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SUBSECRETARÍA DE
DERECHOS HUMANOS,
POBLACIÓN Y MIGRACIÓN

Dirección General de Política Pública
de Derechos Humanos

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2020
LEONORA VICARIO

LAS CIENCIAS FORENSES DESDE UN ENFOQUE DE DERECHOS HUMANOS



Psicopatología Forense y Sistema de **Justicia**

Eric García-López

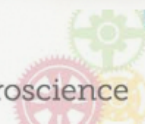
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Investigadores
SNI

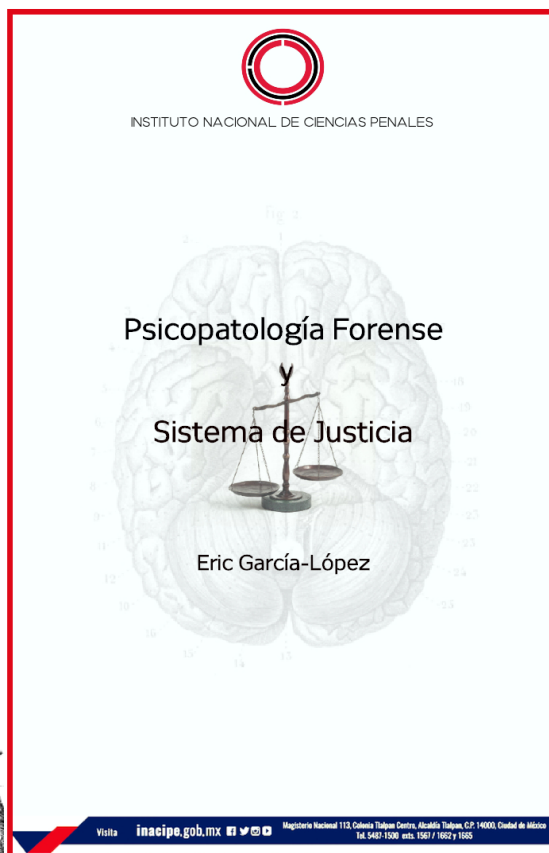


frontiers
in Human Neuroscience



Psicopatología Forense

Sistema de Justicia



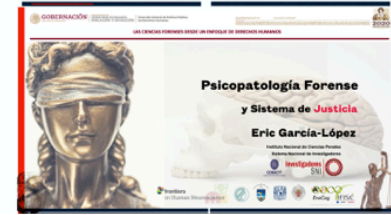
1. ¿Cuál es el papel que desempeñan los peritos para **evitar que en el ejercicio de sus funciones se comenten violaciones a los derechos humanos, malas prácticas médicas, así como la configuración del delito de responsabilidad profesional?**

Lo anterior, con la finalidad de que no se vea implicado el trabajo desarrollado en la investigación y persecución de los delitos y en su caso, se vulneren los derechos del imputado y de las víctimas.



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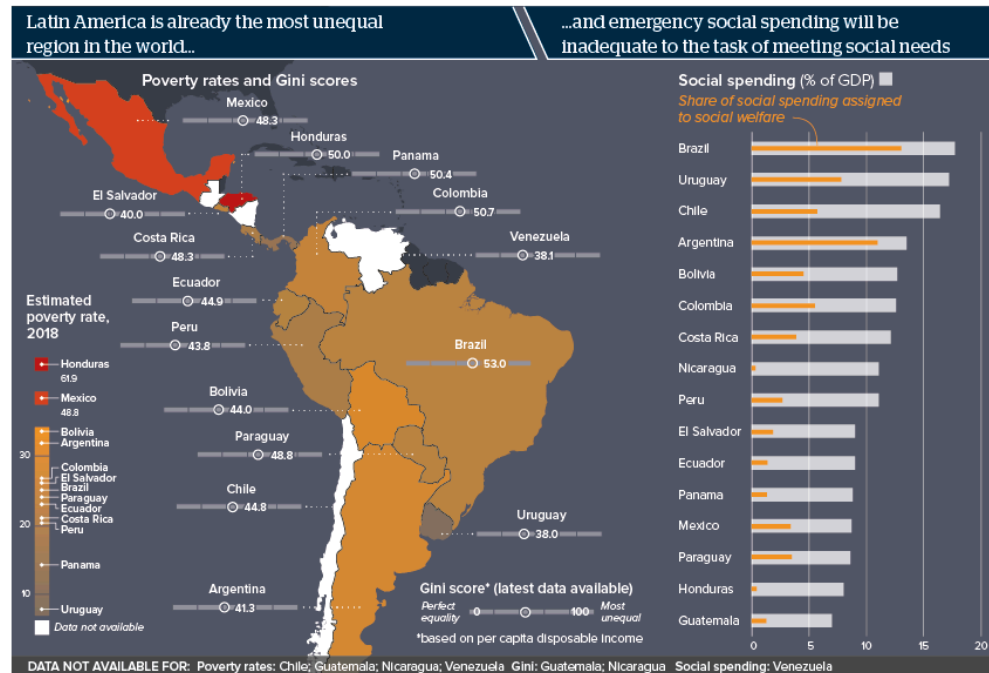


Latin America poverty progress is being reversed

Tuesday, December 10, 2019



Slower growth is undermining advances in reducing poverty and inequality, raising instability risks



Source: UN Economic Commission for Latin America and the Caribbean (ECLAC); IMF; F. Solt's Standardized World Inequality Database

Fuente: <https://dailybrief.oxan.com/g/oxweb/GA249332/602-LATAM-inequality-graphic.png>

The region will see the deepest recession since 1930

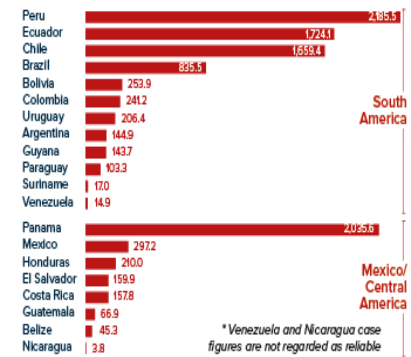


Source: Oxford Analytica; Johns Hopkins; UN Economic Commission for Latin America and the Caribbean (ECLAC); ourworldindata.org

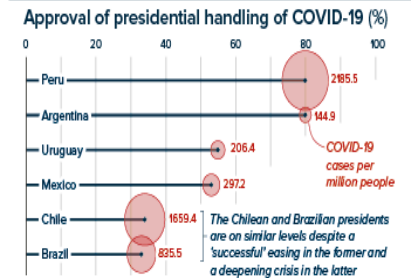
Fuente: <https://dailybrief.oxan.com/g/oxweb/GA252608/646-LatAm-COVID-graphic.png>

As cases continue to rise across Latin America...

Confirmed cases of COVID-19 per million people (as of May 13)



... approval ratings seem to have little to do with either severity or success of measures



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Tabla A.19
Chile: Estimación modelo de discriminación (Oaxaca-Blinder) 2013

	Global	Urbano	Rural
Hombres	9.132***	9.192***	8.608***
Mujeres	8.848***	8.881***	8.552***
Diferencia	0.284***	0.312***	0.055***
Explicada	-0.079***	-0.05***	-0.097***
No explicada	0.363***	0.362***	0.152***

Significancia estadística: *: p<.05; **: p<1%; *** p<0,1%

Fuente: Elaboración propia en base a CASEN 2013.

Tabla A.20
Chile: Estimación modelo de ingresos (Heckman) - 2013

	Población total	Solo hombres	Solo mujeres	Diferencia Género
Género (1=hombre)	.0693***	-	-	-
Años de escolaridad	.0753***	.0854***	.0548***	.031***
Edad	.0225***	.0281***	.0153***	.013***
Edad2	-.00018***	-.00024***	-.0001***	-.0001***
Etnia	-.0499***	-.0365***	-.0768***	-.040***
Asalariado	.0432***	.011***	.0746***	-.064***
Tasa dependencia del hogar	.043***	-.0124***	.134***	-.146***
Zona (1=urbano)	.0208***	.0222***	.0102***	-.012***
Pobreza_2006	-.00889***	-.00756***	-.0112***	-.004***
T_SilveagricolaP	.00877***	-.00986***	.0433***	-.053***
T_Ind_Extractiva	-.038***	-.0439***	-.0337***	-.01***
T_Manufactura	-.0627***	-.0693***	-.0567***	-.013***
T_Otros_Secundarios_cons	.0354***	.0478***	.0208***	.027***
Control rama actividad	7.78***	7.56***	8.34***	-.783***
Control rama actividad	Si	Si	Si	
Modelo Selección				
Género (1=hombre)	.509***			
Años de escolaridad	.0662***	.0447***	.085***	
Edad	-.0028***	-.00193***	-.00274***	
Jefe_hogar	.617***	.441***	.546***	
Casado/conviviente	.321***	.568***	.19***	
Menores 3años	.0157***	.148***	-.0927***	
Menores 6años	.0854***	.102***	.0371***	
Mayores 65años	-.301***	-.415***	-.227***	
Mayores 75años	-.462***	-.592***	-.382***	
_cons	-1.09***	-.402***	-1.22***	

Significancia estadística: *: p<.05; **: p<1%; *** p<0,1%

Fuente: Elaboración propia en base a CASEN 2013.

Fuente: <https://reliefweb.int/sites/reliefweb.int/files/resources/Informe-Latinoamericano-2015.pdf>



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Forum in focus

World is 100 years away from gender parity but these countries are speeding things up



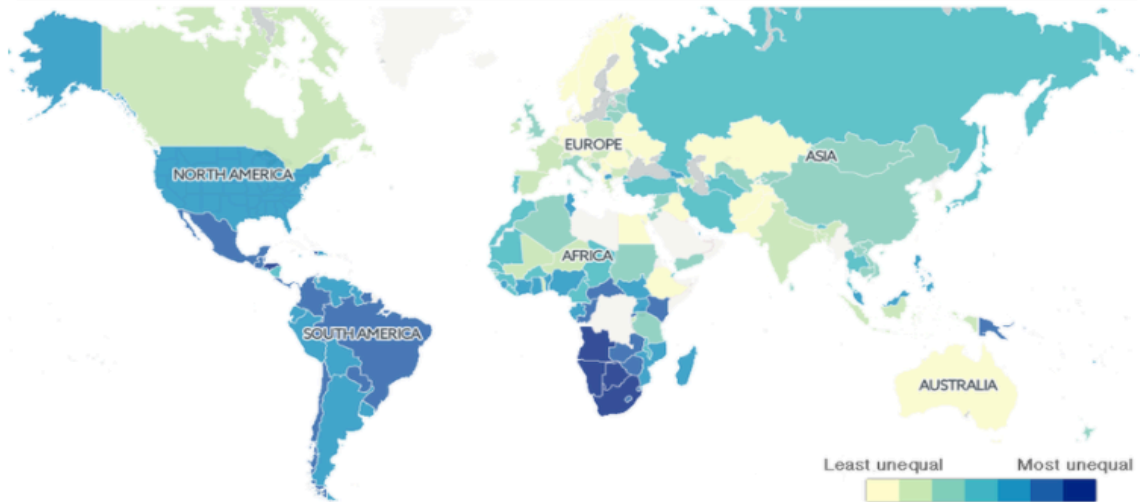
Read more about this project →

Fuente: <https://www.weforum.org/agenda/2016/01/inequality-is-getting-worse-in-latin-america-here-s-how-to-fix-it/>

very wealthy individuals, at the expense of the poor and the middle class. This extreme income concentration and inequality is also confirmed by analysis of the tax data available on personal income in selected countries of the region.

The most unequal regions in the world

GINI index measure of inequality



Source: GINI Index (World Bank estimate)

Safeguarding the advances the continent has already achieved and ensuring inclusive and sustainable growth must be a priority for all the countries in the region. That is why ECLAC



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The politics of inequality and redistribution in Latin America

Governance

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2012-05-10

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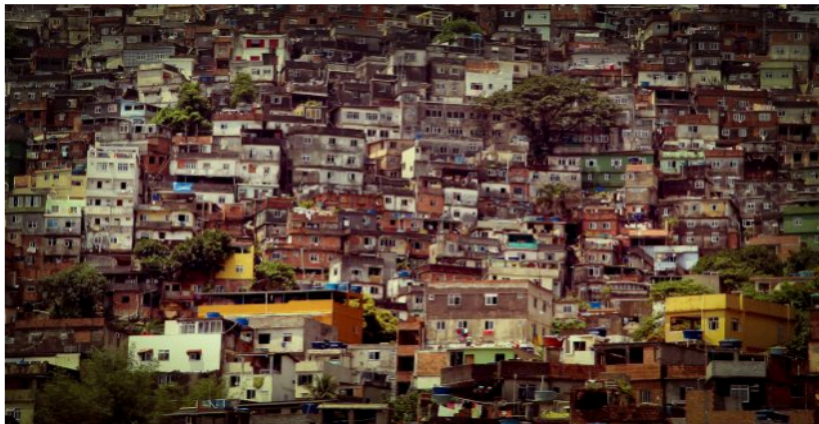


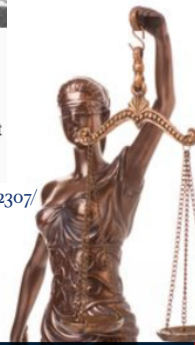
Photo: Alex Eflon Fuente: <https://unu.edu/publications/articles/the-politics-of-inequality-and-redistribution-in-latin-america.html#info>



Children, indigenous communities and Afro-descendants are among the demographics worst hit by extreme poverty levels, studies have revealed.

A new report by the United Nations Economic Commission for Latin America and the Caribbean (ECLAC) warns that income inequality and the amount of people living in extreme poverty are rising in Latin America.

Fuente: <https://brazilreports.com/brazil-is-latin-americas-most-unequal-country-in-terms-of-income-distribution/2307/>



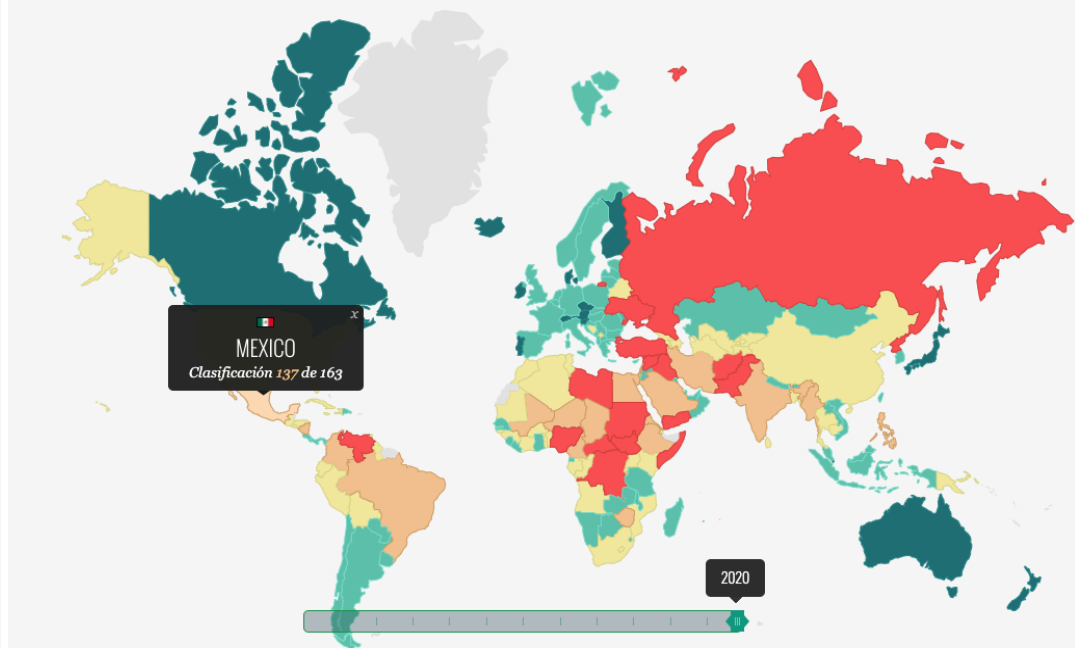
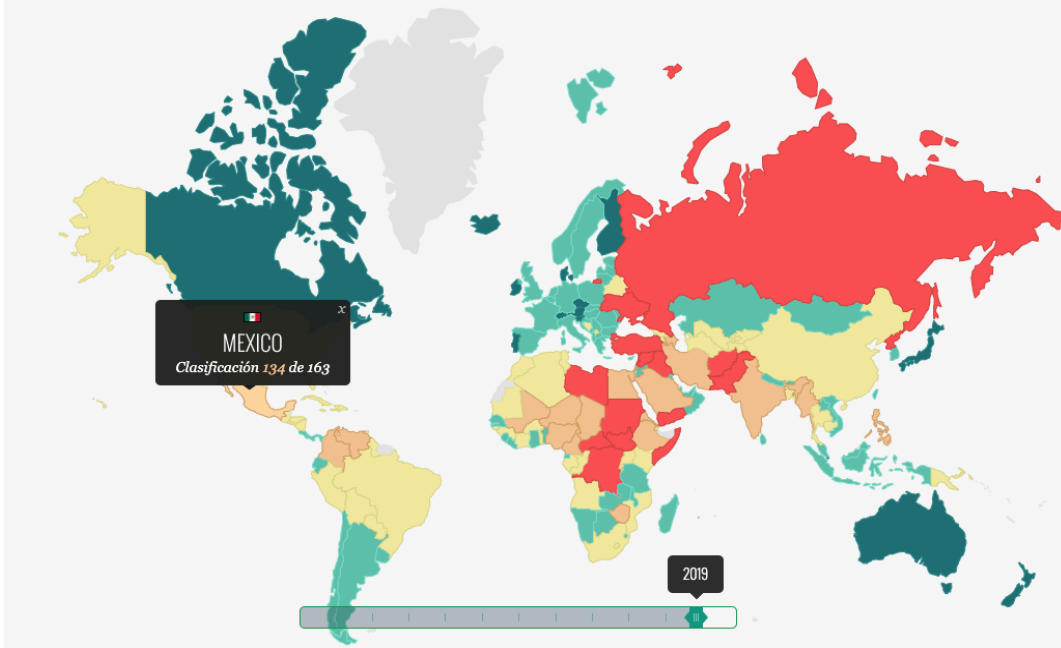
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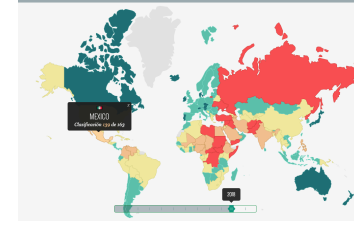
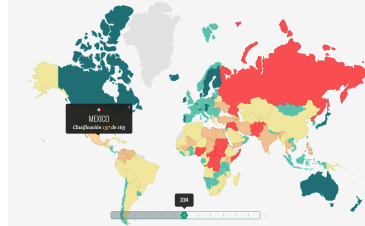
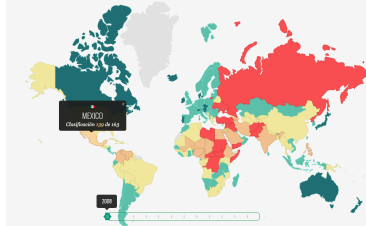
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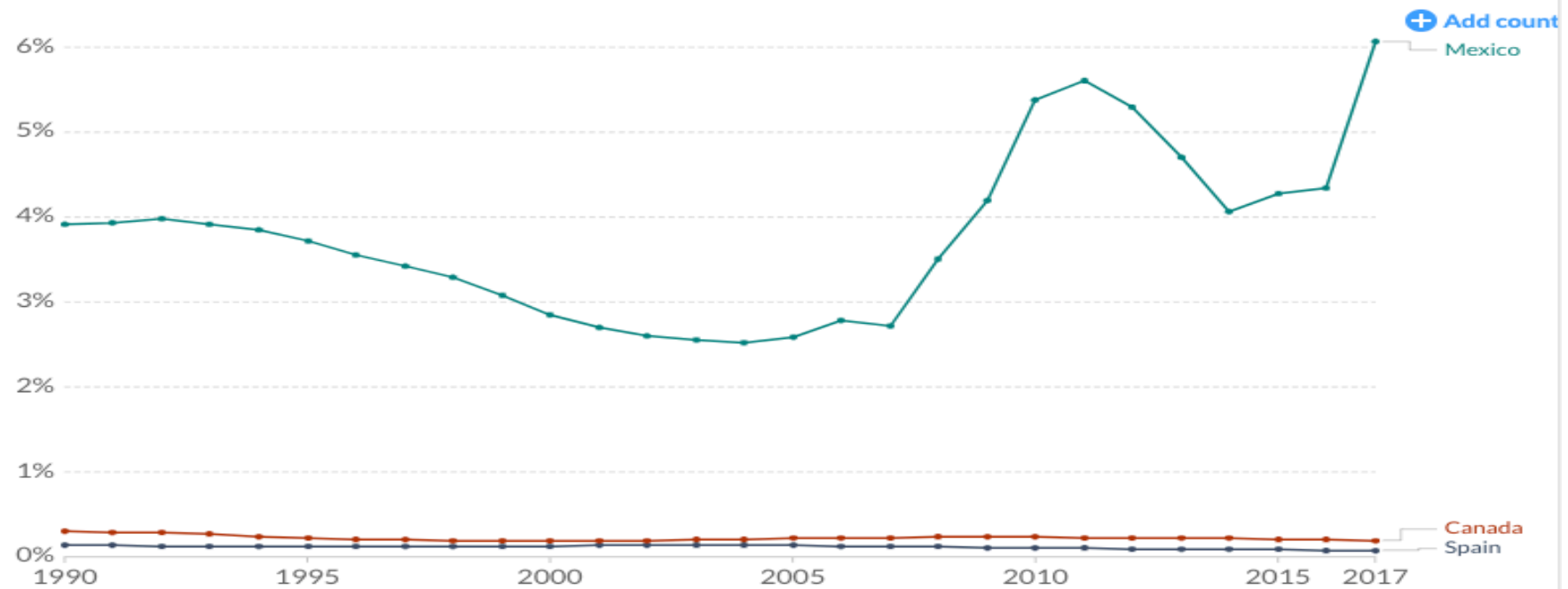


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Share of deaths from homicide, 1990 to 2017



Source: IHME, Global Burden of Disease

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1990 2017

CHART

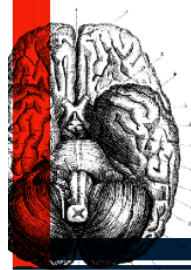
MAP

TABLE

SOURCES



Fuente: <https://ourworldindata.org/homicides>



Psicopatología Forense

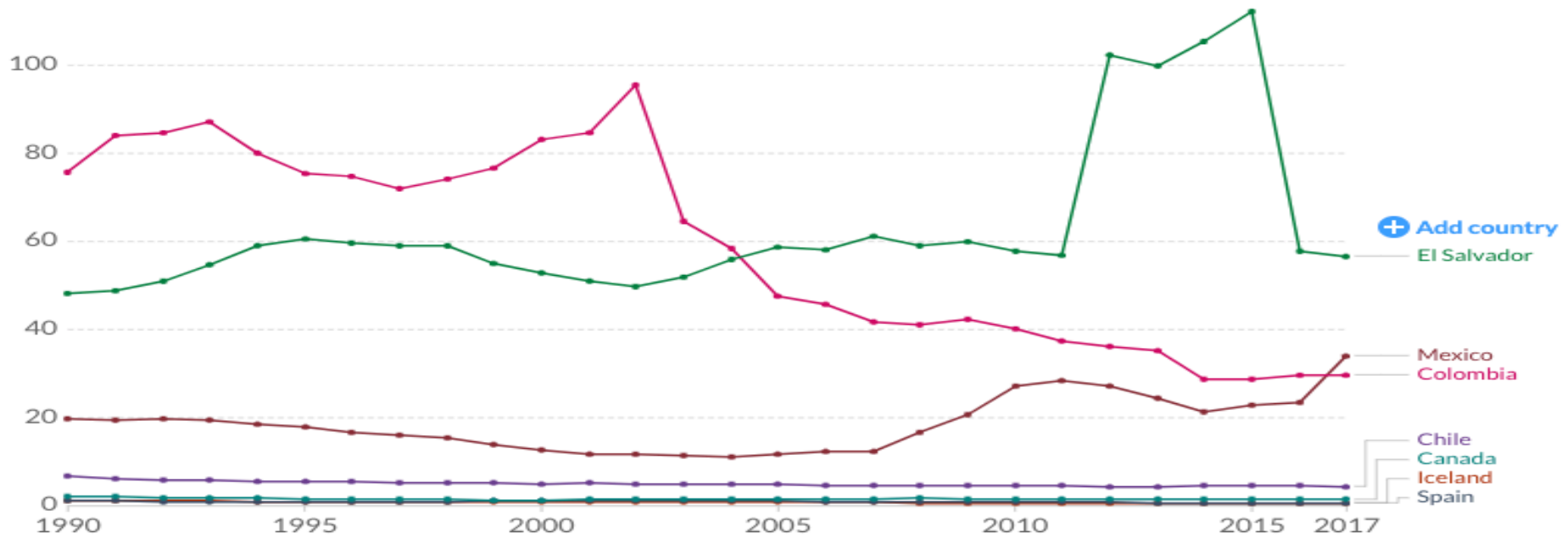
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Homicide rate, 1990 to 2017

Homicide rate is measured as the number of homicide deaths per 100,000 people.

Our World in Data



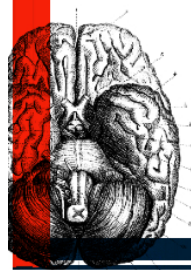
Source: IHME, Global Burden of Disease
 Note: To allow comparisons between countries and over time this metric is age-standardized.

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1990 2017

CHART MAP TABLE SOURCES

Fuente: <https://ourworldindata.org/homicides>





Psicopatología Forense

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Cuando nos referimos a la “Psicopatología”, no solo aludimos a los signos y síntomas que estructuran un síndrome o un cuadro clínico, sino también –y quizá principalmente– al origen, a la raíz en griego y latín de esta palabra, que incluye *Pathos*.

Al descomponer la palabra psicopatología en tres regiones: Psico (*Psyché / ψύχω*); pato (*Pathos / πάθος*) y logía (*Logos / λόγος*), podemos decir que constituye el tratado o estudio de las enfermedades y los dolores del alma y de la mente. Así, no se trata de entender la psicopatología como un conjunto de anomalías, sino esencialmente como profunda y dolorosa expresión del sufrimiento humano. Hay que recordar también, que tanto Platón como Aristóteles (*ethos, pathos, logos*) o Sócrates y en general la filosofía y la mitología griegas son muy necesarias para adentrarse en el estudio de la psicopatología. (García-López et al, 2019).



Psicopatología Forense

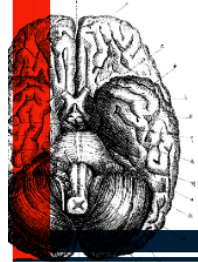
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2. ¿QUÉ PODEMOS ENTENDER POR PSICOPATOLOGÍA FORENSE?

Tal como hemos venido diciendo, la psicopatología forense es quizá uno de los árboles más conocidos del bosque que implica la psicología jurídica, entendiendo a ésta como «el estudio científico del comportamiento humano en todos los ámbitos jurídicos, así como a la disciplina que estudia, investiga y analiza el comportamiento humano, con relación al derecho y la justicia» (García-López, Robles y González, 2010, p. 3).

Por su parte, la psicopatología forense puede implicar «el estudio y la evaluación de los trastornos mentales, los problemas emocionales y las conductas *desadaptativas* de personas vinculadas a procesos legales [...] con el fin directo [...] de presentar dicha información ante las fiscalías y tribunales de justicia» (García-López y Morales, 2014, p. 4).





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INTRODUZIONE: Traduzione sull'ultima edizione tedesca con gli opportuni richiami alla legislazione italiana del Dott. Lorenzo Borri
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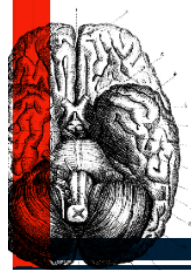
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Psicopatología Forense
y Sistema de Justicia

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De auctoritate & consensu tut. & cur.

222

a Ex hereditate, quam possidebat pupillus, & super qua conueniebatur petitione hereditatis. Accursum.

b Defus possidere, cum autem vendidit, vtrum verum pretium, vel acceptum, vel res ipsa veniat in petitione hereditatis, ut dixi supra de peti. hered. Item veniunt. §. fina. & l. sequen. §. penul.

c Ita. scilicet verum est.

d Id quod pupillus, licet non insidit tutor pupillo rem pu. fal. fore.

e Sabinus, not. quando est soluendo, soluit Arist. sed quando non est soluendo, tunc quaerit Pomponius, sed nō soluit ad praesens, vt subicit, sed si.

f Calamitas id est damnū debet esse pupilli.

g Et perdidisset, quibus casibus bona fide poss. habeat pupillus: & sic pupillus non tenetur, cum locupletior nō sit: vt supra de peti. hered. l. sed & si leg. §. confu. hui. & facit in eo tir. l. deperditū. & no. quōd huiusmodi non soluit, sed in dubio relinquit Pomponius.

h De possessore, alienae hereditatis, & hanc soluit in fia. in fi. l.

i Id quod loquitur Pō. possib. si, & quaerit an Arist. bene dixit in primo casu quando tutor est soluendo, & dicit q. sic, sed in articulo alio in quo dubitasti quōdo non est soluendo, quare dubitasti? Pompo. certe indubitatē debuisti dicere nō teneri pupillum, & in primo vbi est soluendo, melius dixisset Arist. pupillum nō teneri nisi ad cessionē, & sic corrigit Aristonē & seipsum in eo quod approbat eū. dic. ergo secū dū Azo. & l. iug. quōd si pupillus est locupletior ex dolo vel culpa tutoris, tunc tenetur, si pupillo cautum, vel nō sit soluendo, vel non vt supra de act. emp. & ven. l. Iulianus. in fi. & j. de doli excep. l. apud Celsum. §. illa, quae huic videtur contra. & de eue. l. illud. Si vero nō est locupletior, tenetur vt tamen liberetur cedēdo actionem: siue sit soluendo, siue non: vt hic patenter dicit. Nec ob. quōd lex quam dicit, si est soluendo: vt T. de trib. l. iij. §. j. & de pecu. l. sum. ma. §. dolo. & j. ne vis si. ei qui in pos. iur. l. j. §. hoc edicto. & j. tit. l. ij. & aliae plures: quia tunc tenetur, scilicet cedere, maximē si est soluendo tutor. Ita non ob. j. de reg. iur. l. neque. vbi etiam cedere non debet, quia ibi in rem suam commisit tutor doli: &

A trahendū super re hereditaria aliquid stipulatus est, vel mutuū quod dedit minus idoneū habet, vel vēdidit minori pretio, vel minus idoneo hominū debet pupillus cedere actionē quā habet cōtra tutore vel curatorem. Io. immo cōtra promissores. H. o. Si casu. & T. ad leg. Aquil. l. sed & si quemcunque. §. ij. & de rei vind. l. quod infans, excusat enim eum infelicitas facti: vt j. ad leg. Come. de fica. l. infans. do quo ex. Item satis ipso furore punitur: vt j. ad leg. Pō. po. am. de parricid. l. fin. in fine. & T. de off. praes. l. diuus. nec est adenda afflictio afflictio, vt T. ad legem Rhodiam de iac. l. nauis. Accut. de afflic. DE AVCTORITATE & consensu tutorum & curatorum.

Quod non licet de iure directo, licet per consequentiam. Item qui non potest auctorari in negotio, ex quo sibi acquiritur principaliter. Bartolus.

I. VLP IANVS libro primo ad Sabinum.

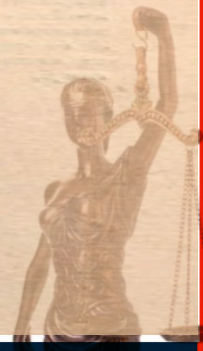
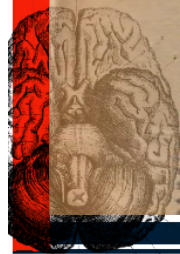
Quāquam regula sit iuris ciuilibus, in rem suam auctorē tutorem fieri nō posse P: tamen potest tutor proprii sui debitoris hereditatem aduenti pupillo auctoritatem accommodare, quamuis per hoc se auctore: quia principaliter circa rem suā auctoraretur. Item nō potest praestare auctoritatem pupillo vel pupillae suae vt promittat filio vel seruo tutoris ipsius vt aliquid eis tradat, nisi ex illa stipulatione vel traditione pupillus esse crederet locupletior: quia tunc de eo tenetur ciuilitē & naturaliter.

[TUTOR.] Titius volebat contrahere cū pupillo tutorem habente, & cum tutor auctoritate ad hoc praestare noller, cum fecit astare contractū per vim: nunquid valet cōtractus? Certo non, ac si tutor contractū interesset dormiens, vel habens morbum qui non permittat eum intelligere quae aguntur. nō enim est differentia vtrum non superueniat auctoritas tutoris, quo casu non valet quod agitur: an vero adhibeatur inutiliter fuit in nostro casu. Vinnianus.

Fati infelicitas facti: vt j. ad leg. Come. de fica. l. infans. do quo ex. Item satis ipso furore punitur: vt j. ad leg. Pō. po. am. de parricid. l. fin. in fine. & T. de off. praes. l. diuus. nec est adenda afflictio afflictio, vt T. ad legem Rhodiam de iac. l. nauis. Accut. de afflic. DE AVCTORITATE & consensu tutorum & curatorum.

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In hant sententiam Om. l. i. l. Apornum. leg. 7. vbi dicitur furtum si furtum ex casu ap. possit sine deficiat.



Psicopatología Forense

Sistema de Justicia



3. Mencionaremos en estos acápites que no todos los autores están de acuerdo con la denominación de **Psiquiatría Forense**, aun-

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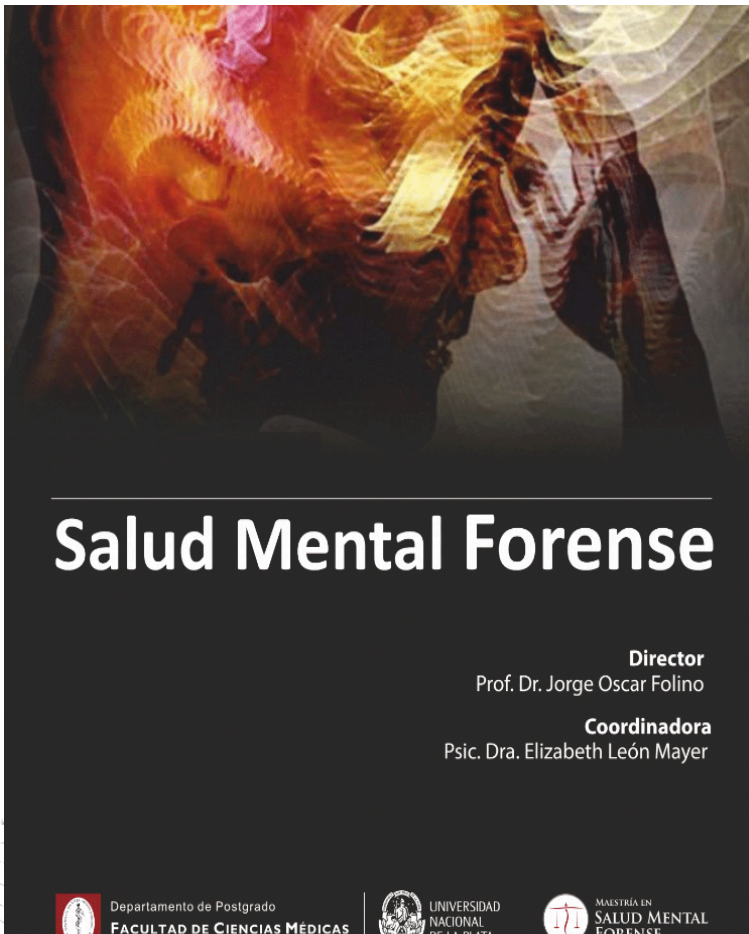
MEDICINA LEGAL Y PSIQUIATRÍA FORENSE

que las materias que se tratan son las mismas, pero ésta es la que se emplea en forma general por los tratadistas y así lo expresan en sus textos. Para el profesor Vargas, el término que se debiera usar es el de Medicina Legal Psiquiátrica, opinión que es compartida por Simonín; para Rojas, Psiquiatría Médico-Legal; según Alvez, **Psicopatología Forense**; Ponsold, Psiquiatría Legal; Quiroz, Psiquiatría Médico-Forense. También se conoce otra terminología que es minoritaria, como Medicina Legal de los Alienados, Psiquiatría Jurídica, **Psicopatología Médico-Legal**, etc. Entre los que aceptan expresamente el nombre Psiquiatría **Forense** para esta sección de la Medicina Legal, tenemos a Bonnet, Riu-Tavella, Marcó y otros, Basile y Waisman, Cousiño, Gómez, Uribe, Serpa, Cabello, etc.



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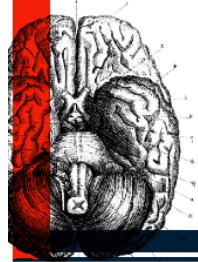
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García-López, E. (2019; 2016; 2014; 2010; 2007; 2004).



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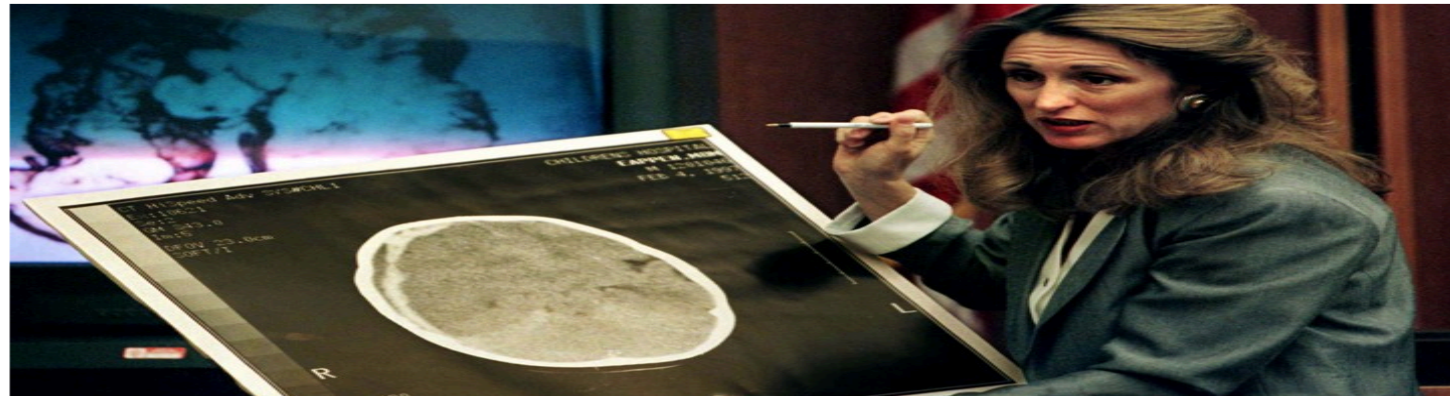
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The Brain Gets Its Day in Court

A new study found that the number of judicial opinions referencing neuroscience as evidence more than doubled between 2005 and 2012.

GREG MILLER MAR 1, 2016



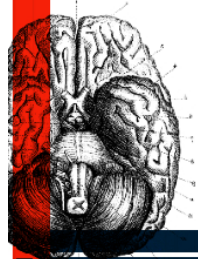
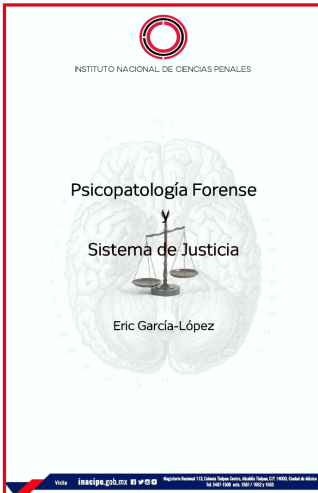
A brain scan is used as evidence in a 1997 trial investigating the death of an infant. (REUTERS)

The crime was brutal. On November 4, 1989, after a night of heavy drinking, David Scott Detrich and a male coworker picked up a woman walking along the side of the road in Tucson, Arizona. After scoring some cocaine, the trio went back to her place, where, according to court documents, Detrich slit the woman's throat and stabbed her 40 times. Later, the two men dumped her body in the desert.

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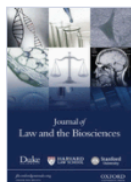


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Neuroscience and behavioral genetics in US criminal law: an empirical analysis

Nita A. Farahany

Journal of Law and the Biosciences, Volume 2, Issue 3, November 2015, Pages 485–509,

<https://doi.org/10.1093/jlb/lsv059>

Published: 14 January 2016

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Abstract

The goal of this study was to examine the growing use of neurological and behavioral genetic evidence by criminal defendants in US criminal law. Judicial opinions issued between 2005–12 that discussed the use of neuroscience or behavioral genetics by criminal defendants were identified, coded and analysed. Criminal defendants are increasingly introducing such evidence to challenge defendants' competency, the effectiveness of defense counsel at trial, and to mitigate punishment.

Issue Section: Original Article

Journal of Law and the Biosciences, 485–509
doi:10.1093/jlb/lsv059
Original Article
Advance Access Publication 14 January 2016



Neuroscience and behavioral genetics in US criminal law: an empirical analysis

Nita A. Farahany*

Law and Philosophy, Duke University, 210 Science Drive, Box 90362, Durham, NC 27708, USA

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ABSTRACT

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KEYWORDS: Neuroscience, neurobiology, criminal law, behavioral genetics, capital punishment, IAC

I. INTRODUCTION

Legal scholars, scientists, and commentators lament the onslaught of behavioral genetics and neuroscience in the criminal courtroom. Fueled largely by anecdotal evidence about the use of bioscience in criminal cases, or media reports of high-profile cases, there is a growing belief that neuroscience has become a mainstay of the US criminal justice system. And while scholars increasingly self-identify as part of the growing fields of 'law and neuroscience' or 'law and the biosciences', to date only small-scale studies have been conducted on the use of neuroscience and behavioral genetics in the US criminal justice system. One recent study involved an empirical analysis of just those cases in which neuroimaging had been reported in a judicial opinion, with 23 analysed

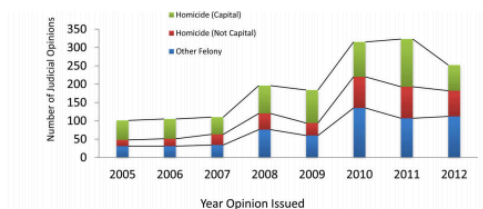
* Professor of Law, Professor of Philosophy, Professor of Genome Sciences & Policy, Duke University; BA, Dartmouth College; MA, JD, Ph.D., Duke University; ALM, Harvard University. Member, Presidential Commission for the study of bioethical issues.

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Graph 1. Judicial opinions discussing neurobiological introduced by criminal defendants 2005–12. (Homicide (capital) are murder cases in which the prosecutor sought the death penalty. Homicide (not capital) are some degree of homicide (murder, manslaughter) cases in which the death penalty was not at issue. Other felony cases are those in which the defendant was not charged with homicide.) © Author, 2016. This image/content is not covered by the terms of the Creative Commons licence of this publication. For permission to reuse, please contact the rights holder.

death penalty, or it was unavailable as a sentence in that jurisdiction). Defense attorneys are introducing neurobiological evidence across the board in serious felony cases, and not just in bifurcated capital sentencing hearings following a conviction of first-degree murder.

What started as about 100 judicial opinions per year discussing neurobiological evidence in criminal law in 2005 climbed to around 250–300 opinions in 2012. The quality and not just the quantity of opinions discussing neurobiological evidence has evolved. Opinions earlier in the study often discuss neurobiological evidence as part of a laundry list of other types of scientific evidence introduced. In later opinions, judges spilled substantial ink discussing the neurobiological evidence often in significant detail and with citations to scientific literature and the experts who testified in the case (see Graph 2). This suggests a shift in both the frequency and the nature of how such evidence is being evaluated by judges and juries in criminal cases.

2. Nature of the Offense When Neuroscience Introduced

One surprising result is how broadly neurobiological evidence is being by criminal defendants at trial. The popular mantra in academic circles is that the use of neurobiological evidence is primarily a phenomenon limited to capital cases, as mitigating evidence for sentencing. In the sample of opinions studied here, only about 40 per cent of the cases were capital, and a staggering 60 per cent of cases were other serious felony cases. Drilling down further by looking at the most serious crime a defendant was charged with in the sample, it becomes clear that across felony cases neurobiological evidence is being used as part of criminal defenses (see Graph 3).

In the 60 per cent of non-capital cases where neurobiological evidence is introduced, neurobiological evidence is also introduced in drug possession and trafficking cases, violent assaults, robbery, fraud, and more. Although this sample likely underrepresents the prevalence of neurobiological evidence used in criminal cases due to the

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Neuroscience and behavioral genetics in US criminal law: an empirical analysis

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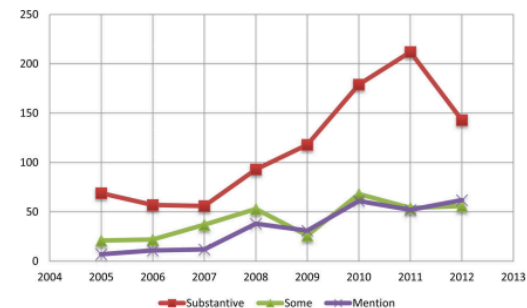
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1. INTRODUCTION

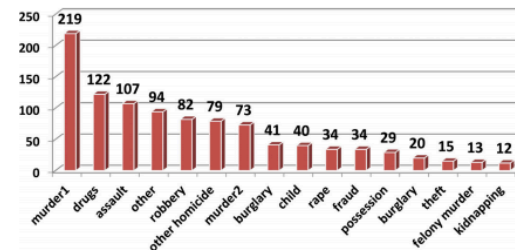
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Graph 2. Degree to which neurobiological evidence is discussed in Judicial opinion. (Mention is in a list of information. Some is less than one paragraph of the opinion. Substantive is one paragraph or more of the opinion discussing the neurobiological evidence introduced by a criminal defendant.) © Author, 2016. This image/content is not covered by the terms of the Creative Commons licence of this publication. For permission to reuse, please contact the rights holder.



Graph 3. Most serious offense charged with when neurobiological evidence raised in non-capital cases, 2005–12. An evaluation of the most serious criminal charge (per case) that the defendant was charged with to illustrate the range of felony cases impacted by neurobiological evidence. © Author, 2016. This image/content is not covered by the terms of the Creative Commons licence of this publication. For permission to reuse, please contact the rights holder.

methodological barriers discussed *supra*, a conservative estimate based on this sample alone is that neurobiological evidence is introduced in at least five to 6 per cent of murder trials in the USA, and 1–4 per cent of other felony offenses.¹⁷

¹⁷ Based on analysis of Bureau of Justice Statistics and FBI arrestee data from 2005–12.

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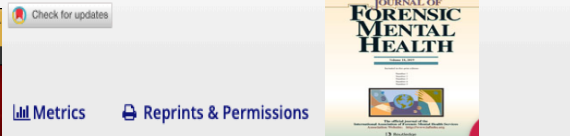
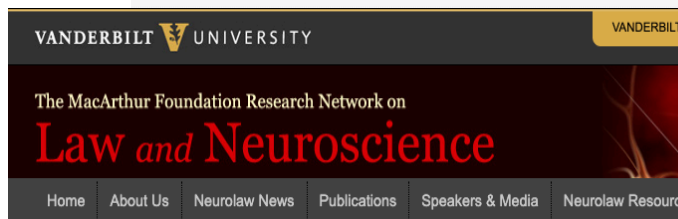
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Neurolaw in Latin America: Current Status and Challenges

Eric García-López, Ezequiel Mercurio, Alicia Nijdam-Jones, Luz Anyela Morales & Barry Rosenfeld

Published online: 09 Jan 2019



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Latin America Neurolaw

neurolaw in English-speaking countries, it is

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Latin America Neurolaw Publications

- Eric García-López, Ezequiel Mercurio, Alicia Nijdam-Jones, Luz Anyela Morales & Barry Rosenfeld, *Neurolaw in Latin America: Current Status and Challenges*, *International Journal of Forensic Mental Health*, DOI: 10.1080/14999013.2019.1581111

total, 61 publications were identified, with Colombia ($n = 12$). None of the published publications discussed complex topics such as criminal responsibility, free will, and neuroethics. The scant literature base and high concentration of publications emanating from three countries suggest that despite its growing impact abroad, more work is needed in this area in order to influence Latin America legislation and on the development of public policies. Future areas of research and policy related implications are discussed.

Keywords: Neurolaw, Latin America, neuroscience, criminal law

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García-López, E., Mercurio, E., Nijdam-Jones, A., Morales, L. A., & Rosenfeld, B. (2019). Neurolaw in latin america: Current status and challenges. *The International Journal of Forensic Mental Health*. Advance online publication. <https://doi.org/10.1080/14999013.2018.1552634>

Abstract

Despite several decades of growing interest in the concept of neurolaw in English-speaking countries, it is only a recent area of focus in Latin America. The objective of this article was to facilitate evidence-informed public policy by examining the current state of neurolaw in Latin America. To achieve this goal, this systematic review summarizes published articles, books, and book chapters, and discusses seminal legal cases in order to identify the current state of neurolaw in Spanish-speaking Latin American countries. In total, 61 publications were identified, with the majority coming from Mexico ($n = 17$), Argentina ($n = 15$), and Colombia ($n = 12$). None of the published work identified presented empirical research, but many publications discussed complex topics such as criminal responsibility, free will, and neuroethics. The scant literature base and high concentration of publications emanating from three countries suggest that despite its growing impact abroad, more work is needed in this area in order to influence Latin America legislation and on the development of public policies. Future areas of research and policy related implications are discussed.

INTERNATIONAL JOURNAL OF FORENSIC MENTAL HEALTH
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REVIEW ARTICLE

Neurolaw in Latin America: Current Status and Challenges

Eric García-López, Ezequiel Mercurio, Alicia Nijdam-Jones, Luz Anyela Morales, and Barry Rosenfeld

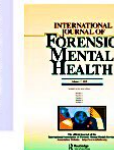
^aInstituto Nacional de Ciencias Penales (National Institute of Criminal Sciences), Mexico City, Mexico; ^bCentro Interdisciplinario de Investigaciones Forenses, National Academy of Sciences in Buenos Aires, Buenos Aires, Argentina; ^cPsychology, Fordham University, Bronx, New York, USA; ^dAutonomous University of Puebla, Puebla, Mexico

ABSTRACT

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KEYWORDS

Neurolaw, Latin America, neuroscience, criminal law



The relationship between black robes (law experts) and white coats (psychology experts) has a fascinating history (García-López, 2010) and is referred to in numerous historical texts, including the Hammurabi Code (1750 BCE), the Talmud Law (3rd century), Digesto (533 AD), the Fuero Juzgo (previously the *Forum Iudiciorum* or *Liber Iudiciorum*, 654 AD), HaiYuan Lu (1247), and the *Constitutio Criminalis Carolina* of 1532 (Esbac & García-López, 2016). As for the relationship between the law and neuroscience, there are several historical events that are of importance, including (according to Shen, 2016a) the first use of electroencephalography (EEG) in the courts in the mid-20th century, the use of psychosurgery for the prevention of violence in the 1960s and 1970s, and the development of neurolaw in the 1990s. These early neurolaw cases focused on the use of neuro-psychology and neurorehabilitation testimony as evidence in the personal injury litigation cases of people who suffered a cranio-cerebral trauma (Shen, 2016a; Taylor, Sherrod, & Anderson, 1991). Morse (2017) has noted that neuroethics and neurolaw have only recently become subjects of attention and

investigation, and there is an increasing possibility that neuroscientific research may be used to clarify and refine legal mental state categories (e.g., *mens rea* and mental disorder). Today, neurolaw is a growing interdisciplinary area that integrates neuroscience research on legal standards and practice (Goodenough & Tucker, 2010), uniting individuals from several disciplines, including social scientists, neuroscientists, lawyers, and philosophers (Vincent, Hall, & Kennett, 2013). However, the state of the field is still under construction, because—as Morse highlighted—Neurolaw could reach its aims if a “proper framework for the relevance of neuroscience to law is established and if a cautious approach to the science is adopted” (Morse, 2017, p. 40).

In recent years, the intersection of neuroscience and law has generated great interest all over the world (Spranger, 2012). Neuroscience in this context has been defined as the multidisciplinary scientific study of the brain that aims to understand the biological mechanisms and nervous system associated with mental activity and behavior (Albright, Jessell, Kandell, & Posner, 2000; Bloom, 2008; Kandell, 2013). The use of

CONTACT Eric García-López garcalopez@gnsc.com National Institute of Criminal Sciences, Street Magister 14000, Mexico City, Mexico.
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Neurolaw in Latin America: Current Status and Challenges

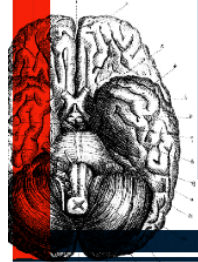
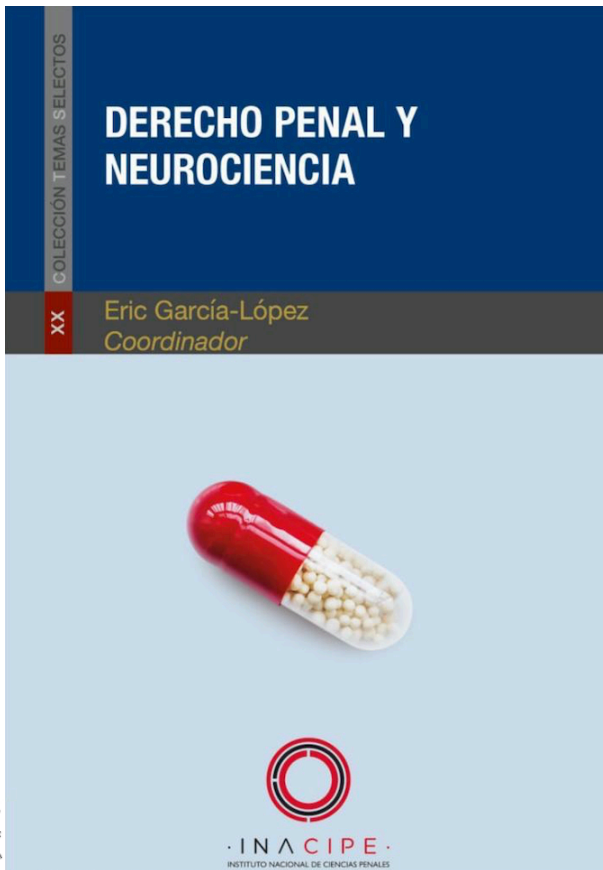
Eric García-López

Instituto Nacional de Ciencias Penales (National Institute of Criminal Sciences), Mexico City, Mexico



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Current Biology

Volume 24, Issue 18, 22 September 2014, Pages R861-R867



Essay

Promises, promises for neuroscience and law

Joshua W. Buckholtz^{1, 2, 3}, David L. Faigman^{4, 5, 6}

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Summary

Stunning technical advances in the ability to image the human brain have provoked excited speculation about the application of **neuroscience** to other fields. The ‘promise’ of neuroscience for law has been touted with particular enthusiasm. Here, we contend that this promise elides fundamental conceptual issues that limit the usefulness of neuroscience for law. Recommendations for overcoming these challenges are offered.

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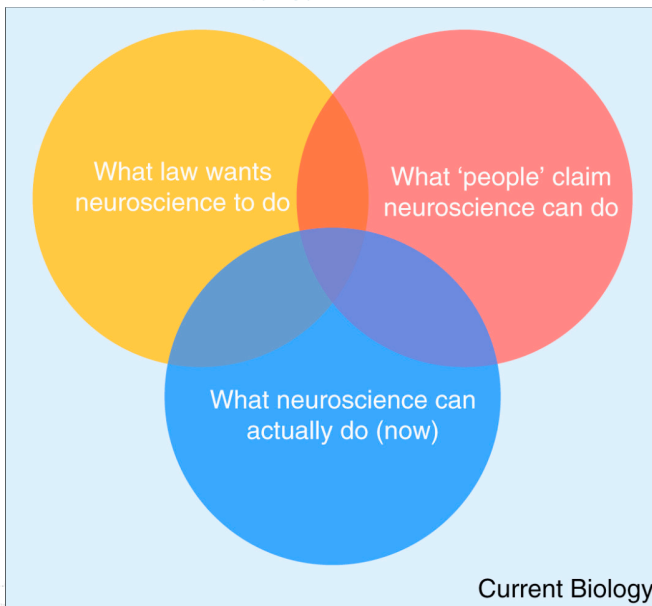
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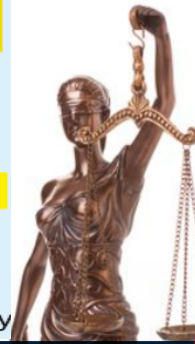
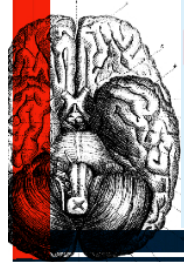
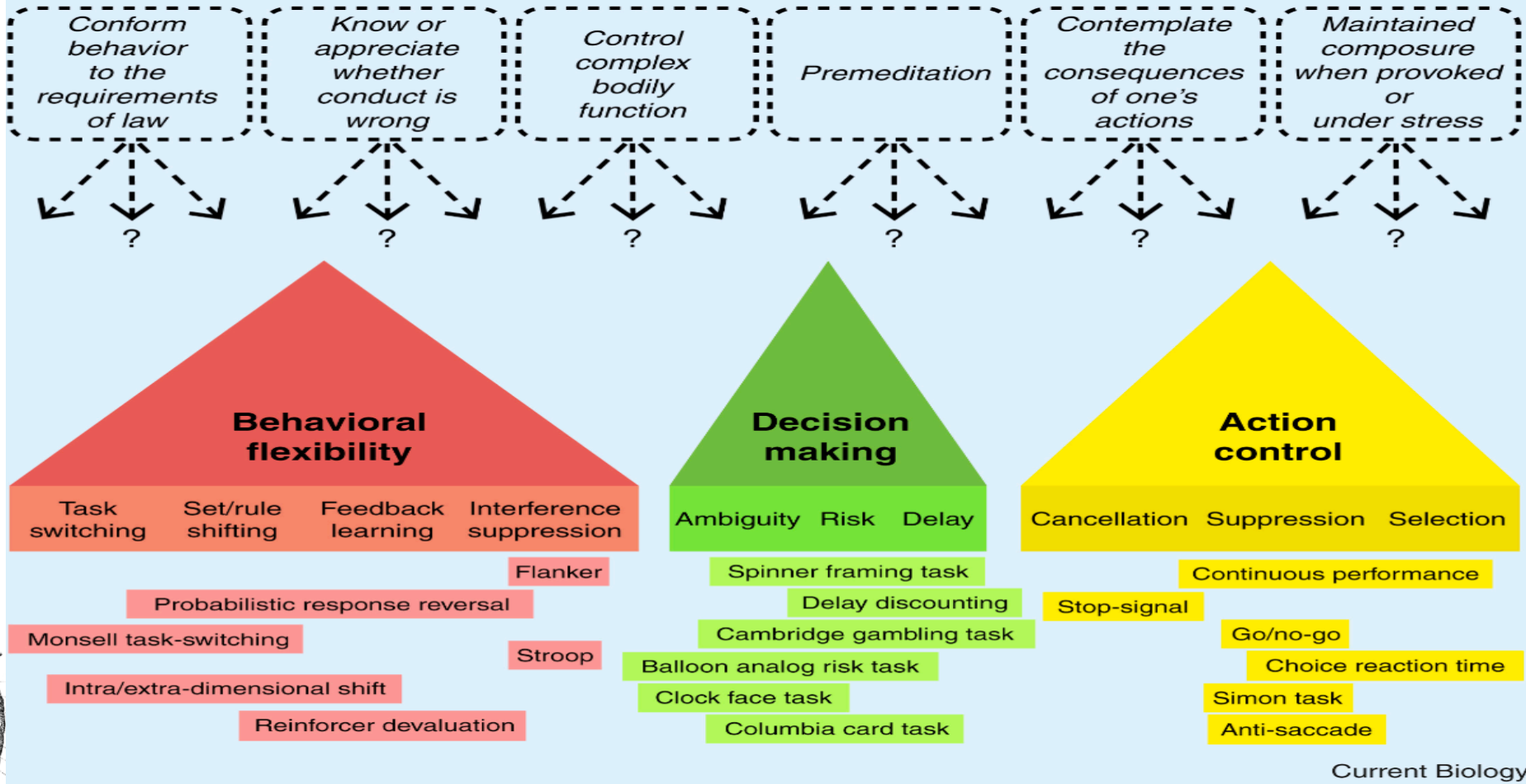
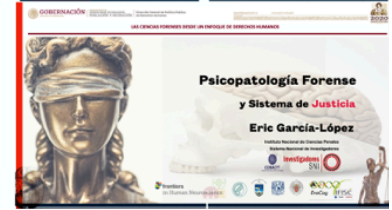
In 1991, using a combination of powerful magnets and “sewer pipe, wire, epoxy, and finger tapping,” a small number of research groups converged on the idea of capitalizing on the magnetic resonance properties of **gray matter** to image the active, thinking human brain — an approach now known as **functional magnetic**

Fuente: <https://www.sciencedirect.com/science/article/pii/S0960982214009208#fig4>



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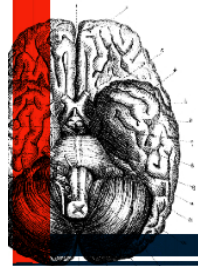
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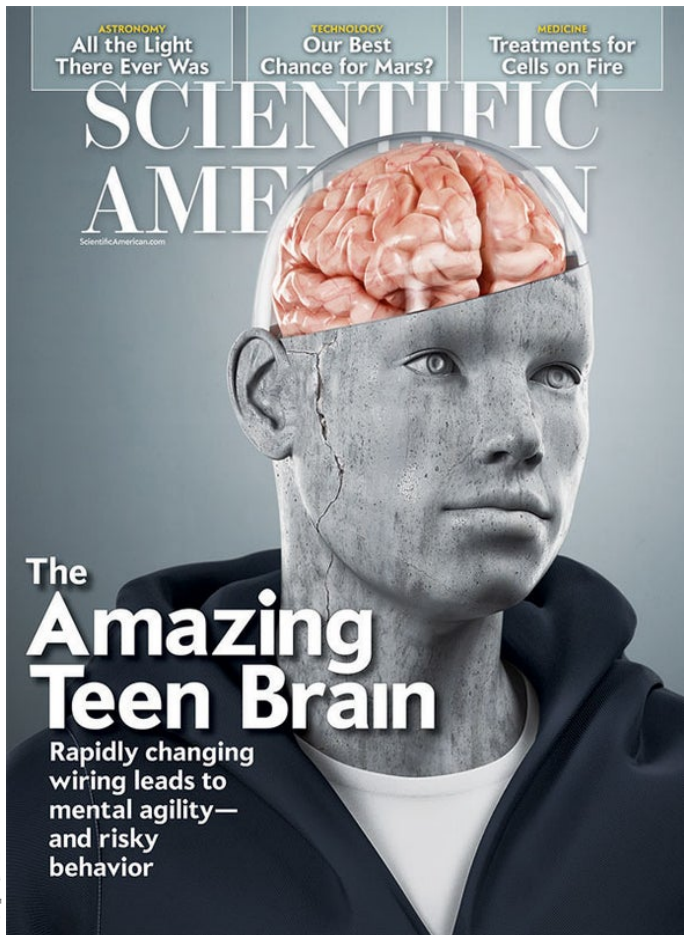


Fuente: The New York Times. Who Will Judge the Judge. Angie Wang



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NATURE | NEWS FEATURE

Science in court: Arrested development

Neuroscience shows that the adolescent brain is still developing. The question is whether that should influence the sentencing of juveniles.

Lizzie Buchen

18 April 2012

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Science and Society

The influence of neuroscience on US Supreme Court decisions about adolescents' criminal culpability

Laurence Steinberg

Nature Reviews Neuroscience 14, 513–518

(2013)

doi:10.1038/nrn3509

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Published online: 12 June 2013

Abstract

In the past 8 years, the US Supreme Court has issued landmark opinions in three cases that involved the criminal culpability of juveniles. In the most recent case, in 2012, a ruling prohibited states from mandating life without parole for crimes committed by minors. In these cases, the Court drew on scientific studies of the adolescent brain in concluding that adolescents, by virtue of their inherent psychological and neurobiological immaturity, are not as responsible for their behaviour

Figure 1: The age-crime curve.

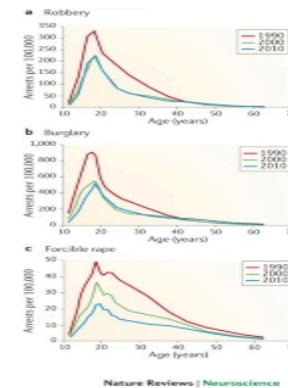
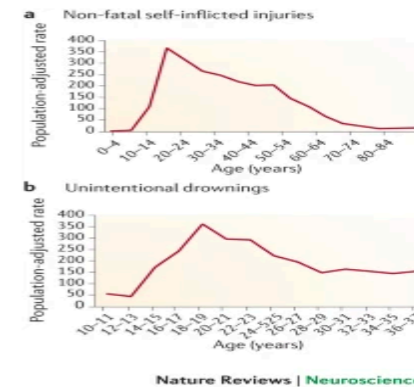


Figure 2: Age and risk-taking.



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Figure 3: Sensation-seeking and impulse control.

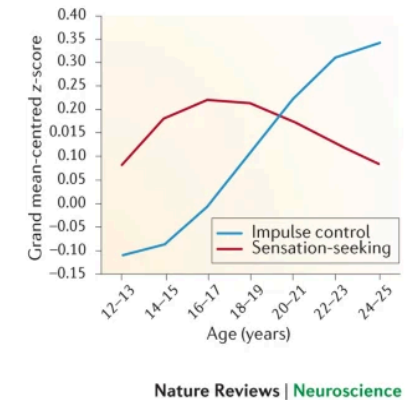
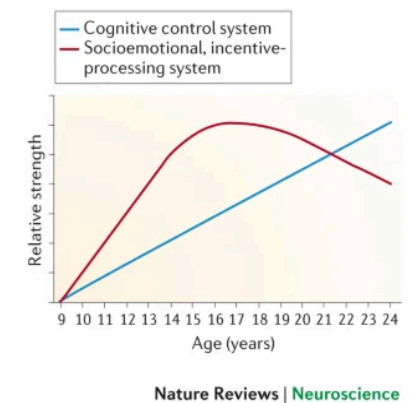


Figure 4: The dual systems model.



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Table 1 | The US Supreme Court's rationale in several cases concerning adolescents' criminal culpability

Case	Year decided	Ruling	Rationale	Refs
<i>Thompson v. Oklahoma</i>	1988	Capital punishment is found unconstitutional for individuals under the age of 16 years	"Contemporary standards of decency confirm our judgment that such a young person is not capable of acting with the degree of culpability that can justify the ultimate penalty."	8
<i>Roper v. Simmons</i>	2005	Capital punishment is found unconstitutional for individuals under the age of 18 years	"As any parent knows and as the scientific and sociological studies... tend to confirm, [a] lack of maturity and an underdeveloped sense of responsibility are found in youth more often than in adults and are more understandable among the young."	3
<i>Graham v. Florida</i>	2010	Life without parole is found unconstitutional for individuals under the age of 18 years convicted of crimes other than homicide	"No recent data provide reason to reconsider the Court's observations in <i>Roper</i> about the nature of juveniles... Developments in psychology and brain science continue to show fundamental differences between juvenile and adult minds. For example, parts of the brain involved in behaviour control continue to mature through late adolescence."	4
<i>Miller v. Alabama</i>	2012	States may not mandate life without parole for individuals under the age of 18 years, even in cases of homicide	"The evidence presented to us... indicates that the science and social science supporting <i>Roper</i> 's and <i>Graham</i> 's conclusions have become even stronger... It is increasingly clear that adolescent brains are not yet fully mature in regions and systems related to higher-order executive functions such as impulse control, planning ahead, and risk avoidance."	2

The legal issues

The central legal issue in *Roper*, *Graham* and *Miller* was whether the application of a particularly harsh sentence to a juvenile — such as the death penalty or life without the possibility of parole — violates the Eighth Amendment of the US Constitution, which prohibits "cruel and unusual" punishment, even if the same sentence is not a constitutional violation when applied to an adult.

How can it be that a punishment is cruel when applied to a juvenile but not when applied to an adult? The answer is found in what is referred to as a 'proportionality analysis', in which a punishment is considered cruel if it is judged to be excessive given the nature and circumstances of the crime. According to a core principle of the

American justice system known as 'penal proportionality', fair criminal punishment is based not only on the harm caused by the crime but also on the blameworthiness of the perpetrator¹. To take an extreme example, imagine that an individual drops a stone from an overpass and that the stone shatters the windshield of a car, causing the driver to lose control, crash and suffer a severe injury. Now consider the individual's age in deciding how he or she ought to be punished.

Few of us would conclude that an 8-year-old and a 26-year-old should be held equally responsible for this act, and few would think it fair to punish an 8-year-old child to the same degree that we might punish a young adult, despite the fact that the crime and the resultant harm are the same in each case. A proportionality analysis would probably conclude that a severe punishment for a young adult who committed such an act of reckless endangerment might be entirely appropriate but that the same sanction would be disproportionate and excessive — in the language of the Eighth Amendment, "cruel" — when applied to a young child.

At issue in the three Supreme Court cases (*Roper*, *Graham* and *Miller*) — which involved juveniles (all male) who ranged in age from 14 to 17 years — was whether an adolescent's developmental immaturity mitigates his blameworthiness to the extent that the punishment in question is disproportionate and, as such, a violation of the Eighth Amendment. The question in these cases was not whether a juvenile's criminal act should be completely excused because of immaturity — normally developing individuals are assumed to be capable of forming criminal intent by the age of 7 years. Rather,

the issue before the Court was whether the sentence the juvenile received was excessive relative to the degree of responsibility he had for his behaviour. It is easy to see why these cases were controversial: the distinction between 8-year-olds and fully mature adults with respect to their judgement, capacity to imagine the consequences of their actions and ability to control themselves is obvious, but the difference between adolescents and adults is not so clear-cut.

Before *Roper*, the Court had relied on common sense and other laws regarding adolescents' behaviour to draw legal boundaries between adolescents and adults for the purpose of determining criminal blameworthiness and had set the dividing line between the ages of 15 and 16 years, at least with respect to eligibility for the death penalty. Two rulings laid much of the legal groundwork for *Roper* and the cases that followed. The first was *Thompson v. Oklahoma*⁸ (from here on referred to as *Thompson*) (TABLE 1), a 1988 case that prohibited capital punishment in cases involving individuals younger than 16 years of age. The second was *Atkins v. Virginia*⁹ (from here on referred to as *Atkins*), a 2002 case in which the Court found the imposition of capital punishment on individuals with mental retardation to be unconstitutional on the grounds that even if a person knows the difference between right and wrong, mental retardation compromises their decision-making in ways that make them less than fully responsible for their conduct.

Although the ultimate conclusion that was reached in *Roper* was not logically different from the conclusions reached in *Thompson* or *Atkins*, *Roper* was important because here, unlike in the prior cases, the Court grounded

its reasoning in developmental science and not just in common sense. In *Graham* and *Miller*, which built on *Roper*, the Court similarly looked to developmental science for guidance. This was partly because much more relevant science was available in 2010 than had been available in 1989 (the last time the Court had considered the death penalty for a juvenile), and partly because advocates for the abolition of the death penalty for juveniles made a concerted effort to bring the relevant research to the Court's attention through the numerous *amicus curiae* briefs that were filed. Of note, in *Stanford v. Kentucky*¹⁰, a case decided a year after the *Thompson* decision, the Court ruled that setting the minimum age for death penalty eligibility at 16 years of age was consistent with "evolving standards of decency" by virtue of the large number of states that permitted capital punishment for 16- and 17-year-olds. Thus, by abolishing the death penalty for juveniles, *Roper* actually overturned a prior ruling on the matter.

These cases raised another important issue concerning adolescent development, although neuroscience did not have a significant role in the Court's analysis of this second issue. This issue was whether the punishments in question should be categorically prohibited for all adolescents or considered on a case-by-case basis depending on individual assessments of a defendant's maturity. (Arguably, this was really the central question in these cases.) Some dissenting justices argued that although most adolescents were likely to be less mature than adults and therefore both less culpable and more amenable to rehabilitation, surely not all of them were. Should judges and juries therefore not have the option of identifying individuals for whom capital punishment or life without parole was an appropriate sanction? In *Roper* and *Graham*, the Court's answer was 'no'; in *Miller*, it left open the possibility of a life sentence without parole for a juvenile but barred states from making this a mandatory sentence and noted that its imposition would probably be uncommon.

How did behavioural and brain science influence the Court's analysis of whether the developmental immaturity of adolescents is sufficient to diminish their criminal responsibility? Writing for the Court's majority in *Roper*, Justice Kennedy explicated three characteristics of adolescents that distinguish them from adults in ways that mitigate their culpability¹¹. First, citing evidence of adolescents' over-involvement in reckless behaviour, Justice Kennedy concluded that adolescents are characterized by immaturity and an underdeveloped sense

of responsibility, which leads them to make impetuous and ill-considered decisions. Second, he noted that adolescents are more susceptible than adults to external influences, especially peer pressure, which makes it difficult for them to extricate themselves from "criminogenic" situations. Last, referencing theories of identity development, Justice Kennedy wrote that the personality traits of adolescents are less fixed than they are in adults and that this makes it difficult to infer that even heinous criminal behaviour during adolescence is evidence of an "irretrievably depraved" character and stressed the fact that adolescents are better candidates for rehabilitation. In response to arguments that the death penalty serves a deterrent function, Justice Kennedy argued that the same characteristics that diminish adolescents' blameworthiness make it less likely that people this age will be deterred by the possibility of capital punishment: individuals who commit crimes impulsively do not pause to consider the consequences they might face if they were to be arrested and convicted.

Graham and *Miller* extended the logic of *Roper* to non-capital cases. In both cases, the Court's majority opinion explicitly referenced the arguments made in *Roper*. It argued that the scientific evidence in support of Justice Kennedy's characterization of adolescents had become stronger over the ensuing years and, importantly, that there was growing neuroscientific evidence that patterns of brain development supported the conclusions drawn from psychological studies. This evidence is summarized below.

Brain and behavioural development

In general, adolescents and individuals in their early 20s are more likely than either children or somewhat older adults to engage in risky behaviour; most forms of risk-taking follow an inverted U-shaped curve with age, increasing between childhood and adolescence, peaking in either mid- or late adolescence (the peak age varies depending on the specific type of risky activity) and declining thereafter. Involvement in violent and non-violent crime also follows this pattern¹² and is referred to as the age-crime curve (FIG. 1). As FIG. 1 illustrates, although the overall crime rate in the United States dropped between 1990 and 2010, the relationship between age and crime remained the same and was virtually identical across three very different types of offences (robbery, burglary and rape).

From a psychological perspective, it is useful to view adolescents' involvement in criminal activity as a specific instance of risk-taking more generally, both because patterns of age

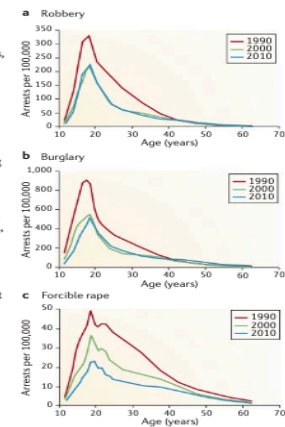


Figure 1 | The age-crime curve. Federal Bureau of Investigation data on crime in the United States show a consistent relationship between age and crime, which is referred to as the age-crime curve. Despite a drop in the overall crime rate between 1990 and 2010, the shape of the curve is the same and is similar across different types of offence, including robbery (a), burglary (b) and forcible rape (c). Data from Bureau of Justice Statistics

differences in criminal activity are similar to those of many other types of risky behaviour¹³ — including those that have nothing to do with crime, such as self-inflicted injury or accidental drowning (FIG. 2) — and because many of the hallmarks of juvenile offending are similar to those that characterize adolescent recklessness more generally. Most juvenile crimes, like most forms of adolescent risk-taking, are impulsive acts that are committed without full consideration of their possible long-term consequences.

In recent years, several psychologists have theorized that the relationship between age and risk-taking is best understood by considering the developmental trajectories of sensation-seeking and impulse control¹⁴.



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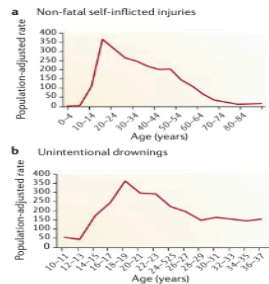


Figure 2 | Age and risk-taking. The relationship between age and many types of risk-taking is similar to that between age and crime. Risky behaviour, including non-fatal self-inflicted injuries (a) and unintentional drownings (b), increases between childhood and adolescence, peaks sometime in mid- or late adolescence and declines during the 20s. Data from the Web-based Injury Statistics Query and Reporting System (WISQARS).

Sensation-seeking — the tendency to pursue novel, exciting and rewarding experiences — increases substantially around the time of puberty and remains high well into the early 20s, when it begins to decline. Impulse control is low during childhood and improves gradually over the course of adolescence and early adulthood. Mid-adolescence, therefore, is a time of high sensation-seeking but still developing impulse control — a combination that predisposes individuals towards risky behaviour. Before adolescence, individuals are typically impulsive, but they are not especially prone towards sensation-seeking. In young adulthood, sensation-seeking is still relatively high, but by then, individuals have developed a more mature level of impulse control (FIG. 3).

Scientific data in support of this account formed part of the basis for Justice Kennedy's characterization of adolescents in the *Roper* decision, and research findings that were consistent with this perspective had become even more extensive by the time *Graham* and *Miller* were argued. Numerous self-report and behavioural studies showed that, compared with adults, adolescents are more impulsive, less likely to consider the future consequences of their actions, more likely to engage in sensation-seeking and more likely to attend to

the potential rewards of a risky decision than to the potential costs¹⁴. Other studies provided support for the contention that adolescents are indeed more vulnerable to coercive pressure than adults¹⁵ and that the presence of peers increases risky decision-making among adolescents but not older individuals¹⁶. The evidence with respect to the relatively unformed character of adolescents was more limited, although numerous reviews had been published showing that more than 90% of all juvenile offenders desist from crime by their mid-20s¹⁷ and that the prediction of future violence from adolescent criminal behaviour, even serious criminal behaviour, is unreliable and prone to error¹⁸.

Over the period that spans *Roper*, *Graham* and *Miller*, the amici who assembled and summarized the scientific evidence showing differences between adolescents and adults in psychological capabilities and capacities that are relevant to judgements of blameworthiness¹⁹ incorporated more and more neuroscience into their briefs, as evidence of significant structural and functional brain maturation during adolescence began to accumulate²⁰. Scientific organizations differed somewhat in the extent to which they made neuroscience a central part of their briefs, with some organizations, such as the American Medical Association, putting neuroscience at the forefront, whereas others, such as the American Psychological Association, using neuroscience mainly to supplement an argument that was primarily grounded in behavioural evidence.

Regardless of whether the neuroscience had a leading or supporting role, the relevant evidence that was brought to the Court's attention in the *amicus curiae* briefs described a maturational imbalance during adolescence that is characterized by relative immaturity in brain systems that are involved in self-regulation during a time of relatively heightened neural responsiveness to appetitive, emotional and social stimuli²¹. With respect to self-regulation, structural imaging studies using diffusion tensor imaging indicate immaturity in connections within a fronto-parietal-striatal brain system (localized primarily in the lateral prefrontal cortex, inferior parietal lobe and anterior cingulate cortex) that supports various aspects of executive function^{22–24}. These connections become stronger over the course of adolescence as a result of both maturation and experience, and the strength of these connections is positively correlated with impulse control²⁵. Maturation of structural connectivity in this brain system is paralleled by increases in functional connectivity²⁶ and by changes in patterns of activation during tasks that measure working memory, planning and

response inhibition (all of which are important for impulse control and thinking ahead), as revealed by functional MRI (fMRI)^{27,28}.

By contrast, numerous fMRI studies show relatively greater neural activity during adolescence than in childhood or adulthood in a brain system that is located mainly in the ventral striatum and ventromedial prefrontal cortex. This system is known to have an important role in the processing of emotional and social information and in the valuation and prediction of reward and punishment^{29,30}. According to what has been referred to as a 'dual systems model'³¹ (FIG. 4), the heightened responsiveness of this socioemotional, incentive-processing system is thought to overwhelm or, at the very least, tax the capacities of the self-regulatory system, compromising adolescents' abilities to temper strong positive and negative emotions and inclining them towards sensation-seeking, risk-taking and impulsive antisocial acts^{32,33}. Although it is less well developed, a growing literature on the development of the 'social brain', which was presented to the Court in *Miller*, provides evidence of functional changes that are consistent with heightened attention to the thoughts of others, which may be linked to adolescents' greater susceptibility to peer influence³⁴. Although the dual systems model has recently been criticized as an oversimplification that ignores occasional inconsistencies in the literature^{35,36}, it was, and continues to be, a useful heuristic that conveys to non-scientists the basic story of adolescent brain development in a fashion that helps to explain many important differences between juveniles and adults that are relevant to our treatment of young people under the law.

Was neuroscience important?

Because the Supreme Court justices' deliberations are never made public, it is impossible to know just how much neuroscience findings influenced the Court's decision-making above and beyond the impact of the behavioural evidence. Nevertheless, a close reading of the transcripts of the oral arguments and opinions makes it clear that the attorneys and justices involved in these cases certainly paid attention to the neuroscience. At times they even insinuated that it was somehow more compelling than the behavioural evidence (as one attorney stated during oral arguments in *Roper*, "I'm not just talking about social science here, but the important neurobiological science"), that it was the fundamental driver of the development of maturity ("as the years go by and neurological development

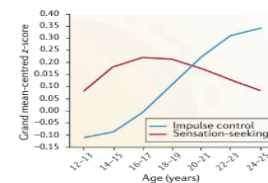


Figure 3 | Sensation-seeking and impulse control. The different developmental trajectories of self-reported sensation-seeking and impulse control³⁷ based on an analysis of data from National Longitudinal Study of Youth (NLSY79) Children and Young Adults (CNLSY), a longitudinal, nationally representative survey of over 7,000 American children and young adults ranging in age from 12 to 24 years (see National Longitudinal Surveys)³⁸.

occurs, [adolescents'] deficiencies will be reformed"³⁷ or, at the very least, that neuroscience added validity to an argument that was based solely on common sense and developmental psychology.

For better or worse, neuroscience may have played a part in persuading the justices that the psychological differences between adolescents and adults as described in *Roper* were genuine and indisputable. Over the course of the three cases, there was a decrease in the amount of time during oral arguments that was devoted to discussions of where to draw the legal line between adolescents and adults. Indeed, this issue occupied a fair amount of discussion in *Roper* but was barely raised 7 years later in *Miller*. In addition, a review of the dissenting opinions in each case shows that the justices who voted with the minority clearly moved from a position of some scepticism about whether adolescents were inherently different from adults to one in which the matter was no longer even contested. For example, in his dissenting opinion in *Roper*, Justice Scalia pointed out that the American Psychological Association, whose *amicus curiae* brief characterized adolescents as too immature to be exposed to capital punishment, had taken the stance 15 years earlier, in *Hodgson v. Minnesota*³⁷, that adolescents should be able to obtain abortions without parental involvement on the grounds that psychological research showed that adolescents were just as mature as adults. The implication of this was that the developmental immaturity argument advanced by social scientists in *Roper* was

just a convenient fabrication concocted by soft-hearted child psychologists to suit their political aims.

By the time *Miller* was decided, things had clearly changed. In his dissenting opinion, Chief Justice Roberts noted that "[*Roper* and *Graham*] undoubtedly stand for the proposition that teenagers are less mature, less responsible, and less fixed in their ways than adults — not that a Supreme Court case was needed to establish that." (REF. 2) We do not know whether the Court's ultimate acceptance of this characterization of adolescents was influenced by neuroscience. Nevertheless, there is a good chance that it was, as the only substantive change in the argument that adolescents are less mature than adults that had taken place between *Roper* and *Miller* involved an increased reliance on neuroscience. The period between these two cases was also characterized by growing coverage of research on adolescent brain development in the popular media.

Was neuroscience appropriate?

Whether neuroscience should have influenced the justices' reasoning is a different question. Certainly, neuroscientific evidence does not make the behavioural differences between adolescents and adults any more real. It only makes them seem more real to non-scientists who view psychological research on children as little more than the confirmation of what 'any parent knows' and who, like most of us, are more easily impressed by science we do not understand well enough to critique than by science that has more familiar methods. Several studies, including a recent one in which judges were the subjects, showed that adding just one or two sentences referring to the brain to a description of behavioural findings makes the behavioural findings that much more compelling³⁹. A cynical reader may conclude that the introduction of the neuroscience of adolescence into the Supreme Court's deliberations about the juvenile death penalty or juvenile life without parole did little more than exploit the scientific ignorance of laypersons. However, I think it did more than this.

The contribution of neuroscience to discussions of adolescent blameworthiness lies not in what neuroscience tells us about differences in the ways in which adolescents and adults act but in what it implies about the source of these differences⁴⁰. For example, findings of structural and functional differences between adolescent and adult brains that are plausibly linked to differences in individuals' ability to control their impulses and to stand up to peer pressure suggest that

these aspects of adolescent immaturity are not merely reflective of juveniles' poor choices or different values but that they are at least partly due to factors that are not entirely under an individual's control, which makes immaturity a more convincing mitigator. Identifying the neural underpinnings of age differences in legally relevant capabilities and capacities does not indicate that these differences are immutable (indeed, adolescence is thought to be a time of heightened neuroplasticity). However, to the extent that brain maturation during adolescence follows a specific and predictable pattern that is consistent with predictable patterns of behavioural changes, the neuroscientific evidence bolsters the basic argument that adolescents are inherently less mature than adults. Moreover, the knowledge that individuals will almost always become more deliberate and self-possessed as they gain experience and as their brains mature, without any special interventions designed to facilitate this process, adds strength to the argument that adolescent offending is unlikely to reflect irreparable depravity. This last point is important, because it provides justification for distinguishing between adolescence, whose immaturity is by definition transient, and fully developed but callow adults, whose immaturity undoubtedly also has neural correlates but is more likely to be an enduring part of their character.

Conclusions and future directions

By all indications, the influence of neuroscience on legal decision-making is growing rapidly, and references to adolescent brain development are appearing regularly in lower court decisions. As scientists, we should welcome the use of scientific evidence in important legal deliberations. However, I believe that in discussions of where we should draw legal boundaries between adolescents and adults, neuroscience should continue to have a supporting role, and behavioural science should continue to carry the weight of the argument. Ultimately, the law is concerned with how we behave and not with how our brains function. As a concrete example, it makes far more sense to rely on a driving test than on a brain scan to decide whether someone should be issued a driver's licence.

Further neuroscientific research on three specific issues would be especially helpful in future discussions of adolescents' criminal responsibility. First, as critics of the use of neuroscience in these court cases have pointed out, few studies have linked changes in brain structure or function between adolescence and adulthood to changes in the legally relevant behaviours, especially as they



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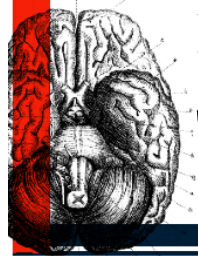
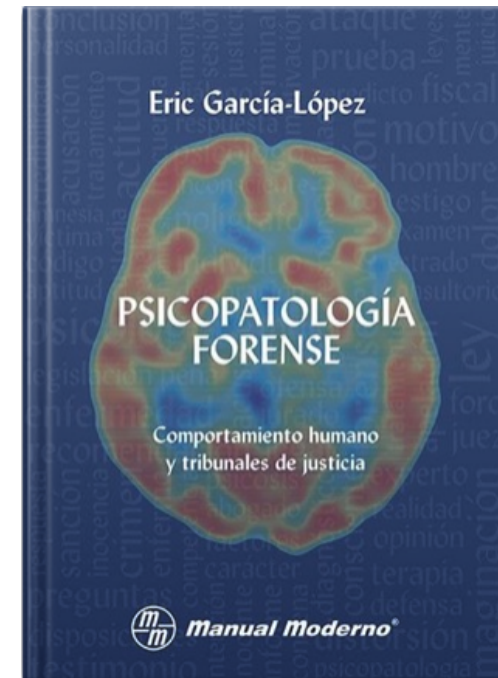
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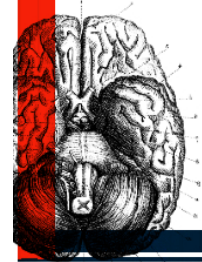
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Maestría en Psicopatología Forense y Sistema de Justicia

Eric García-López
Coordinador del Comité Académico Especializado para la creación del Plan de Estudios



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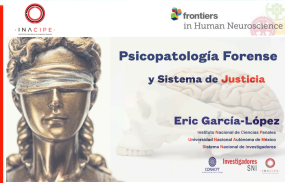


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Convocatoria de ingreso a los estudios de Doctorado en Neuroderecho y Psicopatología Forense

1ª Generación



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El Instituto Nacional de Ciencias Penales y el Instituto Nacional de Neurología y Neurocirugía

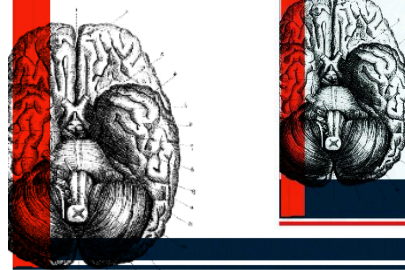
CONVOCAN

A las personas interesadas en realizar los estudios de Doctorado en Neuroderecho y Psicopatología Forense, 1ª generación, a registrarse como aspirantes al PROCESO DE SELECCIÓN, dentro de los plazos y horarios establecidos en la presente convocatoria.

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- 2.- Neurociencia y estándares de prueba judicial
- 3.- Desarrollo cerebral y Sistema Integral de Justicia para Adolescentes
- 4.- Psicopatología Forense
- 5.- Neurobiología de las emociones y Justicia Restaurativa
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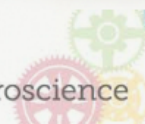


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