

**Stakeholder perspectives and reactions to “academic”
cognitive enhancement: unsuspected meaning of
ambivalence and analogies.** *Public Understanding of Science.*
(2012). 21 (5): 606-625.

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Acknowledgments

The authors would like to acknowledge the support of the Social Sciences and Humanities Research Council of Canada (E.R.), the Canadian Institutes of Health Research (E.R.), and the Fonds de recherche en santé du Québec (C.F. and E.R.). Thanks to Dr. Emily Bell, Dr. Nicole Palmour, Emma Zimmerman, William Affleck and the two anonymous reviewers. The authors report no conflicts of interest. Social Sciences and Humanities Research Council of Canada (E.R.): #118265. Canadian Institutes of Health Research (E.R) :#ICN88366. Fonds de recherche en santé du Québec (E.R.): #11990 and #5798 (C.F.) #17433

Abstract

The existence of diverging discourses in the media and academia on the use of prescription medications to improve cognition in healthy individuals, i.e., “cognitive enhancement” (CE) creates the need to better understand perspectives from stakeholders. This qualitative focus-group study examined perspectives from students, parents and healthcare providers on CE. Stakeholders expressed ambivalence regarding CE (i.e., reactions to, definitions of, risks, and benefits). They were reluctant to adopt analogies to performance-enhancing steroids and caffeine though these analogies were useful in discussing concepts common to the use of different performance-enhancing substances. Media coverage of CE was criticized for lack of scientific rigor, ethical clarity, and inadvertent promotion of CE. Ambivalence of stakeholders suggests fundamental discomfort with economic and social driving forces of CE. Forms of public dialogue that voice the unease and ambivalence of stakeholders should be pursued to avoid opting hastily for permissive or restrictive health policies for CE.

Keywords: cognitive enhancement, neuroethics, stakeholder perspective, ambivalence, media coverage, focus groups

Introduction

The non-medical use of prescription medications to enhance human cognition (e.g., concentration, memory, alertness) in healthy individuals is often described as “cognitive enhancement” (CE). Studies indicate that methylphenidate (MPH; Ritalin), a common treatment for Attention-Deficit/Hyperactivity Disorder (ADHD), is being used by university students for non-medical CE purposes in proportions ranging from 4% to 11% (Racine and Forlini, 2010; Wilens et al., 2008).

Combined with growing bioethics debate and media coverage, these studies on the non-medical uses of stimulants in university students provide a current and well documented example of CE. Proponents of CE in academic bioethics have argued that CE, “has much to offer individuals and society” (Greely et al., 2008). However, others contend that it is premature to declare CE beneficial given existing knowledge gaps (Racine and Forlini, 2009) including limited evidence of its safety and its efficacy in enhancing cognition of healthy people (Barch and Carter, 2005; Bray et al., 2004; Elliott et al., 1997; Mehta et al., 2000). Further,

little attention has been paid to the social context and social factors involved in CE practices. A recent study on autonomy and coercion in CE found that stakeholders (students, parents, healthcare providers) described enormous social pressures to perform, which may in themselves entice use of cognitive enhancers (Forlini and Racine, 2009a). Other studies on the attitudes of the public and stakeholders found general discomfort with CE in the general public and among healthcare providers (Bergstrom and Lynoe, 2008) as well as issues with the justice and fairness of using such medications in competitive environments (Sabini and Monterosso, 2005). Data on how different stakeholder groups view CE on both an ethical and social level is currently sparse but indicate that information about the social aspects of CE may be lacking.

Examining stakeholder perspectives and public appreciation of the ethical and social issues of CE has been suggested to broaden the CE debate and gain further insights into social and contextual aspects of CE (Racine and Forlini, 2009). Currently, stakeholders face a potentially difficult challenge in sorting through the diverging discourses on CE (Forlini and Racine, 2009b). Academic bioethics has generated some optimistic accounts of the impact of CE on society (Greely et al., 2008) despite an unclear understanding of the perspectives of stakeholders and the broader public (Racine and Forlini, 2009) while public health discourses are structured around negative labels like “prescription misuse” and “prescription abuse”. North American and international media have discussed CE as a lifestyle choice referring mainly to the North American context and evoked the issue of ‘pharmaceuticalisation’ with regard to CE (Williams et al., 2008). Research on the media coverage of modafinil, a sleep cycle regulator often associated with CE, has also revealed the use of different frameworks. On the one hand, modafinil is constructed as a “wonder drug” (Williams et al., 2008) and product that can help control sleep (Coveney et al., 2008). On the other hand, media discourses on this topic have voiced cultural and social concerns about the regulation of sleep cycles with modafinil especially for enhancement purposes (Coveney et al., 2008; Williams et al., 2008). Though the different discourses in bioethics, the media, and public health create a rich set of co-

existing perspectives, they may complicate the stakeholders' take on the current controversy surrounding CE. This study aimed to better understand stakeholder reactions to and comprehension of CE for performance enhancement in the academic setting in order to address the need to gather more grounded and social perspectives on CE.

Methods¹

Participants

Three groups of participants were selected, university students 25 and under, parents of university students and healthcare providers (HCP). The prevalence of the non-medical use of methylphenidate in university student populations has been widely studied (Wilens et al., 2008). The age limit on university students reflects data showing this practice exists among undergraduate students (Babcock and Byrne, 2000; White et al., 2006). Parents of university students reflect a generational difference and are directly connected to university education. Healthcare providers work closely with medications to treat disease making their perspective on the repurposing of MPH for enhancement of interest to this study. A HCP was defined as someone having a professional responsibility to care for the health of patients (e.g., doctors, nurses, pharmacists). No particular expertise with MPH was required.

Recruitment

The study and the recruitment strategies were approved by the Research Ethics Board (REB) of institutions where the study was conducted. English and French recruitment advertisements were posted in common areas of two Montréal area universities and affiliated institutions. Advertisements were also featured in various Montréal general and student newspapers as well as online classified sites. E-mail invitations were sent to major student associations and faculty

¹ The data presented in this article is part of a larger study of which the methodology and other non-overlapping data have been previously published (Forlini and Racine, 2009a).

members in healthcare professions. Participants received a fifty dollar compensation for participating.

Focus groups

Focus groups allowed us to gain insight into stakeholder perspectives as opposed to those of individuals. To minimize recruitment bias and encourage participation of non-experts, participants remained unexposed to the specific subject of the discussion (CE with MPH) until they received the documentation package. This package included a print media sample of four articles, a consent form and a short questionnaire. The articles were chosen from a systematic print media sampling of prior discourse analysis (Racine and Forlini, 2010). To maximize the scope of the focus group discussion, articles were selected to reflect variability in content (e.g., details about how students obtain pills, effects, and testimonials), quality of information, overall coverage of ethical issues, length, and country of origin (Laurance, 2003; Morency, 2006; Ross, 2006; Zernike, 2005). After reading the articles, participants were asked to fill out an anonymous questionnaire collecting demographic data and information about prior knowledge of CE with MPH.

The interview grid for the focus groups was based on the results of prior discourse analysis (Racine and Forlini, 2010) and tested with three pilot interviews. During the focus groups, participants were first invited to comment generally on CE (i.e., propose definitions and react to the frequency and social acceptability of CE) and then express their opinions regarding the ethical, social and legal issues related to CE (e.g., safety, justice and fairness). They were also asked to comment on the potential social and healthcare impacts of CE as well as solutions. Finally, participants were asked to give their impression (i.e., completeness of information, realism) on the media coverage of MPH for CE based on the prompt material. The focus groups were moderated to allow spontaneous expression of opinions while ensuring coverage of the topics included in the interview grid.

Coding

Each focus group was transcribed verbatim. The transcripts were coded systematically according to a previously used coding guide that identified major themes and issues from lay, bioethics and public health discourses on CE (Forlini and Racine, 2009b). In this paper, five themes around the non-medical use of MPH for performance enhancement are reported and discussed: (1) stakeholder reactions to CE; (2) stakeholder views on common analogies; (3) descriptions (definitions) of and views on CE; (4) physiological effects, psychological effects and safety of MPH use for CE; (5) stakeholder impression of media coverage on CE.

Results

Demographic data

Sixty-five individuals participated in one of nine homogeneous focus group discussions: 29 students (mean age 20.9 years; focus groups A, B, C); 21 parents (mean age 53.8 years, focus groups D, F, H) and 15 healthcare providers (mean age 31.9 years, focus groups E, G, I). Each participant was assigned an alphanumeric code (e.g., A1) where the letter identified the stakeholder group they belonged to and the number indicated the order in which they were recruited. Results from the demographic questionnaire (Table 4.1) show that the majority of participants were female (68%; N=44/65; S: N=22; P: N=12; HCP: N=10) and had obtained or were in the process of obtaining undergraduate or graduate degrees (86%; N=57/65; S: N=29; P: N=15; HCP: N=13). The commercial name of MPH, Ritalin, was used in the questionnaire because of its familiarity. The remaining results from the questionnaire are presented in Table 4.1 which include the participant's experience with MPH in the medical (questions 1, 2 and 3) and non-medical (questions 4, 5 and 6) contexts as well as the participant's appreciation of the media and their interest in popular science issues (questions 7 and 8).

Table 4.1: Demographic data and participants' experience with the medical and non-medical contexts of MPH use as well as appreciation of media and popular science

Question	Yes (%)			
	S	P	HCP	Total
1. Do you presently have a prescription for Ritalin?	-	-	-	0
2. Have you ever had a prescription for Ritalin?	-	10	-	3
3. Do you know someone with a prescription for Ritalin?	48	29	53	43
4. Have you ever tried Ritalin for non-medical uses?	24	-	-	11
5. Do you know someone who has tried Ritalin for non-medical uses?	69	5	33	40
6. Had you ever heard/read about Ritalin for non-medical purposes before participating in this project?	90	67	53	74
7. Do you subscribe to a newspaper or magazine?	38	67	33	46
8. Are you interested in reading about popular science? *	93	80	93	89

S: students; P: parents; HCP: healthcare providers *64 respondents answered this question

Stakeholder reactions to the non-medical use of MPH for performance enhancement

Reactions toward the non-medical use of MPH varied across groups of stakeholders (Table 4.2). Some were surprised, even shocked to learn about performance enhancement in the academic setting; others, namely students, were not surprised given the lengths to which students will go to in order to succeed. The perspectives of parents and HCP were marked by the presence of two features. The first was a strong association of MPH exclusively with the medical context, which created some confusion about how MPH could actually be used non-medically. The second was a reaction of surprise caused by the perceived frequency and extent of non-medical use of MPH. Some parents were surprised that the non-medical use of MPH was socially acceptable among students but also stated that it was not the first time substances were used to improve performance. Students suggested that MPH had become a common solution for students wanting to improve their performance but some students were also surprised that a neuropharmaceutical like MPH was being used to enhance performance. The dual reactions of students were interesting because many participants had first hand experience with the non-medical use of MPH. For example, student C10 said, "I would see my roommate crash from it. I knew it was happening." Many students were aware of CE before attending the focus groups. As a result, among students who were surprised, many referred to their impression regarding MPH use for performance enhancement the *first* time they heard of it (during their studies) and not necessarily their reaction to the focus group and the focus group prompt material.

Table 4.2: Features of stakeholder reactions with qualitative examples toward the non-medical use of methylphenidate for performance enhancement

Features of stakeholders' surprise and shock about the non-medical use of MPH			
Description	Lengths to which students would go to perform well (S, P, HCP)*	Association of MPH with the medical context (P, HCP)	Perceived extent, frequency (P, HCP), and social acceptance (P) of non-medical use of MPH for CE
Examples	<p>"I found out about it last year like students in my classes were taking Ritalin and I was really surprised, like "What do they need this for?" and since then I've known more, not more and more people necessarily, but it seems to be the norm now." (Student A6)</p> <p>"Yes, really. It shocked me, you know, because I never thought it went that far." (HCP I1)</p>	<p>"Well I know that young kids, in primary school, take a lot of Ritalin, and secondary school too. But I thought it was only for medical purpose, given by the doctor. I was shocked." (Parent F2)</p> <p>"I was very surprised because it is like abusing it. It used to be something prescribed. You used to take it for overactive children and now it is used to enhance your ability to perform." (HCP E7)</p>	<p>"I was more shocked than surprised by the moral ambiguity when some people think it is OK." (Parent H5)</p> <p>"I wasn't expecting that students were cheating this way, but sure I thought maybe 0.5% of students, but we have some statistics of 5%, something like that." (HCP E3)</p>

Features of stakeholders' lack of surprise about the non-medical use of MPH

Description	Students will go to great lengths to perform well (S)	MPH has become a common solution for students (S)	MPH is not the first substance to be used to enhance performance (P, HCP)
Examples	<p>“I just found out about this a few months ago but when I found out about it I wasn’t necessarily surprised. Just sort of with the pressures of being in university and seeing a lot of friends crack under the pressure. A lot of students will go to great length and do almost anything to sort of enhance their academic achievement.”</p> <p>(Student B10)</p>	<p>“I had first heard about it, I guess, half way through my undergrad (...). Back then yeah it surprised me in a “What do you mean? This is so unfair!” way because there was quite a bit of students using it (...). Back then I was surprised but now, quite frankly, it seems that it, everybody, it kind of got out there, got the message.” (Student A9)</p>	<p>“Not surprised but in the 1960s and 70’s, ah, students used coffee, cigarettes, and nowadays there are a lot of possibilities to use drugs.”</p> <p>(Parent F7)</p>

MPH: methylphenidate; S: students; P: parents; HCP: healthcare providers
 *Parentheses indicate that this feature was expressed by at least one participant of this group

Table 4.3: Stakeholder reactions to analogies to performance-enhancing steroids and caffeine in reference to the non-medical use of MPH *

	Steroids	Caffeine
Same	<p>Steroids and MPH are used for the same type of goal (S, P, HCP)</p> <p>Taking either MPH or steroids constitutes cheating (S, P, HCP)</p>	<p>Caffeine and MPH both have a risk of dependence and are used to improve performance (P)</p>
Different	<p>Steroids improve physical performance more than MPH improves concentration (S)</p> <p>MPH can be taken occasionally while steroids require long-term use (S)</p> <p>Athletes are more commonly regarded as role models than academics (S)</p> <p>Different regulation for the use of substances in sports and academics (HCP)</p>	<p>Caffeine does not have the same effect on concentration as MPH (S)</p> <p>MPH is not available over the counter like caffeine (HCP)</p>
Ambivalent	<p>Unsure whether the use of steroids in competition and the non-medical use of MPH are both cheating to the same extent (S)</p>	<p>Unsure whether the regulation of caffeine and MPH make them equivalent given that the goals underlying their consumption by students are the same (S)</p>

*Parentheses indicate that this feature was expressed by at least one participant of this group

Stakeholder views of common analogies for the non-medical use of MPH for performance enhancement

Table 4.3 summarizes the different attitudes (“same”, “different”, and “ambivalent”) expressed by stakeholder groups toward analogies between the non-medical use of MPH and the use of other substances like performance-enhancing steroids in sports or caffeine (coffee) in the academic environment. There was no general consensus within and between groups on the similarities and differences between MPH and these other substances. We found the views voiced by stakeholders to be

complex and sometimes paradoxical. In general, stakeholders were hesitant to consider the use of MPH as completely analogous with the use of other performance enhancing substances. The student group was especially ambivalent about whether the analogies of MPH to steroids and coffee were fair or accurate. In addition to Table 4.3, the text below provides qualitative examples of these views to illustrate how stakeholders compared and contrasted MPH to steroids and coffee.

Stakeholders considered MPH comparable to performance-enhancing steroids

Some participants from all three stakeholder groups agreed that using MPH as a study aid was akin to using performance-enhancing steroids in sports because, in both contexts, the goal is to improve performance. HCP E1 described this goal as “hyper-functioning” because “you are functioning and you want to function better.” In further support of this analogy, both sports and academia were viewed as competitive environments. The competition in both fields was compared by Student A2 who said that in sports “[y]ou want to beat the teams (...) otherwise they will replace you” and in academia “you need that ‘A’ because (...) there are so many just like you who can get your spot.” Stakeholders with this point of view also agreed that the non-medical use of MPH to improve performance would constitute cheating. Student C6 qualified this perspective by explaining that, “[i]n both cases it is an artificial chemical enhancement” because “academic performance is sort of based on merit and hard work, which is the same thing in professional sports, based on natural ability and also hard work.” Some participants from all three groups considered that, by virtue, a substance used as shortcut to perform in a competitive environment renders MPH the same as using steroids.

Stakeholders contrasted MPH and steroids

During the focus group, students and HCP identified some aspects that differentiated the contexts in which MPH and performance-enhancing

steroids are used. They described enhancing athletic performance as having implications for professional advancement whereas enhancing academic performance impacted a student's future. Differences were also discussed by students and HCP regarding the nature of competition in sports and academics. For example, sports competitions were regarded as a "celebration of the natural body and how far the natural body can go (...) without enhancement" (Student B8) and as having extraordinary expectations for achievement, "(...) I don't know if you can compare a baseball player taking steroids because he wants to beat the home run record as opposed to a student that takes Ritalin so that he can pass his exam and get a decent job and make a living out of it" (Student A1). However, one HCP highlighted how the "ordinary" nature of academic achievement renders academic success all the more important, "if you are not succeeding in sports you can do other things. (...). If you are failing in school and have low grades your life is quite impaired for a long time" (HCP I1). Another HCP also added the fundamental difference on which sports competitions are currently regulated, "[t]hey know that there is going to be drugs tests and urine tests in baseball" (HCP G4). In contrast, academic competition was described as "how well you want to do and what grade you want" (Student B5) without "a focus on what's natural" (Student B2).

The contexts of academia and sports were further distinguished by students in terms of physiological targets because, "(...) if you're on steroids (...) you can do things that people can't do no matter what if they weren't on steroids. (...) as far as I can tell, Ritalin (...) could [help] achieve the same level of performance [as someone who has not taken MPH]" (Student A4). Another aspect that appeared to influence students' appreciation of the analogies was the frequency of substance use, "you have to keep taking steroids for a very long period of time to keep that muscle mass" but MPH can be used occasionally at "specific times" (Student A5). Some students further distinguished academia and sports by

describing that sports figures are “idols to society” and this may explain “why society thinks that steroid use is negative for athletes” (Student B8). In sum, some participants in all three stakeholder groups thought academic and sports competitions shared a common goal but differences between MPH and steroids in particular were highlighted in terms of the contexts and purposes for which the substances are used.

Stakeholders compared MPH and caffeine

The use of caffeine as an analogy to the non-medical use of MPH was less debated than the steroid analogy yet it yielded some interesting comparisons and contrasts. The similarities of MPH to caffeine were mainly expressed by parents. Methylphenidate and caffeine were both considered substances which have the potential to cause dependence. However, parents recognized that despite this commonality, the contexts of MPH and caffeine use were different. Parent D5 expressed this observation by saying: “[s]ociety doesn’t get upset when somebody uses caffeine to stay awake. Even though it is a drug it is acceptable.” Parents also regarded MPH and caffeine as similar study aids because: “[t]he kids who do not take Ritalin (...) get a huge latté or whatever it is. (...). So if they don’t take Ritalin they will take coffee, they take Red Bull, they take something” (Parent H2). Thus, some parents regarded MPH and caffeine as drugs that are both used in the academic context.

Stakeholders contrasted MPH and caffeine

Students and HCP contrasted MPH and caffeine more than parents did. The first difference was brought up by students who considered the physiological and psychological effects of MPH and caffeine to be different. For example, Student C10 said that, “I don’t think that caffeine helps you concentrate. I just think that it makes you jittery and not able to fall asleep.” Thus, for students, the targets of MPH and caffeine appeared to be different as were the ways in which they can help a student improve

their academic performance. As with steroids, the regulation of caffeine, in comparison to MPH, was the major difference for HCP. They contended that coffee and energy drinks containing caffeine were available over the counter while MPH is a prescription drug that should not be used as readily for enhancement purposes. With potentially different effects on academic performance and involving different regulatory frameworks, students and HCP considered that performance enhancement with MPH was not equivalent to consumption of caffeine.

Various stakeholder definitions of non-medical use of MPH for performance enhancement

Stakeholders offered incongruent definitions of the non-medical use of MPH. Based on a published discourse analysis (Racine and Forlini, 2010), three terms (“abuse”, “enhancement” and “lifestyle”) were proposed as prompts for the discussion of definitions. Stakeholders associated the non-medical use of MPH with all three terms. Some stakeholders, through the process of elimination, determined which of the three terms corresponded most to their perspective. For example, Student C9 preferred the term enhancement being unsure of, “[going] as far as calling it abuse. Lifestyle sounds kind of soft for [them]. Enhancement [they] think works.” Similar rationales are, “(...) abuse (...) sounds too much” (Student C1) or, “(...) that’s probably more enhancement than it is abuse” (Student B2). Stakeholders also combined terms giving definitions like, “it kind of falls somewhere in between abuse and enhancement” (Student C6). Finally, some stakeholders maintained that “(...) you [can’t] necessarily separate any of these three concepts from the issue (...)” (HCP I3).

Generally, terms were selected in relation to specific features of the non-medical use of MPH. For example, Student A5 explained that, “(...) the difference between these three categories: abuse, enhancement or lifestyle is how [MPH is] taken, how often [MPH is] taken, what are the motives in general.” Abuse and enhancement were the definitions most elaborated upon. Some members from each stakeholder group, mostly

HCP, defined the non-medical use of MPH as abuse, i.e., usually defined as the lack of adherence to MPH's medical label. For instance, the non-medical use of MPH was classified, "(...) as abuse just on the fact that [MPH] is a prescription drug. Coffee and Red Bull you can buy in a store and it is legal but I mean [MPH] is under the table. That is what crosses the line" (HCP G7). The use of MPH without a prescription in healthy individuals also troubled stakeholders. HCP E7 elaborated by saying that, "(...) this is abuse or self-medication because they don't use it for the purpose it was made." Included in the abuse definition were the perspectives that non-medical use of MPH was caused by peer pressure and that it constituted cheating.

When defined as enhancement, stakeholders emphasized that the non-medical use was purposeful because, "(...) the first assumption is that people are taking it to better enhance their concentration" (Student B5). The fact that healthy individuals, as opposed to patients, were using MPH was also a feature of the enhancement definition but some stakeholders nuanced that these individuals were building upon abilities they already had because they, "(...) still have to learn the information this just makes [their] brain think in a certain way" (Student C4). Some students highlighted that because non-medical MPH use by students pertained to certain types of goals it was typically occasional and not necessarily constitutive of a student's life. However, some students and HCP explained that the use of MPH to improve academic performance could become a lifestyle choice if a dependence develops, "(...) you are taking these pills and you can't write without taking them" (Student C2).

A few stakeholders combined terms to form a definition. The two most prominent combinations were abuse-enhancement and abuse-enhancement-lifestyle. The association of abuse and enhancement described how students, "(...) might use it once but along the same lines as caffeine (...) caffeine can be abused too. Any drug can be abused and so; if it becomes obsessive then it becomes abuse" (Student C6). When

adding the lifestyle component to a composite definition, stakeholders of this opinion perceived the definition to include a “(...) choice puts you at an advantage over someone who chooses not to do that” (HCP I3). A composite definition could describe the non-medical use of MPH as striving toward an academic goal by making a choice to use a medication in a manner other than it is normally prescribed. Overall, stakeholders defined the non-medical use of MPH mostly in terms of abuse and enhancement.

Table 4.4: Risks and benefits of the non-medical use of MPH for performance-enhancement identified in prompt material and by stakeholders during focus groups

	Prompt material only	Common to stakeholders and prompt material	Stakeholders only
Risks	Depression linked to withdrawal, dizziness, loss of appetite, irritability	Cluttering of the brain, heart attacks, heart palpitations, insomnia, nausea	Anxiety, bad for the brain, depression, drug interactions, general cardiovascular effects, hallucinations, gateway drug, general health concerns, general mental health concerns, lack of self-esteem, missing out on learning skills, negative effects on nervous system, psychosis, stunting growth, sudden death, suicide, teratogenic effects, toxicity, weight loss, withdrawal from drug
Benefits	Accumulate more information in a shorter time, boost brain activity, increase confidence, increase energy, helps to organize thoughts, helps to think rationally, maintain high performance level, minimize fatigue	Boost concentration, increase focus	Person appears more intelligent

Risks and benefits of the non-medical use of MPH identified by stakeholders

Stakeholders identified and discussed a range of physiological and psychological risks and benefits of the non-medical use of MPH. Risks and benefits identified by stakeholders were compared to those found in the prompt material they read before the focus groups. Table 4.4 shows the risks and benefits that were mentioned (1) exclusively in the prompt material, (2) common to both the prompt material and the focus groups and (3) exclusively during focus groups by stakeholders. There were no observable differences between stakeholder groups, but as a whole, stakeholders identified more risks than benefits of using MPH non-medically. The discussion of benefits was more selective in the focus groups than in the prompt material. Stakeholders also discussed risks beyond those that were present in the prompt material. Only a few risks and benefits found in the prompt material were discussed in the focus groups. Thus, our results show that stakeholders emphasized the risks of non-medical use of MPH.

Stakeholder reactions to safety of the non-medical use of MPH

We asked participants whether they thought the non-medical use of MPH was a safe practice or if they had any concerns.. We found a split between the assessments that the non-medical use of MPH had either significant or limited risks. Two major factors contributed to the perspective that the non-medical use of MPH was unsafe. First, stakeholders considered that many risks were still unknown and “from a pharmacological point of view, this drug has not [been] established and they have not studied long term effects” (HCP E3). Of the potential risks, emphasis was put on the, “(...) long-term effects that it would have on your body, especially if you become dependent on it and end up taking it all your adult working life” (Student C6). They added that this type of data would be difficult to obtain because the non-medical use of MPH happens outside of the medical and research

contexts. Stakeholders related this obstacle to a second factor, general lack of medical supervision. This lack was exacerbated by the fact that MPH is obtained notably through illegal channels such that the drug “(...) [does] not come with instructions” (Student A5) whereas “(...) if you were on a prescription presumably your doctor would be vigilant about monitoring the use and any potential side-effects and counter information” (Student C6). Student C6 went on to describe the supervision of a medical professional as a “safety net” which is absent when one is “self-medicating”. Furthermore, it was mentioned that without professional instructions or guidance, “(...) you really have to experiment to know how much [the drug] affects you” (Student C10). Thus, some participants feared the potential consequences of self-medication for non-medical purposes.

In contrast to the ill ease with unknown risks, other stakeholder responses showed a sense of security with regard to the safety of using MPH non-medically. This sense of security was explained in several ways. First, stakeholders communicated a trust in substances that are subject to an official approval process, otherwise explained as “(...) a perception (...) that because it’s prescription medication and not a street drug that it is pretty safe (...)” (Student B2). An example of this point of view was, “I think when used responsibly it’s relatively safe otherwise they wouldn’t prescribe it” (Student B1). The second perspective had to do with MPH’s reputation as a pediatric medication. Parent F8 explained that, “[t]he fact that this is taken by children, perhaps students think that it is not serious to take this drug, you know. ‘If children can take it, it is fine with us.’” It was assumed that the strict approval and prescription procedure for children, makes a drug like MPH automatically safe for other populations such as adults because, “(...) if it is a drug they have been giving to kids (...) that means it’s pretty benign” (Student B7). Finally, stakeholders’ belief that non-medical use of MPH was safe indicated that regardless of whether a substance is available by prescription or over-the-counter individuals

should consume substances responsibly to avoid dangerous side-effects. To illustrate this point, Student B10 said, “(...) everything is sort of not safe if not taken in moderation even something like caffeine can have some serious effects that people don’t know about (...)”. Many participants with this point of view suggested that the key to responsible use was in moderation of the amount and frequency that a drug like MPH is used non-medically to strike “(...) a balance [in the] amount of times you take it, on a week (...) or how much a day or if you mix it with caffeine” (HCP G3). Accordingly, some participants characterized non-medical use of MPH as “relatively safe” (Student B1), “probably fine” (Student C11), “fairly safe” (Student C9) and “not necessarily dangerous” (HCP I3).

Stakeholder appreciation of media coverage on non-medical use of methylphenidate for performance enhancement

Part of the focus group discussion was devoted to assessing stakeholder appreciation of the media coverage on the non-medical use of MPH based on but not limited to the prompt material. Stakeholder opinions pertained to general aspects of the media coverage, the information contained in the articles and their perspective on the media coverage itself (Table 4.5). The three stakeholder groups, but especially parents, acknowledged that the media coverage on the non-medical use of MPH provided valuable information. However, stakeholders suggested that media coverage may promote the non-medical use of MPH simply by describing the practice. One healthcare provider offered the perspective that professionals who confirm the enhancing effects of MPH could influence the public. Some participants stated that the articles did not present enough reasons to discourage the use of MPH. Though most of the comments on the promotion of the non-medical use of MPH were in the third person, some participants employed the first person to indicate that they would try it. Students, in particular, wondered why media coverage had only recently begun discussing after years of MPH being used non-medically. Students were most critical of the style of the media coverage. For example, one

student said, “it kind of sounded like something that was in [their] high school newspaper” (Student B5).

No stakeholders reported that the information in the articles was complete. Many suggested subjects that they would have liked to see covered more extensively (see column 2 of Table 5). Stakeholders formed a consensus on two information gaps: (1) the lack of information on the workings, effects and efficacy of MPH especially on healthy individuals in the long-term and (2) the debatable quality of the scientific evidence contained in the articles. Topics of interest also included accurate prevalence data, a more developed ethics debate, details about how one uses MPH non-medically and the solutions being explored to reduce the non-medical use of MPH. The last three subjects were specific to students, parents and HCP, respectively.

The last aspect that stakeholders commented on was the perspective of the articles. Some participants from all three stakeholder groups considered the perspective of the articles to be ambiguous. These stakeholders stated that there was not enough discussion of the benefits and social acceptability of the non-medical use of MPH and, consequently, they could not make up their own minds. The majority view indicated the presence of a bias in the media coverage on the non-medical use of MPH. Stakeholders described a negative bias (media emphasized the risks of the non-medical use of MPH) and a positive bias (media focused on the benefits). Only one participant from each stakeholder group said that the articles were well rounded and balanced. A few students and HCP noted that the media coverage was realistic, even if ambiguous, because it reflected the current state of social opinion on the non-medical use of MPH.

Table 4.5: Stakeholder opinions with qualitative examples on the media coverage of the non-medical use of MPH for performance enhancement (in terms of general appreciation, completeness of information and perspective of the media)*[†]

1. General comments on media coverage of the non-medical use of MPH

- A. Positive appreciation of media coverage on non-medical use of MPH (S, P, HCP)
- “I think it’s important to send the message out there you do not need Ritalin to get through things.” (Student A9)
 - “I found it very interesting to be aware of what is going on on campus because (...) I was not aware of it.” (HCP I1)
- B. Criticism of the timing of media coverage on the non-medical use of MPH (S)
- “I remember reading about this in a teenage magazine when I was 13. This has been a problem for ages. I don’t see why there is news coverage announcing it as a new problem.” (Student C10)
- C. Media coverage may encourage non-medical use of MPH (S, P, HCP)
- “I don’t know if spreading it all over the newspapers is a good idea because quite frankly I think it kind of promotes it.” (Student A9)
 - “I think unintentionally it would sort of promote Ritalin use to students.” (Student B2)
 - “I would probably be more likely to take Ritalin now after reading those articles than not because if like the only side effect they can come up with, and I think those articles were slanted pretty negatively, was that my brain can get too full. Like, you know, maybe I’ll try it.” (Student B7)
 - “I don’t know why but it made me want to try Ritalin.” (Student B8)

2. Comments on incomplete information on the risks and benefits of the non-medical use of MPH

- A. Workings, effects and efficacy of MPH (S, P, HCP)
- “I would have liked more content about neuro-physiology and how the pill is actually working. What are the studies that have actually been done? I would have liked more scientific evidence base. (...) I would have liked more things to help me to make my mind up about the medication because after reading the articles it was difficult for me to say yes or no, do I agree do I disagree?” (HCP E2)
 - “It was kind of just like a surface of what was going on and not really delving into it or really what Ritalin does.” (Student B5)

- “I would be interested to read about the student who took it like recreationally or whatever and something bad happened to them like that’s what I really want to know before I try it, like what’s the worst that could happen?” (Student B7)
 - “it would have been nicer to have sort of stronger scientific view as well or just an article that explains what Ritalin physiologically does to your body because not everybody knows.”(Student B10)
 - “it is about the short time effect, not the long term effect. There is nothing; there is nothing about long-term effect.” (Parent H1)
 - “I don’t think it addresses at all the retention of the material [learned with Ritalin].” (Parent D1)
- B. Scientific evidence (S, P, HCP)
- “all of them basically lacked the scientific information. There was no evidence for somebody who would be looking out for Ritalin and reading more about it. Maybe it might be complicated for an ordinary paper but there has to be at least some scientific evidence to be there because it was mostly anecdotal.” (Student A8)
 - “sometimes I wondered about the data in these statements and I wondered where it came from and what sample population it was tested on” (HCP G7)
 - “it just shows you how bad the media are: no data just impressions, ‘I hear that, this and that.’” (HCP G1)
- C. Prevalence data (S, HCP)
- “I kind of got a vague feeling of actual prevalence and the actual size of the problem because here’s one student from [Quebec], she thinks her friends use it. Here’s another student from Ontario... This is not very good sampling really if you want to find out how much we have to be worried about this.” (Student B2)
- D. Ethics debate (S)
- “(...) other articles didn’t really address the ethical issues as much. That is what leapt out at me the most. The articles were more straight on news articles whereas they don’t really talk about the nuanced issues about it.” (Student C6)
- E. Access to of non-medical use of MPH (P)
- “Is it that easy to get those drugs? Do you need a lot of money to get those drugs? We don’t know about that, how these people get the drugs.” (Parent F2)
- F. Solutions to non-medical use of MPH (HCP)
- “(...) where were the solutions? Where were the ‘Hey, this is a problem! Why is this going on?’ What are we

going to do about it?” (HCP G4)

3. Comments on the perspective of media coverage of the non-medical use of MPH

- A. Ambiguous discussion on benefits and acceptability of the non-medical use of MPH (S, P, HCP)
- “the article in all aspects it is really inconclusive. It doesn’t really say where it is good, it doesn’t really say where it is bad. All it really says is that it enhances. Does it enhance?” (Parent D5)
 - “I think that there seems to be this recurrent theme that when discussing things like Ritalin and performance enhancement drugs or substances that there does seem to be something intuitively disconcerting (...) people have a lot of difficulty articulating why they feel that it’s wrong or why they feel that people shouldn’t be doing it. (...) it’s hard to come up with some definitive reason as to why it’s wrong and that’s why I personally think that’s why a lot of people indulge. And that’s what I think B7 was saying about the articles that they seem to be getting to something about there being some nebulous connotation but nobody could quite pinpoint what was wrong.” (Student B1)
- B. Bias in coverage of the non-medical use of MPH (S, HCP) — majority
- “Another problem that I had with the articles is that they really didn’t focus on Ritalin in schools as a social topic. They didn’t say that it is a reflection of what we expect from our kids or it is a reflection of the current job market and what they are looking for. It was just like ‘they’re doing it. It’s bad. Save your children!’” (Student C11)
 - “What I didn’t like about the articles is that they all made the assumption but it kind of became an assertion that taking Ritalin makes you perform better.” (Student A5)
- C. Unbiased coverage of the non-medical use of MPH (S, P, HCP) — minority
- “I think they were quite neutral at exposing the facts.” (HCP E1)
- D. Realistic coverage of the non-medical use of MPH (S, HCP)
- “I think they kind of portrayed how grey of an issue this is that there are many different takes on it that there are many different aspects to it. I think they did pretty well for being a page and a half each.” (Student B1)

MPH: methylphenidate; S: students; P: Parents; HCP: healthcare providers

*Qualitative differences between stakeholder groups are explained in the text

† Parentheses indicate that this feature was expressed by at least one participant of this group

Discussion

This study examined how different stakeholders consider the phenomenon of non-medical use of a common stimulant, a practice often called cognitive enhancement in the bioethics literature. First, though the majority of participants were already familiar with the non-medical use of MPH, many expressed considerable surprise and even reported being shocked when learning about its existence. Second, our study revealed marked ambivalence and pluralism in the perspectives of stakeholders with regard to the non-medical use of MPH to improve performance from both descriptive (what is going on) and normative (what should we do) standpoints. For example, no consensus was reached to the effect that non-medical use of a stimulant like MPH could be described as “cognitive enhancement”, “abuse of a prescription drug” or “a lifestyle choice”. Stakeholders responded to popular analogies of performance-enhancing steroids and caffeine by comparing and contrasting certain features of these substances but hesitated to declare either of them normatively equivalent to the use of MPH. Finally, in contrast to previous studies (Forlini and Racine, 2009a) this study did not find substantial differences in opinion between different stakeholder groups. Media coverage of the non-medical use of MPH was appreciated by stakeholders but also considered as potentially encouraging non-medical use and lacking in certain types of information and a clear or balanced position (mostly by HCP and students).

Limitations

Some aspects of the qualitative nature of this project should be taken into consideration for their proper interpretation. First, due to the small sample, the opinions expressed in the focus groups are not representative of general opinions of students, parents and healthcare providers, especially outside of North America. Though the UK and Australia media are represented in this prompt material, the way in which CE was depicted reflected a largely North American phenomenon. Second, participants were given four representative media articles to read prior to the focus group. Despite the range of topics covered in these articles, such prompts have advantages (e.g., real source of information intended for general readership) and disadvantages (e.g., not addressing in detail every ethical and social issue related to cognitive enhancement). Third, focus groups are discussions and not surveys. Not

all participants answered every question thus when we report the perspectives expressed, these perspectives should be considered as those that were explicitly and *de facto* expressed – not necessarily all that could be expressed. Fourth, our focus groups were conducted in English (given the English-language prompts) but our recruitment included individuals with different mother tongues which could have an impact on how participants expressed themselves. Fifth, some difficulties in data capture (e.g., failed recordings of some comments) and subsequent transcription caused a very small part of participant statements to be unsuitable for analysis.

The results presented in this article bring to light two points that can be further discussed. First, we reflect upon the role of stakeholder ambivalence in the debate on the non-medical use of MPH. Second, we examine how analogies can be useful to dispel ambivalence but can also mislead in the CE debate.

Ambivalence: indicator of indifference and misunderstanding or a reflection of deeper concerns?

Our study revealed fundamental ambivalence and pluralism of stakeholders with respect to descriptive and normative aspects of CE. The ambivalence we noted reflects the coexistence of conflicting reactions and perspectives ("ambivalence, n," 1989) expressed by stakeholders in defining CE, deciding upon its acceptability, and determining its equivalence to common analogies. There are at least two major interpretations of this ambivalence. First, ambivalence may reflect a lack knowledge and exposure to CE among stakeholders. This is likely partly true as some stakeholders expressed surprise about the sheer existence of CE with MPH or about the extent of this practice. Such an interpretation is consistent with the unidirectional model of science communication which "assumes that researchers are in control of media content and are the primary gatekeepers of scientific knowledge" (Racine, forthcoming). This model also suggests that sound science communication is hindered by an information gap between experts and non-experts (Racine, 2010). However, most stakeholders were familiar with CE before the focus groups (see questionnaire data of Table 4.1) and were still able to elaborate and discuss a wide range of issues associated with CE. Stakeholders in our study demonstrated advanced understanding of the consequences and implications of CE during the discussion, going beyond the prompt material to attempt a definition and discuss the risks and benefits of CE.

A second interpretation is more consistent with multidirectional approaches to science communication. The multi-directional model encourages open dialogue and self-reflection between and among stakeholders (science, humanities, public and media) (Racine, 2010). This approach considers that ambivalence may actually reveal something much deeper than mere lack of knowledge, or expertise. Though there were few dominant opinions, stakeholders provided original perspectives regarding the debate on CE. Thus, the ambivalence may reflect that stakeholders sense that CE could carry substantial issues and constitutes a source of discomfort. Hence, a more compelling interpretation is that stakeholders felt uneasy about the social implications of CE in academic and work environments as well as the larger but vexing role that pharmaceuticals could play in helping individuals cope with increasing social demands for performance. This interpretation, more consistent with our findings, also suggests that stakeholders have felt the scope and far-reaching social implications of changes that broader scale CE would bring about. Given this capacity and interest of stakeholders, several authors have suggested multidirectional approaches to include stakeholder experiences in debates about ethical and social issues associated with neuroscience (Illes et al., 2005; Illes et al., 2010; Racine et al., 2005). As stated by Leshner (2004), “[t]he unique attributes of the brain as an organ system and its centrality to our concept of our own humanity raise an array of ethical issues that must be resolved in an open dialogue involving both the scientific community and the wider public before we will see widespread application of the fruits of neuroscientific progress.”

Interestingly, the ambivalence of our focus group participants contrasts quite radically with the often strong and clear-cut pro and con positions encountered in the bioethics literature. Optimists predict that CE can positively and substantially contribute to society (Bostrom and Sandberg, 2009). They suggest that CE could equalize the natural distribution of abilities and talents at the source of some injustices in opportunity (Savulescu, 2006). Individuals who wish to maximize their performances could decide autonomously to do so (Caplan and Elliott, 2004; Caplan and McHugh, 2007). Using pharmaceuticals for CE has been argued to be “morally equivalent to other, more familiar, enhancements” such as “education, good health habits and information technology — ways that our uniquely innovative species tries to improve itself” (Greely et al., 2008). These points of view lay the groundwork for

the public to accept an ideal situation of a society of enhanced individuals but it fails to capture the ambivalence expressed in our focus groups.

The critics of CE have expressed – like proponents of enhancement – strong opinions. One of their main arguments is that CE represents an affront to “human nature” and bypasses the enrichment of life experiences gained by hard work and renders such achievements inauthentic (President's Council on Bioethics, 2003). Sandel (2004) invites us to recognize that, “our talents and powers are not wholly our own doing”, a framework he calls “giftedness” and has been dubbed “gratitude” by Parens (2006). Arguments against CE have garnered the reputation of being inarticulate and largely unpersuasive because they are based on ill-defined concepts such as “human nature” and emotional reactions (Caplan and Elliott, 2004; Caplan and McHugh, 2007; Nature, 2007). As a result, criticism or uncertainty regarding CE has not been brought to the forefront and therefore, much ambivalence that could be expressed in the literature has dissipated under the radicalization of the debate between those in favor and those against CE. Bioethics writings on this topic seem to be driven by what Dewey called a “quest for certainty”.

One exception can be found in the writings of Erik Parens who has attempted to reconcile the academic lenses of optimism and criticism of CE. Parens (2006) describes a “creativity” framework that emphasizes, “our responsibility to be creative, to use our creativity to mend and transform ourselves and the world” instead of accepting the gifts we are handed. Parens (2005) argues that the creativity and gratitude frameworks are superficially opposing yet they have a shared vision of the “moral ideal of authenticity” (Parens, 2006). Consequently, Parens (2005) suggests that the “gratitude and creativity frameworks deserve equal respect and that we should aspire to balance the commitments and insights of both” in order to better consider the issues at stake in CE. In spite of its value for bridging arguments in favor and against CE, Parens’ proposal lacks realism with respect to the motivations underlying CE, especially the socio-economic forces at play and the pressures felt by members of society to respond to increased levels of performance (Forlini and Racine, 2009a). The fear is that, “the self-improvement agenda will be set not by individuals, but by powerful corporate interests” (Caplan and Elliott, 2004). The frameworks of *creativity* and *gratitude* too easily conceal the real politics and economic interests in the development of cognitive enhancers.

Another, more socially-grounded, way to capture the ambivalence of stakeholders can be articulated as a tension between the concepts of “moral acceptability” and “moral praiseworthiness” proposed by Racine (2010). In *Pragmatic Neuroethics*, Racine proposes two “moral tests” to determine both the moral acceptability (i.e., is it ethically acceptable to pursue CE? Can an individual enhance their cognition?) as well as the moral praiseworthiness of CE (i.e., should an individual enhance their cognition? Is this a moral ideal?). Moral acceptability as proposed by Racine (2010) requires that fundamental scientific, ethical, social and policy criteria be met such as safety, respect for autonomy, fair resource allocation, and development of surveillance for CE. However, being deemed morally acceptable is only one condition to being morally praiseworthy. Moral praiseworthiness goes beyond the wishes of individuals seeking performance enhancement to consider broader goals such as addressing the medical needs of humankind. Following these concepts, the ambivalence of stakeholders reflects their hesitation to declare CE morally acceptable since many conditions of moral acceptability are currently not met. For example, reliable scientific data remains to establish the safety, risks and side effects of cognitive enhancers. Ethical and legal conditions such as the freedom from coercion and mitigation of discrimination as well as cultural and social conditions such as the impact of CE on public health issues and health coverage have yet to be fulfilled (Racine, 2010). In addition, participants are perplexed about the moral praiseworthiness of CE. They are troubled by the prospect of a society where success in education and professional life would rely on or require the use of cognitive enhancers.

The dyads of creativity-gratitude and moral acceptability-moral praiseworthiness proposed by Parens and Racine, respectively, have their own strengths and weaknesses. Their common value is to highlight that the type of ambivalence expressed by stakeholders in our study has potential deeper meaning than simple lack of knowledge. It is a sign of moral unrest, i.e., that ideal morals of gratitude, creativity and moral praiseworthiness are troubled by the prospect of broader scale CE. As both Parens and Racine point out in the CE debate, rarely can all aspects be explained and supported by only one framework or one moral construct. Both suggest that broader consideration of alternate frameworks is the way forward (rather than settling in one framework or relying on a single “moral test”).

At this point in time, it is unclear which lens or moral construct would most accurately capture the experiences and perspectives of stakeholders. Ambivalence on the part of stakeholders may reflect the very nature of the CE debate and the fact that issues at stake are captured in different lenses and frameworks. Therefore, stakeholders and non-experts may carry some important wisdom in sensing what challenges broader scale CE would bring about. They are well positioned to gain contextual knowledge allowing them to assess the impact of CE in *their* context and lives. Those in favor of CE in the bioethics community can speculate how society could be improved but they do not have a privileged position to capture the experience of pressures and discomfort that CE carries. Pressures will mount for clearer and more articulate public opinion and policy approaches. Dismissing public perceptions too quickly may engender yet simply remaining ambivalent about descriptive and normative aspects could demonstrate complicit acceptance of broad scale CE. However, the moral unrest that underlies stakeholder ambivalence about CE may also conceal an additional challenge. Stakeholders must consider and contextualize with sufficient time different features of CE before they can assess what the issues and impacts will be.

Analogies: informing or distorting ethics debates?

We noted various reactions and understandings of commonly-used analogies comparing performance enhancement with MPH to steroids or caffeine in our data. When dealing with fuzzy or difficult to comprehend phenomena, one obvious strategy consists of comparison to an allegedly better known phenomenon. In this regard, analogies are attractive conceptual tools that help grasp a theoretical phenomenon or process (target domain) by comparing it with a more familiar phenomenon or process (source domain). This approach has been described in great detail in cognitive science by Johnson and Lakoff (1980) as well as in ethics. Proponents of analogical thinking have argued for the prevalence and general worth of these forms of reasoning and thinking in ethics and beyond (Heath and Heath, 2007). By calling upon familiar concepts and experiences, analogies can reduce the need for background information about a phenomenon. They have also been credited with making messages more concrete; favoring their comprehension and assimilation by non-experts.

Stakeholders in our study discussed the use of analogies in comparing caffeine and steroids with MPH. The process of comparing and contrasting a source domain to the target domain helped to dispel some of the normative ambivalence in comparing steroids and caffeine to MPH. Nonetheless and despite their penetrance and convenience as cognitive short-cuts, analogies can become problematic if they lack the crucial features of a target domain and therefore confuse rather than enlighten the understanding of a phenomenon.

First, though analogies can be helpful to highlight features of a social phenomenon like the non-medical use of MPH, they can rarely capture the whole, or truly unique aspects, of the target domain. For instance, social context and social aspects may differ significantly between the source and the target domains. Participants in our study pointed out many differences in the environments and pressures enticing steroid use and caffeine use in contrast to the non-medical use of MPH. However, the analogies of caffeine and steroids to MPH are largely based on comparing the *substances* and not the *circumstances* in which the substances are taken. By focusing on the substance, the analogy may be masking social issues that are proper to the target phenomenon but absent in the source domain while doing further injustice to the broader social issues. For example, a prior study has also shown that social pressures to perform play a role in the non-medical use of MPH (Forlini and Racine, 2009a). Furthermore, many of the risks and benefits discussed in the focus groups and literature are physiological. Aside from the obvious benefit of increased cognition, there is little data on how CE affects interpersonal relationships. Perhaps these effects could be even more substantial than the physiological effects and risks. After all, if CE does not benefit how we are, who we are and where we are in society why would it even be practiced? Thus, without taking into consideration the social context, current analogies remain loose comparisons with important limitations.

Second, differences in perspective can also compromise the congruency of value-laden analogies to a new phenomenon. Comparison of steroid and caffeine use to MPH provides an example of how analogies can capture opposing values. In our focus groups, steroids are generally frowned upon while caffeine is widely accepted yet both were commonly considered equivalent to MPH use. Using value-laden analogies can prematurely attribute a certain value to an active debate such as CE. The salience and interpretation of value-laden analogies can also depend upon

the unique perspective of different stakeholder groups. The importance of regulation of substances played an important role in HCP opinion on the equivalency of analogies to the non-medical use of MPH. Students, on the other hand, focused more on the goals underlying steroid and caffeine use to compare them to MPH. Considering the varying interpretations of analogies by stakeholders, with sometimes contradictory values and opinions, agreeing on a definition is a challenge and evidence of a descriptive type of ambivalence.

The use of analogies in an ethical and social debate such as CE is therefore vexing for several reasons. They are potentially useful discursive devices but also potentially misleading and unreliable grounds to base values and decisions upon. Analogies can lead both descriptive and normative perspectives of the target domain astray. First, a normative perspective on CE can hardly be considered without a multi-faceted approach to describing and understanding a specific situation, i.e., considering the social context and specific circumstances of the case (Jonsen, 1991). Second, the type of analogies used could also complicate reflection from a health-policy perspective. Consider a public health intervention based on an analogy of MPH to caffeine, a legal and largely accepted substance. On the other hand, consider a public health intervention, which equated steroids and MPH, a substance that is controlled and largely banned for enhancement purposes. The resulting public health interventions would send contradictory and even opposing messages to the public while failing to reflect how CE would actually affect their lives.

Conclusion

This paper reported a study of stakeholder perspectives on the use of MPH for CE. First, we found marked ambivalence in stakeholder perspectives, a clear contrast to most bioethics discourse which stands strongly in favor or against CE. We argued that there is a more profound meaning to stakeholder ambivalence indicating apparent discomfort of stakeholders with the economic and social pressures underlying the drive for cognitive enhancers. Second, we observed that common analogies used by academics and the media in the CE debate could be discursive devices that help dispel ambivalence regarding a new phenomenon (target domain). However analogies may neglect some of the distinct circumstances of CE practices fostering unclear interpretations from a stakeholder point of view and tempering

suggestions that analogies are useful in ethical debates. Public dialogue could help voice the unease of stakeholders and also avoid hastily opting for permissive or restrictive health policies for CE without taking into full consideration current concerns in the public domain.

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