

## *Addiction and Voluntariness: Five “Challenges” to Address in Moving the Discussion Forward*

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**Abstract:** The question as to whether people with an addiction have control (and to what extent) over their addiction, and voluntarily decide to use substances is an ongoing source of controversy in the context of research on addiction, health policy and clinical practice. We describe and discuss a set of five challenges for further research into voluntariness (definition[s], measurement and study tools, first person perspectives, contextual understandings, and connections to broader frameworks) based on our own research experiences and those of others.

**Keywords:** addiction; free will; autonomy; ethics; voluntariness; policy; neuroscience; qualitative research

The question as to whether people with an addiction have control (and to what extent) over their addiction, and voluntarily decide to use substances is an ongoing source of controversy in the context of research on addiction, health policy and clinical practice.<sup>1,2,3,4</sup> In the context of research, the ability for individuals with an addiction to consent to studies that involve decisions about their drug of use has led to heated debates about the voluntary nature of decisionmaking. Some scholars have emphasized the existence of impairments to voluntariness, noting that common understandings of addiction highlight these impairments.<sup>5,6</sup> Accordingly, it could be unethical or contradictory to assume that people with addictions make autonomous, i.e., voluntary, decisions because they experience cravings and compulsions which overrule this aspect of their autonomous decisionmaking. Others have rejected these arguments and have restated the rather preserved autonomy of people with addictions,<sup>7</sup> such that their autonomy should not be considered lessened or refuted. Still, others have argued, in different ways, that decisionmaking capabilities, including the voluntariness of decisions, could be impeded to different degrees, in different situations, at different times, and in ways that call for nuanced and contextualized assessments of voluntariness.<sup>8,9,10</sup>

The question of voluntariness in addiction, and the various perspectives to which it lends itself, is of direct relevance to health policy and healthcare practices. From a health policy perspective, whether addiction is a disease of choice or a condition<sup>11</sup> over which one has no control matters.<sup>12</sup> This question has been at the core of the promotion of the brain-disease model of addiction,<sup>13</sup> which is often viewed as describing addiction as a biological condition for which control and voluntariness is impaired;<sup>14</sup> although stressing biological understandings of addiction does not necessarily lead to determinism.<sup>15,16</sup> Indeed, lack of control can be associated with other accounts of addiction, including some which do not rely

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heavily on biological views.<sup>17</sup> Nonetheless, there remain controversies over the value of such biological accounts not only in terms of their descriptive adequacy, but also in terms of the promotion of more radical interventions such as neurostimulation and neurosurgery.<sup>18,19</sup> Alternatively, emphasizing the chosen aspect of addiction can also lead to important implications. These are well exemplified in the repressive approaches adopted in some American states—and sometimes seducing the United Kingdom—toward women who drink while pregnant.<sup>20,21,22,23</sup> Because of strong beliefs in individual autonomy and responsibility—to the detriment of more social analyses of addiction and alcohol use—some states have criminalized women who drink during pregnancy.<sup>24,25</sup> Given that drinking during pregnancy is the cause of fetal alcohol spectrum disorder, the stakes are high for women who may be accused of not controlling themselves and of choosing to make the wrong decision, or of lacking the willpower to refrain from drinking.<sup>26</sup> This line of thinking, focused on the responsibility of women, can backlash into underuse of health services during pregnancy, which has severe implications for the health of both mother and child.<sup>27,28</sup> In other clinical contexts, assessing the extent to which someone can take on treatment and be compliant is of crucial importance, since setting too high of a goal (e.g., complete abstinence) could be discouraging and impossible to meet, leading to counter-productive discouragement.<sup>29</sup> Accordingly, understanding the voluntary or involuntary nature of decisionmaking in the context of addiction has clear healthcare and ethical implications.

Voluntariness is crucial according to most accounts of ethics and of autonomy<sup>30,31,32,33</sup> but it remains hard to assess and measure.<sup>34</sup> In fact, many research ethics, health policy and healthcare ethics debates could benefit from a greater conceptual and empirical understanding of voluntariness in the context of addiction. However, this type of research is challenging. To make headway in understanding the theoretical and methodological challenges of examining voluntariness, we pull from different traditions, some more quantitative coming mostly from psychology and cognitive science for example,<sup>35</sup> and others, more qualitative, coming mostly from the social sciences and humanities, notably via the influences of phenomenology and pragmatism.<sup>36,37,38</sup> We describe a set of five challenges for further research into this topic, based on our own research experiences and those of others. Our hope is to spark conversations about the future of interdisciplinary health ethics research on this topic.

### **Challenge 1: Definition(s)**

One of the first challenges to reckon with is the plaguing problem of definitions and constructs used to capture voluntariness. Several different and somewhat neighboring concepts are used to examine voluntariness in the context of addiction (see Box 1). For example, the term “will” has important colloquial use. It is used when referring to freedom of the will, that is, the ability to make choices or act without restraint. It is also used when describing one’s capacity (or lack thereof) to carry out a specific task. For example, “I didn’t have the will to resist.” Other examples include “where there’s a will, there’s a way,” and “I willed it to happen.” Interestingly, discussions on addiction are sometimes situated within the context of an individual’s will. For example, addiction has been referred to as a “disease of the will,”<sup>39</sup> a “defect of the will,”<sup>40</sup> among other phrases related to the

**Box 1.** Different concepts used to describe voluntariness in the context of addiction

Free will  
Volition  
Self-determination  
Self-control  
Choice behavior  
Self-regulation  
Autonomy  
Self-efficacy  
Locus of control  
Self-restraint  
Willpower  
Voluntariness  
Agency (sense of agency)  
Compulsion  
Voluntary behavior or action  
Impulse control

\* This list was generated using extensive key word searches with additional validation from expert reviewers with expertise in addiction, ethics, philosophy, and policy.

shortcomings or deficiencies of the will. In these instances, free will is the referent, but who is to say that a disease or defect of one's willpower does not apply as well? Given the possible overlap between the two concepts, it is sometimes unclear which concept is being referred to in certain contexts. In fact, the use of "will" within the context of addiction can mean: (1) people with an addiction do not have the option to freely choose an alternative (free will), or (2) people with an addiction do not have the capacity to resist their drug of addiction (willpower). In the first scenario, will is situated within the context of choice; in the second, it is situated within the context of capability to act.<sup>41</sup>

Beyond free will and willpower, many other concepts are used to explain volition and its failures in addiction. Concepts such as autonomy, self-regulation, self-control and compulsion are commonly investigated; each appears to capture part of what seems to be the issue at stake. However, the subtle theoretical differences between these constructs could potentially have an effect on treatment practices and research directions. For example, treatments targeting a lack of willpower could require a potentially different management approach than treatments focused on restoring autonomy. Similarly, research on the attribution of free will may draw on different investigative approaches in comparison to research examining lack of self-control. Here, we differentiate between five key concepts (self-control, free will, self-efficacy, autonomy, and locus of control) to highlight subtle nuances in how these terms have been used in the addiction literature.

First, the construct of self-control focuses on one's ability to regulate aspects of oneself (for example, behavior, thoughts, emotions) by resisting or altering natural compulsions, urges, or desires.<sup>42</sup> Self-control and free will both examine dimensions of individual constraint. However, one construct examines the ability to

maintain constraint (self-control), while the other examines freedom from it and general resistance to it (free will). Self-control “focuses on a specific set of internal constraints (temptations, desires, urges, needs, etc.),” whereas free will, or a belief in it, is concerned with freedom from all forms of constraints.<sup>43</sup> Self-efficacy on the other hand, has been described as a core judgment or evaluation of one’s ability to perform and succeed at tasks.<sup>44,45,46</sup> Researchers argue that self-efficacy is different from free will in that self-efficacy is concerned with one’s personal evaluation of efficacy, whereas free will captures aspects of choice and agency.<sup>47</sup> The differences between the two constructs have been described as being centered on the fact that “one can perceive the self as incapable and still believe that self is free to choose whether to undertake the action or not.”<sup>48,49</sup> Although they are described as conceptually different constructs, there are some conceptual links between the two.<sup>50</sup> These relate to the fact that “free will beliefs affect intentional effort through perceived control and self-efficacy.”<sup>51,52</sup>

As for autonomy, scholars describe it as focused on regulation of the self, by the self.<sup>53,54,55,56</sup> Autonomy refers to “the self as maintaining a separate and independent self from other agents, without addressing the many other types of constraints to free will, either external or internal.”<sup>57</sup> Measures of autonomy typically relate to constructs such as self-awareness, sensitivity to others, and self-efficacy.

The construct of locus of control refers to the degree to which one attributes outcomes to external or internal causes.<sup>58,59,60</sup> Individuals with an internally focused locus of control attribute the self and their own efforts as the cause of an outcome. Individuals with an externally focused locus of control attribute the cause of events to outside sources or external factors (e.g., luck, fate or powerful others).<sup>61</sup> Researchers have argued that locus of control and free will, as measured by the belief in free will, are different constructs,<sup>62,63</sup> which capture two distinct properties. For example, locus of control focuses on the distinction between internal and external attributions, whereas belief in free will examines the origins of action and perceived choice of enacting said action.<sup>64</sup> Belief in free will does not examine whether actions led to a desired result, whereas locus of control does. All these constructs point to different potential views on voluntariness and, furthermore, different kinds of tools to measure or assess voluntariness in the context of addiction, and beyond. They enrich but complicate the attainment of a more comprehensive point of view.

## **Challenge 2: Measurement and study tools**

Given the broad diversity of constructs used to examine voluntariness, numerous tools (e.g., psychometric scales) have been developed to “measure” or assess the different aspects of voluntariness. Each of these scales bears specific features and speaks to different aspects of voluntariness. Table 1 below provides information on seven constructs related to voluntariness (psychometric scales and their dimensions) based on preliminary review data from our own research. Within the context of addiction, these scales have been used to assess notions of impulsivity, volition, self-control, self-efficacy, free will and self-regulation in a variety of settings. For example, they have been used among people in rehabilitation, adolescents with substance use disorders, undergraduate psychology students, recreational marijuana users, veterans in alcohol detox programs, adolescents in outpatient treatment programs and residential treatment centers, as well as

**Table 1.** Tools used to measure constructs related to voluntariness

Construct	Scale name and source	Dimensions (number and names)
Impulsivity	UPPS-P impulsive behavior scale <sup>81</sup>	4 - Premeditation, urgency, sensation-seeking and perseverance
	Barratt impulsiveness scale BIS-11 <sup>82</sup>	6 - Attention, motor impulsiveness, self-control, cognitive complexity, perseverance and cognitive instability
Free will	Free will and determinism scale <sup>83</sup>	6 - Moral responsibility, free will, personal agency, higher power control, personal responsibility and personal limitations
Locus of control	Generalized locus of control scale <sup>84</sup>	4 - Behaviors, expectancies, reinforcements and psychological situations
	Drinking-related locus of control scale <sup>85</sup>	3 - Intrapersonal control, interpersonal control and general control
	Locus of control of behaviour <sup>86</sup>	2 - Internality and externality
	I-E scale <sup>87</sup>	1 - Unidimensional
Self-control	Alcohol responsibility scale <sup>88</sup>	2 - Internality and externality
	Low self-control scale <sup>89</sup>	6 - Impulsivity, preference for simple tasks over complex ones, risk seeking, preference for physical rather than cerebral activities, self-centered orientation and volatile temper (prone to frustration)
	Brief self-control scale <sup>90</sup>	5 - Achievement, impulse control, adjustment, interpersonal relationships, moral emotions
Self-efficacy	Self-control behavior rating scale <sup>91</sup>	1 - Cognitive-behavioral self-control
	Self-efficacy scale <sup>92</sup>	3 - Magnitude (difficulty of the task), generality (how self-efficacy affects other areas of life) and strength (how certain the person is about doing or not doing behavior)
	General self-efficacy scale <sup>93</sup>	Unitary concept
	Brief situational confidence questionnaire <sup>94</sup>	2 - Negative affect situations (e.g. physical discomfort) and positive affect situations (e.g. social aspect of drinking)

Continued

**Table 1.** Continued

Construct	Scale name and source	Dimensions (number and names)
	Self-efficacy scale <sup>95</sup>	Unidimensional
	Situational confidence questionnaire <sup>96</sup>	8 - (5 Intrapersonal factors) negative emotional states, testing personal control, urges and temptations, positive emotional states, negative physical states + (3 interpersonal factors) interpersonal conflict, social pressure to drink and positive emotional states
	Drinking self-efficacy questionnaire <sup>97</sup>	3 - Social pressure, opportunistic drinking and emotional relief
	Relapse situation efficacy questionnaire <sup>98</sup>	7 - Negative affect, positive affect, restrictive situations, idle time, social/food, low arousal and craving
	Drinking refusal self-efficacy questionnaire revised <sup>99</sup>	3 - Opportunistic drinking, social pressure and emotional relief
	Alcohol abstinence self-efficacy <sup>100</sup>	4- Negative affect, social aspect, physical aspect and withdrawal and urges
	Confidence inventory revised <sup>101</sup>	3 - Social aspect, negative/affective and habit/addictive
	Refusal skills scale <sup>102</sup>	Not reported
	Confidence questionnaire <sup>103</sup>	7 - Restlessness, intrapersonal negative mood states, crutch, time structuring, social, interpersonal negative mood states, self-image
Self-regulation	Self-regulation questionnaire <sup>104,105</sup>	7 - Receiving relevant information, evaluating the information and comparing it to norms, triggering change, searching for options, formulating a plan, implementing the plan, assessing the plan's effectiveness
	Self-regulation inventory <sup>106</sup>	5 - Positive action, controllability, expression of feelings and needs, assertiveness and well-being seeking
Volition	Volition components inventory <sup>107</sup>	3 - Self-regulation, self-control, volitional inhibition

residential nicotine dependence programs. Additionally, these scales have been used in a variety of addiction-related contexts in different countries; for example, in Iran, Spain, Germany, Nigeria, United States, United Arab Emirates, Oman, Indonesia, Malaysia, Iceland, Poland and Norway.<sup>65,66,67,68,69,70,71,72,73,74,75,76,77,78,79,80</sup>

*Exploring voluntariness as captured through FW*

Within experimental philosophy and social psychology, researchers have become increasingly interested in investigating voluntariness as captured through the construct of free will. Through the specific example of free will (represented as beliefs in free will [BFW]), we can see that the quantitative measurement of this construct sheds light on the different dimensions associated with voluntary action. For example, studies have examined the impact of belief in free will on general attitudes and behaviors. Results of these studies suggest that belief in free will has important implications for behaviour.<sup>108,109</sup> For example, studies have found that people who believe in free will have more positive attitudes toward decisionmaking,<sup>110</sup> report higher levels of autonomy and more willingness to exert effort to not conform to group norms,<sup>111</sup> as well as higher levels of self-efficacy and lower levels of helplessness.<sup>112</sup> Studies have also found that belief in free will has an effect on job and academic performance,<sup>113,114</sup> whereby those who believe in free will performed better in the workplace,<sup>115</sup> and on academic tasks (achieved better grades throughout the semester).<sup>116</sup>

Studies also show that fluctuations in BFW have serious behavioral consequences.<sup>117</sup> Researchers report associations between diminished beliefs in free will and cheating behavior (after being exposed to deterministic discourse prompts).<sup>118</sup> They found that weakening beliefs in free will (or encouraging a belief in determinism) influences cheating behavior, whereby those who were presented with text encouraging them not to believe in free will were more likely to cheat on a test. Variations in BFW also affect levels of helpfulness and general temperament.<sup>119</sup> For instance, after reading phrases that undermined free will, participants were found to be less helpful and more aggressive to others.<sup>120</sup> Through these quantitative based experimental studies, we are able to understand components of free will and hypothesize what this can tell us about the voluntary components of behavior within the context of addiction. However, this begs the question: Can quantitative scales on beliefs in free will tell us what we need to know about the nuances of voluntary action? What might we not be able to capture through these forms of assessments?

*Qualitative studies on voluntariness in addiction*

In addition to more quantitative, scale-based studies of voluntariness, qualitative methods have been used and have yielded results which are sometimes compatible, and sometimes incompatible with scale-based assessments. Qualitative studies tend to offer more insights on how certain ways of thinking are inherently tied to personal narratives or specific contexts, often highlighting the limitations of scale based research into such an abstract topic. Interestingly, qualitative studies on voluntariness in addiction are perhaps less widespread than quantitative studies, but reveal just as much information, on the different dimensions of voluntary behavior. One particular dimension that tends to be ignored in quantitative

assessments is the contextual or environmental aspect. In the context of addiction, as Neil Levy notes, one's environment is of utmost importance, as social context has an impact on how one exercises self-control.<sup>121</sup> He notes that the social context is almost always missing from quantitative evaluations and argues that focusing on the experience of the person with an addiction outside of their immediate environment is misleading. Qualitative or ethnographic research that draws on the lived experience of the person can shed light on the impact of environmental or contextual factors on voluntary behavior.

In addition to the environmental/social context, other factors reportedly impact levels of self-control experienced. For example, the pursuit of strategies to mitigate one's urges plays a very important role in maintaining control in addiction treatment.<sup>122</sup> A qualitative study exploring evaluations of the strength of one's will among those who are substance dependent or in recovery found those who implemented strategies to be more successful in their recovery than those who did not.<sup>123</sup> Strategies included: changing one's environment, controlling one's emotions, counselling, eating well, occupying one's mind and body, losing the victim mentality, and positive thinking. Anke Snoek, et al found that regardless of one's recovery status, and despite levels of self-control reported, the majority of participants described themselves as strong-willed.<sup>124</sup> Their findings suggest that despite engaging in strategies to address one's will, or even perceiving oneself as strong-willed, one can still struggle with substance abuse.

Furthermore, as it relates to volition and addiction, Mutsumi Karaski et al., describe two main arguments concerning voluntary behavior, that is: (1) people with addictions are lacking in volition, and (2) people with addictions have some level of control.<sup>125</sup> Their qualitative study examined how Australian service providers and policy makers discuss the role of volition in addiction. The authors cite differences in understandings of addiction and the role of volition in relation to four main factors: cravings, susceptibility, psychosocial factors, and self-concept. As it relates to the first factor (i.e., cravings), some participants believed that addicts have no control, and therefore, viewed cravings as impairing one's sense of rationality. Others believed that addicts have some level of control, and thus viewed cravings as a stimulus that one becomes conditioned to respond to. The second factor, susceptibility, is more complex; participants perceived certain individuals as being more susceptible to addiction due to a range of risk factors. These included: genetics, environmental factors, and a lack of protective buffers. Some suggested that without protective factors, susceptible individuals would be more at risk; however, others noted that choice still plays a major role (regardless of susceptibility).

Participants also understood addiction in terms of psychosocial factors and viewed those with an addiction as having no control due to specific personality traits, such as, self-centeredness, self-obsession and emotional immaturity. However, others understood addiction through this lens, yet still attributed some amount of control to the person. In this regard, they understood addiction as resulting from psychological trauma which may have been exacerbated by social processes. Lastly, in understanding addiction through the lens of self-concept, some perceived addiction as limiting the control one has over one's life, such that one's personal development and self-actualization is compromised. On the other hand, it was also argued that labelling individuals as 'addicts' causes harm, as it has been found to have a self-fulfilling effect. These types of qualitative studies

provide pertinent information on different understandings of volition, and the varying ways in which people think about control in the context of addiction. Such reports illustrate the subjective aspects of voluntariness and underscore the importance of unearthing them.

### **Challenge 3: First person perspectives**

Yet another challenge of studying voluntariness is the inescapable allusion to the internal or subjective states and capacities of agents to act upon their situation and have control over their choices and actions. At least from the standpoint of more positivistic understandings of behavioral and social sciences, this is a problem because voluntariness can hardly be observed or measured without relying on self-reported measures. If this is the case, one might ask whether these measures can ever be objective and reliable, since an agent may have a self-interested tendency to diminish his or her ability for voluntary action. For a long time, this issue meant that voluntariness constructs had to be rooted out of psychological science and the social sciences more generally. However, explaining human behavior without appealing to the agent's interpretation of his or her situation can become extremely complex and counterintuitive. For example, the desire of the person with an addiction to forget painful events, or self-medicate, may be put aside, diminishing the ability to understand the rationality of human behavior and the conflicting values and principles guiding one's behavior. This is implicitly or explicitly the premise of much of contemporary humanities and social science research, in so far as economics, marketing sciences, psychology, etc., presume that individuals have the ability to undertake or refuse to undertake actions, although this ability may be diminished and influenced in all kinds of ways. These limitations are often the focus of research, since it is now well recognized that the exercise of one's autonomy can be a significant source of well-being and human flourishing.<sup>126,127,128</sup> To the contrary, being prevented from acting voluntarily (or losing this ability), is a negative condition associated with states of despair, depression, apathy, and learned hopelessness.<sup>129,130</sup>

Given that the subjective aspect of voluntariness exists and needs to be understood, what strategies could be used to capture this feature of human behavior in credible and reliable ways? Qualitative research on decisionmaking in the context of addiction points to the importance of narratives to supplement more positivist third-person approaches. For example, May Tod Gray has investigated voluntariness from the point of view of those with an addiction, to explain how, in their own words, addiction is a challenge to the ability to make voluntary decisions.<sup>131,132</sup> That being said, first-person accounts and subjective aspects of voluntariness in addiction are sometimes ill-captured and obfuscated by current quantitative measures.<sup>133</sup>

### **Challenge 4: Contextual understandings**

Voluntariness is typically measured through constructs which relate to (more or less stable) traits of the individual. But is it really possible to understand voluntariness in controlled experimental settings, or do we need to take into account the actual options offered to a person, his or her background, and the kind of substance at stake? Sometimes, voluntariness is abstracted from the situation as a

form of disposition; in other instances, the agent's capabilities are inherently tied to the situation. Regardless, we know that voluntariness is affected by situational factors, as shown by recent literature on belief in free will.<sup>134</sup> The contextual cues which can evoke memories of drug use are powerful forces against which the person with an addiction can be confronted. Odors, music, the presence of certain persons, the familiarity of certain places; all these features can lead to recall and potentially relapse. Accordingly, dispositional understandings of voluntariness—as measured by scales such as locus of control scales, or free will scales—may not tell the entire story about situational voluntariness, which could vary in time and space.<sup>135</sup> This observation is consistent with a vast literature on the ways in which agents act in context, and experience contexts as lived situations.<sup>136,137,138,139</sup>

To better account for the varying levels of voluntariness within persons with an addiction, repeated measures of will, control, and so on should be administered out across time to better investigate the fluctuating nature of voluntariness in the context of addiction. Furthermore, the qualitative methods described in the previous section can also be relevant for the study of situational factors which influence the agent's situational voluntariness. Qualitative data can be a rich source of insight into the factors that affect a person's ability to make voluntary decisions. Here, the use of ethnographic methods could be ideally suited to capture how different physical and interpersonal contexts (and variations therein) could impact voluntary abilities. Ethnographic methods often rely on the triangulation of different data gathering methods such as (direct or participant) observation, interviews, and document review.<sup>140,141,142</sup> They allow studying of institutional norms, structures and practices, in addition to the experiences of those living with addiction.

Overall, paying homage to the contextual effects implies adopting a concept of free will which grants the existence of its dynamic properties: that is, voluntariness can fluctuate like other components of autonomous choices (e.g., level of information).<sup>143,144,145</sup> A dynamic approach to free will sees voluntary action as represented by varying levels of voluntariness influenced by internal and external factors. Scholars have started to promote this more dynamic interpretation of free will<sup>146</sup> based on experimental findings.<sup>147,148,149,150</sup> Appreciating and understanding voluntariness in contextual ways calls for a deepening of our views on human psychology and welcomes the incorporation of contexts (and their derived meanings) into our understanding of why people use or decide not to use certain addictive substances.

### **Challenge 5: Connections to broader frameworks**

Finally, we want to put forth the idea that certain understandings of voluntariness (e.g., as an attribute solely of the individual) are embedded in broader epistemologies about the role of individuals in society (and the role of society toward individuals). For example, highlighting the individual nature of voluntary capabilities is consistent with broader political neoliberal assumptions which tend to individualize responsibility for health (including brain health, as in the case of neuro liberalism).<sup>151,152</sup> Furthermore, the effect of discourses on biological, individual, and social causes of addiction is potentially a cause of stigmatization.<sup>153,154,155</sup>

Other strategies that are more sensitive to the relational self could call for reformulations on how we view the role of agents within situations, and how we view

the impact of socially-created situations (e.g., poverty, unemployment) on voluntariness in the context of addiction.<sup>156</sup> There is now clear evidence showing, for example, how level of education (higher education) leads to psychological profiles where autonomous choice, self-control, are not only present but valued.<sup>157,158,159</sup> Understanding how this highly valued trait is embedded in broader narratives that intersect with other categories such as gender, race, language, and so on, helps to highlight that the categories used in research and their intended role in broader discourse are anything but neutral. Accordingly, researchers need to reflect on their work because the epistemologies upon which they rely can be extended to contribute to broader social, political, and regulatory discourse about addiction.

The so-called “brain-hijack” theory of addiction is a clear example of how hyperbolic biological discourse can be used to discount voluntariness and lead to medicalized models of care and intervention.<sup>160</sup> The “brain-hijack theory” is at the core of the brain disease model of addiction, and is supported by neuroscience research.<sup>161, 162</sup> It posits that addiction is a brain disease caused by a dysfunction of brain systems involved in reward and pleasure seeking. According to this view, a greater emphasis on the biological aspects of addiction is a gateway to greater social acceptance of people with an addiction and destigmatization.<sup>163,164</sup>

Greater emphasis on the biological underpinnings of addiction may lead to the belief, in the eyes of those with more neuroscience knowledge, that one has less control over one’s addiction, as predicted by proponents of the brain-disease model of addiction.<sup>165</sup> However, this possibility is also the basis of the worries captured by critiques of the brain-disease model of addiction: namely, that neuroscience information about addiction can actually exacerbate blame and stigma because the person with an addiction is seen as less able to take care of him/herself.<sup>166,167</sup> As a result of such beliefs, the person with an addiction may be considered passive and powerless, and relinquish his/her decisionmaking capacity to others such as healthcare professionals or state authorities.<sup>168,169</sup> For example, a recent qualitative study found that the brain disease model risks downplaying the autonomy of those with an addiction.<sup>170</sup> This observation is made in the context of widespread dissemination of tangential deterministic interpretations of neuroscience<sup>171</sup> undermining the existence of free will.<sup>172</sup>

Such deterministic interpretations are not without consequence. Discussions about the “brain disease model” of addiction and the effects of neuroscience information on belief in free will have implications for treatment, policy and practice. Neuroscience information has been claimed to reduce the stigma associated with addiction<sup>173</sup> because they reduce beliefs about the free will of people with addiction as well as associated attributions of blame and personal responsibility.<sup>174</sup> On the other hand, neuroscience information has also been claimed to increase stigma because lessened attributions of free will infantilize individuals with an addiction and portray them as dangerous individuals lacking some basic requirement for decisionmaking and self-control.<sup>175,176</sup> These are examples of the complex implications created by the connections between individual research studies and publications, broader epistemologies of addiction, and the need for greater clarity and reflexivity.

## **Conclusion**

In this discussion paper, we explained how impaired voluntariness is not only a key aspect of addiction, but also an aspect which is of utmost importance for a

series of ethical questions related to clinical care, research ethics and health policy practices and programs. We drew on work from cognitive science, neuroscience, experimental philosophy and social psychology to bridge current disciplinary divides. Based on our preliminary findings on the socio-ethical aspects of addiction as well as other scholarly work, we reviewed five important challenges emerging in the context of better understanding and appreciating voluntariness. We hope that this discussion will help broaden visions about voluntariness and the methodologies which can be used to better understand it. Furthermore, we hope that different quantitatively and qualitatively-oriented traditions will be taken up and put in dialogue to avoid bracketing voluntariness as a completely objective or a completely subjective phenomenon. Instead, we show how voluntariness is a complex intersubjective phenomenon with both individual and social dimensions. It is our conviction that both qualitative and quantitative methods are needed for a more comprehensive understanding of voluntariness in the context of addiction, and beyond.

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