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Prescription Psychostimulant Use Among Young Adults: A Narrative Review of Qualitative Studies

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ABSTRACT

Background. Within the last decade, the nonmedical use of prescription drugs has raised concern, particularly among young adults. Psychostimulants, that is to say amphetamine and its derivatives, are pharmaceuticals, which contribute to what has come to be known in Canada and the United States as the “prescription drug crisis.” Research in the fields of public health, addiction studies, and neuroethics has attempted to further understand this mounting issue; however, there is a paucity of data concerning the underlying social logics related to the use of these substances. Objectives. The objective of this article is to provide an overview of the current literature related to the social context of prescription psychostimulant use among young adults, and to discuss theoretical considerations as well as implications for future research. Methods. A narrative review of the literature was performed. Results. We found that research efforts have chiefly targeted college students, yet there is a lack of knowledge concerning other social groups likely to use these pharmaceuticals nonmedically, such as persons with high strain employment. Three main emerging patterns related to prescription psychostimulant use were identified: (1) control of external stressors, (2) strategic use toward the making of the self, and (3) increasing one’s performance. Conclusions. Prescription psychostimulant use among young adults is anchored in contemporary normativity and cannot be separated from the developing performance ethic within North-American and other Western societies. We suggest that pharmaceuticalization and Actor-Network Theory are useful conceptual tools to frame future research efforts.

Introduction

Psychostimulants, namely, amphetamine-type stimulants, are among the most controversial pharmaceuticals in contemporary Western societies. This class of medications predominantly refers to Methylphenidate (Ritalin), Dextroamphetamine (Dexedrine), Amphetamine (Adderall), and Lisdexamphetamine (Vyvanse), and is primarily used for the treatment of Attention Deficit Hyperactivity Disorder (ADHD) in the clinical setting. There has been a sharp increase in ADHD diagnosis within the last two decades particularly among young adults (ExpressScripts, 2014; Hinshaw & Scheffler, 2014; Kaye & Darke, 2012). The prevalence of ADHD in the general population is estimated to be between 5% and 10%, with the highest rates found in North America (Hinshaw & Scheffler, 2014; Polanczyk, Willcutt, Salum, Kieling, & Rohde, 2014). ADHD-related trends in the United States (2014) show a “substantial spike in the adult population on ADHD drug treatments in recent years, with the largest gains seen among 26–34 year olds—up 84.4% from 2008 to 2012” (ExpressScripts, 2014). This exponential inflation in diagnosis has contributed to the increasing availability and widespread use of psychostimulants in the United States, Canada, and other Western countries (Hinshaw & Scheffler, 2014). Undeniably, the psychoactive properties of these substances render them amenable to various nonmedical uses, most notably to improve academic or work-related performance (Hinshaw & Scheffler, 2014; Kaye & Darke, 2012). Studies show that the most common methods of procurement of amphetamine and its derivatives are through one’s own prescription or through parents, friends, or peers with prescriptions (Aikins, 2011; Collin, Simard, & Collin-Desrosiers, 2012; DeSantis, Noar, & Webb, 2010; Mui, Sales, & Murphy, 2014; Sansone & Sansone, 2011; Vrecko, 2015).

This has led to growing concern over the nonmedical use of psychoactive pharmaceuticals (Kaye & Darke, 2012; Ulan, Davison, & Perron, 2013; United Nations Office on Drugs and Crime [UNODC], 2011). Psychostimulants contribute to what has come to be known in Canada and the United States as the “prescription drug crisis” (Martin, 2006; Office of National Drug Control Policy [ONDCP], 2011; Ulan et al., 2013). Indeed, the use of these medications for purposes other than therapeutic has been associated with addiction, psychosis and, in some
cases, death (Ulan et al., 2013). Scholars have attempted to shed light on this growing public health concern, chiefly targeting their research efforts toward college students (Kaye & Darke, 2012; McCabe, West, Veliz, Frank, & Boyd, 2014; UNODC, 2011). Indeed, the prevalence of nonmedical psychostimulant use is generally higher in this group compared to the general population (Kaye & Darke, 2012). However, there remains a paucity of data concerning the underlying social logics related to the use of these pharmaceuticals among college students, as well as in other groups likely to use prescription psychostimulants non-medically, such as healthcare professionals or other individuals with high-strain jobs (Green & Moore, 2009; Kaye & Darke, 2012; UNODC, 2011).

The objective of this article is to present a narrative review of qualitative studies exploring the social context in which these pharmaceuticals are used, which allows gleaning emerging patterns across studies, and discussing theoretical considerations as well as implications for future research.

**Psychostimulant use in context: Blurring the boundaries**

Prescription amphetamine-type stimulants have become a drug of choice among many of today’s young adult population (Quintero, 2012). Indeed, psychostimulants are known to increase mental acuity and performance in certain settings (Smith & Farah, 2011). They may also be used, nonmedically, to increase tolerance to alcohol or to lose weight (DeSantis, Webb, & Noar, 2008). However, these practices with regard to psychostimulants are not an entirely new phenomenon.

The period between 1929 and 1971 has been referred to as the “first amphetamine epidemic” (Rasmussen, 2008a, 2008b). Amphetamines were originally marketed in the 1930s for the treatment of allergies and asthma and, soon afterward, depression (Rasmussen, 2008b). Because these medications were readily available over-the-counter until the 1950s, they were extensively used with or without medical supervision (Rasmussen, 2008b). They were eventually classified as “prescription only” drugs due to increasing evidence pertaining to their addictive properties and potentially serious effects, most notably psychosis. However, misuse and abuse of amphetamine was generally associated with marginalized groups such as the Beat poets, Jazz musicians, or prison inmates; this consideration would eventually extend to a wider group (Rasmussen, 2008b). Indeed, at the height of their popularity, in 1969, approximately 8–10 billion doses of 10-mg amphetamine salts were produced by the pharmaceutical industry, 4 billion of which were estimated to be medically dispensed (Rasmussen, 2008b, pp. 177–178).

Use became so widespread that psychostimulant-related effects such as addiction and psychosis eventually percolated into mainstream society (Grinspoon & Hedblom, 1975; Lewis, 1969; Rasmussen, 2008b; Rockwell & Ostwald, 1968). Indeed, at that time, it was reported that a significant number of young people were going on “benders” (i.e., intensive use for an extended period of time) and injecting amphetamine-type stimulants for the purpose of “getting high” (Rasmussen, 2008b). These individuals became commonly known as “speed freaks,” driving the establishment of a “speed culture,” itself part of a broader drug “counterculture,” in the United States (Grinspoon & Hedblom, 1975; Rasmussen, 2008b). Thus, while psychostimulants were used by a great number of people by the end of the 1960s, their use was increasingly considered illegitimate and immoral. This lead to amphetamine-type stimulants being further regulated, in the early 1970s, by the American government (Rasmussen, 2008b). Psychostimulants were then classified as substances with a “high abuse potential,” and their possession became illegal outside of quantities acquired within the limits of a personal prescription (Rasmussen, 2008b). In addition, the clinical indications for amphetamine and its derivatives were relegated, by the Food and Drug Administration, to what was then considered a minor pediatric pathology: the “hyperkinetic reaction of childhood” (which would come to be known as ADHD, by the late 1980s, within the medical profession) (Rasmussen, 2008b). With these measures in place, production and use of psychostimulants significantly decreased by the mid-1970s (Rasmussen, 2008b).

Since the early 1990s, however, psychostimulants have reemerged in clinical practice, and thus have been introduced once again to a significant number of young people, as first-line treatment for Attention Deficit/Hyperactivity Disorder. As the prevalence of ADHD diagnosis has significantly increased since the early 1990s, so has the industrial production of amphetamine-type stimulants since the nadir of the 1970–1990 period (Diller, 1996; Hinshaw & Scheffler, 2014). American pharmaceutical companies produced approximately 84 tons of prescription psychostimulants in 2010; with regard to amphetamine (Adderall) in particular, there has been a 745, 600% increase in production quota (as per the US Drug Enforcement Administration) from 1996 to 2010 (Diller, 2011). These quantities are reminiscent of those circulating in 1969, at the height of amphetamines’ “first epidemic” (Rasmussen, 2008b). In addition, studies examining trends in prescription rates for psychostimulants show a significant increase within the last decade (ExpressScripts, 2014; Kaye & Darke, 2012; McCabe, West, Teter, & Boyd, 2014). Indeed, 69% of American children diagnosed with ADHD were receiving
pharmaceutical treatment in 2011 (Visser et al., 2014). In Canada, approximately 50% of children and adolescents diagnosed with ADHD are medicated (Hinshaw & Scheffler, 2014). Furthermore, a recent study estimates that 7% of Canadian high school students used prescription medications, including amphetamine-type stimulants, recreationally in the past year (Pulver, Davison, & Pickett, 2014). These figures attest to a renewed pervasiveness of psychostimulants in North America (Hinshaw & Scheffler, 2014).

Indeed, it appears that the same psychostimulants that were “misused or abused” by a wide number of people, over half a century ago, are now prescribed to children, adolescents, and young adults. These varying patterns of amphetamine use illustrate a flux in a general state of infatuation with psychostimulants, offset by one of “pharmaceutical Calvinism” (Collin & Otero, 2015; Williams, Martin, & Gabe, 2011). These states seem to fluctuate and overlap according to a “complex, nonlinear dynamic,” in line with the sociocultural interpretation of different medication classes at a certain moment in time (Collin & Otero, 2015). Thus, it can be argued that psychostimulants today are interpreted differently as they were by the end of the 1960s. What has changed since then? One answer may be that amphetamine and its derivatives are generally understood by today’s users as legitimate objects in all of their uses, therapeutic and nonmedical alike (Cutler, 2014; DeSantis et al., 2010; Mui et al., 2014). Actually, data suggests that psychostimulant users today do not seem to be part of a “drug counterculture”; rather, young adults appear to be striving to adhere to contemporary social norms, such as a “performance ethic,” with the assistance of these pharmaceuticals (Hinshaw & Scheffler, 2014; Kerley, Copes, & Griffin, 2015; Mannon, 1997).

**Between use, diagnosis, and discourse**

Contribution to the perceived legitimacy of nonmedical prescription psychostimulant use is the fact that, unlike the speed users of the 1960s, contemporary consumers of amphetamine and its derivatives are more likely to be well integrated members of society, for example, college students, professionals, or workers such as truck drivers (Leyton et al., 2012; McCabe, West, Teter, et al., 2014; UNODC, 2011; Vrecko, 2015). Indeed, among a recent sample of young adult prescription drug users, 70.8% were employed (Mui et al., 2014). Whether they are used with or without a prescription, because amphetamine-type stimulants can be prescribed, they are perceived as endorsed by the biomedical field and therefore thought of as safe and predictable in their effects (Cutler, 2014; de Souza, 2015; DeSantis et al., 2010; Green & Moore, 2009; Kerley et al., 2015; Mui et al., 2014). Consequently, the decision to use these pharmaceuticals for nonmedical purposes seems to be made with less (or no) moral conflict, as well as a decreased perception of risk when compared to alcohol and other drugs (Cutler, 2014; DeSantis et al., 2010; Vrecko, 2015).

In addition to the perception that psychostimulants are generally safe and socially acceptable to use, these pharmaceuticals are extensively available to young people; as one recent study reports: “For all of our participants, access to prescription drugs (…) was easy and uncomplicated” (Mui et al., 2014). While recent data show that the acquisition of psychostimulants for nonmedical purposes may be a complex and heterogeneous phenomenon (Vrecko, 2015), obtaining and using these pharmaceuticals by means other than through a personal prescription (i.e., through friends, acquaintances, or family members) is generally not regarded as an illicit act (Aikins, 2011; DeSantis et al., 2010; Kerley et al., 2015). Nevertheless, the personal prescription remains a common gateway to amphetamine-type stimulants (DeSantis et al., 2010).

Some authors are critical of the cursory manner in which the ADHD diagnosis can be established by physicians (Hinshaw & Scheffler, 2014). However, research shows that this is quite a complex undertaking (Diller, 2011; Kovshoff et al., 2012; Rafalovich, 2005). While practice guidelines are available in the Unites States and Canada, it remains that there is no clear, focused process for the diagnosis of ADHD (Rafalovich, 2005). Physicians must also contend with patients who may fake their symptoms in order to receive a personal prescription (Aikins, 2011; Sansone & Sansone, 2011; Vrecko, 2015). Notwithstanding these challenges, in many cases, amphetamine-type stimulants can be prescribed even when the patient is deemed to have “mild” ADHD (Diller, 2011; Rafalovich, 2005). Indeed, psychostimulants are quite useful to manage the symptoms associated with this condition, which has been referred to as a “protean” diagnosis, amenable to a variety of “clinical pictures” (Diller, 2011).

Thus, contemporary prescription psychostimulant use appears to be influenced by consumers’ perceptions of legitimacy and safety, as well as physician’s prescribing patterns and ambivalent diagnostic process. Within this North American landscape of “amphetamine-type stimulant pervasiveness,” nonmedical prescription drug use has been raised as a “major public health issue” (Sembower, Ertischek, Buchholtz, Dasgupta, & Schnoll, 2013; Ulan et al., 2013; UNODC, 2011). What has become known as the “prescription drug crisis” refers to the increasing prevalence of harms associated with the misuse or abuse of pharmaceuticals such as psychostimulants.

With regard to amphetamine and its derivatives, there is a paucity of data pertaining to their associated harms in relation to contemporary use. Indeed, according to a
recent review, “( …) Despite the fact that abuse potential is well documented, there is little evidence for widespread abuse” (Kaye & Darke, 2012). Nonetheless, both the United States and Canada have set forth strategies to prevent prescription drug-related harms, targeting in part amphetamine-type stimulants. The framework for these planned interventions does not distinguish between patterns of use; rather, it considers all nonmedical use of psychostimulants as inappropriate and harmful (Quintero, 2009). Thus, there seems to be a dissonance between user’s accounts and perceptions of prescription psychostimulant use—legitimate, safe, and banal—and what is promoted by public health institutions—deviant and dangerous (Quintero, 2012).

This tension between public discourse and user experiences helps to expose prescription psychostimulants as objects which allow exploring contemporary social trends. Indeed, through their many uses, these pharmaceuticals stand at the crossroads of what is medical/nonmedical, licit/illicit, normal/pathological, and ethical/moral issues raised by this phenomenon, with regard to the normative and moral issues raised by this phenomenon, clarifying the many uses prescription stimulants have been associated with considerable stress leading to depression and substance abuse (Allan, 1998). Nevertheless, there is a dearth of data concerning prescription psychostimulant use among professionals and the working population as a whole. (Eade, 1993; Leyton et al., 2012; Mui et al., 2014; Toher & Robitaille, 2011), a recent study showed that 11% of alumni report continued use of prescription stimulants after graduation (Underhill & Langdon, 2013). Considering the pervasiveness of psychostimulant use among today’s young adults, important insights may be gained by turning our gaze toward social groups other than college students.

Furthermore, in these fields of study, the use of psychoactive pharmaceuticals such as amphetamine and its derivatives is considered from the starting point as one among many forms of addictive practices. Indeed, the implicit understanding of “misuse,” “abuse,” or “diversion” of prescription drugs as necessarily leading to addiction is challenged by research that reveals a significant proportion of psychostimulant users as casual or low-level users (Quintero, 2009; Smith & Farah, 2011). Moreover, the implicit understanding of all nonmedical use as dangerous and harmful, which frames many of the studies concerning prescription amphetamine-type stimulants, hinders a full understanding of the values, contexts, and representations that underlie these medication-taking practices.

Nonmedical use of prescription amphetamine-type stimulants

Amphetamine-type stimulant use in public health and addiction literature

The majority of studies pertaining to the nonmedical use of amphetamine-type stimulant use stem from the public health and addiction literature and chiefly target the college student population (Aikins, 2011; Garnier-Dykstra, Caldeira, Vincent, O’Grady, & Arria, 2012; Judson & Langdon, 2009; Kaye & Darke, 2012; Levinson & McKinney, 2013; McCabe, West, Teter, et al., 2014; Quintero, 2009; Quintero, Peterson, & Young, 2006; Varga, 2012; Vo, Neafsey, & Lin, 2015). Indeed, lifetime prevalence rates of nonmedical use of psychostimulants among college students are higher than those reported in the general population, and can range between 5% and 43% (Kaye & Darke, 2012). However, there is a lack of consistency between studies with regard to prevalence rates, which may vary widely depending on the sample used. Furthermore, the majority of studies administer questionnaires on a voluntary basis to participants, which can lead to a skewed appraisal of prevalence rates. With regard to purposes of use, results show that improving academic performance is most often cited by participants; others include staying awake, improving tolerance to alcohol, managing depression or anxiety, and losing weight (Garnier-Dykstra et al., 2012; Kaye & Darke, 2012; McCabe, West, Teter, et al., 2014; Vo et al., 2015).

While college students are considered to be at higher risk of using prescription psychostimulants nonmedically, this phenomenon has received less attention among other groups (Aikins, 2011; Kaye & Darke, 2012; Storr, Trinkoff, & Anthony, 1999; UNODC, 2011). For example, healthcare professionals have been identified as a group that is at risk for nonmedical use of prescription drugs, including stimulants (UNODC, 2011). Nurses, pharmacists, and physicians have been reported to misuse prescription drugs partly due to their easy access to pharmaceuticals as well as their expert knowledge on medications (Merlo, Singhakant, Cummings, & Cottler, 2013; Lisa J. Merlo, Trejo-Lopez, Conwell, & Rivenbark, 2013). However, these studies do not focus on psychostimulant use in particular. Similarly, other professions such as law have been associated with considerable stress leading to depression and substance abuse (Allan, 1998). Nevertheless, there is a dearth of data concerning prescription psychostimulant use among professionals and the working population as a whole. (Eade, 1993; Leyton et al., 2012; Mui et al., 2014; Toher & Robitaille, 2011), a recent study showed that 11% of alumni report continued use of prescription stimulants after graduation (Underhill & Langdon, 2013). Considering the pervasiveness of psychostimulant use among today’s young adults, important insights may be gained by turning our gaze toward social groups other than college students.

Cognitive enhancement

Prescription psychostimulant use has also been addressed within a bioethical framework, with regard to the normative and moral issues raised by this phenomenon,
such as academic doping or cheating, inequity and social injustice, and the epistemological distinction between treatment and enhancement (Cakic, 2009; Forlini & Racine, 2009; Mohamed, 2014; Outram, 2012; Sahakian & Morein-Zamir, 2011). Indeed, neuroethics is emerging as a new field of study that explores, among other issues, the use of “pharmaceutical cognitive enhancers,” such as amphetamine-type stimulants, to increase performance (Mohamed, 2014). However, these studies are chiefly concerned with the question of risk versus benefit pertaining to the use of these pharmaceuticals, their influence on autonomy and questions regarding universal accessibility (Mohamed, 2014). Furthermore, research in neuroethics tends to draw a straight line between the use of psychostimulants and enhancement; it seldom unpacks what underlies this construct, although some authors are calling for further analysis (Vrecko, 2013). Thus, this framework provides an analysis of individual behavior and moral choices toward performance; however, it does not tend to address broader social issues in relation to the use of psychostimulants (Sattler, Forlini, Racine, & Sauer, 2013; Sattler, Mehlkop, Graeff, & Sauer, 2014). Indeed, while numerous articles have been published recently on these ethical issues (e.g., should cognitive enhancers be used, for what reason and by whom), most do not provide data about practices and representations regarding their use.

A sociological approach as a means to further understand psychostimulant use among young adults

Neither the biotechnical or public health and addiction standpoints are able to fully capture this phenomenon. The normative and moral stances that frame many of the studies concerning prescription psychostimulants restrict a broader, more profound, understanding of the values, contexts, and representations that underlie the medication-taking practices of young adults. Indeed, qualitative studies which adopt a sociocultural approach to address this problem can provide a deeper analysis and understanding of the practices and representations related to psychostimulants among young adults. Indeed, qualitative studies which adopt a sociocultural approach to address this problem can provide a deeper analysis and understanding of the practices and representations related to psychostimulants among young adults (Collin et al., 2012; Quintero, 2009; Vrecko, 2015). The objective of this article is to provide a review of this literature and highlight emerging patterns of prescription psychostimulant use among young adults, and also to discuss theoretical considerations as well as implications for future research.

Methods

A literature search was performed with the keywords: “prescription,” “stimulant,” and “context,” in the following databases: Web of Science, Medline, EMBASE, PsychINFO, ERIC, Social Sciences Abstracts, Sociological Abstracts, and Google Scholar. The search was completed by a manual review of references listed in key papers. Our search identified 211 publications. Criteria for inclusion were (1) qualitative empirical study and (2) the nonmedical use of prescription pharmaceuticals, including psychostimulants, among young adults as the study’s main focus. Publications in both English and French were considered. In the initial analysis, performed by one author, general and subthemes were extracted from the studies. This was followed by a second review of the papers by both authors.

Results

Twenty-one qualitative studies were included, published between 2006 and 2015. A summary of these papers is presented in Table 1. These publications attest to the varied ways in which nonmedical prescription drug use may be explored. Sixteen studies specifically examined the use of psychostimulants while the remaining focused on prescription drug use in a more general manner, and a number of different theoretical positions were called upon to frame the authors’ analyses. These elements suggest that the study of prescription drug use is still an emerging phenomenon and has yet to be fully understood.

Research was undertaken in the United States (n = 15), Canada (n = 3), Australia (n = 2), and Germany (n = 1). All but three studies recruited college students as participants. The average age of participants, when available, ranged between 21 and 26 years. The majority of data was obtained through semistructured interviews; two studies also used participant observation (Green & Moore, 2009; Petersen, Nørgaard, & Traulsen, 2014) another relied on focus groups (Collin et al., 2012) and one performed a document analysis (Quintero, 2012). Two studies also administered a questionnaire to participants (DeSantis et al., 2008; Mui et al., 2014).

Three main emerging patterns related to prescription psychostimulant use were identified: (1) control of external stressors, (2) strategic use toward the making of the self, and (3) increasing one’s performance. While these themes may overlap, they serve as entry points to further illuminate the practices and representations related to the use of prescription drugs and psychostimulants specifically.

Control of external stressors: Navigating everyday life

As Quintero (2009) suggests, there is a “growing body of literature,” which uses a framework of “controlled release”
### Table 1. Qualitative studies focusing on the social context related to the use of prescription psychostimulants among young adults.

<table>
<thead>
<tr>
<th>Authors and date</th>
<th>Title of article</th>
<th>Country</th>
<th>Theoretical position underlying the research</th>
<th>Sample characteristics</th>
<th>Methods</th>
<th>Type of prescription pharmaceuticals used</th>
</tr>
</thead>
<tbody>
<tr>
<td>Quintero et al. (2006)</td>
<td>An Exploratory Study of Socio-Cultural Factors Contributing to Prescription Drug Misuse among College Students.</td>
<td>United States</td>
<td></td>
<td>52 college students from 18 to 25 years old. Average age = 22 years</td>
<td>Exploratory and semistructured interviews</td>
<td>Most commonly: narcotic analgesics, benzodiazepines. Stimulants also &quot;misused widely.&quot;</td>
</tr>
<tr>
<td>Green &amp; Moore (2009)</td>
<td>&quot;Kiddie drugs&quot; and controlled pleasure: Recreational use of dexamphetamine in a social network of young Australians</td>
<td>Australia</td>
<td></td>
<td>Members of the same social network aged between 18 and 31 years. Average age of interviewees = 24 years</td>
<td>Participant observation and semistructured, in-depth interviews (n = 25)</td>
<td>Dexamphetamine</td>
</tr>
<tr>
<td>Quintero (2009)</td>
<td>Controlled Release: A Cultural Analysis of Collegiate Polydrug Use</td>
<td>United States</td>
<td></td>
<td>50 college students from 18 to 25 years old. Average age = 22 years</td>
<td>Semistructured interviews</td>
<td>Most commonly: Analgesics, CNS depressants, and CNS stimulants</td>
</tr>
<tr>
<td>McKinney &amp; Greenfield (2010)</td>
<td>Self-compliance at Prozac campus</td>
<td>Canada (QC)</td>
<td></td>
<td>22 university or postuniversity young adults between 19 and 24 years of age.</td>
<td>Semistructured interviews</td>
<td>“Psychiatric medication for mental health problem,” including Adderall and Ritalin ADHD stimulants</td>
</tr>
<tr>
<td>DeSantis et al. (2010)</td>
<td>Speeding Through The Frat House: A Qualitative Exploration Of Nonmedical ADHD Stimulant Use In Fraternities</td>
<td>United States</td>
<td></td>
<td>79 full-time male fraternity undergraduates</td>
<td>In-depth interviews</td>
<td>ADHD stimulants</td>
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<tr>
<td>Aikins (2011)</td>
<td>Academic Performance Enhancement: A Qualitative Study of the Perceptions and Habits of Prescription Stimulant–Using College Students</td>
<td>United States</td>
<td>Theory of perceived self-efficacy (Bandura, 1997)</td>
<td>12 college students, at least 18 years of age</td>
<td>Semistructured interviews</td>
<td>Methylphenidate (Ritalin) or amphetamine-type stimulant (namely, Adderall) for performance purposes</td>
</tr>
<tr>
<td>Thoer &amp; Robitaille (2011)</td>
<td>Use of prescription stimulants to enhance performance: Discourses and practices among young adults in Quebec</td>
<td>Canada (QC)</td>
<td>Pharmaceutical leaking (Lovell, 2008) and medications as technical objects (M. Akrich, 1996)</td>
<td>26 young adults from 18 to 25 years. Average age = 23 years</td>
<td>Semistructured interviews</td>
<td>Stimulants</td>
</tr>
<tr>
<td>Collin, Simard, &amp; Collin-Dessosiers (2012)</td>
<td>Between smart drugs and antidepressants: A cultural analysis of pharmaceutical drug use among university students</td>
<td>Canada (QC)</td>
<td></td>
<td>42 college students between 18 and 30 years of age</td>
<td>Focus groups (n = 5) and semistructured interviews (n = 10)</td>
<td>Most commonly stimulants and anxiolytics/hypnotics</td>
</tr>
<tr>
<td>Quintero (2012)</td>
<td>Problematising “drugs”: A cultural assessment of recreational pharmaceutical use among young adults in the United States</td>
<td>United States</td>
<td>Pharmaceuticalization (Williams et al., 2011)</td>
<td>91 college students from 18 to 25 years of age. Average age = 22 years</td>
<td>Document analysis of NIDA, ONDCP and other media documents; semistructured interviews (n = 91)</td>
<td>Most commonly narcotic analgesics, anxiolytics, and stimulants</td>
</tr>
<tr>
<td>Authors and date</td>
<td>Title of article</td>
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<td>Theoretical position underlying the research</td>
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<td>Levinson &amp; McKinney (2013)</td>
<td>Consuming an edge: ADHD, stimulant use, and psy culture at the corporate university</td>
<td>United States</td>
<td>The concept of &quot;psy&quot; (Rose, 1996)</td>
<td>22 college students from 19 to 24 years of age</td>
<td>Semistructured interviews ($n = 22$); formal open-ended interviews with senior clinicians from campus health services; informal interviews with clinic staff and faculty</td>
<td>Stimulants used in the treatment of ADHD</td>
</tr>
<tr>
<td>Partridge et al. (2013)</td>
<td>Australian university students’ attitudes towards the use of prescription stimulants as cognitive enhancers: Perceived patterns of use, efficacy and safety</td>
<td>Australia</td>
<td>19 university students from 18 to 31 years of age. Average age = 24 years</td>
<td>Semistructured interviews</td>
<td></td>
<td>Prescription stimulants</td>
</tr>
<tr>
<td>Cutler (2014)</td>
<td>Prescription Stimulants Are ‘A Okay’: Applying Neutralization Theory to College Students’ Nonmedical Prescription Stimulant Use.</td>
<td>United States</td>
<td>76 college students from 18 to 26 years. Average age = 21 years.</td>
<td>Semistructured interviews</td>
<td></td>
<td>Prescription stimulants (e.g., Adderall, Ritalin, Concerta, and Vyvanse)</td>
</tr>
<tr>
<td>Hildt et al. (2014)</td>
<td>Life context of pharmacological academic performance enhancement among university students – a qualitative approach</td>
<td>Germany</td>
<td>18 university students. Average age = 25.8 years</td>
<td>Semistructured interview</td>
<td></td>
<td>Prescription or illicit (psycho-) stimulants: amphetamines, methylphenidate, ecstasy, and cocaine</td>
</tr>
<tr>
<td>Mui et al. (2014)</td>
<td>Everybody’s Doing It: Initiation to Prescription Drug Misuse</td>
<td>United States</td>
<td>120 young adults from 18 to 25 years of age. Median age = 21 years.</td>
<td>Questionnaire and in-depth interview</td>
<td></td>
<td>Prescription drugs, including Adderall, Dexedrine, Ritalin, and Concerta.</td>
</tr>
<tr>
<td>Petersen, Nørgaard, &amp; Traulsen (2014)</td>
<td>Going to the doctor with enhancement in mind: An ethnographic study of university students’ use of prescription stimulants and their moral ambivalence</td>
<td>United States</td>
<td>20 university students from 19 to 32 years of age</td>
<td>In depth, semistructured interviews; participant observation with three university students</td>
<td></td>
<td>Prescription stimulants, notably Ritalin and Adderall</td>
</tr>
<tr>
<td>De Souza (2015)</td>
<td>“I’ve Thought About This, Trust Me”: Understanding the Values and Assumptions Underlying Prescription Stimulant Misuse Among College Students</td>
<td>United States</td>
<td>37 college students from 18 to 21 years of age</td>
<td></td>
<td></td>
<td>Prescription stimulants used without a legal prescription</td>
</tr>
<tr>
<td>Kerley et al. (2015)</td>
<td>Middle-Class Motives for Non-Medical Prescription Stimulant Use among College Students</td>
<td>United States</td>
<td>22 undergraduate students from 19 to 24 years of age</td>
<td>In-depth interviews</td>
<td></td>
<td>Prescription stimulants</td>
</tr>
<tr>
<td>Vrecko (2015)</td>
<td>Everyday drug diversions: A qualitative study of the illicit exchange and non-medical use of prescription stimulants on a university campus</td>
<td>United States</td>
<td>38 university students</td>
<td>Semistructured interviews</td>
<td>Psychostimulants, notably Adderall and including Ritalin, Concerta, and Dexedrine</td>
<td></td>
</tr>
</tbody>
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* authors’ translation; QC: Quebec; ADHD: Attention Deficit/Hyperactivity Disorder; CNS: Central nervous system.
to describe behaviors where “(…) individuals conduct themselves in ways that assert either the value of control through some type of discipline or release through practices that express the personal gratification of desire.” (Quintero, 2009) Focusing on college students’ practices, the author suggests that different types of substances are used, including pharmaceuticals, to manage their many requirements. Indeed, course work and examinations, varied social expectations, such as participating in parties and other similar events can render the “college experience” quite stressful (Quintero, 2009). Drugs are used in this setting to either offset stress (release) or to meet various demands (control). This allows the maintenance of a lifestyle that is compatible with social activities as well as with an academic ethic, which often weighs heavily upon students. For example, psychostimulants are often used to “get the paper done” for the next morning, to read and understand texts, or to memorize large quantities of data in a short period of time (de Souza, 2015; Quintero, 2009).

While the framework of “controlled release” is not explicitly called upon by other authors included in this review, a number of papers highlight the importance of drug use, particularly psychostimulants, to manage students’ stress (Aikins, 2011; Collin et al., 2012; de Souza, 2015; DeSantis et al., 2010; Hildt, Lieb, & Franke, 2014; Partridge, Bell, Lucke, & Hall, 2013; Thoer & Robitaille, 2011) As Partridge et al. (2013) note: “There was also a typical view that university study is highly stressful and that the use of prescription stimulants may be an attractive mechanism for coping with stressful tasks, such as exams.” Indeed, psychostimulant use is shown to occur most often during examination periods, rather than in a leisurely setting (DeSantis et al., 2010; Partridge et al., 2013). While these pharmaceuticals are not the only solution to manage the stresses of college life, their effects seem particularly suited to appease university-related anxieties. Indeed, they help students get through their coursework in a timely manner, thus creating space for activities other than academic. In addition, and perhaps more importantly, psychostimulants foster an interest in scholarly work: “The positive effects the drugs had on participants’ focus, motivation, and enjoyment was apparent. Prescription stimulants offered a way to be productive at work and experience pleasure at the same time” (de Souza, 2015). While a majority of the selected papers focused on the college student population, this may also hold true for young adults on the job market, where, as Thoer & Robitaille (2011) suggest, psychostimulants can be a “solution to face one’s multiple engagements” (Thoer & Robitaille, 2011).

Strategic use toward the making of the self: Titrating toward acceptance

While psychostimulant use may serve as a means to manage external stressors in the college setting, their use also highlights the normative and moral context in which these practices occur. Indeed, research suggests that controlling one’s behavior to remain within the socially acceptable framework may also be a significant determinant of the non-medical use of prescription psychostimulants. Such a framework could be described here as an academic, or more broadly, a performance ethic which prevails in North-American and Western societies (Ehrenberg, 2011; Mannon, 1997). One example of this is the use of prescription psychostimulants to increase tolerance to alcohol, which can be understood as a manner of “performing well” in a leisurely setting (Aikins, 2011; Green & Moore, 2009). Indeed, exhibiting drunken behavior was rather stigmatized in certain social circles: “(…) the maintenance of ‘controlled’ or ‘functional’ drug use was much valued by network members.” (Green & Moore, 2009) Therefore, users are able to use stimulants’ effects to better meet their needs, such as attaining and maintaining status as an “insider.”

In accordance with such practices, strategic non-medical use of pharmaceuticals, as represented by dose titration practices, was reported by the majority of studies identified in this review: “(…) prescription medication serves as a tool to discipline behavior and enhance a sense of self-control” (Loe & Cuttino, 2008). The relationship between the making of the self and drug use has been addressed by scholars, most notably Nikolas Rose (2007), as well as others (Persson, 2004; Rose, 2007). With regard to prescription psychostimulant use among college students, Loe & Cuttino (2008) report the different ways these substances affect a “sense of self.” They show that most participants distinguish between their “authentic,” or non-medicated, and their medicated self (Loe & Cuttino, 2008). A large part of navigating between these “selves” is performed by dosing adjustments, for example, stopping psychostimulant use during weekends or increasing the dosage or frequency of use during exam time. Such titration practices also come to light in McKinney & Greenfield’s (2010) study: “(…) patients assume significant personal decision making power in terms of dosages, when to discontinue use and even what medications to take” (McKinney & Greenfield, 2010). Thus, studies included in this review reveal rather enterprising young adults, adjusting pharmaceuticals’ effects, both physiological and affective, to better accept “their self” or be accepted by the larger group, be it in leisurely or academic settings.
Increasing one’s performance: The importance of being “successful” in college and beyond

Making oneself a “successful” individual seems to be central to the use of prescription psychostimulants users, namely, college students (Aikins, 2011; DeSantis et al., 2008; Kerley et al., 2015; Levinson & McKinney, 2013; Underhill & Langdon, 2013). Indeed, as McKinney and Greenfield report, “Many of the participants were academically high achieving despite reporting significant emotional suffering” (McKinney & Greenfield, 2010). Moreover, some authors note that the desire to adhere to a “performance ethic” may be permeating into aspects of students’ lives other than intellectual, such achieving a desired health/physical status. For example, the body may be “stimulated at will” so to tame it into physically performing as required (Collin et al., 2012). Research also shows that such high performance standards are likely to extend to young adults participating in the workforce (Thero & Robitaille, 2011; Underhill & Langdon, 2013). Indeed, 70.8% of nonmedical prescription drug users in the study conducted by Mui et al. (2014) were employed (Mui et al., 2014).

Given the various settings in which psychostimulants can be called upon, it can be argued that these pharmaceuticals are a socially acceptable tool to keep up with performance standards—and thus maintain one’s status as an “insider”—in many aspects of everyday life (Collin et al., 2012; Kerley et al., 2015). However, as Loe & cuttino (2008) remark, users may be unknowingly “contributing to the social expectations to which they are responding” (Loe & Cuttino, 2008).

Discussion

This review of qualitative studies shows that there are similarities between the studies selected for this review concerning the social context of non-medical prescription psychostimulant use. Indeed, they suggest that non-medical use of pharmaceuticals is not only legitimized but considered quite banal (Cutler, 2014; Green & Moore, 2009). Furthermore, we notice that prescription psychostimulants can serve as useful tools to navigate the stresses of everyday life, as well as maintain a socially acceptable standing within one’s group of reference (Green & Moore, 2009; Kerley et al., 2015; Quintero, 2009). Finally, these studies highlight the negotiations that take place between fashioning one’s sense of self and adhering to the prevailing performance ethic in North-American and other Western societies. This then raises the following question: What are the underlying mechanisms, or social processes, contributing to the production of prescription psychostimulant use among young adults? In search of an answer, we argue that pharmaceuticalization may be a useful conceptual tool to understand this contemporary phenomenon.

Indeed, drug use has been largely informed by theories related to deviance (Becker, 1966; Boeri, 2013; Cutler, 2014; Mui et al., 2014; Reinarman, 2012). While these theories have been instrumental in understanding the use of illicit drugs, such as marijuana or methamphetamine, we argue that they are less suitable to understand the use of prescription pharmaceuticals. As we have attempted to show in this article, the social controls which usually moderate illicit drug use, such as issues of access, fear of being caught and having to deal with the immorality of the act itself are less likely to be present with prescription psychostimulants (Becker, 1966). Alternatively, the concept of pharmaceuticalization can bring important insights into the contemporary use of drugs, including prescribed psychoactive substances (Collin, 2016; Quintero, 2012; Vrecko, 2015). Pharmaceuticalization, as defined by Williams et al. (2011): “(…) denotes the translation or transformation of human conditions, capabilities and capacities into opportunities for pharmaceutical intervention” (Williams et al., 2011). Indeed, the authors propose that there is a social process of pharmaceuticalization beyond that of medicalization. While medicalization represents the process by which “the experiences of life” are reinterpreted through the lens of disease, pharmaceuticalization can refer to use of drugs as technological tools to “improve” all aspects of our lives. Furthermore, Collin (2016) suggests that pharmaceuticalization can be envisaged as the interaction of three processes: medicalization, molecularization, and biosocialization. Indeed, the use of psychostimulants by healthy young adults to enhance their performance can be understood as a leading example of this broader social process (Williams et al., 2011), particularly with regard to biosocialization, which may be “(…) conceived as a mechanism through which there is a progressive superimposition of two antinomic conditions: inclusion in and exclusion from society” (Collin, 2016). Thus, the tension between performing as per the prevailing standards and managing one’s authentic “sense of self,” as illustrated by strategic dosing practices of psychostimulants, reflects this aspect of pharmaceuticalization. Indeed, the process of pharmaceuticalization can “exist” because the technology, in the form of pharmaceuticals, is readily available for use and interpretation by individuals; arguably, prescription psychostimulants are some of the most accessible pharmaceuticals in North America and other Western societies. However, drugs are distinct from other technologies in that: (1) they are “material”—they are objects amenable to reinterpretation by different individuals in various settings of use; (2) their effects are plural, and can vary according to the...
context in which they are used; and (3) they are “temporal”—their effects endure only as long as they are used, and may thus be reversed. These properties allow pharmaceuticals to reach “far beyond the medical realm” (Collin, 2016).

While pharmaceuticalization can be understood as a broader social process, it is not yet clear, from this review of qualitative studies, how this translates into local, everyday practices (Duff, 2011). Indeed, Duff (2011) argues that understanding these requires a framework that can free the researcher from the “artificial” dichotomies of licit and illicit use, medical and nonmedical use, deviance and normalization, objects, and individuals. As we have argued, prescription psychostimulants stand at the crossroads to moral/immoral, licit/illicit, normal/pathological; adopting the position, from the outset, that all nonmedical use is immoral, addictive, and pathological does not allow exploring the different patterns of drug use and gaining a deeper understanding of the underlying mechanisms that produce psychostimulant use in contemporary North-American and other Western societies. To achieve this, we turn to Actor-Network Theory (ANT) (Duff, 2011). ANT refers to “(…) a body of theoretical and empirical writing which treats social relations (…) as network effects.” (Law, 1992) and has gained traction within the last decade and particularly within the last 5 years as a new way of understanding drug use (Demant, 2009; Cameron Duff, 2013; Keane, 2013; Moore, 2004). This framework is attractive for the study of prescription psychostimulant use because it entails that the researcher must not have any preliminary assumptions on how “things are connected”; rather, he must aim to first deconstruct the network and then reassemble it (Latour, 2005; Law, 1992). It is this reassembly that will yield new insights on the social effects produced by a given network (Latour, 2005). Therefore, with regard to future research concerning nonmedical prescription psychostimulant use, ANT can become a useful conceptual tool to think beyond what is moral/immoral, licit/illicit, or normal/pathological.

**Conclusion**

The chief limitation of our article is that it does not provide a systematic review of the literature. Nonetheless, our goal was to flesh out emerging patterns related to the use of prescription psychostimulants among young adults, and we believe our narrative review allowed us to achieve this. Our analysis shows that users of prescription psychostimulants do so in a strategic manner, to avoid stigma and also to conform to a contemporary normative framework related to an ethics of performance. While most studies target college students, we suggest that future research focus on other social groups who are using these substances, including those occupying the digital space, as well as adopt a more sociological approach for understanding this phenomenon, by mobilizing the concepts of pharmaceuticalization as well as ANT.

**Glossary**

**Actor-Network Theory**: Actor-Network Theory (ANT) refers to theoretical advances in sociology proposed by, among others, Latour, Law, and Callon Law (1992). ANT refers to “(…) a body of theoretical and empirical writing which treats social relations (…) as network effects.”

**Amphetamine-type stimulants**: Amphetamine-type stimulants refer to substances similar in structure to amphetamine, such as dexamphetamine, lisdexamphetamine, and methylphenidate, excluding amphetamine-like substances, which demonstrate hallucinogenic properties.

**Pharmaceuticalization**: Pharmaceuticalization refers to the process by which human capacities and capabilities are translated into opportunities for pharmaceutical intervention, as proposed by Williams et al. (2011).

**Declaration of interest**

The authors report no conflicts of interest. The authors alone are responsible for the content and writing of the article.

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