NEUROPLASTICITY, BELIEF BIAS AND IRAC — OLD PEDAGOGY BUT BRAND-NEW TOOLS FOR FIRST-YEAR LEGAL EDUCATION?

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Abstract

'Belief bias' is the tendency to be influenced by the believability of the conclusion when attempting to solve a syllogistic reasoning problem, or to judge the strength of arguments based on the plausibility of their conclusion rather than how strongly its premises support that conclusion.

This paper explores whether the presentation of a supportable, yet implausible, syllogistic conclusion to a legal problem, coupled with a direction to the student to plot the analytic path to that conclusion, enhances the student's predisposition to base an argument on legal logic rather than their own beliefs, and thereby ultimately enhance their cognitive skills.

IRAC, the formulaic legal problem template, is the legal variant of the Aristotelian syllogism. These hypotheses thus find a parallel in legal problem-solving and also align closely with an objective of advocacy training of presenting the premises of a syllogistic argument convincingly.

I Introduction

'Neuroplasticity', according to one lay definition is:

> The brain's ability to reorganize itself by forming new neural connections throughout life. Neuroplasticity allows the neurons (nerve cells) in the brain to compensate for injury and disease and to adjust their activities in response to new situations or to changes in their environment.[1]

The belief bias effect — that people are more likely to accept the conclusion to a syllogism if they believe it than if they disbelieve it irrespective of its logical validity — has long been accepted in the psychology of reasoning.[2] Proponents of the belief bias effect propound also that people are more likely to engage in logical thinking if a syllogistic conclusion is unbelievable.[3]

IRAC, the well-known acronym for 'Issue, Rule, Application and Conclusion', is a framework for legal problem-solving introduced early in Australian studies. It is frequently stated in legal commentary that IRAC is the legal variant of the Aristotelian syllogism, where the 'R' (for

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1 'Neuroplasticity' (24 January 2017) MedicineNet <https://www.medicinenet.com/script/main/art.asp?articlekey=40362> (accessed 17 June 2018).

2 Stephen Newstead, Paul Pollard, Jonathan Evans and Julie Allan, 'The source of belief bias effects in syllogistic reasoning' (1992) 45 *Cognition* 257, 258.

3 Newstead et al, above n 2, 257.

'rule') corresponds with the syllogistic major premise; the 'A' (for 'application'), with the minor premise; and the conclusion the logical outcome of the premises.[4] The hypotheses above can immediately be seen to be applicable to a legal problem. This paper explores whether it would be a beneficial development to incorporate this model within the law curriculum.

In Part II, 'Critical Thinking, Belief Bias and the Legal Syllogism', we explore the correlation between the three, focusing on the pedagogy that compelling the student to confront the unbelievable premises of a syllogistic argument will enhance their reasoning ability.

Part III is 'Overcoming Belief Bias — Tinkering with the Legal Curriculum'. In this part, we demonstrate practical ways in which those pedagogies can be adapted within the legal studies curriculum, focusing on how the law lecturer can create legal problem questions that align with those approaches. The discussion is prefaced by a brief introduction of a pedagogy called 'schemata theory'.[5] We then commence the discussion proper with a non-legal example to demonstrate the reasoning mind-set demanded, followed by two authentic legal examples.

II Critical Thinking, Belief Bias and the Legal Syllogism

A syllogism, to provide a layperson's definition that is adequate for present purposes, is a 'formal argument in logic that is formed by two statements and a conclusion which must be true if the two statements are true'.[6]

Newstead and colleagues describe belief bias as a 'well-established finding in the psychology of reasoning'[7] that:

> People are more likely to accept the conclusion to a *syllogism* if they believe it than if they disbelieve it, irrespective of its actual logical validity.[8]

Newstead et al also infer that there is a correlation between logical validity and the believability of the conclusion, and that logic has a larger effect on unbelievable than on believable conclusions, so that people focus on the conclusion and only engage in logical processing if this is found to be unbelievable.[9]

Even advocates of the phenomenon of belief bias — psychologists who have performed empirical psychological experiments such as Newstead and colleagues — acknowledge that its

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4 Anita Schnee, 'Legal Reasoning "Obviously"' (1997) 3 *Legal Writing: The Journal of the Legal Writing Institute* 105, 116; Kenneth Yin and Anibeth Desierto, *Legal problem-solving and syllogistic analysis: A guide for foundation law students* (LexisNexis, 2016) 6; Bradley C Clary and Pamela Lysaght, *Successful Legal Analysis and Writing: The Fundamentals* (Thomson West, 3rd ed, 2010) 842.

5 Camille Lamar Campbell, 'How to use a tube top and a dress code to demystify the predictive writing process and build a framework of hope during the first weeks of class' (2010) 48 *Duquesne Law Review* 273, 281.

6 'Syllogism' (2018) Merriam-Webster Dictionary <http://www.merriam-webster.com/dictionary/syllogism> (accessed 11 November 2018).

7 For example, it was noted elsewhere: 'Belief bias is most clearly marked by a tendency for subjects to accept invalid conclusions which are a priori believable': J St B T Evans, S E Newstead, J L Allen and P Pollard, 'Debiasing by instruction: The case of belief bias' (1994) 6(3) *European Journal of Cognitive Psychology* 263. Also, to similar effect: 'The notion of the rational reasoned has been challenged … untrained reasoners are not strictly logical and they base their decisions primarily on their personal knowledge … when solving such syllogisms students do not appear to base their judgments on the logical form of the arguments; instead they appear to base their judgements on the believability of the conclusions': Russell Revlin and Von Otto Leirer 'The effects of personal biases on syllogistic reasoning: Rational decision from personalized representations' in R Revlin and R Meyer (eds), *Human Reasoning* (Wiley, 1978) 52.

8 Newstead et al, above n 2, 258. They also acknowledged that whilst there was little doubt about the effects of belief bias, little was known about its source.

9 Newstead et al, above n 2, 257.

origins cannot be identified with certainty.[10] Newstead et al concede that their own hypotheses[11] may not, invariably, be accurate.

We do not claim Newstead et al's conclusions to be immediately applicable to legal argumentation since, amongst other things, their findings are underpinned by empirical psychological experimentation rather than authentic legal scenarios. We nevertheless rely on Newstead et al for the limited proposition that the presentation of an implausible legal syllogistic conclusion should increase the prospect that the participant (a law student) will engage the processes of logic more so than a plausible conclusion. Newstead et al's conclusion thus provides at least a bare foundation on which to graft further layers of legal pedagogy.[12]

As law lecturers, it is important to understand that the effect of belief bias must be confined to *syllogistic* conclusions, as this immediately aligns with the idea that IRAC is the legal variant of the Aristotelian syllogism described above.[13] Students are taught early on a feature of our common law tradition: that whenever a lawyer makes an assertion of legal principle, it must be supported by authority.[14] The idea that syllogism is a pedagogical tool to compel students to engage with principle is well explained by Professor Barbara Kalinowski as follows:

> It is the process of *forcing* ideas into a syllogism — whether revealing an objective 'truth' or not — that is likely to improve students' critical thinking skills.[15]

Legal commentators posit that '[e]very good legal argument is cast in the form of a syllogism',[16] and that 'legal analysis and argument must be grounded in the legal syllogism'.[17] Also, advocates and law students must know how to present an argument that is both supportable and convincing. Professor James Gardner, in his seminal work on syllogistic argumentation, explained that the syllogism was the model whereby one could reshape an 'argument into a tool capable of converting the most sceptical decision maker to the advocate's point of view'.[18]

Professor Kalinowski noted the science of neuroplasticity recognises that the brain can efficiently reorganise allocation of its resources to meet demands, and that humans can form bad and good neurological habits.[19] Her observations admittedly do not themselves add substantive material to our understanding of neuroplasticity[20] — inasmuch as they are essentially a reprise of the fundamental definitions of the same — but are noteworthy as they were directed to their application in legal studies and for her adoption of syllogistic logic. She lamented a 'modern trend of diminishing thinking skills' and advocated that law students be taught the means to employ logic, and that the syllogistic structure promotes clarity and consistency by

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10 Ibid 258.

11 Ibid.

12 '[I]t is possible that there are individual differences in the way in which people tackle syllogisms, and that not everyone attempts to construct mental models. There is indeed a strong possibility that more than one theory may be appropriate to explain performance in syllogistic reasoning tasks': ibid 283.

13 Newstead et al, above n 2, 258.

14 Catriona Cook, Robin Creyke, Robert Geddes, David Hamer and Tristan Taylor, *Laying Down the Law* (LexisNexis Butterworths, 9th ed, 2014) 484.

15 Barbara A Kalinowski, 'Logic Ab Initio: A Functional Approach to Improve Law Students' Critical Thinking Skills' (2018) 22 *Legal Writing: The Journal of the Legal Writing* Institute 109, 129 (emphasis added).

16 James A Gardner, *Legal Argument: The Structure and Language of Effective Advocacy* (LexisNexis, 2nd ed, 2007) 8; Yin and Desierto, above n 4, 5.

17 James Boland, 'Legal Writing Programs and Professionalism: Legal Writing Professors can join the Academic Club' (2006) 18(3) *St Thomas Law Review* 711, 719.

18 Gardner, above n 17, 3.

19 Kalinowski, above n 16, 120.

20 Especially 'Neuroplasticity', above n 1.

allowing one to observe each step of the analytic process.[21] Professor Kalinowski proposed the introduction of a practical method of harnessing the metacognitive benefits of logic,[22] and familiarity with syllogistic logic, including the skills of induction[23] and deduction,[24] was integral to her proposal.[25]

Professor Hillary Burgess[26] similarly stated that law professors might benefit from lessons in neuroscience and psychology by incorporating efficient and innovative teaching methods,[27] and argued that there should be a 'Revised Taxonomy' for learning and teaching.[28]

We introduce the various tiers of cognition on the Revised Taxonomy briefly, starting with the *fourth* tier — 'analysing'.[29] Professor Burgess explained 'analysis' to be a learning objective that was procedural such that, when students were presented with a hypothetical, analysis of that hypothetical served the purposes of deepening the students' knowledge of the rule, as well as teaching students the procedural knowledge of how to analyse similar problems.[30]

The *fifth* tier of cognition on the Revised Taxonomy — 'evaluating' — requires students to assess a situation based on defined criteria such as quality, effectiveness and consistency, including discriminating between relevant and irrelevant facts. This meant (for example) that students had to check their new understanding of the rule for inherent inconsistencies and with the cases that created the rule.[31]

The *sixth*, and highest, taxonomic tier — 'creating' — is 'combining multiple cases to create an understanding of the rule of law and thereby creating their own understanding of how the cases work together'.[32]

We propose that the learning outcomes of each taxonomic tier be enhanced by the prescription of an *implausible* syllogistic conclusion to a hypothetical, and students directed to plot a supportable analytic path towards that conclusion. The observant reader might note that our model of the hypothetical predicates an *implausible*, rather than *unbelievable*, syllogistic conclusion. This is because a lawyer's appreciation of syllogistic reasoning is different to the psychologist's, as Professor Gardner clearly explains:

> Unlike a philosopher, a legal advocate does not deal with open-ended questions, nor does the advocate approach a legal problem with an open mind. The need to make a legal argument never arises in a vacuum; it arises only in the context of a specific case in which specific parties seek specific judicial relief …[33]

It is therefore unhelpful for a law student to engage the *impossibilit*y of a syllogistic conclusion, merely that it is *implausible* yet supportable. Syllogistic analysis for a law student

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21 Kalinowski, above n 16, 129.
22 Ibid 111.
23 Ibid 132.
24 Ibid 127.
25 Ibid 139.
26 Hillary Burgess, 'Deepening the Discourse Using the Legal Mind's Eye: Lessons From Neuroscience and Psychology that Optimise Law School Learning' (2011) 29 *Quinnipiac Law Review* 1, 16.
27 Ibid 2.
28 Ie 'revised' from Bloom's celebrated 'Taxonomy for learning, teaching and assessment' — for convenience, we call it here 'the Revised Taxonomy'. L Anderson, D Krathwohl and B Bloom, *A taxonomy for learning, teaching, and assessing: A revision of Bloom's taxonomy of educational objectives* (Longman, abridged ed, 2001), as cited in Burgess above n 26, 7.
29 Ibid 16.
30 Ibid.
31 Ibid 19.
32 Ibid 21.
33 Gardner, above n 17, 11; Yin and Desierto, above n 4, 11 (emphasis added).

has a purely pedagogical focus: to furnish an adequate foundation for teaching and understanding legal problem-solving.

Case methodology, eponymously, is a pedagogy that is underpinned by the concept that doctrine is developed via the cases through which it evolved, such that the only way of mastering doctrine was by studying those cases.[34] To that end, only a small portion of cases was considered necessary for analysis and were selected for study, as those decisions revealed a relevant body of doctrine or a mistaken deviation from the rules.[35]

In syllogistic reasoning, the student explores their repository of cases in order to determine the appropriate legal arguments that support their case and engages the processes both of *induction* and *deduction*. The following excellent explanation captures the essence of both processes and illustrates the movement between both: 'Induction creates and evolves rules; deduction applies them',[36] and syllogism is the vessel in which these processes find expression, within the respective major and minor premises.

Professor Catherine Wells[37] posited that case methodology invokes a process of 'second-order induction',[38] which demands that a certain relationship must hold true on all occasions; that the presence of even one non-conforming case means that the second-order induction is 'false', and that 'success (in identifying a relevant rule) is usually obtained' by restricting the field of search to a few well-chosen instances and attempting to find a pattern or construction that these few will *precisely* fit.[39]

It is comparatively straightforward to plot an analytic path to a syllogistic conclusion that aligns with the fundamental legal principle being applied; achieving this would require little more than a superficial appreciation of the leading cases. On the other hand, by comparison, when confronted with a mandated implausible syllogistic conclusion, the student must 'ferret'[40] through the development of the cases to search for the 'patterns and constructions'[41] within that

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34 Kuan-Chun Chang, 'The Teaching of Law in The United States: Studies on the Case and Socratic Methods in Comparison with Traditional Taiwanese Pedagogy' (2009) 4(2) *National Taiwan University Law Review* 1, 11–12.

35 Ibid 11.

36 Schnee, above n 4, 117; see also Yin and Desierto above n 4, 14.

37 Catherine Pierce Wells, 'Langdell and the invention of legal doctrine' (2010) 58(3) *Buffalo Law Review* 551.

38 In contrast to 'a general fact' that Wells described as an induction by simple enumeration, which is mentioned only for completeness, the idea 'general fact' methodology is not invoked today: ibid 600.

39 Ibid 601. Her reference to the need to find a 'pattern' or construction is pivotal and itself might attract a dedicated study of its own. A more detailed discussion is contained in Yin and Desierto, above n 4, 61, where I describe induction as including the process 'of drawing on fact patterns or generalisations that need to be present for the principles under discussion to apply in the case to apply in the case being decided'. Professor Linda Edwards, in her most useful work, gave the wise advice that 'Learning to recognize rule structures will be fundamental to your legal analysis in all settings — legal writing assignments, course outlines and examinations': L H Edwards, *Legal Writing Process, Analysis and Organisation* (Wolters Kluwer, 6th ed, 2014) 17.

40 'Ferreting' was a useful description of case methodology adopted by Professor Scott Anderson, who said: 'The casebook method focuses on cases — judges' written interpretations of the legal authorities they used to decide concrete legal disputes. By reading these cases, the law student is shepherded into the fold of legal reasoners. The lesson is: as judges think, so you must think also. Law students learn to reason by ferreting out the rationales lurking within these cases': Scott A Anderson, 'A Novel Teaching Practice: Using Nonlegal Fiction to Instil Legal Values' (2012) 21 *Perspectives: Teaching Legal Research and Writing*, 28.

41 Wells, above n 38.

would apply to the mandated conclusion. This is the *inductive* phase of syllogistic reasoning of rule *creation*.

Second-order induction in case methodology is the legal pedagogical equivalent of the search for what would be termed in math the 'highest common factor'.[42] This mathematical description evocatively conveyed to us the idea of second-order induction. Second-order induction — the search for the jurisprudential highest common factor — where the mandated syllogistic conclusion is anomalistic or implausible, ipso facto poses greater challenges than where the conclusion is in conformity with some general body of doctrine.

Professor Gardner provides useful advice that the major premise may need to be 'tinkered with' in order to yield the desired conclusion. In addressing the argument that the law is externally fixed, Professor Gardner noted that 'there is far more play in the joints of the law than the fiction of legal determinancy would have us believe'.[43] The result was that there is a degree of 'uncertainty' that is the lawyer's job to exploit, by attempting to 'fill in' a grey area of law in a way favourable to his client. Professor Gardner also noted that this does *not* mean that 'any argument at all will be acceptable', but, rather, that these arguments are dictated by the 'general contours of the law', which require '[s]ome limits on the types of arguments that can be considered contextually plausible'.[44] The veracity of Professor Gardner's advice will be evident when performing the case studies in Part III below.

The exercise of second-order induction immediately engages the various taxonomic tiers in the Revised Taxonomy.

In passing, it must not be assumed that a 'rule' is confined to some pithy proposition containing a solitary concept such as 'the age at which one can vote is 18'. Obviously, these rules do exist and are important,[45] but the discussion of rule structures and contours would be sterile if rules were always as simple. Far more useful, both jurisprudentially and pedagogically, is the challenge of having to synthesise more sophisticated and complex rules.

Having now identified the applicable rule (the achievement of 'success' in second-order induction),[46] the *deductive* phase of syllogism creation is then characterised by 'shoehorning'[47] the facts within the parameters of that rule.

The *fourth* taxonomic tier in the Revised Taxonomy — 'analysing'— is thereby engaged by the students' attempts to identify some applicable legal principle to support their implausible syllogistic conclusion. By their process of 'second-order induction',[48] they are compelled en route to explore the relevant case law to identify the principles that would capture the circumstances of their case study, an exercise that will likely result in a greater understanding of the cases beyond their stark findings as this outcome can be achieved only by 'ferreting' out the rationales that underpin the principles of case law.

The *fifth* taxonomic tier — 'evaluating' — is immediately engaged also. The process of induction, performed in their search for the correct rule, demands that students actually confront the question of whether their understanding of the rule is consistent with its underpinning rationales. If their understanding of the rule is not supported by, or inconsistent with, the

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42 For those unfamiliar, this is a term in elementary math. The highest number that can be divided exactly into each of two or more numbers: '6 is the highest common factor of 12 and 18': 'Highest common factor' (2018) Oxford Dictionary https://en.oxforddictionaries.com/definition/highest_common_factor (accessed 11 November 2018).

43 Gardner, above n 17, 25; Yin and Desierto, above n 4.

44 Gardner, above n 17, 25; Yin and Desierto, above n 4, 61.

45 Professor Edwards calls them 'a simple declarative statement with no sub-parts': Edwards, above n 40, 17; Yin and Desierto above n 4, 123.

46 Edwards, above n 40.

47 Kalinowski, above n 16, 26.

48 Edwards, above n 40.

underpinning rationales extracted from their research, then their understanding of the rule is necessarily flawed.

The *sixth* taxonomic tier — 'creating' — is a logical extension of the two lower tiers, which is immediately engaged by their synthesising the various principles and cases to bring into existence a composite rule addressing the particular problem (here the implausible, mandated syllogistic conclusion).

Each of the above processes is more clearly explained via the case studies discussed in Part III.

III Overcoming Belief Bias — Tinkering with the Legal Curriculum

There are two sub-parts to this part: in the first, we introduce the methodology by using an everyday example; in the second, we show its workings by an authentic legal example.

Using a non-legal example to teach legal writing principles is aligned with a method in adult education termed 'Schemata Theory', which is based on the idea of using acquired knowledge as a scaffold for creating new knowledge.[49] Professor Charles Calleros, a proponent, notes that non-legal examples perform the 'vital function of making abstract concepts more concrete'.[50] Professor Camille Campbell, another proponent, explains that legal writing professors commonly use non-legal examples to introduce fundamental legal writing principles[51] and demystify the legal reasoning process for first-year law students.[52] Professor Campbell cites the very example of 'rule synthesis' as the type of concept whose teaching is enhanced by the use of non-legal examples.[53]

We adopt the pedagogy of the Schemata Theory in our first case study, 'Shadow the Vicious (Maybe) Labrador', before exploring authentic legal examples:

Case Study 1 — Shadow, the Vicious (Maybe) Labrador

Consider the following exercise:[54]

The postman has been bitten by a dog, and Shadow the Labrador is suspected to be the culprit. The postman says:

> I reckon Shadow bit me but I didn't see it as it was dark. I know Labradors are meant to be generally friendly dogs — in fact, nearly all Labradors are friendly. I guess there is never any way of being 100 per cent sure, even with a Labrador though. I know that Shadow was the subject of inbreeding and also had been subject to abuse as a pup, which might have caused some problems and made it vicious.

There are three sub-parts to the question:

a. Disregarding questions of evidence, and confining your answer within the factual parameters above, set out an argument in the form of a syllogism/IRAC leading to the conclusion: *it is likely that Shadow bit the postman*. Shadow's propensity for viciousness

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49 Campbell, above n 5, 281, citing (inter alia) Joan Catherine Bohl, 'Generations X and Y in Law School: Practical Strategies for Teaching the "MTV/Google Generation"' (2008) 54 *Loyola Law Review* 775, 784.

50 Charles R Calleros, 'Using Classroom Demonstrations in Familiar Nonlegal Contexts to Introduce New Students to Unfamiliar Concepts of Legal Method and Analysis' (2001) 7 *Legal Writing: Journal of the Legal Writing Institute* 37; Campbell, above n 5, 278.

51 Campbell, above n 5, 276.

52 Ibid 278.

53 Ibid 277.

54 This exercise is an adaptation of one that I created for Yin and Desierto, above n 4, online resources that were created for the purposes of syllogism creation.

is the only substantive issue. Direct a student who proclaims themselves to be a dog/Labrador-lover to perform this part.

b. Using the same fundamental facts and assumptions adopted above, construct a syllogism in which the conclusion is: *it is not likely that Shadow bit the postman.* This sub-part should be directed to a student who is ambivalent towards dogs — or better, asserts they do not like dogs!
c. Discuss how to provide greater certainty to support 'their' respective conclusions; assume that any relevant 'research' material is readily accessible.[55]

The following answer would be considered a satisfactory response to sub-part a:

Issue: Did Shadow the Labrador bite the postman?

Major premise/rule: Labradors are generally, if not nearly always, friendly. Inbreeding and abuse as pups might, however, cause them to develop vicious tendencies.

Minor premise/application: Although Shadow is a Labrador and can therefore be expected to be friendly, as Labradors mainly are, it was the subject of inbreeding and suffered abuse as a pup. For these reasons, it cannot be confidently said that Shadow would, like almost all Labradors, be friendly, but might have vicious tendencies.

Conclusion: It is likely that Shadow may have had vicious tendencies, and consequently that it bit the postman.

The following would be an appropriate response to sub-part b:

Major premise/rule: Labradors are generally, if not nearly always, friendly. Inbreeding and abuse as pups might, however, cause them to develop vicious tendencies.

Minor premise/ application: Shadow was the subject of inbreeding and was subject to abuse as a pup. This might result in Shadow, unlike Labradors in general, having vicious tendencies. Nevertheless, since Labradors are generally, if not nearly always, friendly, it is unlikely that, despite its inbreeding and that it suffered abuse as a pup, Shadow could turn out differently.

Conclusion: It is unlikely that Shadow bit the postman.

Depending on the participant's predisposition towards dogs, a particular conclusion may be implausible. A participant who does not like dogs, in order to derive the mandated conclusion in the above example, must overcome their predisposition by dispassionately articulating the major premise fully and completely and then applying it to the circumstances of the particular case in order to demonstrate the analytic path culminating in the mandated syllogistic conclusion, a process that Professor Kalinowski would have described as 'forcing' their ideas into a syllogism.[56]

We next address another pair of responses to demonstrate the flawed thinking that attempting the exercise will hopefully overcome:

Version 1

Issue: Did Shadow the Labrador bite the postman?

Major premise/rule: Labradors that were the subject of inbreeding or abused as pups are likely to be vicious/can be vicious.

Minor premise/application: Shadow was abused and was the subject of in breeding.

Conclusion: Shadow was likely vicious and likely bit the postman.

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55 The direction here to assume that 'any relevant material is readily available' is made in order to align the case study more readily with a fundamental precept of conventional case methodology, which is that only a small portion of cases was considered useful and those were the ones selected for study: Wells, above n 38, 41.

56 Kalinowski, above n 16.

Version 2

Issue: Did Shadow the Labrador bite the postman?

Major premise/rule: Labradors are generally friendly.

Minor premise/application: Shadow was a Labrador.

Conclusion: Shadow was likely friendly and likely did not bite the postman.

The major premise in Version 1, 'Labradors that were the subject of inbreeding or abused are likely to be vicious', is seriously flawed as this does not accurately reflect the nuance of the rule at all. The essence of extracting the major premise is to identify the nuance of the rule and thereby to recognise its subtleties and contours, and this response achieves neither.[57]

Applying the idea of Professor Wells' 'second-order induction',[58] the major premises in the two flawed versions do not represent the achievement of 'success' in identifying the correct rule, as neither rule can *precisely* apply to the circumstances of an inbred Labrador that was the subject of abuse. The major premise in Version 1 is flawed as not all Labradors that were abused as pups or inbred will be vicious; Version 2 is flawed because not all Labradors are friendly since those that were abused as pups or inbred may not be friendly. In order to ascertain as best one can whether a Labrador will be vicious, one cannot legitimately assess the criteria discretely. To explain why not, one might proffer the following explanation in lay terms:

> On the one hand, it is a Labrador; on the other hand, it is the subject of inbreeding and also was abused as a pup. So, all things considered, is it likely to be vicious or not?

The benefit of adopting the Schemata Theory approach is that explaining the logical flaws of compartmentalising the various considerations this way will assist students to understand more intuitively the workings of induction, or rule evolution, without the impediment of an explanation that is too technical.

The *fourth* and *fifth* taxonomic tiers on the Revised Taxonomy — 'analysis' and 'evaluating' — are immediately engaged. 'Analysis' takes the form of recognising the various patterns or construction of the relevant 'cases', thereby providing students the knowledge of how to analyse similar problems.[59] 'Evaluation' is engaged in their having to confront the inconsistencies between one 'case' (which propounds that 'Labradors are friendly') with some other (in this case, say, 'Labradors that have been abused as pups or were the subject of inbreeding may be vicious'), and thus evaluate the veracity of their 'new' understanding of the rule. The achievement of the *sixth* taxonomic tier — to create a rule based on the 'new' understanding that has been achieved — is easiest to describe as it yields a tangible outcome: the creation of a satisfactory ultimate response (the respective 'satisfactory' major premises above).[60]

Such as it is, the major premise now finds expression in its 'correct' form but remains unpersuasive. The intended outcome is for the advocate, and the law student, to create a more compelling argument as a legal syllogism is necessarily created in the context of a contest between adversaries to a dispute.[61] The advocate must perform research into the questions of what will make a Labrador more or less likely to be vicious in the light of the desired conclusion.

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57 A person who was at best ambivalent towards dogs might feel predisposed towards providing an answer resembling Version 1.

58 Adopting Professor Well's language of second-order induction, above n 38, or of the recognition of *patterns or generalisations* to which I refer in Yin and Desierto, above n 4, 61. See also Edwards, above n 40, 17.

59 Burgess, above n 27.

60 For convenient reference, it is: *Labradors are generally, if not nearly always, friendly. Inbreeding and abuse as pups might, however, cause them to develop vicious tendencies.*

61 Gardner, above n 17.

This again, by parity of reasoning, engages each of the *fourth* to *sixth* tiers of cognition on the Revised Taxonomy.

For the advocate who was arguing that Shadow was likely to be vicious, the major premise might ultimately look something like the following (suspending disbelief):

> *Major Premise/rule*: Labradors are generally friendly dogs. Statistics, however, have shown that 'a great percentage' of those that have been abused as pups have a propensity as adult dogs to be vicious. Both the level of abuse and the 'percentage' are, admittedly, inconclusive … etc.
>
> The researches have shown likewise that inbreeding has the same effect. Some contend that whilst the offspring of siblings are almost bound to have this propensity, those born of other familial relationships are not so prone … etc.

Having created the major premise, the advocate and law student then applies the propositions above to the relevant facts in Shadow's case, this taking place in the minor premise.[62]

Case Study 2 — Who Gets the Baked Beans?

This exercise should be performed early in contract law studies, when 'offer and acceptance' are typically taught:

> Norman manages a large supermarket. There is one can of baked beans left on the shelf. He wants it for himself as he has not cooked dinner. Larry, a customer, brings it to Norman, who is working at the cashier's desk, and tenders the can. Norman says: 'Sorry, that's not for sale'. Larry replies: 'It's on the shelf, so that means it's for sale, doesn't it?'

Assuming the conclusion to be 'Norman/the supermarket is bound to sell the can of baked beans', set out the argument leading to this conclusion in correct syllogistic form. Confine your argument to: *is the display of the can of baked beans an offer.*[63]

First-year contract students will likely have a predisposition to the view that a display of goods in a retail shop may be an 'invitation to treat' not an 'offer' because of their having recently studied the principles in *Boots*[64] — a celebrated case that is authority for the view that, typically, a display of goods is an invitation to treat, not an offer. So, to them, the more plausible conclusion to the conundrum is: 'the display is an invitation to treat and not an offer', as it would be consistent with their likely superficial understanding of *Boots.*

The mandated conclusion will not fit within the general proposition that a display of goods is an invitation to treat. Expressed in the language of 'second-order induction',[65] this mandated conclusion would constitute 'a non-conforming case' to the rule: *a display of goods is an invitation to treat and not an offer*, with the result that the process of second-order induction has not been achieved (ie is 'false').[66]

The logical starting point to chart a syllogistic path to the mandated conclusion that the shop was bound, and could not refuse, to sell displayed goods like a can of baked beans is to define 'offer', of which one of several acceptable definitions is that it is a statement by which someone is prepared to be bound if acceptance is communicated to them.[67]

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62 Ie 'Shoehorns' them; Kalinowski, above n 16.

63 The situation has, in truth, been much modified by consumer protection laws. This direction compels the student to confront the most basic module in contract law, which will likely be their first substantive lesson.

64 *Pharmaceutical Society of Great Britain v Boots Cash Chemists (Southern) Ltd* [1953] 1 QB 401 ('*Boots*').

65 Wells, above n 38.

66 Wells, above n 38.

67 Eg *Levingston v Levingston* [2017] WASCA 91 ('*Levingston*'); *Crest Nicholson (Londinium) Ltd v Alaria Investments Ltd* [2010] EWCACiv 1331 at [25] ('*Crest Nicholson*').

The display in *Boots* was pharmaceutical goods whose sale could only be effected by a pharmacist. The upshot of a display being an invitation to treat is that the customer makes the 'offer', which the shop can accept or reject. On the other hand, a large supermarket arguably regards itself bound to sell commonplace items on display. Most are aware of the practice of insisting on being sold an item at the displayed price at a supermarket and familiar with the idea that if you present an item to the cashier and the scanned price is shown higher than the displayed price, you could insist on being sold the item at the price displayed.

The whole argument, expressed in its ultimate syllogistic/IRAC form will likely look something like the following:[68]

> *Issue:* Was the display of the can of baked beans in Norman's supermarket an offer?
>
> *Major premise/rule*: An offer is a statement that an offeror is prepared to be bound if acceptance is communicated whilst it (the offer) is alive — see *Levingston*.[69] Another definition is to ask if the offeree, having knowledge of the relevant circumstances, would understand that the offeror was making a proposal to which it intended to be bound, and, if 'yes', that proposal would be an 'offer' — see *Crest Nicholson*.[70]
>
> A display of goods is generally considered to be an invitation to treat and not an offer, this principle being underpinned by the rationalisation, and with the consequence, that it is the customer who makes an offer that the shop can either accept or reject — the *Boots* case.[71] *Boots* was a case of a retail chemist and there was a requirement that a registered pharmacist be present to handle the transaction.
>
> On the other hand, an advertisement might be regarded to be an offer if it was sufficiently certain and unequivocal. Such was the case in *Carlill*,[72] where the offeror's sincerity was found to be evident in their setting up a bank account to meet possible claims of people who had contracted influenza contrary to the offeror's claims that inhaling a smoke ball would prevent its onset.
>
> *Minor premise/application*: Two things differentiate the present case from *Boots*: the *first* is that the displayed item is a commonplace item, a can of baked beans that would not have to be sold under the supervision of anyone on behalf of the shop, unlike the chemical goods in *Boots.* The *second* is that the 'shop' is a contemporary supermarket and not a pharmacy.
>
> Contrary to *Boots*, it could be argued that the shop (supermarket) relinquished the right to refuse to sell to customers since a large shop like a supermarket arguably holds itself out as bound to sell at least common or household items that they have displayed and at the price they are displayed. This argument is fortified by the common experience that a customer considers themselves at liberty to insist on being sold commonplace items displayed in a large store at the displayed price. If so, then the display of the item would constitute an 'offer' under the respective definitions in *Levingston* and *Crest Nicholson.*
>
> A further distinguishing feature from *Boots* is that there is no analogous requirement in the present case for a registered pharmacist to handle the transaction. Such a requirement lends itself more readily to the argument that the shop could refuse to sell.
>
> The better argument is that the display of the can of baked beans is an offer.
>
> *Conclusion:* The displayed can of beans is an offer and Norman cannot refuse to sell to Larry.

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68 In the interests of realism, the names of the cases have been shortened, as this is the way students would be likely to set out their answers in class. The full names of the cases have been set out in footnotes for the benefit of the reader, though students would not ordinarily do so in class.

69 *Levingston*, above n 68.

70 *Crest Nicholson*, above n 68.

71 *Boots,* above n 65.

72 *Carlill v Carbolic Smoke Ball Co* [1893] 1 QB 256 ('*Carlill*').

Lest it be suggested that the answer is 'wrong', the reader is reminded that the correctness of the mandated conclusion is not the point of the exercise, merely that it be syllogistically *supportable*.

While this case study is self-evidently a far cry factually from Shadow the Labrador, the same generic mindset and pedagogical pathways are applied to achieve the intended outcome of traversing a syllogistic path to the mandated conclusion.

Second-order induction[73] has been achieved by the same analytic path of exploring the nuances of the rationales underpinning the relevant principles — in this case of an 'offer'.

The *fourth* taxonomic tier of 'analysis' is concomitantly engaged by exploring the patterns/contours of the underpinnings of an 'offer'. 'Evaluating', at the fifth taxonomic tier, is engaged by their being compelled to confront the inconsistency between the outcomes in *Carlill* and *Boots*. Then, having traversed each taxonomic tier, the 'creation' of the ultimate major premise above is the logical outcome of those processes.

The processes demands that students explore case law deeply, to 'ferret'[74] through it, but does not require them to perform any fresh research as the applicable principles are contained in cases that are all conventionally covered in early contract studies. This conforms with a precept of conventional case methodology that only a small number of cases are presented for study, being those that contain principles considered to be essential to the doctrine under consideration.[75]

Case Study 3 — Shadow Goes Missing[76]

Shadow the Labrador has run away. Michael, his owner, attaches 'flyers' to lamp posts in his locality, offering a reward of $500 for anyone who brings Shadow back. Norma knows Shadow, has seen the dog somewhere and sees Michael's flyer. Norma tells Michael: 'I know where Shadow is.' Michael says: 'I will pay you the $500 to find Shadow.' Norma says: 'Excellent, I will find Shadow.' Is Norma *bound* to find Shadow?

The mandated conclusion is: *Norma is bound to find Shadow.* The conclusion is obvious to an experienced lawyer, but personal experience suggests that first-year contract students struggle with it and find the conclusion initially implausible, something that lecturers unused to teaching first-year law students actually might find puzzling. The reason why first-year students perceive this conclusion to be implausible is that they theorise that Michael's offer led to a unilateral contract because they erroneously regarded the principles of *Carlill*[77] in relation to unilateral contracts to be applicable. *Carlill* is transported to the forefront of their consciousness because that case, like the question before them, invokes a 'reward' of some sort. They accordingly wrongly speculate that, by applying the principles of a unilateral contract in *Carlill*, Michael is bound to pay Norma the reward if she finds Shadow, but Norma is not *bound* to do so.

The answer that Norma is *not* bound to find Shadow is thus incorrect and betrays the fatal error of conflating the respective principles of a bilateral contract with executory obligations on the one hand, with the principles applicable to a unilateral contract on the other hand.

The mandated implausible conclusion is not only correct, but the only jurisprudentially supportable one. If one then converted the argument leading to the mandated conclusion to

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73 Wells, above n 38.

74 Anderson, above n 41.

75 Chang, above n 35; Wells, above n 38.

76 The facts are an adaptation of a case study we presented in our recent article: Kenneth Yin and Jennifer Moore 'Hypothetical Cases as a Pedagogical Tool in Contract Law Studies' (2017) 10 *Journal of the Australasian Law Teachers Association* 203, 208.

77 *Carlill*, above n 73.

the premises of a syllogism/IRAC, it would likely look something like the following, in stark outline:[78]

> *Issue:* Was an enforceable contract formed between Norma and Michael whereby Norma was bound to find Shadow?
>
> *Rule/Major premise*: A contract to be enforced conventionally demands the fact of agreement to be satisfied, and conventionally this is by an exchange of offer and acceptance — see eg *Marist Bros*.[79]
>
> An offer is a statement that an offeror is prepared to be bound to if acceptance is communicated whilst it (the offer) is alive — *Levingston*.[80]
>
> Acceptance brings about a meeting of the minds, and is an unqualified statement to be bound by the terms of the offer and there is nothing left to be negotiated — *Paal Wilson.*[81]
>
> A promise to be binding must be supported by consideration on the part of the offeree; consideration is something of value in the eyes of the law, either a promise or act — *AG for England.*[82]
>
> *Application/Minor premise:* Michael told Norma he would pay her $500 if she found Shadow. There is no suggestion of equivocality about his statement, or any question that he intended to be bound, such that the only supportable conclusion is that he made an offer in those terms.
>
> Norma, in response by saying 'excellent' followed by 'I will find Shadow', unequivocally accepted.
>
> Michael, by his promise to pay Norma $500, provided consideration to support Norma's promise to find Shadow and can prima facie enforce that promise.
>
> *Conclusion*: An enforceable contract was formed whereby Norma would find Shadow and she is bound to do so.

These arguments do not even engage the levels of jurisprudential sophistication demanded in the Baked Beans case study above, since, unlike the Baked Beans case study, the starkness of the premises is such that the processes of second-order induction are not even engaged. The nuances, or contours, of any individual bodies of doctrine (respectively, 'offer', 'acceptance' and 'consideration'), which are constituents of the ultimate, composite issue of whether a binding contract was made, are not even engaged. At its most pungent, a student who cannot resolve the issue would simply have missed the whole point of the question.

In order to resolve the 'issue', the students had to do no more than recognise that, based on the bland facts and unadorned legal principles, three incontrovertible conclusions should be drawn: Michael made an offer to pay Norma $500 to find Shadow; Norma accepted that offer; Norma's promise to find Shadow is supported by consideration on Michael's part. That ultimate conclusion finds expression in the mandated syllogistic conclusion: Norma is bound to find Shadow.

To achieve the mandated outcome, students need to engage with the sixth and highest tier of cognition on the Revised Taxonomy, 'creation'. The process of *forcing*[83] them to express the analytic path leading to the mandated syllogistic conclusion compels them to confront the rules

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78 It would be legitimate to break this down into sub-issues, addressing, separately, 'offer', 'acceptance' and 'consideration', and, in complex cases, would be more appropriate to do so. The present case is, however, straightforward and we have not troubled to do so.

79 *Marist Brothers Community Inc v The Shire of Harvey* (1991) 14 WAR 69.

80 *Levingston*, above n 68.

81 *Paal Wilson & Co A/S v Partenreederei Hannah Blumenthal* [1983] AC 854.

82 *Attorney-General for England and Wales v The Queen* [2002] 2 NZLR 91.

83 Kalinowski, above n 16.

of offer, acceptance and consideration as a coherent whole and thereby to *create* the ultimate major premise in the form above. The starkness of the premises immediately demands a cogent understanding of the doctrine of contract formation as a coherent whole, failing which they will not succeed in charting a legitimate syllogistic path culminating in the mandated syllogistic conclusion.

III Conclusion

This paper commenced with the proposition that neither the credence of the belief bias effect, nor the idea that people are more likely to engage in logical thinking if they are confronted with an unbelievable syllogistic conclusion, is novel. Both ideas have long been accepted in contemporary psychology.

More surprising is the fact that, despite the apparent absence of controversy about these core concepts, there is limited evidence of their explicit adaptation as dedicated pedagogical tools in law studies. We suggest that their adaptation as a dedicated pedagogical tool in legal studies is particularly apt, given that problem-solving is very much part of the legal curriculum. Problem-solving in legal studies in turn demands that students demonstrate an ability to synthesise a legal rule and to apply that rule to the facts of the problem at hand, leading to a supportable conclusion. The suggested method here of directing students to plot an analytic path to a mandated, implausible syllogistic conclusion very much aligns with the acquisition of these skills.

Our experience as Australian law lecturers suggests there is a paucity of training in critical thinking in the law school curriculum, and we concur with Professor Hillary Burgess's observation that familiarity with syllogistic logic, including the skills of induction and deduction, be part of a practical method of harnessing the metacognitive benefits of logic.[84] The methods suggested in this paper are based on the fundamental proposition that compelling students to convert legal argumentation into their syllogistic form will lead to a closer understanding of doctrine as a whole. This can be achieved with relatively little interruption to the existing curriculum, as it draws on the assumption that, in any event, familiarity with IRAC, the formulaic problem-solving template, is an integral part of their training. The two examples provided above, respectively 'Who Gets the Baked Beans' and 'Shadow Goes Missing', were deliberately drawn from modules in early first-year studies, which would be covered in any conventional Australian first-year law curriculum, to show the relative ease with which the proposed method can be adopted.

84 Burgess, above n 27.