



Essay

Drug and narcotic drug: scientific definition, legal stipulation, and terminological clarification

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ABSTRACT

This article challenges the recurrent claim that the concept of *drug* is scientifically indefinable or reducible to a legal, social, or normative construct. It argues that semantic and classificatory variability does not entail ontological indeterminacy: substances possess materially real and causally efficacious properties that constrain scientific classification, while the concepts constructed from those properties remain discipline-specific, situated, and epistemically mediated.

Combining legal textual analysis, epistemology, logic, and terminology, the article distinguishes pharmacological, neuroscientific, legal, and lexicographic registers and examines how their conflation has contributed to the apparent indeterminacy of the concept. A structured process of individuation – moving from ontology to taxonomy, typology, and terminology – is used to reconstruct the concept and clarify the relation between causal properties and classificatory practices.

The analysis shows that the term *drug* admits of more than one scientifically coherent intension, depending on disciplinary framework and explanatory purpose. In pharmacology, it denotes the broad class of exogenous chemical substances, other than nutrients or essential dietary ingredients, that produce biological effects. In neuroscience, it denotes the narrower subclass of psychotropic substances acting on the central nervous system and modifying mental processes. Neither definition is universally privileged outside its disciplinary domain. *Narcotic drug*, by contrast, is a stipulative legal category whose extension is determined through institutional designation and scheduling rather than through derivation from the scientific intension of *drug*.

The article concludes that the claims of scientific indefinability examined here arise in substantial part from conflating semantic variability, scientific concepts, legal classifications, and moral or social representations.

Introduction

“There are no drugs ‘in nature’”, and there is “no objective, scientific, physicalist or ‘naturalist’ definition of drugs.” According to these statements from a 1989 French-language interview with Jacques Derrida, the “concept of a ‘drug’ is a non-scientific concept, based on moral or political judgements” insofar as it “inherently embodies a norm or a prohibition” (Derrida, 1989). It therefore “allows for no description or observation; it is a slogan.” While not all authors explicitly endorse this position, several – not least Howard S. Becker – converge on similar conclusions. Indeed, Becker argues that *drug* does not correspond to a “scientific or pharmacological category” (Becker, 2001), while Vincenzo Ruggiero maintains that the designation of a substance as a drug arises more from evaluative (subjective) than descriptive (objective) processes (Ruggiero, 1999). More recently, Toby Seddon has characterised the

“modern drug concept” as an “invented legal-regulatory construct” (Seddon, 2016), historically contingent and shaped by governance rather than grounded in any stable scientific category.

This article challenges these claims by arguing that drugs possess causally efficacious biological properties grounding their ontological status, and that the concept of *drug* consequently admits of coherent scientific definitions. In pharmacology, for instance, contrary to Becker’s claim, “a drug can be defined as a chemical substance of known structure, other than a nutrient or an essential dietary ingredient, which, when administered to a living organism, produces a biological effect” (Rang et al., 2011: 1). Rang et al. further note that “in everyday parlance, the word drug is often associated with addictive, narcotic or mind-altering substances – an unfortunate negative connotation that tends to bias uninformed opinion against any form of chemical therapy” (ibid.: 2), a semantic association and normative connotation this article

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seeks to address.

This pharmacological definition provides a general scientific intension, that is, a set of defining properties constituting the concept and determining the conditions under which the term applies, rather than the substances falling under it. Within this classificatory hierarchy, psychotropic substances form a subclass characterised by their action on the central nervous system, allowing *drug* to acquire a narrower neuroscientific intension referring to substances that modify mental processes, perception, cognition, mood, or behaviour. This specification does not contradict the broader pharmacological definition but adds a defining property that delimits a subordinate class relative to a more restricted disciplinary object. The coexistence of such definitions reflects not conceptual inconsistency but differing disciplinary frameworks, explanatory aims, and levels of causal specification.

Neither intension is therefore treated here as universally privileged outside its disciplinary framework. The narrower neuroscientific definition is particularly relevant to drug-policy research and drug-focused social-scientific research focused on drugs, insofar as these fields ordinarily take psychotropic substances, rather than the broader pharmacological class, as their object of inquiry.

In the classical Aristotelian genus–differentia model adopted here, a model that also underlies much scientific classification, an intensional definition specifies a concept by identifying the broader category to which it belongs and the characteristics that distinguish it from other members of that category. This matters because claims that *drug* is indefinable often conflate lexicographic and terminological definitions: the former describe patterns of usage and connotation, whereas the latter specify a concept through its defining properties. Variability in usage and extension – that is, in the entities to which a concept applies – can therefore be mistaken for instability in intension.

Within this distinction, a scientific definition consists in a terminological definition formulated within a scientific disciplinary framework, whose intension is selected from empirically established properties relevant to that framework's explanatory aims. *Scientific* therefore does not imply that a definition is universally privileged across disciplines, nor that classification consists in simply reading a unique division already inscribed in nature. Empirical reality constrains scientifically defensible classifications, while the selection and terminological stabilisation of defining properties remain epistemic operations.

The distinction between variability in usage or classification and instability in scientific intension is particularly important when assessing claims of scientific indefinability. For example, Seddon (2016), following broadly constructivist and anti-essentialist positions associated with Derrida and Becker, construes the modern concept of *drug* as an “invented legal-regulatory construct”. The difficulty is that the historical and institutional contingency of regulatory classifications is thereby extended to the concept of *drug* itself. While Seddon's observation captures the variability and contingency of legal classifications, it conflates drugs as psychotropic substances with externally defined regulatory categories such as *narcotic drugs*, *dangerous drugs*, or *controlled substances*, thereby inferring incorrectly that the contingency of legal classifications entails the absence of any scientifically definable intension of *drug*.

The present analysis does not dispute the historical and institutional contingency of legal-policy classifications of controlled substances, an observation present in the accounts of Derrida, Becker, and Seddon. That point of convergence is, however, limited to this observation; it does not extend to the identification of *drug* with such regulatory categories or to the conclusion that *drug* lacks a scientifically definable intension.

Similar conflations appear elsewhere in the literature. Baron et al. (2023), Coomber et al. (2013), and Hugh-Jones (2007) variously treat legal, institutional, moral, or context-specific predicates as if they belonged to the intension of the concept itself rather than to external normative frameworks or variable patterns of use. By contrast, Tupper (2012) and Bordet (2020) more clearly distinguish the ontology of substances from the frameworks governing their classification, although

they ultimately continue to treat the indeterminacy of the concept as largely irreducible and do not clearly distinguish between intension and extension, nor between types of definitions (Wagner, 2025).

Such claims of indefinability may result, at least in part, from treating heterogeneity in usage and meaning as evidence against the possibility of a unified terminological definition. The authors discussed above rely on lexicographic definitions, which register semantic variability through multiple senses but do not provide the conceptual unity required of terminological definitions grounded in a unified intension. By failing to distinguish between these types of definition, and between intension and extension, they proceed from variability in usage and social representations rather than from the identification of defining properties capable of grounding a concept. Methodologically, this reverses the logical order of concept formation by attempting to derive conceptual unity from heterogeneous usages rather than from defining properties.

To address this methodological error and the resulting conceptual confusion, this article examines three questions: what a drug is, ontologically and conceptually; how a scientific definition can be constructed through a structured process of individuation; and why confusion between scientific concepts and normative categories has permeated legal and social discourse. It builds on previous work (Chouvy, 2023, 2025a, 2025b) while extending the argument on more explicit logical, epistemological, and terminological grounds.

Theoretical and methodological framework

Theoretically, this analysis is grounded in a framework combining ontological naturalism and epistemological conceptualism (Marfori, 2025). The former affirms the existence of causally efficacious properties independently of their conceptualisation, while the latter holds that concepts are constructed and stabilised through practices of classification and use. This position is informed by Hilary Putnam's *semantic externalism* (1975), according to which the reference of a term is not fixed by speakers' beliefs or descriptions but by objective properties of its referents, thereby supporting the distinction between subjective representations and the properties that constrain extension. Together, these perspectives support a position that avoids both reductionism – by recognising the epistemic mediation involved in classification and conceptual organisation – and relativism – by grounding concepts in causally efficacious properties of the entities classified.

This position also resonates with Donna Haraway's (1988) notion of situated knowledge, which foregrounds the historically and institutionally situated character of knowledge and classification without requiring the objects of knowledge to be reduced to their contingent representations. Such epistemic situatedness is therefore compatible with the existence of underlying causal properties capable of grounding coherent scientific definitions.

In this respect, the position adopted here is also compatible, though not identical, with the critical realism defended in drug-policy research by Stevens (2020), which maintains a distinction between concepts and antecedent reality while recognising the situated and fallible character of knowledge. Stronger ontopolitical approaches, including those developed by Fraser (2020) and Lancaster and Rhodes (2020), instead emphasise how drug use, effects, and other drug-related objects are enacted through practices, relations, research, policy, evidence, and method. The present article acknowledges the epistemic and classificatory work performed by such practices but maintains that the causal capacities of material referents are not thereby constituted by them.

At the level of drug-use events and effects, relational and assemblage approaches provide a further qualification to this position. Duff (2016), for example, argues that drug-use events cannot adequately be understood by treating substances, subjects, and contexts as ontologically isolated entities, since effects emerge through heterogeneous relations among bodies, substances, practices, affects, technologies, and environments. This relational account of drug effects does not, however,

preclude the scientific individuation of substances according to causally efficacious properties. The manifestation of a causal capacity may depend on dose, route of administration, organism, physiological conditions, and context without that capacity being reducible to those relations or to the classifications through which it is described. The present argument therefore distinguishes between classificatory individuation and causal explanation: identifying properties by which substances may be scientifically classified does not imply that their concrete effects, uses, meanings, or harms can be explained independently of the assemblages in which they occur.

On this theoretical basis, the methodological approach combines legal textual analysis with conceptual, epistemological, logical, and terminological analysis. It proceeds through a structured process of individuation, moving from ontology to taxonomy, typology, and terminology, culminating in the specification of intension and the delimitation of extension. Because it addresses claims of indefinability advanced by Derrida and Becker – neither of whom proposes or tests an explicit definition – the analysis foregrounds the distinction between lexicographic and terminological definitions. By relying implicitly on lexicographic usage without distinguishing it from terminological definition, these accounts also overlook the distinction between intension and extension. Their claim that *drug* is indefinable is thus methodologically ungrounded: they neither define what counts as a definition nor specify which type is at issue, and they do not show why definability would fail.

The argument proceeds in three stages. First, it examines the historical and semantic variability of *drug* and the emergence of *narcotic drug* as a legal category. Second, it reconstructs the concept through a process of individuation and specifies its pharmacological and neuroscientific definitions. Third, it reassesses claims of indefinability by identifying the logical and methodological confluences on which they rest.

The concept of *drug*: etymology, semantics, and legal categories

As Ernst Jünger (1973: 30) noted, the etymology of *drug* remains obscure and contested, offering little assistance in establishing the concept's defining properties. Despite this etymological uncertainty and historical variation in usage, the principal historical senses of *drug* referred to physical substances or preparations endowed with material properties and causal effects, rather than to legal or moral categories. What changed over time was not the material nature of the referent, but the conceptual, medical, moral, and legal frameworks through which these substances were understood and classified.

The meaning of words evolves over time, making an ahistorical perspective untenable in analysing the term *drug* and the substances to which it refers. Yet recognising semantic and historical variability does not entail denying the existence of stable material referents or causal properties. As François Leturcq (2020) emphasises, one must guard against fixism, anachronism, and essentialism, which conflate historically variable classifications with intrinsic properties, project past meanings onto present concepts, and blur the distinction between ontological properties and conceptualisation, thereby undermining the formulation of a precise contemporary definition of *drug*.

According to the *Oxford English Dictionary*, the word *drug* first appeared in English around 1400, when it referred, broadly, to “any substance, of animal, vegetable, or mineral origin, used as an ingredient in pharmacy, chemistry, dyeing, or various manufacturing processes”. In later use, it referred more specifically to “a natural or synthetic substance used in the prevention or treatment of disease, a medicine”, “a substance that has a physiological effect on a living organism” and, also, “a substance with intoxicating, stimulant, or narcotic effects used for cultural, recreational, or other non-medical purposes.” More recently, it has also come to mean “a controlled substance used illegally and often habitually.” These lexicographic definitions are inherently descriptive and context-sensitive, recording historically variable senses and patterns

of usage rather than establishing a single, terminologically delimited concept.

The last definition is particularly revealing of the limits of lexicographic approaches when they are treated as if they captured the concept of *drug* in scientific or legal terms. Indeed, neither pharmacological nor neuroscientific definitions of *drug* imply illegality, and legal control does not make a substance intrinsically illegal; illegality attaches to particular acts involving substances under specified legal conditions (United Nations, 1961). Moreover, this lexicographic definition does not define *drug* through either intrinsic properties or formal legal designation, but through a contingent behavioural and legal criterion: the illegal use of certain controlled substances. In doing so, it conflates the scientific concept of *drug* not merely with the legal category of *controlled substance*, but with the narrower condition of a controlled substance being used illegally. The *definiendum* – the term or concept being defined – has therefore shifted: instead of defining *drug* as a substance category, the definition effectively constructs a different object – a controlled substance in a particular legal and behavioural context. Taken literally, it would imply that the same substance may count as a *drug* when used illegally but cease to count as one when used lawfully, which shows that the definition has failed to capture the concept it purports to define. More broadly, the example illustrates a logical difficulty inherent in definition: even an authoritative lexicographic source may convert a contingent pattern within the extension of a term into a purportedly defining property of its intension. What may be descriptively accurate as a record of usage can therefore be conceptually inadequate as a definition.

More broadly, the difficulties illustrated by these lexicographic definitions reflect the wider semantic variability of the term *drug* in English, both within individual dictionaries and across English-speaking countries. This variability reflects divergent legal, cultural, and medical frameworks that influence how the term is used, interpreted, and applied.

For instance, in the United States, where the War on Drugs was launched in 1971 and the Drug Enforcement Administration was created in 1973 to enforce federal controlled-substances laws, the term *drug* exhibits a systematic divergence between formal legal designations and institutional or common usage. Federal legislation itself already illustrates the terminological heterogeneity of the term. The Federal Food, Drug, and Cosmetic Act defines drugs, in part, by their intended use, as “articles intended for use in the diagnosis, cure, mitigation, treatment, or prevention of disease”, that is, medicinal products, and as “articles (other than food) intended to affect the structure or any function of the body of man or other animals”, thereby encompassing a range of substances far broader than psychotropic substances (sec. 201(g)(1))¹. By contrast, the Controlled Substances Act organises federal drug control around the legal category of *controlled substance*, within which *narcotic drug* constitutes a more specific statutory category, and classifies substances according to criteria including accepted medical use, potential for abuse, and dependence liability.²

Despite these formal distinctions, institutional and informal usage within drug-control discourse frequently narrows the word *drug* to psychotropic substances subject to control. This semantic narrowing is reinforced by the very name of the Drug Enforcement Administration, which employs the generic term *drug* while its mandate concerns the enforcement of controlled-substances legislation. The result is a persistent semantic slippage between scientific concepts of *drug*, whether pharmacological or neuroscientific, and legally constituted categories of controlled substances.

By contrast, in the United Kingdom and the European Union, legal

¹ <https://www.fda.gov/cosmetics/cosmetics-laws-regulations/it-cosmeti-c-drug-or-both-or-it-soap>. Accessed on 14 April 2026.

² <https://www.congress.gov/crs-product/R45948>. Accessed on 14 April 2026.

terminology avoids part of this ambiguity by not employing *drug* in the medicinal sense. Instead, it relies on the more precise expression *medicinal product*, as defined in the Human Medicines Regulations 2012³ (United Kingdom) and Directive 2001/83/EC of the European Parliament and of the Council (European Parliament & Council, 2001). In European legal and regulatory terminology, therapeutic substances are generally distinguished from substances subject to restrictions on use, possession, supply, or other forms of control through separate legal categories. At the national level, these include categories such as *controlled drugs* in the UK and *stupéfiants* in France, thereby maintaining a clearer conceptual and terminological separation between therapeutic designation and the legal regulation of non-medical use, even where the same substances may fall under both frameworks.

A coherent framework therefore requires distinguishing these levels. Scientifically, *drug* may denote the broad pharmacological class of exogenous biologically active substances or the narrower neuroscientific class of psychotropic substances. Legally, categories such as *controlled substance* and *narcotic drug* are constituted through authoritative designation and scheduling, while *medicinal product* is defined by therapeutic use. The persistence of *drug* across these domains, particularly in the United States, obscures their distinctions.

History, rather than etymology, explains how this confusion arose. Throughout the development of international drug control (Bewley-Taylor, 2012), the term *drug* remained an informal and undefined umbrella word, while the legal framework progressively refined its focus on specific categories of substances. The 1909 Shanghai Opium Commission addressed opium and its derivatives without defining *drug*, using the term loosely. The 1912 International Opium Convention introduced *narcotic drugs* as an informal category but provided no formal definition. Subsequent conventions expanded this category while continuing to rely on enumeration rather than conceptual definition.

In 1961, the Single Convention on Narcotic Drugs marked a turning point by targeting *narcotic drugs* in both its title and operative provisions. Curiously, however, the Convention defines neither *narcotic drug* nor *narcotic* itself. Although *drug* appears among the definitions in Article 1, it is defined only stipulatively and extensionally, by reference to substances included in Schedules I and II, rather than through any substantive intension: “Drug” means any of the substances in Schedules I and II, whether natural or synthetic” (Single Convention on Narcotic Drugs, 1961, Article 1(j)). The provision therefore functions primarily as a rule of legal designation: membership in the category follows from inclusion in the relevant schedules rather than from the possession of specified intrinsic properties. The 1971 Convention on Psychotropic Substances subsequently introduced a parallel category, likewise defining *psychotropic substance* stipulatively by reference to substances included in Schedules I–IV rather than through an intrinsic intension (United Nations, 1971).

Consequently, legal control does not make drugs illegal *per se*: under the international drug-control conventions, restrictions attach to scheduled substances and to specified acts involving them (Dudouet, 2017). As the United Nations Commission on Narcotic Drugs notes, “controlled narcotic drugs and psychotropic substances are not prohibited, but [...] their production, manufacture, export, import, distribution of, trade in, use and possession should be limited exclusively to medical and scientific purposes” (Commission on Narcotic Drugs, 2014: 1). However, the formulation “controlled narcotic drugs” introduces a conceptual ambiguity of its own: within the Convention's framework, *narcotic drugs* are already the substances subjected to control, making *controlled* redundant and potentially implying the existence of a distinct class of uncontrolled narcotic drugs. More broadly, this clarification, which frames control rather than prohibition as the operative principle, underscores that legal categories are regulatory constructs rather than

ontological ones.

The central implication of the foregoing analysis is that the ambiguity surrounding *drug* does not stem from any intrinsic indefinability of the concept, but from the coexistence and conflation of distinct definitional frameworks: scientific-terminological, stipulative-legal, and lexicographic. The scientific definitions developed here are intensional and grounded in causal properties. By contrast, the legal designations at issue here are not intensional but stipulative and list-based: they designate, through institutional authority, which substances belong to a legal category, without thereby determining the extension of a scientific concept. Lexicographic definitions, for their part, reflect variable usage across contexts. Failure to distinguish these definitional frameworks can therefore produce an appearance of conceptual indeterminacy where heterogeneous criteria of definition and classification are in fact being conflated.

Drug, narcotic drug, and stupéfiant: terminological incoherence and stipulative legal classification

In addition to the fact that *narcotic drug* remains undefined in the 1961 Convention, a related terminological asymmetry arises across its equally authentic language versions. Whereas the English text defines *drug* as any substance included in Schedules I and II, the French and Spanish versions use *stupéfiant* and *estupefaciente*, respectively, rather than *drogue* and *droga*. These terms correspond more closely to *narcotic substance* than to the broader English term *drug*. The Russian version likewise uses *narkoticheskoe sredstvo*, a narcotics-specific expression rather than a general equivalent of *drug*. Significantly, UNODC itself notes that the Russian terminology follows the French and Spanish versions in this respect (UNODC, 2006: viii). The Chinese version similarly employs *mázuipīn*, again a narcotics-specific term rather than a generic equivalent of English *drug*. This is therefore not a neutral multilingual equivalence but a significant terminological asymmetry: whereas the English text anomalously employs the broader and polysemous term *drug* in its definitional provision, the French, Spanish, Russian, and Chinese versions use terms more closely aligned with the narrower legal category reflected in the title of the Convention.

In none of these language versions, however, is the category defined intensionally. Instead, its extension is fixed by reference to the substances included in the schedules. The Convention thus designates its object through stipulative enumeration rather than by specifying intrinsic properties, leaving the conceptual relation between *drug*, *narcotic drug*, and their equivalents in the other official language versions unresolved.

This terminological incoherence bears directly on the arguments of Derrida and Becker. Treating *drug* and *narcotic drug* as conceptually equivalent conflates a scientific substance category with a restricted legal category whose membership is institutionally determined. In Derrida's case, this confusion is reinforced by the French linguistic context: the ordinary use of *drogue* as an imprecise designation for *stupéfiant* encourages the conflation of a general term with a specific legal category. His claim that drugs cannot be scientifically defined therefore rests not on a refutation of scientific definitions but, in part, on ordinary and administrative usage. The same conflation persists in political discourse, where *drogue* is frequently used in place of *stupéfiant*, importing legal and normative connotations into the broader term.

Becker's argument, formulated in English, arises in a different linguistic context but produces a comparable problem. Although he correctly notes that *drug* often denotes a socially and legally constructed category in public discourse, he does not distinguish this usage from scientific uses of the term, whose status as a coherent scientific category he denies. In particular, he does not engage with either the broader pharmacological definition of *drug* or the narrower neuroscientific definition centred on psychotropic substances, nor does he distinguish these from legal categories such as *narcotic drugs* or *controlled substances*. As a result, variability in social and legal classifications is projected onto

³ <https://www.legislation.gov.uk/ukSI/2012/1916/contents>. Accessed on 14 April 2026.

the scientific concept itself.

In logical terms, this conflation can be analysed as a category mistake in a Rylean sense (Ryle, 1949): predicates belonging to one analytical level – legal or normative classification – are treated as though they were constitutive properties at another – scientific classification. It also entails an equivocation between different senses of *drug* and, ultimately, a conflation of variability in legal extension with indeterminacy of scientific intension.

The relevant distinction is therefore between scientifically defined drugs and institutionally constituted legal categories. Categories such as *narcotic drug*, *stupéfiant*, and *controlled substance* have their extension fixed through authoritative legal designation rather than through intrinsic defining properties. The historical and institutional construction identified in the literature is therefore more appropriately attributed to these legal-policy categories than to the scientific concept of *drug* as such.

This distinction has practical consequences in French law. Since its introduction in the law of 12 July 1916, *stupéfiant* has lacked a clear intensional definition, a problem already reflected in parliamentary debates concerning its “imprecision and heterogeneity” (Retaillaud-Bajac, 2009). As a result, in 2022, the *Conseil constitutionnel* was asked to assess the constitutionality of the category. Its response was problematic on two counts: by characterising *stupéfiants* as “psychoactive substances characterized by a risk of dependence and harmful effects on health”,⁴ it did not refer to the formal criterion determining membership in the category – inclusion in the relevant schedules – and instead introduced quasi-pharmacological criteria that would logically encompass substances such as alcohol and tobacco, which are not classified as *stupéfiants*. This illustrates the difficulty of supplying intrinsic intensional criteria for a category whose extension is in practice constituted through legal designation.

Together with the definitional difficulties encountered above in the OED and in United Nations drug-control terminology, this example also shows that institutional or lexicographic authority does not in itself guarantee conceptual or logical adequacy in definition. More broadly, it suggests that the conceptual and logical requirements of definition – extensively debated in terminology and philosophy – are often left implicit or taken for granted, particularly the distinctions between intension and extension, descriptive and stipulative definition, and intrinsic properties of a referent and contingent conditions governing the application of a term.

A more coherent legal definition would therefore make the institutional criterion explicit, for example: “*Stupéfiant* (law): psychotropic substance whose designation under applicable legislation entails that its production, distribution, and use are restricted to medical and scientific purposes.” Such a formulation does not present legal status as an intrinsic property of the substance but identifies institutional designation as constitutive of the legal category. From a policy perspective, this distinction is particularly relevant when new psychotropic substances are considered for scheduling: psychotropism, dependence potential, and harmfulness may inform the decision, but none determines legal classification by itself. Scheduling remains a normative and institutional decision informed, but not logically dictated, by scientific properties.

Process of individuation, from taxonomy to typology and terminological definitions

As with definition more generally, the difficulty of defining *drug* concerns individuation: determining the criteria by which entities are identified as instances of the same category and distinguished from others. From Aristotle's genus-differentia model to contemporary

debates on classification and reference, definition has depended on specifying criteria of identity. Applied to *drug*, this requires distinguishing empirical classification, typological selection, and terminological stabilisation.

In this respect, Putnam's semantic externalism (1975) provides a useful point of reference insofar as it distinguishes the properties of referents from speakers' beliefs or descriptions of them. The present argument adopts this externalist insight without assuming that *drug* constitutes a natural kind characterised by a common microstructural essence. Drugs are chemically and pharmacodynamically heterogeneous, and their scientific classification may instead rely on higher-level causal or functional properties selected relative to particular disciplinary objects and explanatory purposes. Causally efficacious properties of substances therefore constrain scientifically defensible classifications without uniquely determining their conceptual organisation.

This position supports a synthesis of ontological naturalism and epistemological conceptualism, in which causally real properties are accessed and stabilised through classificatory practices. Biological taxonomy illustrates a comparable tension between realist constraint and classificatory plurality: evolutionary biologist Ernst Mayr grounds species classification in objective evolutionary and reproductive relations, whereas philosopher of biology John Dupré's pluralism rejects the assumption that biological reality determines a single uniquely privileged taxonomy (Dupré, 1981; Mayr, 1963).

Beginning with ontology, a naturalist-conceptualist framework holds that drugs can be individuated through causally efficacious properties and biological mechanisms. At the broadest scientific level, exogenous chemical substances produce biological effects, providing the basis for a pharmacological concept of *drug*. Within neuroscience, a narrower class can be individuated by psychotropic action on the central nervous system.

Scientific individuation then proceeds through taxonomy, understood here as empirical classification according to observable and measurable characteristics. Pharmacology groups exogenous substances according to their interactions with biological systems – including receptor binding, enzyme inhibition, and neurotransmitter modulation – thereby identifying a broad class of biologically active substances. Analgesics, antibiotics, antihypertensives, and psychotropic substances can all fall within this pharmacological category because they share the general property of producing biological effects. Neuroscience, by contrast, identifies within this broader field a narrower class of substances characterised by effects on perception, mood, cognition, or behaviour through their action on the central nervous system. These classifications arise from empirically established properties and causal mechanisms but differ in explanatory focus and level of generality.

The extension of the narrower category includes chemically and pharmacodynamically diverse substances whose effects on the central nervous system are empirically established, including alcohol, opioids and benzodiazepines; stimulants such as cocaine, amphetamines, nicotine and caffeine; psychedelics such as LSD and psilocybin; as well as cannabis, ketamine and MDMA. Their pharmacological mechanisms and effects differ, and their subcategories are not universally standardised, but this heterogeneity does not preclude the empirical coherence of a category defined by psychotropism. What unites its members is not legal status, moral valuation, or addiction potential, but a shared capacity to modify mental processes through action on the central nervous system.

The distinction between psychotropism as a defining property and addiction as a contingent phenomenon is nevertheless often obscured in ordinary language by the semantic extension of *drug* to behaviours or products associated with addiction, such as gaming, work, sport, sex, or sugar. In Aristotelian terms, addiction constitutes an accident rather than the essence of drugs. From a different ontological perspective, Fraser (2020) likewise cautions against reifying addiction as a stable property of drugs or subjects, emphasising instead its constitution through heterogeneous practices, interventions, and relations. Within

⁴ Décision n° 2021-960 QPC du 7 janvier 2022 :

<https://www.conseil-constitutionnel.fr/decision/2022/2021960QPC.htm>.

Accessed on 12 June 2025.

the neuroscientific framework adopted here, the defining property of drugs therefore lies not in the contingent possibility of compulsive use but in their status as psychotropic substances acting exogenously upon the central nervous system. Extending *drug* on the basis of addiction potential replaces this defining criterion with a contingent behavioural phenomenon. Such usages may have rhetorical or metaphorical value, but they do not provide a stable terminological definition.

Yet identifying an empirically coherent category does not by itself determine which property should function definitionally. Taxonomy alone cannot yield a unique terminological definition, since the selection of defining properties depends on disciplinary objects and explanatory purposes. This is where typology becomes decisive. Whereas taxonomy identifies properties and empirical groupings, typological selection determines which property is constitutive of a specified type and therefore enters its intension (Borgès Da Silva, 2013). In schematic terms, induction establishes candidate properties and empirical classes; typological selection designates a property as defining; deduction then governs membership in the resulting type. The existence of a causally efficacious property does not, therefore, confer definitional priority upon that property by itself: definitional relevance arises through its selection relative to a specified scientific disciplinary framework.

From this perspective, pharmacology and neuroscience do not generate contradictory definitions of *drug*, but distinct and hierarchically related intensions. In pharmacology, the relevant typological choice remains broad because the discipline is concerned with exogenous substances producing biological effects in general. In neuroscience, the object of inquiry is the central nervous system and mental processes; within this more specific framework, psychotropism becomes the defining property selected for the concept of *drug*. It acquires defining necessity not merely because it is causally real, but because it is selected typologically as the property specifying the intension of the category.

The final step is terminological stabilisation, in which a linguistic label is assigned to the resulting conceptual type. Within pharmacology, *drug* designates the broad class of exogenous biologically active substances. Within neuroscience, the same term may receive the narrower intension of psychotropic substance. The terminological definition *drug* = psychotropic substance is therefore valid within the neuroscientific framework without superseding the broader pharmacological definition; it specifies a subclass relative to a different disciplinary object.

This neuroscientific usage is well established. The World Health Organization, for example, defines *psychoactive substances*⁵ by their effects on mental processes: “Psychoactive substances, more commonly known as psychoactive drugs, are substances that, when taken, have the ability to change an individual’s consciousness, mood or thinking processes” (WHO, 2004: 1–2). The European Union Drugs Agency, although not providing a strict terminological definition of *drug*, likewise employs the term in contexts centred on psychotropic substances, as illustrated by formulations such as “drug addiction: addiction based on consumption of a (psychotropic) substance”.⁶ These usages support the identification of psychotropism as the relevant defining property within a neuroscientific framework.

A comparable usage occurs in French official discourse, where *drogue* may be defined as a psychotropic substance despite its frequent non-technical use as a synonym for *stupéfiant*. A French governmental definition states: “A ‘drug’ is any psychotropic substance that disrupts the functioning of the central nervous system (sensations, perceptions,

mood, affect, motor functions) or alters states of consciousness.”⁷ The coexistence of these usages further illustrates why terminological definition must be distinguished from ordinary and legal usage: the same lexical item may circulate across different semantic registers without those registers constituting the same concept. Precisely because usage alone cannot determine which properties should constitute a scientific concept, terminological definition requires explicit criteria of adequacy.

Accordingly, a rigorous terminological definition must satisfy principles of conciseness, clarity, explicitness, and adequacy (Vézina et al., 2009: 12–16). Adequacy requires the definition to capture the characteristics constitutive of the concept’s intension while excluding attributes that are contingent upon particular members of its extension (ibid.: 35). In this sense, *drug* = psychotropic substance is terminologically and logically valid within neuroscience: the *definiendum* functions as a linguistic designation for the *definiens* – the expression that provides the definition –, which states the property selected as constitutive of the concept. At the broader pharmacological level, by contrast, the appropriate intension remains that of an exogenous biologically active substance.

The pharmacological and neuroscientific definitions are therefore distinct but compatible. Both are constrained by empirically established causal properties, while the property selected as definitionally salient depends on the disciplinary object and level of analysis. Scientific definability thus requires neither a single universally privileged classification nor the assumption that *drug* constitutes a natural kind defined by a common microstructural essence.

Conclusion: drugs and narcotic drugs, between ontological continuity and legal contingency

It follows from the foregoing analysis that *drug* admits of discipline-specific scientific definitions formulated intensionally. Within pharmacology, drugs are exogenous chemical substances, other than nutrients or essential dietary ingredients, that produce biological effects (Rang et al., 2011: 1); within this broader category, neuroscience identifies the narrower class of psychotropic substances acting on the central nervous system and modifying mental processes (WHO, 2004: 1–2). By contrast, *narcotic drug* designates a legal category whose extension is fixed through the scheduling mechanism established by the Single Convention (United Nations, 1961) rather than derived from intrinsic defining properties. These scientific definitions and legal classifications therefore belong to distinct classificatory frameworks: the former define scientific concepts intensionally, whereas the latter constitute legal categories through institutional designation.

Distinguishing these levels shows that semantic and legal variability does not entail the scientific indefinability of *drug*. Pharmacological and neuroscientific definitions are constrained by causally efficacious properties, but the selection of those properties as defining depends on disciplinary objects and explanatory purposes. The position defended here is therefore realist without being classificatory essentialist: empirical reality constrains scientifically defensible classifications without uniquely determining their conceptual organisation.

This distinction between the causally efficacious properties of material referents and epistemically constructed classifications also permits a more direct answer to Derrida’s claim that “there are no drugs in nature”. His claim rests, however, on the false premise that *drug* denotes a category constituted by illegality. Once that premise is rejected, the inference loses its force: neither legal status nor the moral judgement that may underpin it is a constitutive property of drugs. Even granting that illegality is not a property found “in nature”, the inference is a *non sequitur*: the non-natural character of a legal predicate does not entail the absence from material reality of the substances to which it is applied, nor

⁵ *Psychotropic* and *psychoactive* are synonymous, but *psychotropic* is preferred here for its etymological coherence (Greek–Greek), whereas *psychoactive* is a hybrid (Greek–Latin) form, making the former more regular in scientific terminology.

⁶ https://www.euda.europa.eu/activities/iate-glossary_en. Accessed on 14 April 2026.

⁷ <https://www.drogues.gouv.fr/quest-ce-quune-droque>. Accessed on 14 April 2026.

their incapacity for naturalistic description. What is institutionally constituted is the legal predicate – not the substances or causal capacities to which that predicate is applied – and that predicate is in any event irrelevant to the scientific individuation of *drug*. Nor does the fact that the concept *drug* itself does not exist “in nature” distinguish it from scientific concepts more generally, since concepts are classificatory constructs rather than objects found ready-made in the world. The conceptual character of *drug* therefore neither entails the non-existence of its referents nor precludes a scientifically defensible intension.

Within the narrower neuroscientific framework, this entails that legal and moral predicates are not constitutive of *drug*. Legal categories such as *narcotic drug*, *stupéfiant*, or *controlled substance* operate at a different analytical level, since their extension is fixed through institutional designation rather than derived from a scientific intension. Addiction-related predicates, often treated as intrinsic properties of drugs, are non-constitutive for a different reason: addiction cannot serve as a defining property of *drug* because it is neither necessary nor sufficient for membership in the neuroscientific category; it may involve behaviours and activities, while even highly dependence-producing substances do not generate addiction systematically or mechanically (Chouvy, 2023).

More broadly, these distinctions clarify the methodological status of *drug* in social-scientific and policy research. If *drug* cannot be scientifically individuated, it cannot function unqualified as an analytical category: it may still be studied as a legal, social, or ordinary-language category, but the object of inquiry must then be specified accordingly. This exposes a tension in Becker (2001), who denies that *drug* constitutes a scientific or pharmacological category while nevertheless treating *drug* as an object of inquiry without specifying alternative criteria by which that object is delimited. Where the object of inquiry is psychotropic substances, by contrast, the neuroscientific intension provides an explicit delimitation without constraining analysis of their uses, relations, representations, or institutional settings. The claims of indefinability examined here may therefore result, at least in part, from conflating variability in the extension of legal and social categories with indeterminacy in the intension of scientific ones. Explaining how such confluences and conceptions are produced and stabilised lies beyond the present analysis, but could be approached through an assemblage analysis (Deleuze & Guattari, 1980; DeLanda, 2006) of the relations among scientific categories, legal classifications, institutions, practices, discourse, and ordinary language, without treating the causal properties of material referents as products of those relations.

A geographical and historical perspective further clarifies this distinction by showing that the ontological continuity of psychotropic substances coexists with profound spatial and temporal variability in their legal classification, regulation, and social interpretation. Drugs, when defined within the neuroscientific framework as psychotropic substances, therefore exhibit ontological continuity across changing spatial and historical classificatory contexts, whereas narcotic drugs remain spatially and historically contingent legal constructs.

Failure to distinguish these levels of classification can generate substantive errors rather than mere lexical imprecision – for example, mistaking a legally constituted extension for a scientific category, inferring scientific indefinability from legal heterogeneity, or attributing juridical or moral predicates to substances as though they were constitutive properties. The definitional difficulties identified in the OED, United Nations drug-control terminology, and the French *Conseil constitutionnel* further show that such problems are not confined to scholarly accounts, but may also arise in authoritative lexicographic and institutional sources. Conceptual clarification therefore concerns not merely terminology, but the individuation of the research object and the logical consistency and comparability of scientific analysis.

Scientific terminology should consequently be clearly distinguished from ordinary usage. Lexicography describes how words are used; terminology specifies the concepts that scientific terms are intended to designate. Expressions such as *illegal drugs* illustrate the problem by

misleadingly attributing illegality to the substance itself rather than to legally prohibited acts involving it. Indeed, drugs are never illegal *per se*: illegality attaches to particular acts or relations involving substances – such as production, possession, supply, prescription, administration, or use – under specified legal conditions. A controlled substance may therefore be involved in both lawful and unlawful activities. The persistence of such formulations in scientific and official discourse illustrates how ordinary and legal categories can continue to structure specialist understandings of the object.

These terminological distinctions also have policy implications. Alcohol and nicotine are drugs irrespective of their markedly different legal and social statuses, while the designation of particular substances as *narcotic drugs*, *stupéfiants*, or *controlled substances* establishes regulatory status rather than scientific properties. The same distinction applies to addiction and dependence potential: addiction is not constitutive of the scientific category of *drug*, while dependence potential may inform regulatory assessment without by itself determining legal status. Conceptual clarification does not prescribe a particular drug policy, but it can improve the conditions under which policy is formulated. By demoralising and de-juridicising the term *drug* – reducing its capacity to operate as semantically charged shorthand for danger, illegality, addiction, or deviance – it helps keep scientific properties, legal statuses, and moral evaluations analytically distinct and thereby makes more coherent, better-informed, and conceptually more accurate policy possible.

This article has therefore argued that the semantic variability of the term *drug* does not preclude the construction of scientific concepts grounded in causal properties. By distinguishing ontological properties, scientific concepts, legal categories, and social representations, it has sought to avoid conflating social variability with conceptual indeterminacy. Ultimately, definitions, although necessarily reductive abstractions, remain indispensable conditions of intelligibility.

Declaration of generative AI and AI-assisted technologies in the manuscript preparation process

During the preparation of this work, the author used ChatGPT (OpenAI) and Le Chat (Mistral AI) for language editing, identifying inconsistencies and logical weaknesses, and testing the robustness of arguments against the author's epistemological and methodological framework. After using this tool/service, the author reviewed and edited the content as needed and takes full responsibility for the content of the published article.

CRediT authorship contribution statement

Pierre-Arnaud Chouvy: Writing – review & editing, Writing – original draft, Methodology, Formal analysis, Conceptualization.

Declaration of competing interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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