6
2C-E	23	Hallucinogen	78.9	72.1	9.8
Salvia divinorum	21	Hallucinogen	51.0	50.1	3.7
3-MeO-PCP	19	Dissociative	83.1	69.3	43.7
Dextromethorphan	19	Dissociative	75.2	60.7	40.8

Table 3
The mean approval rates for each motivation split by drug group.

Motivated by	Hallucinogens	Stimulants	Dissociatives	GABA	Synthetic cannabinoids	Opioids	Total
Pleasure and enjoyment?	68.9 (*SD* = 29.6)	72.9 (*SD* = 29.0)	77.0 (*SD* = 23.0)	60.8 (*SD* = 33.5)	70.4 (*SD* = 29.9)	80.6 (*SD* = 25.3)	70.8 (*SD* = 29.2)
Facilitation of social situations?	22.9 (*SD* = 28.6)	43.1 (*SD* = 35.5)	26.4 (*SD* = 29.3)	45.7 (*SD* = 36.8)	28.8 (*SD* = 31.2)	25.5 (*SD* = 29.6)	30.7 (*SD* = 32.7)
Enhanced mental or physical abilities?	45.5 (*SD* = 36.4)	56.5 (*SD* = 34.9)	38.0 (*SD* = 35.1)	28.8 (*SD* = 33.4)	18.5 (*SD* = 27.6)	35.6 (*SD* = 33.6)	44.0 (*SD* = 36.5)
Coping with pain, boredom, emotions, problems, anxiety, sleep deprivation?	24.7 (*SD* = 29.7)	35.5 (*SD* = 34.6)	49.7 (*SD* = 33.9)	77.2 (*SD* = 26.9)	47.5 (*SD* = 37.4)	68.9 (*SD* = 30.6)	37.4 (*SD* = 35.6)
Self-assertion and self-confidence?	21.7 (*SD* = 28.8)	36.0 (*SD* = 32.5)	27.4 (*SD* = 30.7)	35.3 (*SD* = 36.1)	15.6 (*SD* = 23.8)	22.2 (*SD* = 28.2)	26.7 (*SD* = 31.0)
Habit or addiction?	8.3 (*SD* = 15.9)	25.6 (*SD* = 32.0)	25.6 (*SD* = 28.7)	31.9 (*SD* = 33.6)	25.2 (*SD* = 30.4)	51.4 (*SD* = 38.1)	19.2 (*SD* = 28.1)
Self-exploration or spiritual attainment?	76.6 (*SD* = 29.3)	33.1 (*SD* = 33.9)	68.3 (*SD* = 30.6)	17.4 (*SD* = 25.5)	28.4 (*SD* = 30.8)	28.6 (*SD* = 33.2)	55.1 (*SD* = 38.4)
Circumstances such as price, legal status, availability, non-detectability in screening tests?	40.6 (*SD* = 37.0)	48.4 (*SD* = 37.8)	51.6 (*SD* = 35.6)	64.0 (*SD* = 34.2)	66.3 (*SD* = 36.9)	55.7 (*SD* = 36)	47.9 (*SD* =37.7)

See Table 3 for complete list. The mean appreciation of drug effects across all NPS was 70.8 (*SD* = 28.8), and the extent to which the respondents planned on using the substance again was 60.7 (*SD* = 38.4). The addictive potential of all the reported NPS was estimated at 32.6 (*SD* = 33.1). However, both the motivations and the attitudes varied significantly between drug groups. The means and standard deviations are presented in Table 3 and illustrated in Fig. 2a–f. The variations in attitudes are illustrated in Fig. 1. The most significant mean differences (abbreviated *MD* below) between drug groups and their specific characteristics are outlined below. The most common NPS in each group was defined by a threshold of 50% saturation or the three most frequent substances.

Hallucinogens

The most common NPS in this group were 25i-NBOMe (10.5%), 4-AcO-DMT (10.3%), 2C-B (9.5%), AL-LAD (8.4%), 4-HO-DET (7.0%), and 5-MeO-MiPT (4.0%). The most approved motivation for hallucinogens was self-exploration or spiritual attainment (*mean* = 76.6, *SD* = 29.4) (Fig. 2a), which was significantly ($ps < 0.001$) higher than all other groups; GABA (*MD* = 59.1), synthetic cannabinoids (*MD* = 48.1), opioids (*MD* = 47.97), stimulants (*MD* = 43.4), and dissociatives ($p = 0.038$, *MD* = 8.3). Hallucinogens also stood out among all other groups in that they had significantly ($ps < 0.001$) lower scores on habit and addiction (*mean* = 8.31, *SD* = 15.9) compared with all other groups. See Table 3 for comparison of means. In addition, the respondents considered the hallucinogenic NPS to have significantly ($ps < 0.001$) less addictive potential (*mean* = 8.8, *SD* = 13.4) than all other groups (Fig. 1).

Stimulants

The most common NPS in this group were ethylphenidate (12.4%), methylone (8.2%), MDMA (8.2%), 4-fluoroamphetamine (7.9%), mephedrone (7.6%), and 5-MAPB (4.8%). According to the respondents, the primary motivation for using stimulants was pleasure and enjoyment (*mean* = 72.9, *SD* = 28.9) (Fig. 2b). However, enhancement of mental and physical abilities (*mean* = 56.5, *SD* = 34.9) distinguished stimulants ($ps < 0.001$) from synthetic cannabinoids (*MD* = 38.0), GABA (*MD* = 27.7), opioids (*MD* = 20.9), dissociatives (*MD* = 18.5), and hallucinogens (*MD* = 10.9). Furthermore, stimulants had significantly ($p = 0.002$) higher scores on facilitation of social situations (*mean* = 43.1, *SD* = 35.5) than all other drug groups except for GABA. See Table 3 for comparison of means.

Dissociatives

The most common NPS in this group were methoxetamine (70.5%), 3-MeO-PCP (12.2%), and dextromethorphan (12.2%). The highest ranked motivation was pleasure and enjoyment (*mean* = 77.0, *SD* = 23.0) (Fig. 2c). The use of dissociatives for self-explorative or spiritual purposes (*mean* = 68.3, *SD* = 30.7) had significantly ($ps < 0.001$) higher prevalence compared with the following drug groups: GABA (*MD* = 50.8), synthetic cannabinoids (*MD* = 39.8), opioids (*MD* = 39.7), and stimulants (*MD* = 35.1). The dissociatives were also characterized by having the highest score

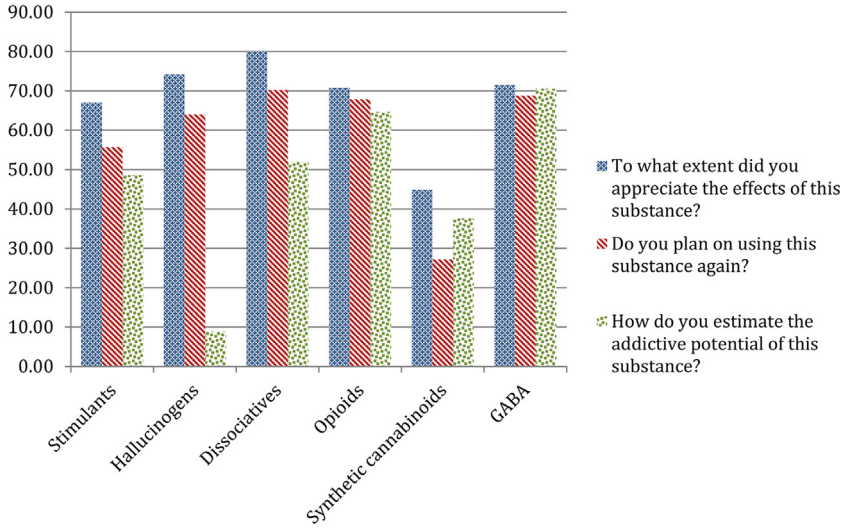

Fig. 1. The extent to which the respondents (1) appreciated the effects, (2) planned on using the same substance again, and (3) estimated the addictive potential. Split by drug group.

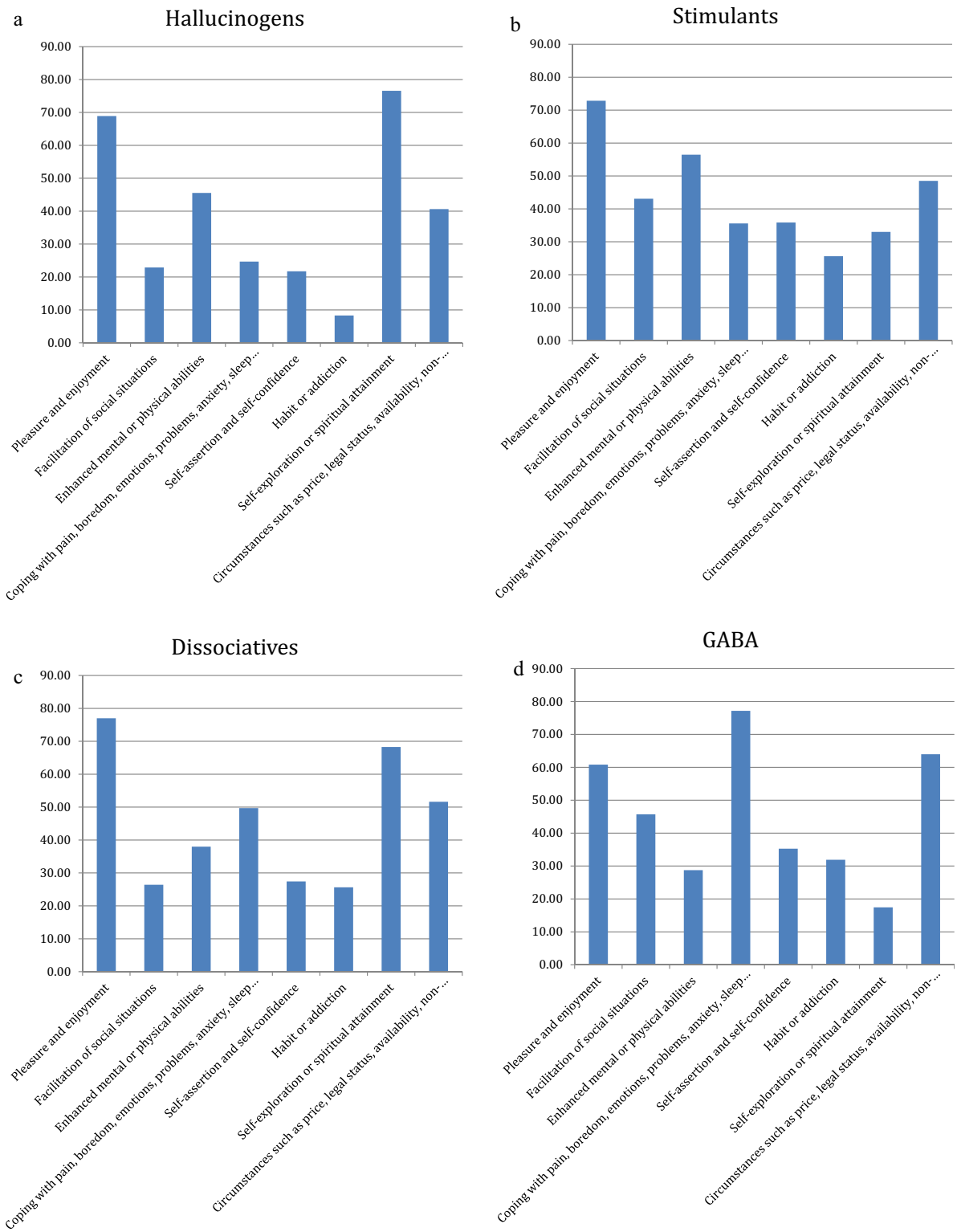

Fig. 2. (a) The mean motivation profile for hallucinogens. (b) The mean motivation profile for stimulants. (c) The mean motivation profile for dissociatives. (d) The mean motivation profile for GABA. (e) The mean motivation profile for synthetic cannabinoids. (f) The mean motivation profile for opioids.

on appreciated effects (*mean* = 80.0, *SD* = 24.7) and planned re-use (*mean* = 70.3, *SD* = 35.0) of all the drug groups.

GABA

The most common NPS in this group was etizolam (51.9%), flubromazepam (11.3%), and diclazepam (7.5%). Use of GABA was primarily driven by coping with life challenges (*mean* = 77.2, *SD* = 26.9) (Fig. 2d), which was significantly ($ps < 0.001$) different from hallucinogens (*MD* = 52.5), stimulants (*MD* = 41.7), synthetic cannabinoids (*MD* = 29.6), and dissociatives (*MD* = 27.5). In addition, GABA significantly ($ps < 0.03$) differed from all other groups except stimulants in that they to a larger extent were used for

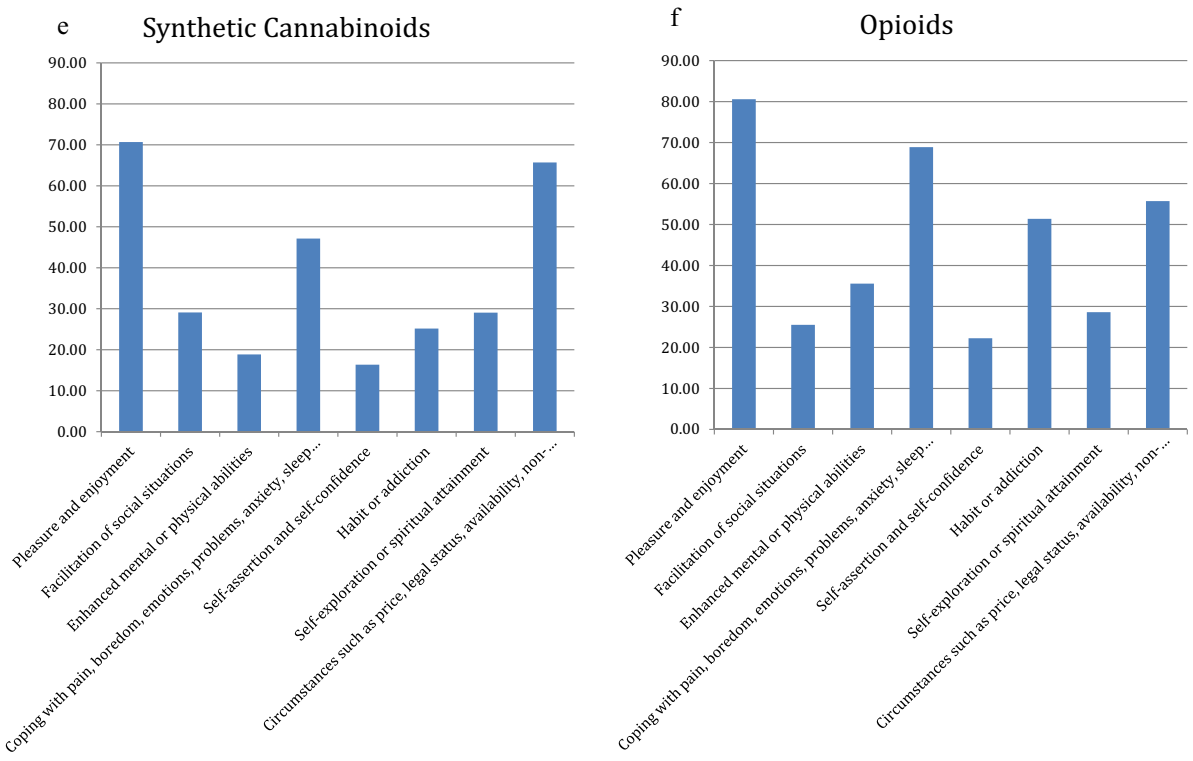

Fig. 2. (*Continued*).

social facilitation (*mean* = 45.7, *SD* = 36.8). See Table 3 for comparison of means. This group was also characterized by having the lowest pleasure and enjoyment mean (60.8, *SD* = 33.5) of all groups. GABA was also estimated to have the highest addictive potential (*mean* = 70.6, *SD* = 28.8) of all groups.

Synthetic cannabinoids

The most common NPS in this group were unspecified cannabinoid (25.6%), followed by branded cannabinoid with unknown psychoactive substance (20.0%), and the cannabinoid JWH-018 (8.9%). The primary motivation for using synthetic cannabinoids was pleasure and enjoyment (*mean* = 70.4, *SD* = 29.9), followed by circumstances such as price, legal status, availability, non-detectability in screening tests (*mean* = 66.3, *SD* = 36.9) (Fig. 2e). The extent to which these circumstances acted as motivation was significantly greater than for hallucinogens ($p < 0.001$, *MD* = 25.7), stimulants ($p = 0.001$, *MD* = 17.9), and dissociatives ($p < 0.038$, *MD* = 14.7). In general, synthetic cannabinoids had lower scores across all motivations (Table 3). They also had significantly (*ps* < 0.001) lower scores on both appreciation of effects (MD1) (*mean* = 44.8, *SD* = 30.3) and plan on re-use (MD2) (*mean* = 27.2, *SD* = 35.5) compared with all other groups; dissociatives (*MD*1 = 35.2, *MD*2 = 43.1), hallucinogens (*MD*1 = 29.4, *MD*2 = 36.7), GABA (*MD*1 = 26.6 *MD*2 = 41.6), opioids (*MD*1 = 25.98, *MD*2 = 40.7), and stimulants (*MD*1 = 22.2, *MD*2 = 28.5). See Fig. 1 for an illustrative comparison.

Opioids

The most common NPS in this group were Kratom (56.6%), AH-7921 (9.4%) and o-desmethyltramadol (5.7%). The highest approval rates were given to pleasure and enjoyment (*mean* = 80.6, *SD* = 25.3) (Fig. 2f), which also constituted the largest mean across all drug groups and motivations. Furthermore, opioids were to a greater extent used for coping with life challenges (*mean* = 68.9, *SD* = 30.6) compared with all other groups except for GABA; hallucinogens ($p < 0.001$, *MD* = 44.2), stimulants ($p < 0.001$, *MD* = 33.4), synthetic cannabinoids ($p = 0.002$, *MD* = 21.4), and dissociatives ($p = 0.002$, *MD* = 19.2). Also, the use of opioids was significantly (*ps* < 0.001) more motivated by habit and addiction (*mean* = 51.4, *SD* = 38.0) compared with all other drug groups. See Table 3 for comparison of means. The addictive potential of opioids was also considered to be significantly (*ps* < 0.001) larger than for all other groups except GABA: hallucinogens (*MD* = 55.8), synthetic cannabinoids (*MD* = 27.0), stimulants (*MD* = 16.1), and dissociatives ($p = 0.015$, *MD* = 12.7).

Discussion

The purpose of the present study was to investigate the characteristics, including attitudes and motivations, of a self-selected sample of international NPS users. The results exposed several distinct and drug group related motivation profiles, which were based on a sample of 619 experienced drug users with an affinity for both traditional and novel substances, indicating that the two go hand in hand. Lifetime experience of traditional drugs was 99% and the majority of the participants (85%) had used several NPS during the last five years. Perhaps even more remarkable is that close to 30% of the participants had experience of nine or more NPS, which was nearly twice as many as those with experience of one NPS (15%). Moreover, a comprehensive total of 177 different NPS had been used among the 619 participants, reflecting a drive towards varied and novel drug experiences that was further supported by the fact that three quarters (76%) of the participants with multiple NPS experiences had used substances belonging to different drug groups. The numbers stated in parenthesis throughout the discussion are rounded off to the nearest integer and if nothing else is stated the numbers refer to the mean VAS-scale scores from 0 to 100.

The majority of participants were young males (mode 18 years), which is consistent with previous findings (Vardakou et al., 2010;

Werse & Morgenstern, 2012). However, a broad range of ages up to 75 years (mean 28 years) of both genders (16% females and 84% males) was represented, indicating that the use of NPS is not exclusively a youth male phenomenon. The females were slightly but significantly older than the males. Despite extensive drug experience, the participants appeared to have good quality of life, indicated by the sample's overall well-being score of 58, which according to Topp et al. (2015) is above the suggested threshold (50) for poor well-being. Interestingly enough, the mean consumption of alcohol per participant and year (6 l) was marginally less than the average worldwide consumption (6.2 l) (WHO, 2014), which means that the sample did not use alcohol in excess of the general population.

Although the Internet is usually purported as the main arena in which NPS are marketed and sold, it turned out that close to 40% of the NPS reported in this study were acquired through other means, mainly friends and dealers. Similarly, another study (Sande, 2016) showed that the majority of a sample of novel stimulant users in Slovenia obtained their drugs from friends or dealers as opposed to the Internet. This shift towards a greater reliance on real world interactions is known to occur when an NPS is banned (McElrath & O'Neill, 2011), which indicates that a gradual overlapping between the traditional and novel markets is taking place.

It is noteworthy that the characteristics usually associated with the use of novel substances in particular, such as being affordable, legal, available and non-detectable in screening tests, constituted a significantly less endorsed motivation (48) than pleasure and enjoyment (71) which was the most approved motivation for using NPS in general. Recent research (Sande, 2016) partly agrees with the notion that some circumstances, such as the legality of NPS and lack of access to traditional drugs, are less important reasons for NPS use while, on the other hand, other circumstances such as low price and high purity were among the most important reasons. Nevertheless, several studies of both traditional (Boys et al., 2001; Novacek et al., 1991) and novel (Corazza et al., 2014; Werse & Morgenstern, 2012) drugs support our finding that pleasure, in the form of "enjoying intoxication" and "having a good time", is the key incentive for using drugs, but what does that imply? In our earlier studies (Kjellgren & Soussan, 2011), we have concluded that recreational NPS users were more concerned with experiencing per se rather than the desire for specific experiential content such as euphoria. This drive towards non-ordinary and novel experiences can explain why the overall effects, positive or negative, of the reported NPS were appreciated to a large degree (71), and why the participants for the most part planned on using the NPS again (61).

Furthermore, the participants estimated that the addictive potential of NPS in general was comparatively low (33), which can be viewed as an expression of denial but can also mean that some types of NPS are experienced as insignificantly addictive. Going beyond the broad-brush approach to NPS by analysing the results, not at the general level but at the level of drug groups, revealed significant variations in motivation and attitudes. For example, the estimated addictive potential was remarkably lower for hallucinogens (9) than for GABA (71) and opioids (65). The variations in addictiveness were further validated by the participants' approval of the different motivations for using NPS, which showed that habit and addiction constituted only a minor incentive for use of hallucinogens (8) but much more so for opioids (51) and GABA (32). In addition, the past year use of traditional drugs revealed a similar drug group pattern where the use of hallucinogens was more prevalent but considerably less frequent (8 times) than stimulants (45 times) and opioids (83 times) (GABA was not queried). Hence, there are strong reasons to believe that the prevalence and frequency of use and the addiction potential of NPS are drug group dependent.

Besides variations in addictiveness, the results exposed several other distinctive characteristics inherent to each drug group. Synthetic cannabinoids were the least appreciated (45) and the least likely to be used again (27), most probably reflecting their numerous and quite severe side effects (Soussan & Kjellgren, 2013), and the fact that 93% of a population of synthetic cannabinoid users essentially preferred traditional cannabis (Winstock & Barratt, 2013). Also, it was found that the use of synthetic cannabinoids was to a larger extent than any other drug group motivated by circumstances such as price, legal status, availability and non-detectability in screening tests (66), which further establishes their position as mostly a substitute for users in need of an alternative to traditional cannabis.

The mean motivations and attitudes clearly show that there is a specific profile to each drug group that includes but also goes beyond the obvious and general pleasure and enjoyment incentive (Fig. 1 and Figs. 2a to 2f). Hallucinogens were substantially motivated by self-exploration and spiritual attainment (77). So were the dissociatives (68) but with the difference that they to a greater extent were linked to habit and addiction. The use of opioids (69) and especially GABA (77) was, besides connected with addiction, mainly motivated by coping with pain, boredom, emotions, problems, anxiety, and sleep deprivation. GABA, however, stood out in being more of a social facilitator type of drug (46) than opioids (26). Stimulants, on the other hand, were also associated with the facilitation of social situations (43) but were to a greater extent used to enhance mental and physical abilities (57), which is in line with previous findings demonstrating that substances such as ethylphenidate is increasingly used as "social lubricants" and cognitive enhancers (Soussan & Kjellgren, 2014).

Although the different drug groups to some extent overlap in motivation and attitudes, it is our conviction that they attract users for different reasons such as inner exploration, self-medication, cognitive enhancement, novel sensation seeking and so forth. The point here is not only to outline the specific differences in motivations but also to show that approaching NPS in terms of drug groups can reveal crucial information to legislators, prevention strategists and health care personnel, especially considering that a more nuanced understanding of the different pathways to drug use is believed to be essential in enabling effective treatment, prevention and consequently a reduction in harm (Adams et al., 2003). Hence, identifying not only the general but the specific reasons for NPS use will most likely improve the efficiency of interventions aimed at preventing the behavior or reducing its harm. In addition, more subtle and detailed knowledge about the motivations and addiction potential of different drug groups can also be used to allocate resources to areas where harm potential is the most prevalent more quickly. In essence, understanding the different pathways to NPS use can enable more effective drug prevention strategies and consequently a reduction in harm.

Limitations

This study may have been limited by the use of a self-selected sample of NPS users who previously have been characterized as well-informed, knowledgeable and connoisseur-like (Davey et al., 2012; Soussan & Kjellgren, 2014; Werse & Morgenstern, 2012). Furthermore, gathering data online frustrates any attempt to confirm the identity of the reported substances. Therefore we do not claim the results to be representative of a wider population although the bias towards experienced users could just as well have contributed to richer and more nuanced responses and the validity of substance identities than otherwise. The eight VAS items concerning the motivation for NPS use may have limited the results as they were abstracted from the conventional literature on drugs, which means that novel or qualitatively unique motivations

could have been missed. Therefore, further research should make use of qualitative and inductive methods of analysis in order to capture potential motivation for NPS use that goes beyond the preconceived ones.

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