



“This drug turned me into a robot”: an actor–network analysis of a web-based ethnographic study of psychostimulant use

Caroline Robitaille¹

Received: 4 February 2018 / Accepted: 16 October 2018 / Published online: 21 November 2018
© The Canadian Public Health Association 2018

Abstract

Objectives This study aims to understand contemporary psychostimulant use within the socio-cultural context of Western societies. Two objectives are addressed: to describe accounts of practices related to psychostimulant use among members of selected online fora and to examine how these are related to representations of the self.

Methods This research is a qualitative study of psychostimulant use among members of selected online fora. Drawing on actor–network theory (ANT), this study focuses on three publicly accessible online discussion fora belonging to the Reddit website. Non-participant observation was performed over a period of 18 months to observe exchanges between members, interactions with moderators, and esthetic elements. In total, 331 postings were collected from the selected fora for qualitative analysis. We present our analysis of one discussion forum, corresponding to 149 posts (515 pages, double spaced).

Results Our study reveals the emergence of an online socio-cultural space formed around psychostimulant use. Members share their experiences openly and some offer guidance, sometimes contrary to prescribers’ directives. An ANT analysis points to translations fostering positive or negative subjectivities, related to psychostimulant effects, and to translations fostering healthy or harmful practices, related to r/Adderall as an agentic space.

Conclusion These findings may contribute to shaping public health policies and interventions that acknowledge the values of the individuals they seek to help, and that attempt to reduce the potential harms associated with these pharmaceuticals as an alternative to more prohibitive approaches.

Résumé

Objectifs Cette étude cherche à comprendre les usages contemporains de psychostimulants dans le contexte socio-culturel des sociétés occidentales, et poursuit deux objectifs : décrire les pratiques liées à l’usage de psychostimulants, telles que rapportées par les membres des forums de discussion sélectionnés, et examiner comment ces pratiques sont liées aux représentations de soi.

Méthodes Cet article présente une recherche qualitative concernant l’usage de psychostimulants auprès de membres de forums de discussion en ligne. Informée par la Théorie de l’acteur–réseau (TAR), cette étude explore trois forums de discussion publiquement accessibles et faisant partie du site web « Reddit ». Une observation non-participante des forums a été effectuée sur une période de 18 mois, portant attention aux échanges entre les membres, les interactions avec les modérateurs, et des éléments esthétiques. Au total, 331 billets ont été collectés afin de procéder à une analyse qualitative. Cet article présente l’analyse d’un forum de discussion, r/Adderall, correspondant à 149 billets (515 pages, espace double).

Résultats Cette étude révèle l’émergence d’un espace socio-culturel façonné autour de l’usage de psychostimulants. Les membres partagent leurs expériences ouvertement et certains offrent des conseils, parfois contraires aux directives du prescripteur. Une analyse informée par la TAR trace deux processus de traduction. Le premier révèle l’émergence de subjectivités positives ou négatives en lien avec les effets des psychostimulants. Le deuxième montre l’émergence de pratiques saines ou liées à des méfaits concernant r/Adderall en tant qu’espace en ligne.

✉ Caroline Robitaille
c.robitaille@umontreal.ca

¹ Department of Social and Preventive Medicine, University of Montreal, 7101, avenue du Parc, 3^{ème} étage, Montréal, (Québec) H3N 1X9, Canada

Conclusion Les résultats de cette étude peuvent contribuer à la création de politiques et d'interventions de santé publique reconnaissant les valeurs des individus auprès desquels on souhaite agir. Cela peut aussi contribuer à réduire les méfaits potentiels associés à ces substances, en tant qu'alternative à des approches davantage prohibitives.

Keywords Amphetamine · Ethnography · Qualitative research · Social media

Mots-clés Amphétamine · Ethnographie · Recherche qualitative · Médias sociaux

Introduction

This study aims to understand contemporary psychostimulant use within the socio-cultural context of Western societies. This is important because psychostimulant use has been increasing over the past two decades in North America (Chen et al. 2016; Weyandt et al. 2016; Ulan et al. 2013). This refers notably to pharmaceuticals, such as Adderall (amphetamine), Ritalin (methylphenidate), and Vyvanse (lisdexamphetamine). Studies conducted predominantly in the United States reveal a prevalence rate of non-medical use ranging from 5% to 35% (Weyandt et al. 2016; Arria et al. 2018), and a meta-analysis estimated the average rate of misuse at 17% among university students (Benson et al. 2015). Canadian data regarding the use of psychostimulants remains scarce. The 2015 Canadian Tobacco, Alcohol and Drugs Survey (CTADS) shows that 22% of Canadians aged 15 years and older used psychoactive pharmaceuticals (CTADS 2015). Among the Canadian working adult population, the incidence of psychotropic medication use, including psychostimulants, is approximated at 3.5% over a period of 8 years (Blanc and Marchand 2010).

While these medications are generally prescribed as first-line treatment for attention deficit/hyperactivity disorder (ADHD), an accrued non-medical use of these substances is reported (Weyandt et al. 2016; Arria et al. 2018). This can be defined as “the use of a medication (...) without a prescription or in a way that is inconsistent with a doctor’s orders” (Arria et al. 2018). This is sometimes confounded with the term “misuse” (Weyandt et al. 2016; Benson et al. 2015). In light of this, the non-medical use of psychostimulants has been linked to a “prescription drug epidemic” by public health authorities in both Canada and the US (Ulan et al. 2013; ONDCP 2011). However, while scholars continue to pay attention to this phenomenon, we contend that public health concerns regarding the non-medical use of psychostimulants have largely shifted below the radar in recent years, as other drugs—namely opioids—have justifiably taken centre stage (Cheng and DeBeck 2017). However, these substances, also known as amphetamine-type stimulants, are associated with significant health risks, such as psychosis, substance use disorder, and overdose (Ulan et al. 2013; Arria et al. 2018; Sara et al. 2017). American data show that emergency department (ED) visits in relation to the non-medical use of amphetamine rose by approximately 156% between the years of 2006 and

2011 (Chen et al. 2016; Sara et al. 2017). Furthermore, the issue of cognitive enhancement is also of concern, as psychostimulants are considered part of a larger category of substances referred to as “smart drugs,” or cognitive enhancers (Sahakian and Morein-Zamir 2011). These may be defined as substances used to “augment a person’s capacities of focus and concentration to higher functioning levels and for a longer period” (Enck 2013). Neuroethicists have explored the normative and moral issues related to cognitive enhancers, which may be used by “healthy” individuals (i.e., not diagnosed with ADHD) to increase academic or work-related performance (Sahakian and Morein-Zamir 2011). They ask, for example, whether this behaviour is akin to cheating, therefore to be prohibited, or if this may be permitted in specific settings (Sahakian and Morein-Zamir 2011; Enck 2013).

Still, there remains a lack of knowledge concerning the issue itself: what are the logics and dynamics related to the use of psychostimulants? What are the values and ethics at play among individuals who call upon psychostimulants? How do they transform the way individuals perceive themselves, and what social repercussions does this entail? We argue our research can shed further light on this phenomenon, through a web-based ethnographic approach. Two objectives are addressed: to describe accounts of practices related to psychostimulant use among members of selected online fora and to examine how these are related to representations of the self. First, we discuss how this question is relevant for public health. We then detail our conceptual framework, actor–network theory, and our method. Last, we present our analysis of one online discussion forum, r/Adderall, part of the larger website Reddit.

An actor–network analysis of psychostimulant use through a web-based ethnographic approach: relevance for public health

First, gaining a deeper understanding of psychostimulant use through a web-based ethnographic study is relevant to public health because it “facilitates access to difficult fields,” and to accounts of psychostimulant use experiences, that would otherwise remain hidden from scholarly view (Krieg et al. 2017). Focusing chiefly on epidemiological data, namely from emergency department visits, may limit public health’s understanding of the complexities related to psychostimulant use.

Drawing from a web-based ethnographic approach, our research can make visible important network connections, and foster a critical public health perspective, to appreciate the varied ways individuals engage with these pharmaceuticals. Such knowledge concerning psychostimulant use generally eludes health care professionals (Milne et al. 2017).

Furthermore, this can raise awareness to new socialities shaping psychostimulant use, namely in online settings (Collin 2016). Thinking of psychostimulant use in a network perspective can help steer away from intervention approaches focusing on individuals' "predilection for irrational choice of consumption" (Duff 2014). The concept of network allows a renewed understanding of how psychostimulant use emerges, facilitated by a forum/drug/individual interconnection, bringing to light its collective dimensions. This can also shed light on the significant role spaces (Duff 2011) and, notably, drugs may play in "building collective identities through individuals sharing their experiences related to consuming the drugs (...)" (Collin 2016).

Thus, thinking of psychostimulant use through the framework of actor–network can help put in place relevant harm-reducing public health policies and interventions, mindful of network configurations that foster positive or negative subjectivities (Törrönen and Tigerstedt 2018). Moreover, this may open the discussion to a wider debate regarding how public health thinks about psychostimulant use—often through the lens of risk factors, individual responsibility and moral choices—and how this may contrast with how psychostimulants are being put into practice in everyday life.

Actor–network theory as a conceptual framework

The importance of context in understanding drug use has been recognized for some time (Duff 2011; Zinberg 1984). However, how contextual elements contribute to psychostimulant use at the micro-level, in everyday life, remains largely unexplored (Duff 2014; Robitaille and Collin 2016). To this end, actor–network theory (ANT) offers an innovative and useful perspective (Duff 2011). Moving away from a macro-level understanding of context—such as "political conditions, economic forces, and collective norms" (Duff 2014; Duff 2011), an actor–network perspective envisages "an assemblage of forces that produces both the subject of drug use and the effects of this use" (Duff 2014). These forces link both human and non-human actors/actants insofar as their interconnectedness enables action toward the emergence of, in this case, psychostimulant use (Latour 2005).

Our account of psychostimulant use draws principally on two concepts related to ANT: the network and the multiplicity of agencies (Latour 2005). The concept of network allows rethinking what is social in terms of associations comprised of human and non-human actors/actants. In an ANT framework, actors—persons—do not act from their intentionality

alone; rather, they do so always as part of a network, in relation to other mediators. These may be other individuals or objects, which leads to the multiplicity of agencies. Within an ANT logic, action is mediated by human and non-human entities alike. Non-human entities may be, for example, "structures, practises, beliefs, objects and spaces" (Duff 2011). Our research presents an ANT perspective on psychostimulant use as explored in online discussion fora. The actor–network observed here is comprised of various actors/actants, notably members of the selected subreddits, medical professionals, Reddit and subreddits as spaces, and psychostimulants as objects. In our analysis, we explore how the configuration of these different actors/actants—notably r/Adderall as a space, psychostimulants as objects, and forum members—translates toward the emergence of psychostimulant use. We examine how the varying intensity of the linkages between these actors/actants allows psychostimulant use to emerge, fostering positive or negative subjectivities (Törrönen and Tigerstedt 2018).

The self in an actor–network theory framework

An important aspect of an ANT analysis is to map out the actors/actants comprised of a given network, and to "trace 'translations'—understood as the ways in which the subjects (in this case the forum members) engage with things, objects and persons" (Latour 2005; Rönkä and Katainen 2017). We contend that understanding how members take part in this network also relates to representations of the self, because they are connected to how the self is enacted. This "enacted self" can be shaped by non-human actants insofar as the link between an individual and an object enables action (Jerolmack and Tavory 2014).

Thus, we define the concept of self here as a social self, constructed through engaging with others, both human and non-human (Jerolmack and Tavory 2014). While we still envisage a reflexive subject, capable of thoughtful considerations regarding questions of selfhood, we also accept that such reflections may be molded by non-human entities (Jerolmack and Tavory 2014). More specifically, we consider members of the selected online fora as subjects always in relation with others. Fora members, r/Adderall as a space, medical professionals, psychostimulants as objects, and other mediators contribute to how members perceive—and enact—themselves, for example, by consuming psychostimulants or by refusing to do so. Understanding the self in this perspective is important for public health because it highlights that behaviours do not stem from individual choices; rather, they are produced by social-subjects in specific settings.

Our research adds to ANT scholarship on drugs in two ways. First, it explores the use of psychostimulants that are also prescription pharmaceuticals, differing from most studies we identified, which focus on alcohol and other drugs (AOD)

(Duff 2014; Rönkä and Katainen 2017; Gomart 1999; Demant 2009). Second, we mobilize an ANT perspective through a web-based ethnographic study of online discussion fora. Few studies have studied drug use in this manner; thus, our research presents a novel way of understanding psychostimulant use (Rönkä and Katainen 2017).

Methods

Research design: a web-based ethnographic approach

Our research proposes a qualitative analysis of three publicly accessible online discussion fora pertaining to psychostimulant use: r/Adderall, r/ADHD, and r/Stims, using a web-based ethnographic approach (Kozinets 2010; Kozinets 2015). Notably, this approach can offer a remedy to the challenges related to the recruitment of participants for studies concerning the use of pharmaceuticals or other substances, in view of the taboo that may be associated with this activity (Robards 2018). In this article, we present our analysis of one of our selected fora, r/Adderall. Our approach draws upon netnography, which can be simply defined as a “type of online or Internet, ethnography.” (Kozinets 2010). The key difference from a traditional ethnography pertains to provenance of data and how it is collected. In the case of a netnography, this occurs predominantly online (Kozinets 2015). Drawing from this, our methodological approach encompasses non-participant observation of three online discussion fora over an 18-month period. We also collected key posts pertaining to our research objective—in text form—for analysis. This was preceded by a period of planning field work and exploring the selected online setting—Reddit—to identify relevant fora. As part of our doctoral project, this research received ethics approval from the Health Research Ethics Committee (CERES), University of Montreal.

Planning fieldwork: a focus on discussion fora

We decided to focus on discussion fora because this setting seemed most amenable to the creation of what may be referred to as an online community (Caliandro 2017). Furthermore, previous studies concerning drug use have also turned to online discussion fora (Rönkä and Katainen 2017; Barratt and Lenton 2010). We performed a search using multiple search engines (Google, Yahoo!, Omgili, Icerocket), and the following search terms: “Adderall + forum,” “Vyvanse + forum,” “Ritalin + forum,” “smart drugs + forum” (Kozinets 2010). Our initial search identified 75 online discussion fora pertaining to amphetamine-type stimulants. From this, we selected 18 discussion threads (stemming from 14 distinct fora) for closer exploration, according to the following criteria: (1) forum must be active, as defined by discussions occurring within the last 3 months, and (2) the main topic must be

psychostimulants (Kozinets 2010). Among these, we selected r/Adderall because it was active (on average 3 to 4 new posts per day), presented a significant number of members (now 14,960), and the exchanges between members seemed rich in content. We then performed an exploratory analysis of 350 posts dating back up to 3 months, to glean main discussion themes, which were the following: psychostimulant effects, modes of acquisition, and dosing strategies. Through this, we were able to confirm that the content of the exchanges would allow our research objectives to be met.

Data collection and analysis

Data collection consisted of non-participant observation of the selected fora: r/Adderall, r/ADHD, and r/Stims. Over a period of 18 months, we observed interactions among members, including moderators, as well as esthetic elements, which we recorded in field notes. In total, 331 postings were collected from the three selected fora, in text form, for analysis. Posts were selected if they focused on psychostimulant-related experiences, e.g., reflections on the self, ADHD diagnosis, medical expertise. Posts were excluded when they related to questions of a technical nature, such as product identification or drug-drug interactions. Posts were collected over a period of 4 weeks, extending up to 9 months prior to the time of data collection or as far back as was possible to go on these subreddits. We present our analysis of r/Adderall, which includes 149 posts (515 pages, double spaced).

We coded all collected posts using Dedoose qualitative analysis software. Table 1 shows the frequency of codes applied. Codes were determined in an iterative manner, stemming from our multiple readings of the material, observations of r/Adderall as recorded in field notes, our exploratory analysis and our review of the literature concerning psychostimulant use. A

Table 1 Frequency of codes pertaining to selected posts ($n = 149$) on r/Adderall

Code	Frequency
Description of psychostimulant effects (i.e., lived experiences, effects on representations of the self or on social relations)	116
Relation to the health care system and experts (e.g., physicians, psychotherapists)	41
Relation to performance (i.e., academic or work-related)	34
Description of dosing strategies (i.e., management of dose or frequency of use)	26
Relation to the body while on psychostimulants (e.g., sleep or eating habits)	26
Relation to other substances (i.e., other than psychostimulants)	22
Relation to attention deficit/hyperactivity disorder diagnosis	18
Total	283

journal was used to record decisions pertaining to data collection and analysis. Our qualitative analysis was informed by ANT and Paillé and Mucchielli's conceptual category method, which aims to make sense of the data as they are being analyzed. Thus, beyond simply descriptive annotations, “meta-categories”—or conceptual categories—emerge to try to understand the phenomenon at hand (Paillé and Mucchielli 2016).

Ethical considerations

When conducting a study online, certain ethical considerations specific to this setting must be addressed. An important aspect is whether the selected online fora can be considered public or private. We contend that the selected subreddits can be considered publicly available. Anyone who is interested, and who has online access, may explore posts on a given subreddit, thus rendering the data public. However, we also consider that certain members would prefer not to be identified. Unlike Facebook or Twitter, Reddit fosters the anonymity of its members through the use of pseudonyms, posing a challenge to identifying users (Chang-Kredl and Colannino 2017). Still, we must also be mindful of the taboo that may be associated with psychostimulant use, potentially placing Redditors and online fora at risk of harm if the posts were circulated to a larger audience (Kozinets 2015; Barratt and Lenton 2010). In light of this, we have chosen to reveal the names of the selected discussion fora because they are important to describe the setting in which our netnographic research takes place. However, we concealed pseudonyms and removed any information that may help identify a Redditor, such as age, gender, profession, or provenance, in the selected quotes.

Results

In our analysis, we trace how actors/actants, as part of a specific network related to psychostimulant use, engage with one another. We explore how the configuration of these different actors/actants—notably r/Adderall as a space, psychostimulants as objects, and forum members—translates toward the emergence of psychostimulant use. We examine how the varying intensity of the linkages between these actors/actants allow psychostimulant use to emerge, fostering positive or negative subjectivities (Törrönen and Tigerstedt 2018). For this paper, we focus on two translations: how forum members describe engaging with psychostimulants as objects, contributing to the emergence of drug effects, and how members engage with r/Adderall as a space, contributing to the emergence of new socialities (Rönkä and Katainen 2017). We contend that these two key translations can shed light on the emergence of contemporary psychostimulant use.

The subreddit r/Adderall as an agentic space

Reddit can be viewed as a massive online sharing and discussion website (Chang-Kredl and Colannino 2017). It houses numerous discussion fora, varying in membership size and area of interest, known as subreddits, where members can share text, images, links, and videos. An email address and a chosen pseudonym are required to register, favouring more firsthand, personal communications (Chang-Kredl and Colannino 2017).

Subreddits are created by Reddit users themselves (Robards 2018; Chang-Kredl and Colannino 2017). At the time of writing, there are over 1.2 million, encompassing a wide variety of topics, for example, r/Olympics, r/atheism, or r/fountainpens (Reddit Metrics 2018). The majority of subreddits are open to all, while some require an invitation from moderators (e.g., r/lawyers). Redditors must also follow general rules of conduct, or “reddiquette” (reddiquette 2018). Each subreddit also sets specific rules, commonly concerning structure and content of posts, the application of which is monitored by moderators (Robards 2018; Chang-Kredl and Colannino 2017).

Health care experts, such as physicians, pharmacists, nurses, and public health professionals are present on Reddit; however, it is rarely with an interventionist point of view. Rather, they are part of the discussion and sharing their own experiences, commonly on fora dedicated to different specialities (e.g., r/medicine, r/pharmacy, r/publichealth).

We acknowledge that Reddit users are not representative of Internet users or the general population, and that the grassroots and anonymous nature of this website may attract a specific subset of individuals wishing to participate in the discussions taking place there (Robards 2018; Chang-Kredl and Colannino 2017). Demographic data on Reddit users are scarce. A report published by the Pew Research Center's Internet & American Life Project (2013) states that Reddit users represent 6% of online adults, and 15% of male internet users aged between 18 and 29 years (Duggan and Smith 2013). Also, most Reddit users appear to be young men living in urban settings (Duggan and Smith 2013).

The subreddit r/Adderall was created on April 3, 2010, and is described as “A subreddit dedicated to discussing ADHD drugs for both recreational and medical uses” (Reddit Metrics 2018). The forum, at the time of writing, lists 14,960 members. We contend that r/Adderall, as an agentic space, mediates psychostimulant use most notably through offering guidance, fostering openness, and ensuring the circulation of experiential information. Within agentic spaces, specific features play a role in whether a given substance is used or not, as well as how, when and where it is used (Duff 2011). In this subreddit, members find a space where they can relate to common experiences and feel a sense of belonging. The posts presented in this section were selected because they illustrate

specific features of r/Adderall, such as asynchronous communications, direct messaging, and moderator interventions that contribute to its agentic properties.

Engaging with r/Adderall as a space: the emergence of new socialities

“Don’t do this. Use NOT as directed on label”: relating to common experiences

One way in which r/Adderall fosters new socialities is to enable members to relate to common experiences, thus transforming what is largely a lonely experience of psychostimulant use to a communal one (Gomart 1999). For example, when some members share experiences concerning positive/euphoric effects of psychostimulants, others may offer advice to temper use, even if this contradicts prescribers’ instructions:

Member 1: “(...) At the moment, I’m in complete shock. I’ve never felt so confident, calm, collected, and under control. I can actually choose what to do with myself. Is this what normal people are supposed to feel like?!?! (...)

I’ve missed out on so much.

I’ve wasted so much time.

(...) I’d probably have a substantial job right now. I’d have friends. I would have a foreseeable future highlighted in star-beams and food in my fucking fridge.

(...) My mind has been blown.

“EDIT (FYI): I am aware, and you should also be aware—that this is not a drug you should be taking daily (at least for the vast majority of people). It is great to help you occasionally catch up with the bi-weekly crunch at work, study for midterms, and to initiate social reactions. But you should be doing your best to avoid using it—once the drug helps you catch up with your work and establish friendships, you should need it less than ever.

(...) the more you take in repeatedly, the less effective it becomes— and the larger amount you need to take to get the same effect... this can create a dependence on the drug, which leads to being incapable of functioning without it. Don’t do this. Use NOT as directed on label, but when you’ve hit a stressful task you cannot seem to manage on your own terms. (...).”

This post elicited 16 replies, including this exchange:

Member 2: “Yeah man, but just know that its because you’re on speed, and speed is awesome. Everyone feels like that on adderall, it’s not how anyone normally feels without it, and it doesn’t work better for people with ADHD, it just works for everyone because it pumps your brain full of dopamine and that feels great. I’ve taken it for years, but I know so many people who lie to themselves and act like they “need” it. It’s just speed. Truly

similar to meth, but not as intense. Be careful, don’t do it too often or you’ll be worthless without it.”

Member 1: “I think I already wrote in my response to a previous comment that I do not have any intentions of taking it daily as prescribed. I think that’s a terrible idea.

But, with what I was able to accomplish yesterday while on the drug— makes me feel SO much better today without it. I get so backlogged on work, school, and general stuff, that taking 10mg once every two weeks to catch up with the stuff I’ve been putting off seems like a decent idea.

Otherwise it just will not get done, and I’ll sink deeper into that hole.”

This discussion shows how relating to common experiences may reinforce ways of putting psychostimulant use into practice, in this case, going against the prescriber’s directives, based on personal and shared experiential knowledge. The subreddit thus plays an active role in fostering such exchanges and shaping psychostimulant use among members of this forum.

“Feel free to DM myself or a mod”: a sense of belonging

Members may also reach out to each other for guidance. We contend this fosters a sense of belonging through relating to one another’s experiences. Furthermore, moderators can be called upon for assistance, highlighting their role in how members interact in this space, as this quote illustrates:

Member 3: “In the end the main points are: Be careful. Be safe. You know your body better than anyone. One stim at a time (NO MORE CAFFEINE. You may know your body, but I know 1200mg of caffeine and 60mg of addy daily is not good for the heart). If you have any questions, post again, comment back, or feel free to DM myself or a mod.”

As these quotes show, the subreddit r/Adderall is a space which fosters guidance, openness, the circulation of experiential information. Members may feel a sense of belonging to a group of peers. In this example, member 3 proposes to another member that they send them a “DM”—direct message—or contact a “mod”—moderator—for support. Thus, r/Adderall fosters the emergence of new ways of connecting between psychostimulant users, shaping the use of psychostimulants according to logics emerging through shared experiences.

Engaging with psychostimulants as objects: the emergence of drug effects

In addition to spaces, objects too may become agentic. This entails recognizing “the force of the substance and its role in shaping consumption patterns” (Duff 2011). By producing effects on the mind and body, psychostimulants play a role

in the modulation of their use (Duff 2011; Rönkä and Katainen 2017; Persson 2004). We observe that members of r/Adderall often discuss psychostimulant effects. We observe members engaging with psychostimulants in a nuanced, complex, at times emotional manner. The posts selected in this section were chosen because they represent members' experiences as they relate to positive or negative subjectivities, sometimes falling in an “in between zone” where both positive and negative subjectivities can coexist. About half ($n = 62$) of the 116 excerpts coded for “Description of psychostimulant effects” (see Table 1) tended toward positive subjectivities, and 58 excerpts related to negative subjectivities, including those “in between”.

“This drug turned me into a robot”: between positive and negative subjectivities

There appears to be a conflict between how members perceive themselves while taking psychostimulants and while off them. Members highlight the significant positive effects of these pharmaceuticals—these are often described as “life-changing.” However, we also observe individuals who describe oscillating between positive and negative subjectivities. The following quote illustrates this tension:

Member 4: “I was recently prescribed 30mg of Vyvanse and it has significantly changed my life. I went from failing 4 classes to straight A's. I'm able to practice my violin for hours on end, I taught myself Microsoft excel, I'm reading and understanding boring books on fundamental/technical analysis (...) at very fast rate. At this point the only things I care about is money and academics. (...) I no longer think of my crush and I no longer value the company of my friends. This drug turned me into a robot and I don't know if that is a good or a bad thing.”

“I have become a complete parallel of the person I was before”: toward negative subjectivities

Furthermore, for some, the balance may shift toward negative subjectivities. This member is clearly distressed by her use of Adderall. However, she still credits this pharmaceutical for the occurrence of significant, positive, life events. This post also illustrates the strong sense of attachment this member seems to have to Adderall:

Member 5: “I have been taking adderall for 4 years now, since then, I have become a complete parallel of the person I was before taking it. (...) I have always been a lover (...) blessed with more friends that I could count and always willing to make

more, a ‘hippy’ soul who just wanted everyone to love life and be happy, I was a writer, a hopeless romantic, I was always eager for my next adventure and optimistic about what the future had in store for me.

Fast forward to now, I am not the same person I used to be and I am positive it's the adderall that has changed me. I am constantly tired. Constantly in a haze. I want to be alone but I am so fucking lonely. I'm not happy. I'm not sad. I'm numb. I feel nothing until I feel everything. (...)

I know the solution seems simple: just quit. Right? I wish I could just tell my doctor to stop prescribing it to me, but I really don't know if my willpower to make that change will be strong enough without going through some form of therapy that, as it stands now, I simply could not afford. Plus every accomplishment I have to feel proud of came during my time with adderall: my license, my car, my job, my apartment, my independence. I don't know what my current life will be like without adderall and that terrifies me. (...) How did this become my life?

(...) I want my old self back again. I'm hanging onto the hope one day that I will find me again.”

In their responses, other members thank member 5 for sharing her experience. Many express similar accounts. One response is as follows: “My heart goes out to you. The parallels between your story and mine freaked me out”, highlighting that members may find common ground in their accounts of psychostimulant use experiences.

“I tried to eat and just couldn't”: bodily effects relating to negative subjectivities

Engaging with psychostimulants as objects also entails experiencing bodily effects which foster negative subjectivities among some members. Amphetamines are seemingly “difficult” pharmaceuticals to use. Such challenges often elude healthcare professionals, who are not witness to users' everyday lives. The following quote illustrates these hurdles:

Member 6: “I left to run an errand with my sister in law and by the time we got home, dinner was ready. My brother made a delicious looking tri-tip, salad, and garlic bread. It looked amazing. I tried to eat and just couldn't. It was kind of fucking awful. I knew it was good, but the act of mastication made me almost nauseous, and I got upset and started crying because he made delicious food and I couldn't eat it so I felt bad. It was totally irrational. After dinner I went to my room and noticed that I was just feeling very tired, but not sleepy, and extremely sad. I ended up taking a clonazepam to help me sleep, but my

stupid cat woke me up about 4 hours in and I've been unable to go back to sleep.

So, how does this compare to your experiences? How do I deal with not being able to eat? And is the irrational anxiety, sadness, and weepiness normal?"

“I feel like it is too good to be true”: toward positive subjectivities

On the other hand, some members relate to positive subjectivities. As the next quote shows, this member describes her use of Adderall in a mindful, purposeful way. She credits this medication with positive, life-changing effects. This also shows that the use of psychostimulants in ways not intended by the prescriber may not necessarily result in harmful effects, nor be construed as misuse or abuse:

Member 7: “Last year I tried adderall 15mg IR (from a friend) and after discovering it gave me incredible euphoria I sought to convince a provider that I had adhd with success. I was in a meaningless existence in my severe depression + eating disorder so I didn't care much about the risks. I have been taking 20mg IR of Adderall regularly for four months now and my bulimia is gone. I eat, but reasonably & mindfully, able to prepare and consume a nutrient dense plate of food without the overwhelming compulsive to devour it in two seconds with a follow up purge. I exercise regularly but not excessively and enjoy it + its benefits (more energy / better sleep). I draw and read for fun again. I go out with friends again. I have become more productive, engaging and pleasant at work. I pursued Adderall for the high it gave me after deciding that I was never going to cure my bulimia / depression and it's turning my life around. I don't feel so euphoric anymore when I take Adderall but it still keeps me motivated, confident, social and bulimia free. I feel like it is too good to be true – that this one little pill could change my life around – but suppose while it lasts, do my best to take this new-found positive energy and re-create myself into a better, healthier human. I am concerned though that it will all come crashing down eventually... so I want some advice from those who have experience with Adderall (...).”

As these quotes illustrate, the psychostimulants as objects allow both positive and negative subjectivities to emerge. Their effects are not static, rather, they are fluid, changing, transforming, as individuals feel a sense of attachment to the substance that may fluctuate over time (Törrönen and Tigerstedt 2018).

Discussion

The forum/drug/individual interface: contemporary psychostimulant use emerging

The convergence of r/Adderall as a space, members of this discussion forum, and accounts of drug effects form part of a network fostering the emergence of psychostimulant use. We explore two translations, related to r/Adderall as an agentic space and to psychostimulants as agentic objects. Both mediate psychostimulant use.

This subreddit mediates psychostimulant use through the sharing of common experiences and the creation of a sense of belonging. Relating to similar experiences, or ways of putting into practice psychostimulant use, can reify practices that are understood as beneficial by members. In the example shown, members 1 and 2 agree that not using psychostimulants regularly is a healthy practice, despite going against prescribers' directives. Furthermore, new possibilities of connecting through asynchronous communications, and direct messages to members or moderators can facilitate the reduction of harm, as shown in member 3's quote. Thus, r/Adderall as an agentic space may, in some instances, mediate healthy psychostimulant use. It can be argued that when members feel a stronger sense of attachment to the r/Adderall space, their experience with psychostimulants may differ from that of members with a lesser sense of belonging to the subreddit. Indeed, support from specific members or moderators, through direct messages, may change the way individuals put psychostimulants into practice.

Drug effects accounted for on r/Adderall appear to flow across a continuum ranging from positive to negative subjectivities. Drug effects can mediate psychostimulant use through a sense of attachment that may fluctuate over time. Arguably, a stronger sense of attachment to these substances can lead to sustained use, as described by members 5 and 7. This sense of attachment seems related to reaching aspirations, such as making money, obtaining a diploma, driving a car, etc. Negative subjectivities seem to appear when there is a discordance between such aspirations and perception of happiness, confidence, motivation, or satisfying relationships, as member 5 relates. Indeed, she states going from being a “happy” person before using Adderall to becoming a person “parallel” to her former self. However, she is still proud of her accomplishments while taking this medication. On the other hand, member 7's account shows the opposite. For her, psychostimulants made her into a better, healthier individual, able to maintain friendships, and become motivated and confident. She is no longer depressed, and a positive subjectivity emerges. Nevertheless, both members 5 and 7 express a strong sense of attachment to psychostimulants.

Thus, a closer analysis of how psychostimulants as objects, through their effects, mediate their use, allows for a critical reflection on what is necessary to put into action to attain “a better life.” Acknowledging that this sometimes creates

negative subjectivities, such as feeling like a “robot” or a “parallel version” of oneself, may help public health actors and health care professionals provide care and develop interventions that foster positive subjectivities and promote health.

Conclusion

Our study uses an innovative web-based ethnographic approach to further understand the growing use of psychostimulants in contemporary Western societies, namely in North America, which is an important public health issue. An ANT analysis points to translations fostering positive or negative subjectivities, related to psychostimulant effects, and to translations fostering healthy or harmful practices, related to r/Adderall as an agentic space. These findings may contribute to shaping public health policies and interventions that acknowledge the values of the individuals they seek to help, and that attempt to reduce the potential harms associated with these pharmaceuticals as an alternative to more prohibitive approaches. Moreover, this may open the discussion to a wider debate regarding how public health thinks about psychostimulant use—often through the lens of risk factors, individual responsibility and moral choices—and how this may contrast with how psychostimulants are being put into practice in everyday life.

Publisher's Note Springer Nature remains neutral with regard to jurisdictional claims in published maps and institutional affiliations.

References

- Arria, A. M., Geisner, I. M., Cimini, M. D., et al. (2018). Perceived academic benefit is associated with nonmedical prescription stimulant use among college students. *Addict Behav*, *76*, 27–33.
- Barratt, M., & Lenton, S. (2010). Beyond recruitment? Participatory online research with people who use drugs. *International Journal of Internet Research Ethics*, *3*(12), 69–86.
- Benson, K., Flory, K., Humphreys, K. L., & Lee, S. S. (2015). Misuse of stimulant medication among college students: a comprehensive review and meta-analysis. *Clin Child Fam Psychol Rev*, *18*(1), 50–76.
- Blanc, M. E., & Marchand, A. (2010). Quel est le rôle du travail dans l'incidence de la consommation de médicaments psychotropes au Canada? *Rev can santé publique*, *101*(Suppl. 1), S63–S68.
- Caliandro, A. (2017). Digital methods for ethnography: analytical concepts for ethnographers exploring social media environments. *J Contemp Ethnogr* 089124161770296.
- Chang-Kredl, S., & Colanino, D. (2017). Constructing the image of the teacher on Reddit: best and worst teachers. *Teach Teach Educ*, *64*, 43–51.
- Chen, L. Y., Crum, R. M., Strain, E. C., Alexander, G. C., Kaufmann, C., & Mojtabai, R. (2016). Prescriptions, nonmedical use, and emergency department visits involving prescription stimulants. *The Journal of clinical psychiatry*, *77*(3), e297–e304.
- Cheng, T., & DeBeck, K. (2017). Between a rock and a hard place: prescription opioid restrictions in the time of fentanyl and other street drug adulterants. *Canadian Journal of Public Health*, *108*(3), e325–e327.
- Collin, J. (2016). On social plasticity: the transformative power of pharmaceuticals on health, nature and identity. *Sociology of Health & Illness*, *38*(1), 73–89.
- CTADS. (2015) Canadian Tobacco Alcohol and Drugs (CTADS): 2015 summary
- Demant, J. (2009). When alcohol acts: an actor-network approach to teenagers, alcohol and parties. *Body Soc*, *15*(1), 25–46.
- Duff, C. (2011). Reassembling (social) contexts: new directions for a sociology of drugs. *Int J Drug Policy*, *22*, 404–406.
- Duff, C.. (2014) Assemblages of drugs, spaces and bodies. *Assemblages of Health: Deleuze's Empiricism and the Ethology of Life*: Springer.
- Duggan, M., Smith, A.. (2013) 6% of online adults are reddit users: young men are especially likely to visit the “front page of the internet.”. Pew Research Center's Internet & American Life Project, July 3.
- Enck, G. (2013). Ideals of student excellence and enhancement. *Neuroethics*, *6*, 155–164.
- Gomart, E. (1999). Hennion a. a sociology of attachment: music amateurs, drug users. *Sociol Rev*, 220–247.
- Jerolmack, C., & Tavori, I. (2014). Molds and totems: nonhumans and the constitution of the social self. *Sociological Theory*, *32*(1), 64–77.
- Kozinets, R. V. (2010). *Netnography: doing ethnographic research online*. London, UK: SAGE Publications.
- Kozinets, R. V. (2015). *Netnography: redefined*. London, UK: Sage Publications.
- Krieg, L. J., Berning, M., & Hardon, A. (2017). Anthropology with algorithms? An exploration of online drug knowledge using digital methods. *Medicine Anthropology Theory*, *3*, 21–52.
- Latour, B. (2005) Reassembling the social: an introduction to actor-network theory. Oxford University Press.
- Milne, A., Weijs, C. A., Haines-Saah, R. J., & McLaren, L. (2017). Parents' online discussions about children's dental caries: a critical content analysis. *Canadian Journal of Public Health*, *108*(3), e265–e272.
- ONDCP. (2011). *Epidemic: Responding to America's prescription drug abuse crisis*. Washington: Executive Office of the President of the United States.
- Paillé, P., Mucchielli, A.. (2016) *L'analyse à l'aide des catégories conceptualisantes. L'analyse qualitative en sciences humaines et sociales*. 4e ed. Paris, France: Armand Colin 319–377.
- Persson, A. (2004). Incorporating pharmakon: HIV, medicine, and body shape change. *Body Soc*, *10*(4), 45–67.
- reddiquette. (2018) January 22; <https://www.reddit.com/wiki/reddiquette>.
- Reddit Metrics. (2018), January 22; <http://redditmetrics.com/top>.
- Robards, B. (2018). ‘Totally straight’: contested sexual identities on social media site reddit. *Sexualities*, *21*, 49–67.
- Robitaille, C., & Collin, J. (2016). Prescription psychostimulant use among young adults: a narrative review of qualitative studies. *Substance Use & Misuse*, *51*(3), 357–369.
- Rönkä, S., & Katainen, A. (2017). Non-medical use of prescription drugs among illicit drug users: a case study on an online drug forum. *Int J Drug Policy*, *39*, 62–68.
- Sahakian, B. J., & Morein-Zamir, S. (2011). Neuroethical issues in cognitive enhancement. *J Psychopharmacol*, *25*(2), 197–204.
- Sara, G., Lappin, J., Dobbins, T., Dunlop, A. J., & Degenhardt, L. (2017). Escalating patterns of emergency health care prior to first admission with amphetamine psychosis: a window of opportunity? *Drug Alcohol Depend*, *180*, 171–177.
- Törrönen, J., & Tigerstedt, C. (2018). Following the moving and changing attachments and assemblages of ‘addiction’: applying the actor network approach to autobiographies. *Int J Drug Policy*, *54*, 60–67.
- Ulan, S., Davison, C., & Perron, M. (2013). *First do no harm: responding to Canada's prescription drug crisis*. Ottawa: Canadian Centre on Substance Abuse.
- Weyandt, L. L., Oster, D. R., Marraccini, M. E., et al. (2016). Prescription stimulant medication misuse: where are we and where do we go from here? *Exp Clin Psychopharmacol*, *24*(5), 400–414.
- Zinberg, N. (1984). *Drug, set, setting: the basis for controlled intoxicant use*. New Haven, CT: Yale University Press.