

DISEASE OR DECISION? HOW DIFFERENT VIEWS TOWARDS ADDICTION CAN AFFECT LEGAL RESPONSIBILITY

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The debate over how addiction should be conceptualised is long-standing and contentious, particularly between the brain disease model and the choice model of addiction (Goldberg, 2020). As the names suggest, the brain disease model highlights how chronic brain changes from prolonged drug use lead to behavioural issues like impaired self-control (Leshner, 1997; Volkow et al., 2016), while the choice model emphasises voluntary control over drug use and recovery through motivation (Heyman, 2009). Although many models exist beyond these two (West, 2013), the brain disease versus choice model debate remains a focal point in addiction discussions, especially in legal contexts. I do not intend to quarrel further over these two models but rather wish to address the consequences of this debate on the field of legal decision-making. If addiction is best classified as a brain disease leading to uncontrollable craving and other mental impairments, should an addicted defendant be held accountable for their addiction-driven crimes? Conversely, if we contend that (at least some) addicted individuals can control their substance use and recover with or even without treatment, should they not be considered to be in control of their criminal behaviour, too? Clearly, these statements are overdrawn in the sense that reality is likely somewhere in the middle, but it is to be expected that different models can fuel different perceptions of criminal responsibility: societally, and thereby also affecting legal professionals.

Hence, regardless of which model ought to prevail, different conceptualisations will influence courtroom decisions. Bearing this in mind, this chapter has two main objectives. First, it presents the results of an experimental vignette study exploring how two models of addiction (brain disease model and choice model) affect public prosecutors' views on criminal responsibility and recidivism risk in cases involving violent and property offences. The study uses hypothetical cases where the defendant's addiction is framed differently, along with varying offence types. Importantly, criminal responsibility is used here as an umbrella

term containing the lack of any excuses (such as an insanity defence) as well as matters of sentencing. As the context is that of Dutch criminal law, the Dutch equivalent of the insanity defence is used throughout, which is referred to as the non-accountability excuse. Moreover, the Netherlands also accommodates a generalised diminished accountability possibility, which is a widely accepted reason for sentencing mitigation. I refer to other authors who have provided more details on this excuse as well as a comparative overview relating the requirements to other jurisdictions (Meynen, 2016).

A second aim is to examine the outcomes of this study in a broader societal context. In the discussion, I address how societal perspectives, such as the stigma surrounding substance disorders (Room et al., 2001), may shape legal decisions. This research indeed suggests that perceptions of prior fault under the choice model could lead to harsher judgments, while vice versa, framing addiction as a voluntary decision in the legal context may reinforce societal stigma. By exploring the interaction between societal views and legal outcomes, this study contributes to understanding the responsibility of addicted offenders and the broader implications for legal and societal perceptions. As I will argue, my empirical research on addicted defendants exposes the implicit effects of preconceived notions on legal decision-making, thereby advancing the notion of a 'jurisprudence of consequences' (Miller, 1965).

All in all, the central research question addressed in this chapter is the following: How do different conceptualisations of addiction influence the perception of public prosecutors regarding the criminal responsibility and recidivism risk of an addicted offender, and how are such legal decisions shaped by societal perspectives? To answer this question, I first provide the analytical framework to understand and operationalise the concepts central to this study. I then outline the experimental research design used – a vignette study – and continue by addressing the key results thereof. In the discussion that follows, I reflect on the implications of these findings as well as on the implications for the interaction between law and society.

2 ANALYTICAL FRAMEWORK

Although comparing the effects of a brain disease with a choice model perspective of addiction on responsibility assessments is novel, previous studies have explored the impact of neuroscientific information on criminal responsibility. Initially, it was widely hypothesised that neuroscientific evidence would lead to more lenient responsibility judgments (Bennett, 2016), and with the increase of neuroscience in courtrooms (Catley & Claydon, 2015; De Kogel & Westgeest, 2015; Farahany, 2015), many researchers have tested this hypothesis. It was shown that the effects of neuroscientific evidence are not only exculpatory but that they also lead to a higher level of perceived dangerousness of the defendant (Barth,

2007), likely because biological factors are considered ‘fixed’ or unchangeable. This phenomenon, known as the ‘double-edged sword’ (Aspinwall et al., 2012), suggests that highlighting physiological or neurological causes may lead to a perception of behaviour as being beyond individual control, thus reducing perceived personal responsibility (Allen et al., 2019).

Other studies have also explored the ‘double-edged sword’ concept (Aspinwall et al., 2012; Denno, 2015) and suggest that the impact of neuroscience on responsibility assessments is more complex than simply reducing blame. The following well-known studies illustrate these differences in findings. Greene and Cahill (2012) investigated the role of brain scans in capital punishment decisions. In this experiment, 259 psychology students read vignettes that varied in terms of the defendant’s perceived dangerousness (low versus high) and the type of diagnostic evidence presented (diagnosis only, diagnosis plus neuropsychological results, or diagnosis with both neuropsychological and neuroimaging evidence). Participants were asked to recommend a sentence – either a death sentence or life imprisonment without parole – after the defendant was found guilty. The results showed that neuropsychological tests and imaging reduced the likelihood of a death sentence, but this effect occurred only for defendants considered high risk for future dangerousness (Greene & Cahill, 2012). In addition, Gurley and Marcus (2008) examined the likelihood of acquittal under a ‘not guilty by reason of insanity’ (NGRI) defence. Using vignettes featuring psychosis or psychopathy diagnoses and varying the inclusion of MRI evidence, they studied 396 psychology undergraduates. Participants received jury instructions on the insanity standard and a court-ordered expert’s statement. The presence of neuroimages significantly increased NGRI verdicts, with jurors more likely to acquit if an MRI (magnetic resonance imaging) showing a brain lesion was presented. Psychotic defendants also received more NGRI verdicts than psychopathic ones, suggesting public perception of disorders influences judgments. This is relevant to addiction cases, as the addiction debate elicits diverse views on the nature of addiction.

In this vein, Sinclair-House et al. (2019) examined how neuroscientific insights regarding addiction influence sentencing. Using vignettes, they compared defendants addicted to heroin with those suffering from a fictional neuropsychiatric illness. Despite equal impairments in capacities and equal focus on the neuroscientific consequences of the disorder, prison sentences were not reduced for the addicted defendant compared to the defendant with the fictional disorder. This was attributed to the role of prior fault (i.e. anterior culpable behaviour) in the acquisition of the addiction. Subsequent research supports this view, suggesting substance abuse is often seen as a prior fault, assigning blame regardless of specific culpable actions (Goldberg, 2022; Goldberg et al., 2021).

These studies represent only a small proportion of research using vignettes to examine the effects of neuroscience. Other studies that used such designs found outcomes ranging from lower sentences (Allen et al., 2019; Aspinwall et al., 2012)

to longer involuntary hospitalisation (Allen et al., 2019) and effects on perceptions of legal responsibility (Fuss et al., 2015). An excellent overview of different studies and effects has been provided by Aono et al. (2019). While results are mixed, the general trend of mitigating effects from neuroscientific information also informs the hypothesis of this study: vignettes framing addiction as a brain disease will lower perceived accountability and suggested sentences but increase perceived recidivism risk, reflecting the ‘double-edged sword’ phenomenon.

Besides the design varying on addiction explanation, I also manipulated offence type, resulting in a violent and a property crime version of the vignette. Two different offences were included to assess whether the hypothesised neuroscientific effects on responsibility are only relevant in certain types of offences. Both property crimes and violent offences have links with addiction and substance use. In simplified terms, property crimes may have an *instrumental* connection to substance abuse, as it can provide the necessary funds to sustain a drug habit (Hoaken & Stewart, 2003). Conversely, the link between violent offences and addiction is often more *reactive*. This relationship can, for instance, be explained by some negative effects of craving (irritability) which could create an aggressive response from the offender after a non-violent encounter with the victim. But not only as a result of craving: potential damage to the prefrontal cortex as a consequence of prolonged substance use may cause problems with inhibition and thus aggressive outbursts (Volkow et al., 2016). Perhaps the violent nature of the offence may amplify neuroscience’s mitigating effects, as such crimes are often linked to a loss of control. If and when impaired volitional capacities are central to the offence (e.g. in violent crimes), neuroscientific evidence reducing responsibility for this impairment may have a greater impact than for offences where such impairment is less apparent (e.g. in property crimes).

Because both types of crime can be related to addiction (Bronson et al., 2017; Goldstein, 1985), albeit in different ways, and the vignette clearly explicates this relationship in both instances, I tested whether the type of crime influences perceived criminal responsibility. It is hypothesised that property offences will be judged more leniently – resulting in lower accountability and punishment – because their utility and purpose are more understandable and evoke greater sympathy in the context of addiction.¹

1. None of the previously mentioned vignette studies explored the effects of different types of offences. Hence, it is merely a careful hypothesis. Although this is an intuitive hypothesis, its logic does appear in German criminal legal practice. The German Supreme Court has clarified that only property offences, directly related to the irresistible impulse caused by the withdrawal symptoms, are an acceptable reason to judge the defendant as partially or completely non-culpable (provisions 20 and 21 of the German Criminal Code, the German insanity defence equivalence; Goldberg & Roef, 2019). Hence, what is already explicit in German law may reflect an implicit tendency that this study aims to test.

3 DATA & METHODOLOGY

3.1 *Participants*

The study involved 109 practising public prosecutors from seven of the ten districts in the Netherlands, representing just over 10% of the approximately 900 prosecutors employed nationwide (Openbaar Ministerie, 2020). While response bias is a potential concern, it is not problematic for examining between-subject effects, although it is considered when generalising results. Women made up a slight majority of the sample (58.7%). No additional demographics were collected to ensure anonymity. Participants reported their prior (neuro)psychological knowledge, which analyses showed did not confound the results. Prosecutors were randomly assigned to one of four vignette conditions by the used software.

3.2 *Design*

The basis of the experiment is a vignette, i.e. a fictional criminal case, of an addicted offender (André). The vignette first contains details about the offence and the offender and subsequently contains an excerpt from a behavioural expert witness report written by a psychologist. The vignette is constructed in a 2×2 between-participants design in which there are two independent variables, being the type of offence (hereafter referred to as *offence type*) with the levels ‘violent offence’ and ‘property offence’. The second independent variable is the way that addiction is explained in the behavioural report (hereafter referred to as *addiction explanation*), containing the levels ‘neuroscientific explanation’ and ‘choice-based explanation’. As such, there were four versions of the vignette distributed among the respondents, as shown in Table 1.

Table 1 Overview of the 2×2 Factorial Vignette Design

	Addiction Explanation	
	Neuroscientific	Choice
Offence type	+	+
	Violent	Violent
	Neuroscientific	Choice
	+	+
	Property	Property

3.3 *Measures*

3.3.1 *Independent Variable: Offence Type*

The independent variable *offence type* has two variations: half of the vignettes contained the story of André committing a violent crime (aggravated assault under Art. 302 DCC, stabbing a victim after being bumped into), whereas the other half concerned a property crime (armed robbery under Art. 317 DCC, using a knife to threaten and rob a food delivery employee). In both scenarios, André's addiction was causally linked to the crime – irritability from drug cravings in the violent offence and a need for money to satisfy the craving in the property offence. Both vignettes explicated this (causal) connection.

To ensure any differences arose from the offence type, not severity, both crimes were matched for severity based on sentencing guidelines. Both offences carried a recommended 30-month imprisonment, explicitly stated in the vignette to equalise perceived severity. Aside from offence-specific details, the events in the vignette case contained as much as possible the same information, including the use of a knife and the presence of a victim.

3.3.2 *Independent Variable: Addiction Explanation*

The independent variable *addiction explanation* was presented as two versions in the behavioural report excerpt. One version framed addiction as a brain disease, incorporating textual neuroscientific evidence. This included details about the chronic nature of addiction, the role of the brain and affected capacities. Example statements from the neuroscientific version of the vignette include the following:

Recent neuroscientific research shows that substance dependency is largely caused by disruptions in the dopamine circuit, which influences the experience of motivation, reward and pleasure to a great extent. Changes in the dopamine circuit, particularly in the frontal side of the brains (the prefrontal cortex) result, amongst others, in compulsive drug use and loss of control over drug-related behaviour. This impedes the individual's ability for reaching out for and sustaining professional help. Consequently, the disorder of the defendant can be classified as a brain disease of a chronic nature.

In contrast to the neuroscientific version, the choice version elaborates further on addiction as a free choice, along the lines of the choice model of addiction. Particularly the continuously conscious decisions to continue the drug use instead of quitting or seeking help, while the negative consequences were known and foreseeable for the suspect, are important in this explanation. Example statements from the neuroscientific version of the vignette include the following:

The defendant's addiction is a disorder which continuously influences his behavioural choices. However, the defendant has regularly had the opportunity to cease his substance use.

Additionally, he has had enough treatment in the past to be aware of his impulsive actions caused by these well-known cravings. These cravings, and the associated feelings of unrest and agitation, which were present at the time of the offence, were therefore foreseeable for the defendant.

Importantly, both versions explicitly link the addiction to the offence, because the non-accountability excuse requires a causal connection between disorder and offence (Nauta et al., 2024). Because both vignettes contain the same underlying disorder, and only the explanation of that disorder is being tested, a causal connection to the offence must be present in all cases. All data and materials used for this publication are openly available (Goldberg, 2021).

3.3.3 *Dependent Variables*

There are three dependent variables, namely the answers to the questions “what is your perception of the degree of accountability?”, “what would be your proposed sentence?” and “what is your estimation of the recidivism risk?” (referred to as *perceived (degree of) accountability*, *suggested sentence* and *recidivism estimate*, respectively). Perceived accountability was measured on a 5-point Likert scale: fully accountable; slightly diminished accountable; diminished accountable; strongly diminished accountable; and non-accountable. These categories are numbered, whereby 1 = fully accountable and 5 = non-accountable, allowing for ANOVA analyses later. The suggested sentence variable was measured by asking the prosecutors which sentence they would impose. There were three multiple-choice answer options: 30 months, conform to the sentencing guidelines; less than 30 months, namely [open space]; and more than 30 months, namely [open space]. Lastly, the answer option regarding the assessment of recidivism risk was again a 5-point Likert scale: little to no chance of recidivism; small chance of recidivism; probable chance of recidivism; large chance of recidivism; very large chance of recidivism, also categorised using the numbers 1-5.

3.3.4 *Analyses*

All data were entered in IBM SPSS Statistics 24. I used a two-way 2 (*offence type*: violent vs. property) $\times$ 2 (*addiction explanation*: neuroscientific vs. choice) factorial ANOVAs for both Likert-scale variables *degree of accountability* and *recidivism estimate*. The prosecutor’s answers regarding *suggested sentence* were analysed using Fisher’s exact test.

3.4 *Additional Vignette Elements*

All vignettes presented identical circumstances and background scenarios, including the offence’s time and place, the offender’s name (André), his cocaine dependency, the presence of a victim and the use of a knife. Each vignette

explicitly stated that André was the offender, eliminating evidentiary concerns. They also explained that André had been addicted to drugs for years and that prior treatment attempts were unsuccessful before introducing the behavioural report excerpt. The report excerpt included the *addiction explanation* variations while also providing standard details about André's cocaine dependence, based on DSM-5 characteristics and symptoms. These general remarks were consistent across all vignettes, the only divergence occurring in the addiction explanation section described under the 'independent variables' section.

3.5 Procedure

Seven of the ten districts in the Dutch Public Prosecution Service agreed to participate. Team managers invited employees to participate via a link to the online testing environment created in Qualtrics, which hosted the four vignette versions and questions. Informed consent was obtained at the experiment's start, with no IP addresses or personal data collected. Participants were instructed to make an informed judgment based on the vignette, despite its brevity (about one page) and were assured that the limited details would be considered when interpreting the results. After submission, participants received a written debriefing explaining the study's purpose and the researcher's contact details.

4 RESULTS

4.1 Perceived (Degree of) Accountability

Tables 2 and 3 show the responses to the question "what is your perception of the degree of accountability?", while differentiating between *offence type* and *addiction explanation*, respectively.

Table 2 Overview of Responses to the Accountability Variable, Differentiated by Offence Type

	Violent Offence		Property Offence		Total	
	N	%	N	%	N	%
Fully accountable	20	38.5	21	38.9	41	38.7
Slightly diminished accountable	26	50.0	27	50.0	53	50.0
Diminished accountable	6	11.5	5	9.3	11	10.4
Strongly diminished accountable	0	0.0	1	1.9	1	0.9
Non-accountable	0	0.0	0	0.0	0	0.0
Total	52	100	54	100	106	100

Table 3 Overview of Responses to the Accountability Variable, Differentiated by Addiction Explanation

	Neuroscientific Explanation		Choice-based Explanation		Totals	
	N	%	N	%	N	%
Fully accountable	13	25.0	28	51.9	41	38.7
Slightly diminished accountable	29	55.8	24	44.4	53	50.0
Diminished accountable	10	19.2	1	1.9	11	10.4
Strongly diminished accountable	0	0.0	1	1.9	1	0.9
Non-accountable	0	0.0	0	0.0	0	0.0
Total	52	100	54	100	106	100

The tables show that, in general, most participants considered the defendant fully accountable (38.7%, $n = 41$) or slightly diminished accountable (50%, $n = 53$). A small group thought that the defendant was diminished accountable (10.4%, $n = 11$), and only one prosecutor considered the defendant strongly diminished accountable. None of the prosecutors considered the defendant non-accountable. This suggests that there is some willingness to integrate addiction into the accountability judgment, as addiction was the only factor in the vignette that could possibly affect (degrees of) accountability, although this effect is limited.

To assess whether *offence type* affected responsibility decisions, the mean response of the violent offence vignette can be compared to the mean of the property offence vignette.² The means seem highly similar between the two versions, with a mean of 1.73 ($SD = 0.660$) for the violent offence compared to a mean of 1.74 ($SD = 0.705$) in the property offence condition. Indeed, there is a non-significant main effect for *offence type*, showing that the type of offence in itself does not affect the judgment regarding accountability ($F(1, 102) = 0.012$, $p = 0.914$). This is contrary to the hypothesis that the property offence would have blame-reducing effects.

On the other hand, significant main effects were found for *addiction explanation* as well as *sample*. This means that, as predicted, participants reading the neuroscientific conceptualisation of the vignette considered the defendant to be less accountable for the offence ($M = 1.94$, $SD = 0.669$) compared to the choice-centred perspective of addiction ($M = 1.54$, $SD = 0.636$), $F(1, 102) = 10.493$, $p = 0.002$. This confirms the hypothesis that the neuroscientific version would lead to perceptions of reduced accountability.

2. To be clear, the numerical values for the variable *degree of accountability* represent: 1 = fully accountable; 2 = slightly diminished accountable; 3 = diminished accountable; 4 = strongly diminished accountable and 5 = non-accountable.

Although these are interesting main effects, the ANOVA reveals no interaction effects: that is, whether the independent variables interact and affect the outcome variable. Hence, there is no evidence that the mitigating effects of neuroscientific evidence are more pronounced in either the violent or the property offence ($F(1, 102) = 2.658, p = 0.106$). This contradicts the hypothesis that the blame-reducing effects of neuroscientific information would be more pronounced in the case of the violent offence.

4.2 *Suggested Sentence Length*

This variable contains the answers to the question “which sentence would you impose?” Table 4 shows the responses as a function of both the *offence type* and the *addiction explanation*. In addition to the multiple-choice answers, the prosecutors could also indicate their preferred alternative in writing.

Table 4 Overview of Responses to the Sentence Length Variable, Differentiated between Both Offence Type and Addiction Explanation

	Offence Type				Addiction Explanation				Totals	
	Violence	%	Property	%	Neuro	%	Choice	%		%
<30 months	22	42.3	33	63.5	29	55.8	26	50.0	55	52.9
30 months	26	50.0	17	32.7	18	34.6	25	48.1	43	41.3
>30 months	4	7.7	2	3.8	5	9.6	1	1.9	6	5.8
Total	52	100	52	100	52	100	52	100	104	100

Half of the prosecutors considered the suggested sentence (30 months) too strict: 52.9% ($n = 55$) would rather impose a shorter sentence. There does not seem to be a difference between the distribution of answers as a consequence of *addiction explanation* (Fisher’s Exact test, $p = 0.201$). Neither is there a difference between the two offence types ($p = 0.058$), meaning that there is no difference in the participant’s sentencing decision for the violent offence or property offence. Both of these findings are contrary to the hypotheses that the property offence would result in lower sentences and that the neuroscientific version of the vignette would lead to lower sentences.

4.3 *Recidivism Estimate*

This variable reflects answers to the question “what is your estimation of the recidivism risk?” Tables 5 and 6 show the responses, as differentiated, first, by *offence type* and, second, by *addiction explanation*.

Table 5 Overview of Responses to the Recidivism Estimate Variable, Differentiated by Offence Type

	Violent Offence		Property Offence		Total	
	N	%	N	%	N	%
Little to no chance of recidivism	0	0.0	0	0.0	0	0.0
Small chance of recidivism	0	0.0	2	3.7	2	1.9
Probable chance of recidivism	12	23.1	7	13.0	19	17.9
Large chance of recidivism	32	61.5	35	64.8	67	63.2
Very large chance of recidivism	8	15.4	10	18.5	18	17.0
Total	52	100	54	100	106	100

Table 6 Overview of Responses to the Recidivism Estimate Variable, Differentiated by Addiction Explanation

	Neuroscientific Explanation		Choice-based Explanation		Totals	
	N	%	N	%	N	%
Little to no chance of recidivism	0	0.0	0	0.0	0	0.0
Small chance of recidivism	1	1.9	1	1.9	2	1.9
Probable chance of recidivism	8	15.4	11	20.4	19	17.9
Large chance of recidivism	35	67.3	32	59.3	67	63.2
Very large chance of recidivism	8	15.4	10	18.5	18	17.0
Total	52	100	54	100	106	100

Most of the respondents considered the defendant to be at a high risk of recidivism, as 80.2% of the prosecutors ($n = 85$) indicated a large chance or a very large chance of recidivism. The descriptive data shows little meaningful variation across the experimental conditions, suggesting that the *offence type* or *addiction explanation* does not affect their perception towards the recidivism risk of the defendant. Indeed, the difference between the violent offence ($M = 3.92$, $SD = 0.621$) and the property offence ($M = 3.98$, $SD = 0.687$) is not significant ($F(1, 102) = 0.222$, $p = 0.639$).³ There is also no significant difference between the neuroscientific version of the vignette ($M = 3.96$, $SD = 0.625$) and the choice-centred perspective ($M = 3.94$, $SD = 0.685$), $F(1,102) = 0.017$, $p = 0.898$. This

3. Note that the value 1 represents 'little to no recidivism' and that the value 5 represents 'very large chance of recidivism'.

contradicts the hypothesis that the neuroscientific version would result in a higher perception of recidivism risk due to the theory of the 'double-edged sword'. Lastly, there is no interaction effect between *offence type* and *addiction explanation* ($F(1, 102) = 0.530$ $p = 0.468$).

5 DISCUSSION

In this section, I first reflect on the findings of the vignette study, exploring their explanations, implications, and the interaction between law and societal perspectives. The results – showing that addiction is judged more leniently when framed with a neuroscientific perspective – highlight the influence of societal views on legal decision-making. I argue, however, that the law keeps these views firmly in place through their decision-making, resulting in a reciprocal process.

5.1 *Reflecting on the Findings*

This study examined public prosecutors' legal decision-making on criminal responsibility by varying addiction explanations (brain disease model vs. choice model) and offence types (violent vs. property) in a vignette. The hypotheses were, first, that neuroscientific information would lower perceptions of accountability and lead to more lenient sentencing; second, that property offences would be judged more leniently than violent offences; third, that the neuroscientific vignette would increase perceived recidivism risk; and, fourth, the presence of an interaction effect where violent offences would show stronger mitigating effects of neuroscientific evidence. The experiment found evidence only for the hypothesised impact of neuroscientific evidence on accountability perceptions.

The results indeed show that the offender is considered less accountable for the offence when his addiction was explained from a neuroscientific perspective, compared to an explanation related to choice. The confirmation of this hypothesis is in line with previous studies that generally indicate the exculpating effects of neuroscientific evidence (Aono et al., 2019).

These results cannot be directly compared to studies on neuroscientific evidence and the insanity defence (e.g. Gurley & Marcus, 2008; Schweitzer & Saks, 2011). While this study supports the idea that neuroscientific perspectives lower perceived accountability, this differs conceptually from previous findings of more successful insanity defences. Unlike the all-or-nothing insanity defence, Dutch law allows degrees of accountability, giving jurors more flexibility in assessing responsibility. This is reflected in the fact that none of the prosecutors in this study ruled for complete non-accountability, which is rare and requires full loss of control or rationality – especially difficult to prove in addiction cases (Goldberg & Roef, 2019). Since addiction can be factored into sentencing and accountability

degrees, it does not need to serve as a fully exculpatory defence. Consequently, differences in perceived accountability remain within a spectrum (full, slightly diminished or diminished), making the practical impact of neuroscientific evidence in Dutch law more nuanced than in jurisdictions where it leads to full exculpation.

However, specifically in addiction cases, neuroscientific information may have a distinct exculpatory effect. Addiction is often perceived as a form of prior fault, where defendants are considered at least partly responsible for their addiction and related behaviour (Goldberg et al., 2024). Prior fault, as mentioned, effectively blocks defences when these exculpatory conditions are culpably caused (Jansen, 2020), meaning voluntary intoxication cannot negate responsibility (Van Kalmthout, 1998). While the vignette avoided explicitly mentioning *culpa in causa* to prevent bias, the choice-based version did imply voluntary drug use, potentially leading participants to engage with prior fault reasoning and assign higher accountability. As prior fault primarily applies to excuses, and much less to sentencing, this could also explain why no effect was found on sentencing perceptions. Prior fault was also considered the pivotal factor in the study by Sinclair-House and colleagues, whereby addiction was considered less mitigatory than a fictional psychiatric illness because addiction was associated with prior fault (2019).

Perceptions of prior fault in cases of addiction could be indicative of stigma towards individuals with substance use. Room and colleagues (2001) found that addictions and substance usage are among the most stigmatic features for individuals. The brain disease model of addiction might impact such stigma, possibly leading to lower accountability perceptions. While research suggests the brain disease model does not directly reduce stigma (e.g., Meurk et al., 2014), it may mitigate perceptions of choice and prior fault. This, in turn, could increase leniency without fully eliminating stigma – an idea worth exploring in future research.

Regarding sentencing effects – or the lack thereof – it is notable that the type of addiction explanation did not influence sentencing recommendations. This contradicts previous findings of lower prison sentences with neuroscientific evidence (Sinclair-House et al., 2019) and challenges the expectation, based on common legal practice, that lower accountability judgments typically lead to reduced sentences (Claessen & De Vocht, 2012). One possible explanation is that the data did not distinguish between prosecutors who significantly reduced the 30-month benchmark and those who merely proposed partial suspension, potentially obscuring subtle differences. Additionally, Dutch sentencing allows for individualised decisions, considering personal circumstances. Many participants indicated they would tailor sentences and conditions to the defendant's addiction. This suggests that, regardless of the addiction explanation, prosecutors already factored addiction into their sentencing decisions. Hence, the additional difference

between a neuroscientific perspective and a choice perspective may not have altered this further.

Participants may also apply different reasoning to accountability and sentencing. While accountability judgments focus on personal responsibility, sentencing serves multiple goals, both retributive and utilitarian (e.g. proposing additional measures or conditions). These considerations do not always align: one can view an offender as fully responsible yet still support a reduced sentence for practical reasons. This could explain why neuroscience's exculpatory effects appear in accountability assessments but not in sentencing. Future research could explore the punishment goals guiding these decisions to better understand this unexpected discrepancy.

No differences were found in recidivism risk estimates, contradicting the *double-edged sword* theory (Aspinwall et al., 2012; Barth, 2007). This suggests that neuroscientific information alone does not shape risk assessments – a positive finding, as risk evaluation involves multiple dynamic factors (Campbell, 2016). Mere predisposition is not a valid predictor for reoffending; perhaps the participants of this study noted that. Another explanation is that prior research on the *double-edged sword* did not focus on addiction, which is a well-established risk factor for recidivism (Dowden & Brown, 2002). Given that addiction itself signals a high risk, participants may have already considered recidivism likely, making additional neuroscientific details less impactful.

Lastly, the lack of significant differences between property and violent offences – whether in accountability, sentencing or recidivism estimates – is unexpected. For accountability, this can be considered a positive outcome, as judgments should be based on the offender rather than the offence. Regarding the lack of effects on sentencing, two possibilities can be explored. First, both offences may be seen as equally severe, aligning with sentencing guidelines. However, this contradicts the intuitive expectation that violent crimes are judged more harshly. Second, the vignette's property offence did involve a violent element, as a knife was used for extortion, which may have led to similar judgments as the violent offence. A less confrontational property crime, such as a theft from a supermarket, might have revealed clearer differences, but it would have disrupted the sentencing severity balance. Prior research shows that more heinous crimes lead to stronger responsibility perceptions and harsher punishments (Appelbaum & Scurich, 2014). To isolate offence type effects, future studies should use a design where severity is controlled and at the same time, ensure that the property crime lacks violent elements.

5.2 *Strengths, Limitations and Implications*

A key limitation of this study is the artificial nature of the vignettes in replicating real-life cases. While efforts were made to enhance realism, a one-page summary

cannot capture the depth of information necessary for evaluating complex legal matters like accountability, sentencing and recidivism risk. Full case dossiers would have provided a more realistic context but were avoided to ensure broader participation. Consequently, the study's findings remain largely theoretical, with limited generalisability to real-life cases.

Another limitation is potential response bias. With just over 10% of Dutch prosecutors participating, the results should be interpreted cautiously. Additionally, while the study focused on accountability judgments, prosecutors do not make final accountability decisions – judges do. Including judges in the sample would have strengthened the findings, although permission to conduct the experiment among them was not granted. Nevertheless, using a sample of experienced prosecutors is a strength, as many experimental studies rely on students or laypersons. Still, future research should aim to include judges to enhance the study's applicability.

Overall, using vignette research as a method has shown to be a strength in the field of empirical-legal research, especially in light of the concept of 'jurisprudence of consequences'. Legal research into court decisions is, by definition, limited to the information provided in case law: here, the exact motivations are necessarily obscured, not only because judges are bound by confidentiality agreements but also because factors are considered integrally in determining the final judgment. As such, for an empirical scholar, it will always remain unclear which factors may have contributed to a certain judgment – let alone the exact extent to which they did. Vignette studies, despite their limitations in external validity, offer a window into the legal decision-making process and allow us to pinpoint the exact effects of certain case facts. Uniquely, vignette studies make visible the influence of certain factors, which even through introspection by the subject may not have surfaced. Therefore, empirical methods such as these expose implicit processes, thereby contributing to a 'jurisprudence of consequences' (Miller, 1965). After all, the findings of these studies can be used to further educate lawyers on the pitfalls of stigma and bias, and specifically, the preconceived notions surrounding addiction and the effects of the addiction debate. Accordingly, this research and other studies may positively impact legal decision-making in cases of addicted defendants and, by extension, defendants with mental disorders, in general.

5.3 *Reflecting on the Interaction of Law and Society*

Finally, I wish to draw some conclusions beyond the findings of this study. The results of this experiment, but also those of previous studies, indicate that the way we present information about a disorder can have concrete consequences for legal outcomes. Apparently, societal perspectives on addiction (such as perceptions of choice or disease) affect legal decision-making. In my study, the consequences are relatively minor: although accountability was judged more leniently in the brain

disease vignette, in practice this would not have fundamentally changed the legal outcome of the case. Other studies, however, including experiments conducted in the Netherlands, have found more far-reaching consequences. For example, Van Es et al. (2022) found that the presence of a behavioural expert's mental health report increased guilty verdicts by nearly 20% compared to cases without such a report. In other words, the mere presence of a disorder contributed to the belief that the defendant was guilty. A possible explanation is the stereotype linking mental disorders with (violent) crime, leading respondents to view the disorder itself as evidence of having committed the offence (Van Es et al., 2022).

As such, it is important to underscore the interaction between bias, stigma or stereotypes in the field of forensic mental health and the law. I argue, however, that this process may be reciprocal, creating a vicious cycle where preconceived notions affect the law, but the law consequently reinforces these perceptions. An examination of jurisprudence of cases with addicted defendants reveals how judges justify sanctions or accountability assessments. Courts frequently emphasise the defendant's personal responsibility in developing or maintaining a substance use disorder, further entrenching the notion of addiction as a matter of choice rather than illness.⁴ In a similar vein, it stands out that courts will find responsibility for the addicted defendant even when circumstances present themselves in polar opposite ways. For instance, in three cases in which the defendant had sought either treatment or therapy for the addiction once, multiple times or never, the courts used remarkably similar argumentations and considered the defendant responsible for all three situations. In the first, they argued that repeated (unsuccessful) treatment was indicative of the defendant's knowledge of the dangers and pitfalls of substance use and dependencies; in the second, the court stated that a previous period of abstinence (during treatment) meant that the defendant was clearly able to abstain if he wanted to; and in the last scenario, the judge blamed the defendant for not reaching out to professional mental health care. What these examples show is that courts continue to find responsibility for being addicted, seemingly without much differentiation as to the exact context. This strengthens the view of addiction as a disorder of choice, which may uphold societal views whereby addiction may often remain perceived as a moral weakness.

4. For instance, a court which stated: "He is ultimately responsible himself for the acquisition and continuation of his addiction behaviour. He can be considered blameworthy, although the offence can be accounted to him to a diminished extent. Court of Appeal's-Hertogenbosch, February 29 2016, ECLI:NL:GHSHE:2016:704. (Own translation of the original: "Hij is in laatste instantie zelf verantwoordelijk voor het ontstaan en continueren van zijn verslavingsgedrag. Er kan hem dus een schuldverwijf worden gemaakt, ook al is het delict hem in verminderde mate toerekenbaar.")

6 CONCLUSION

In conclusion, this study aimed to investigate the role of the addiction debate on assessments of criminal responsibility in two types of crimes. The results are mixed, suggesting an accountability-reducing effect of neuroscientific explanations of addiction but no further mitigating effects on sentencing. Because the effects of neuroscientific information were present only in accountability judgments, it remains unclear what the exact mechanism that caused these effects was. A major explanation for the mixed results can be found in the nature of the Dutch legal system, in which the questions regarding accountability and sentencing have a distinctly different function. Thus, some legal questions or elements may be more susceptible to the effects of neuroscience than others. More research into the exact reason why neuroscience can have mitigating effects or not and the role of different underlying disorders or offences is necessary to pinpoint this mechanism. Aside from noting the limitations and strengths, the present study provided further insight into how presenting information in a certain way can influence decision-making. Especially in the legal arena, where decisions can have far-reaching consequences, it is important to be aware of the effects that the presentation of case facts has on professionals. This means that the underlying conceptualisation of addiction, as presented by an expert witness, has further implications for the defendant. Awareness of these effects is necessary for both the experts and the judges. Additionally, it is important to understand that societal perspectives towards mental disorders, including addictions, impact legal decision-making, but that such decision-making also reaffirms such preconceived notions.

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