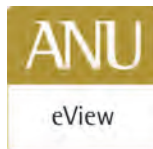


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Foreword

Welcome to Volume X of the Bruce Hall Academic Journal, *Cross-sections*. A ten year milestone for a student run Journal of such exemplary standard is truly impressive. The work that you see here is the result of substantial effort by contributors, editors and copy editors and is deserving of the highest regard.

I am grateful for the opportunity to introduce this volume of *Cross-sections*, through my role as a Bruce Hall Fellow. The creativity, vigour and enthusiasm of student-led intellectual life at Bruce Hall have been evident to me on many academic and social occasions at the W. P. Packard Dining Hall. It is a delight to extend my association to this compilation of student work so that I can encourage you too to enjoy an extraordinary breadth and depth of contribution. From analytic philosophy to Argentinian politics, archaeology, Mexican drug cartels, physics research, anarchy, analysis of anti-vaccination campaigns, and genocide to name but a few of the topics covered.

The Australian National University has a philosophy and guiding principle of excellence in research and in education. *Cross-sections* provides a vibrant demonstration of what this means in the flesh - the quality output of students collaborating, challenging themselves, enthusing others and showing the joy of intellectual endeavour. This is no dry collection of dusty papers. Read on and be inspired by these, our emerging leaders.

*Associate Professor Paula Newitt
Dean of Students
Australian National University*

Editorial

For most of the year, *Cross-sections'* presence at Bruce Hall is through the copies scattered around the study rooms and communal areas. Sometimes noticed, occasionally thumbed on catching a familiar name or provocative idea, it lives precisely in the spaces where focus rests on the critical thought and creativity that goes into a new essay, story, proof or report. These are the spaces where the work that will become the next edition are created. And in this modest presence, *Cross-sections* has become a significant aspect of the academic culture of Bruce Hall.

In its tenth edition, the hallmark of the journal is once more on display - namely, the outstanding standard of work, drawn from disciplines across the university. On this matter, the journal speaks for itself. What is important to note are the differences in this year's edition. We have continued the shift towards equalising the treatment of 'the sciences' and 'the arts' as academic disciplines. In addition to exclusively featuring artwork from Bruce Hall students studying at the School of Art, we have included a piece of creative writing, accompanied by a justification that provides valuable insight into its creation. Furthermore, we have amalgamated the art section into the body of the journal to align with the belief that although the visual arts are a discipline like no other, they undoubtedly share the journal's common ground of being an academic discipline.

A highlight of being an editor was the opportunity to sit down with the overwhelming number of submissions received and immerse ourselves in the studies of those around us. It was truly rewarding to engage with some of the high quality work that Bruce Hall residents produce daily. Another highlight was the enthusiasm of the copy editors to lend a hand, and we warmly thank them. We would also like to extend our heartfelt thanks to Cormac Relf, for providing his technical and stylistic expertise; Allen Chen, for managing the project; Mingji Liu, for the wisdom of an old hand; Matilda Hillam, for discussions that helped keep us on track with the philosophy of the journal; and Marion Stanton and Tim Mansfield for their continued support.

So, whether you have purposefully sat down to read your copy of *Cross-sections* from cover to cover or have simply picked up your copy in the reading room, you will find a thought-provoking collection of articles for your literary pleasure.

Siobhan Tobin, Flo Verity, Catherine Perry
The 2014 Cross-sections Editors

Authors

Laura Burfitt

After serving two and a half years as a loyal resident of Bruce Hall, Laura is now undertaking an exchange program in the United Kingdom. Currently in her third year of a Bachelor of Development Studies/Languages degree, she looks forward to carrying out field work in Indonesia in her final year at the Australian National University before travelling to South America as a volunteer in a development and environmental conservation project.

Kerryne Chia

Kerryne is a Bruce Hall resident in her third year of pursuing a Bachelor of Psychology (Honours). In preparation for her impending honours year, she is assisting in the running of a study on personality and driving behaviour and is currently experiencing the painful joys and pitfalls of academic research.

Alexandra Fogg

Alexandra Fogg is a third year Bruce Hall resident studying a Bachelor of Philosophy (Science). She hopes to pursue post-graduate studies in medicine following her Honours year in Population Health.

Josephine Ginty

Josephine is in her third year of a Bachelor of Philosophy (Science) degree, and is also a third year resident at Bruce Hall. She is driven by her passions for creative writing and environmental conservation, and hopes to continue finding new, imaginative ways to combine these pursuits.

Thomas Ginty

Thomas is a Bruce Hall resident in his fourth year, graduating at the end of 2014 with a Bachelor of Arts/Development Studies. Having travelled in New Zealand as part of a delegation from the ANU United Nations Society, he is planning to return to that country next year to begin a career in journalism.

Mingji Liu

Mingji is a Bruce Hall resident currently undertaking Honours in Economics, having previously completed majors in International Relations and Political Science at the ANU. He plans to spend sometime as a graduate consultant in the commercial sector before returning to the ivory bastion of academia to undertake further study and research.

Bronnagh Norris

Bronnagh is a third year Bachelor of Arts with an Archaeology Major and double minor in Latin and Ancient History. As this is her final semester, she hopes to graduate mid-December and continue next year in a Master of Liberal Arts as a further step towards her career hopes in the realm of museum education.

Janis Lejins

Janis is a current Bruce Hall resident in his fourth year. After completing a combined Bachelor of Visual Arts/Arts degree, he is now undertaking honours in both Art History and Visual Art. His work increasingly investigates relational parallaxic aspects of Art. Janis one day hopes to pursue a prosperous career in the arts.

Minh Nguyen

Minh spent one semester at Bruce Hall as an exchange student from Yale University. She is now in her final year of study for a Bachelor degree in Philosophy. Her future plan is to apply to philosophy grad school and pursue a career in academia.

Henry Orton

Henry, resident at Bruce Hall and in his second year of studying a Bachelor of Philosophy (Science), is pursuing organic chemistry and structural biology in a quest for understanding human molecular interactions with synthetically designed molecules. He looks forward to further exploration of this exciting field with diverse research projects at the ANU.

Duncan Stuart

Duncan is an ex-Brucie in his third year of a Bachelor of Arts/Science degree and most likely a commie. When not waiting for the revolution to occur, he writes adoring fan mail to Slavoj Žižek in the hope that one day, he too, will be called a “blithering idiot” by the Giant of Ljubljana.

Alice Zhang

Alice is a current Bruce Hall resident in her third year of a Bachelor of Arts/Bachelor of Laws degree. She particularly enjoys studying jurisprudence, public policy, and international relations, and hopes to pursue a career that combines her interdisciplinary interests.

Wolves in the Throne Room: Exclusion and Democracy

Duncan Stuart

Thinking begins when you ask really difficult questions. For example:
What is really decided in a democratic process?

- Slavoj Žižek

Democracy is supposedly representative, but is this actually the case? Since antiquity the concept has existed, and yet it is precisely in antiquity that the problems of representation and exclusion originate. It has often be observed that the Greeks had democracy, but only for male citizens; everyone one else was excluded from participation in ancient Greek democracy. However this kind of exclusion may not be a result of poor implementation of the ideal of democracy, but a problem with the very nature of democracy and exclusion.

We begin with Badiou's analysis of the French 2002 election in which he asserts that the electoral system is conservative. In the 2002 election, the incumbent prime minister and socialist candidate, Jospin, is eliminated in the first round.¹ The second round results in Le Pen, the extreme right-wing candidate, facing off against the incumbent, unpopular and also right-wing president Chirac.² All of which the French left wing responded to by taking to the streets and calling for people to vote for Chirac.³ Badiou finds two things strange in the ensuing leftist reaction to this: the pure horror at Le Pen making it to the second round of the election, and the grafting of the left's desire onto the less right-wing candidate, instead of outrage at a system that had denied them political expression (by presenting no left candidate). In the first instance, Badiou sees the response to Le Pen making it as far as he did as an indication that "to be elected to a place pre-coded for potential power you have to conform to a certain norm..."⁴ Thus the electoral system seeks to preserve the homogeneous, it reacts against the heterogeneous, and guarantees "our continuing

¹ Alain Badiou, 'Philosophical considerations of the very singular custom of voting: an analysis based on recent ballots in France' (2003) 6(3) *Theory and Event* 1.

² Ibid.

³ Ibid.

⁴ Ibid 5.

just like before”⁵ Badiou’s analysis leaves open a plethora of pathways to take in thinking about the electoral system and democracy. The pathway chosen here is to examine the electoral system in terms of the Derridan concept of enclosing the question: does democracy enclose its own question?

The 2002 French election could be phrased as the following question: ‘who should rule: Le Pen or Chirac?’ For Derrida “the question is always enclosed”; that is, a question always presupposes an answer of some kind⁶ Two examples are: ‘What does democracy mean?’ and ‘Does democracy mean something?’ The first question presupposes the meaning of democracy; the second presupposes that democracy might not mean something. To enclose the question is to limit possibility - in a psychological sense the phrasing of a question can affect answers, and in a political sense, if we ask ‘who should rule: X or Y?’ the possibility of who should rule is instantly limited to X or Y (in this case Le Pen or Chirac). Questions don’t exist in a vacuum (if they did Badiou’s article wouldn’t exist), and thus it is always possible to challenge the question. However, whether the question is challenged or not (at the level of political action, not individually) seems to be contingent on circumstances - see the transformation of leftists’ slogans on elections go from May 1968’s “Elections, Traps, Idiots!” to May 2002’s “I think therefore I vote”.⁷ Generally an enclosed question co-opts how one thinks of an answer and the question of elections, ‘who should rule: X or Y?’, is highly enclosed.

From the enclosure that the election produces, a paradox emerges in the term electoral democracy. Democracy’s etymology is the Greek terms ‘demos’, meaning any of people, poor or many, and ‘kratos’ meaning strength or rule⁸ However, as the 2002 French election points out, a democracy operating with the enclosed question ‘who should rule: X or Y?’ will exclude some persons from being the demos - their vote will become an empty gesture as there is no candidate for them. Thus the current methodology of carrying out electoral democracy in France subverts what it is trying to achieve, as it denies democracy in its etymological sense and thus renders the electoral part pointless (from the perspective of the excluded persons).

Of course this enclosed question does not physically limit someone’s political action to “vote for X or Y”; however, electoral democracies tend to see voting as the expression of political will *par excellence*. A protest against the two candidates is likely to result in two new candidates facing off, while the structure, the electoral system,

⁵Ibid 6.

⁶Jacques Derrida, ‘Violence and Metaphysics: An Essay on the Thought of Emmanuel Levinas’ (1978) *Writing and Difference* 80.

⁷Badiou, above n 1, 80.

⁸Douglas Harper, ‘Online Etymology Dictionary’ <<http://www.etymonline.com/index.php?term=democracy>>.

remains in place, perpetuating exclusion and limiting political possibility.

It is not just elections that pose a problem of exclusion. For Schmitt “democracy always entails relations of inclusion-exclusion”⁹. This relates back to the idea that “if the people are to rule, it is necessary to determine who belongs to the people”.¹⁰

To phrase this in Derridan terms, the question “Who are the people (demos)?” presupposes a group that are not the ‘demos’, not the people, and thus not in a democracy, not to rule; thus, even if there was a way to run a democracy without elections (or without questions), inherent in the very notion of democracy is an inclusion. If we must ask who make up the demos this implies that there is a group of people who are not the demos, and thus excluded from the political order.

For Mouffe this exclusionary nature of democracy must be embraced. “Liberal-democratic politics consists, in fact, of the constant process of negotiation and renegotiation - through different hegemonic articulations - of this constitutive paradox”.¹¹

This is Mouffe’s concept of agonistic politics; politics is continual struggle between the included and excluded groups that must comprise a democracy. The perfect (inclusionary) democracy is perhaps best signified by Derrida’s concept of the ‘democracy to come’. Democracy for Derrida is “infinite ideality”¹² and “infinitely perfectible”,¹³ and thus it is always to come (*a-venir*). To combine Derrida and Mouffe, democracy will have tensions, paradoxes and contradictions in its practice, and the concepts of democracy we employ in our discourse, of an inclusionary, fair, just democracy, where every election features candidates representing all interests, is always awaiting; its arrival is forever yet to be.

One can say that electoral democracy and the question of ‘who should rule: X or Y?’, is enclosed and exclusionary, and Badiou’s piece is evidence of this. However via Schmitt the analysis can be pushed back a step - at the etymological centre of democracy there lies an enclosed question, “Who are the demos?”, which suggests a group who are not the demos and thus excluded from rule. Thus the enclosed question of electoral democracy can be seen as a consequence of the enclosed question of democracy, and it is not electoral democracy that limits its own political possibilities and produces exclusion; it is democracy itself that does so.

⁹Chantal Mouffe, *The Democratic Paradox* (Verso Books, 2005) 43.

¹⁰Ibid.

¹¹Ibid 45.

¹²Romand Coles, *Beyond gated politics : reflections for the possibility of democracy* (University of Minnesota Press, 2005) 149.

¹³Nicholas Royle, *Jacques Derrida* (Routledge, 2003) 117.

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Imaginary Companions, Fantasy Proneness, and Self-Talk in Adulthood

Kerryne Chia

Abstract

Children with imaginary companions have been shown to score higher on measures of fantasy proneness and self-talk frequency than children who do not have imaginary friends. The current study investigated whether adults who had imaginary companions in their childhood also score higher on orientation to fantasy and engagement in self-talk. The participants were 165 students from the Australian National University. Fantasy proneness was assessed using the Creative Experiences Questionnaire (CEQ) and self-talk frequency was measured using the Self-Talk Scale (STS). The results demonstrated that adults who had childhood imaginary companions scored significantly higher on the measure of fantasy proneness than their peers who did not have imaginary friends, but no significant difference was found for self-talk frequency between the two groups. Fantasy proneness and self-talk were also found to be significantly positively correlated in this study.

I. INTRODUCTION

Imaginary companions (ICs) are vivid, imaginary characters that are treated and interacted with as if they were real¹ and may be invisible or personified objects.² Researchers have clearly and consistently identified that while some children develop ICs, others never have such friends throughout development.³ Research examining how these two groups differ has shown that children who engage in IC play are more creative,⁴ have better sustained attention,⁵ and perform better at social

¹Paula Bouldin and Chris Pratt, 'Characteristics of preschool and school-age children with imaginary companions' (1999) 160(4) *The Journal of Genetic Psychology* 397.

²Tracy R Gleason, 'Imaginary companions and peer acceptance' (2004) 28(3) *International Journal of Behavioral Development* 204.

³Gabriel Trionfi and Elaine Reese, 'A good story: Children with imaginary companions create richer narratives' (2009) 80(4) *Child Development* 1301.

⁴Eva V Hoff, 'Imaginary companions, creativity, and self-image in middle childhood' (2005) 17(2) *Creativity Research Journal*.

⁵Tracy R Gleason, Raceel N Jarudi and Jonathan M Cheek, 'Imagination, personality, and imaginary companions' (2003) 31(7) *Social Behaviour and Personality: an international journal* 721.

perspective-taking tasks among others.⁶

Children with ICs also experience a heightened engagement in fantasy, which is unsurprising given their very nature. Acredolo, Goodwin, and Fulmer found that infants who preferred fantasy over reality-based toys tended to develop ICs later on in childhood.⁷ Children with ICs were also more likely to spontaneously incorporate fantasy aspects such as myth and magic into their play⁸ and to experience vivid imagery when engaging in pretend play and daydreams.⁹ The creation of ICs has thus been argued to represent an extension of the make-believe games that children typically engage in, particularly for children prone to fantasy.¹⁰ According to Vygotsky,¹¹ such play represents an important arena in which a child learns to develop self-regulation: the ability to control and direct their own attention as well as goal-driven activities.

Vygotsky's sociocultural theory hypothesised that the emergence of private speech is the mechanism by which children transition to this internal self-regulation from external regulation.¹² Initially, children's speech starts out as social speech intended for communication with others¹³ From this, overt talk directed solely to the self emerges and functions as the child's self-monitoring guide, before gradually becoming internalised as verbal thought.¹⁴ However, this process of development is dependent on one's social environment. For example, children from Appalachian families with limited adult-child verbal interactions show delayed self-talk development.¹⁵

⁶ Anna C Roby and Evan Kidd, 'The referential communication skills of children with imaginary companions', (2008) 11(4) *Developmental Science* 531 ; Marjorie Taylor et al, 'The characteristics and correlates of fantasy in school-age children: Imaginary companions, impersonation, and social understanding', (2004) 40(6) *Developmental Psychology* 1173 .

⁷ Gleason, above n 2, 204.

⁸ Bouldin and Pratt, above n 1, 397.

⁹ Paula Bouldin, 'An investigation of fantasy predisposition and fantasy style of children with imaginary companions' (2006) 167(1) *The Journal of Genetic Psychology* 17.

¹⁰ Kerry C Krafft and Laura E Berk, 'Private speech in two preschools: significance of open-ended activities and make-believe play for verbal self-regulation', (1998) 13(4) *Early Childhood Research Quarterly* 637 ; Trionfi and Reese, above n 3, 1301.

¹¹ Tracy R Gleason, 'Social provisions of real and imaginary relationships in early childhood' (2002) 38(6) *Developmental Psychology* 979.

¹² Lev S Vygotsky, *Thought and language* (MIT Press, 1962) ; Krafft and Berk, above n 10, 637.

¹³ Faye Stanley, 'Vygotsky - from public to private: learning from personal speech' in Tim Waller, Judy Whitmarsh and Karen Clarke (ed), *Making sense of theory & practice in early childhood: The power of ideas* (McGraw-Hill International, 2011) 11.

¹⁴ Paige E Davis, Elizabeth Meins and Charles Fernyhough, 'Individual differences in children's private speech: The role of imaginary companions', (2013) 116(3) *Journal of Experimental Child Psychology* 561 ; Stanley, above n 15, 11.

¹⁵ Laura E Berk and Ruth A Garvin, 'Development of private speech among low-income Appalachian children' (1984) 20(2) *Developmental Psychology* 271.

Clearly, Vygotsky's theory emphasises the importance of a social component for the development of self-talk. Harris describes children's interactions with their ICs as a form of simulated social exchange.¹⁶ Research demonstrates that such relationships can approximate real-life social interactions.¹⁷ In line with this, children with ICs should therefore present a higher frequency and greater internalisation of self-talk compared to children without ICs as a function of having more dialogic social opportunities.¹⁸ Davis et al found convincing support for this prediction; in their study, children in the IC group were found to engage in more covert private speech than their peers who had no ICs.¹⁹

Moreover, there was a tendency for the children with ICs to engage in more fantasy-related private speech compared to the no ICs group.²⁰ The link between fantasy and private speech is further supported by Matuga's findings that children utilised self-talk to a greater degree when drawing make-believe objects compared to drawing real objects, suggesting that engagement in fantasy is associated with an increase in private speech.²¹ Further, Krafft and Berk²² found that incidences of self-talk among children were higher during fantasy play compared to closed-ended or other open-ended activities. This is consistent with Vygotsky's theory that make-believe play sets up a vital context for self-regulation to develop.

Therefore, the literature suggests that associations exist between the presence of ICs, fantasy proneness, and self-talk. While most of the literature in this area focuses on children, there is some evidence that certain traits associated with having ICs also carry over into adulthood. For example, creativity, a trait associated with children who have ICs,²³ was found to be higher in adults who recalled having ICs in childhood than adults who did not.²⁴ Gleason et al also demonstrated that female college students with recollection of childhood ICs scored higher on the use

¹⁶Paul L Harris, *The work of the imagination* (Wiley-Blackwell, 2000) .

¹⁷Davis, Meins and Fernyhough, above n 14, 561; Gleason, above n 11, 979.

¹⁸Thomas M Brinthaup, Christian T Dove, 'Differences in self-talk frequency as a function of age, only-child, and imaginary childhood companion status' (2012) 46(3) *Journal of Research in Personality* 326.

¹⁹Davis, Meins and Fernyhough, above n 14, 561.

²⁰*Ibid.*

²¹Julia M Matuga, 'Situated creative activity: The drawings and private speech of young children' (2004) 16(2-3) *Creativity Research Journal* 267.

²²Krafft and Berk, above n 10, 637.

²³Hoff, above n 4, 2.

²⁴Evan Kidd, Paul Rogers and Christine Rogers, 'The personality correlates of adults who had imaginary companions in childhood' (2010) 107(1) *Psychological Reports* 163.

of imagery.²⁵ Further, Brinthaup and Dove found that self-talk frequency was higher in their adult sample for those who had ICs in their childhood compared to the no IC group.²⁶

Therefore, the aim of this study was to investigate if fantasy proneness demonstrates the same “carry forward” pattern into adulthood and to replicate Brinthaup and Dove’s²⁷ findings that self-talk frequency is associated with IC status. The first hypothesis was therefore that adults who had an IC in childhood would score higher on orientation to fantasy than adults who did not. The second hypothesis was that adults who had a childhood IC engage in a higher frequency of self-talk than adults who did not. As this study was also interested in the possible relationship between orientation to fantasy and self-talk frequency, the third hypothesis was that there would be a significant positive association between fantasy proneness and self-talk.

II. METHOD

The participants in this study consisted of 165 students from the Australian National University enrolled in a second-year psychology course. Of the 165 students, 114 were female and 51 male. The participants’ ages ranged from 17 to 40 years of age ($\mu = 21, \sigma = 3.2$). Although this study was conducted as part of a university course, participation was voluntary with no incentives offered. All data was collected with the informed consent of participants. A quasi-experiment was conducted using a within-subjects design. The independent variable was the presence (recollection) of a childhood IC. The dependent variables were fantasy proneness and self-talk frequency.

The study was conducted as part of the participants’ compulsory laboratory class during regular class hours. Groups of approximately 19 people completed the study in a classroom over the course of one week. Participants began by reading an information sheet briefly describing the study and its procedure. They then completed the 25-item Creative Experiences Questionnaire (CEQ), a measure of fantasy proneness developed by Merckelbach, Horselenberg, and Muris.²⁸ Participants then completed the absorption scale from the Multidimensional Personality Questionnaire (MPQ), the results of which are not covered under the scope of this report. After the MPQ, participants proceeded to complete the 16-item Self-Talk Scale (STS), developed by

²⁵ Gleason, Jarudi and Cheek, above n 5, 721.

²⁶ Brinthaup and Dove, above n 18, 326.

²⁷ Brinthaup and Dove, above n 18, 326.

²⁸ Harald Merckelbach, Robert Horselenberg and Peter Muris, ‘The creative experience questionnaire (CEQ): A brief self-report measure of fantasy proneness’ (2001) 31(6) *Personality and Individual Differences* 987.

Brinthaupt, Hein, and Kramer,²⁹ to assess self-talk frequency.

Participants then answered an Imaginary Companion Questionnaire where they were asked to indicate whether they had had any ICs in childhood as well as to provide demographic information such as age and gender. The IC definition provided in the questionnaire was “...a very vivid imaginary character (person, animal, or object) with which a child interacts during his/her play and daily activities. Although the companion does not actually exist, it is very real to the child who endows it with an individual personality and consciousness. Imaginary companions can be invisible, or they can be ‘personified objects’, which are toys or objects (e.g. a teddy bear or doll) that a child treats as a real creature in the manner described above.”

Responses to the CEQ were coded by summing the number of “yes” responses in each questionnaire to give a score out of 25. Responses to the STS were coded by summing the selected number for each response in the questionnaire to give a score out of 80. All questionnaires were answered in pen and paper.

III. RESULTS

IC status	Fantasy proneness		Self-talk	
	μ (σ)	95% CI	μ (σ)	95% CI
IC	11.62 (3.6)	[10.62, 12.62]	56.06 (9.8)	[53.34, 58.78]
NIC	9.11 (3.8)	[8.4, 9.72]	53.6 (12.4)	[51.28, 55.92]

Table 1: Results (IC = imaginary companion, NIC = no imaginary companion).

The results showed that participants who reported having an IC in childhood scored higher on average on the CEQ compared to participants who did not report an IC (see Table 1). A two-tailed t test for independent samples at an alpha level of 0.05 found that this difference was significant, $t(163) = 4.04, p < 0.001$. Participants in the IC group also scored higher on the STS compared to the no IC group (see Table 1). However, this difference did not reach statistical significance, $t(163) = 1.26, p = 0.21$. A bivariate Pearson’s coefficient was also computed for the fantasy proneness and self-talk measures and revealed that the two were significantly positively correlated ($r = 0.29, p < 0.001$).

IV. DISCUSSION

The first hypothesis was that adults who had an IC in childhood would score higher on orientation to fantasy than adults who did not. The results of this study support this first hypothesis. The findings suggest that fantasy proneness is an IC-associated trait that shows developmental continuity into adulthood. That is, children who

²⁹Thomas M Brinthaupt, Michael B Hein and Tracey E Kramer, ‘The self-talk scale: Development, factor analysis, and validation’ (2009) 91(1) *Journal of Personality Assessment* 82.

have imaginary companions may be more orientated to fantasy and may retain this predisposition into adulthood. This parallels similar findings in the literature for IC-associated traits such as creativity,³⁰ and imagination.³¹

The second hypothesis was that adults who had a childhood IC engage in a higher frequency of self-talk than adults who did not. The results of the study failed to support this second hypothesis. Although the participants who had a childhood IC did engage in more self-talk on average compared to the participants with no childhood IC, this difference did not prove significant. Thus, the results of this study contradict those of Brinthaup and Dove,³² who found a significant effect with their sample of adults. As such, our findings do not appear to support Vygotsky's theory³³ that pretend play is a context in which the development of private speech advances, or at least, that effect does not seem to extend to adults. However, this disparity in findings could possibly be attributed to the larger sample size used in Brinthaup and Dove's experiment³⁴: 675 participants compared to 165 in this study. A larger sample would be more able to accurately tease out any real differences between self-talk frequency as a function of having had an IC or not in childhood.

The third hypothesis was that there would be a significant positive association between fantasy proneness and self-talk. The findings of this study show support for this hypothesis. This is consistent with past research indicating a link between engagement in fantasy and private speech frequency.³⁵ However, the association found in the study was quite weak, and as such further replications should be carried out in order to determine the reliability of this finding.

Nonetheless, the lack of support for Vygotsky's theory raises an interesting question about how fantasy proneness and self-talk are related. The inability of the results of this study to support the second hypothesis suggests that unlike fantasy proneness, the tendency to engage in self-talk does not seem to carry over into adulthood. This suggests that an underlying factor other than the creation of ICs may be responsible for both fantasy proneness and increased engagement in self-talk. One possibility could be susceptibility to verbal imaginary experiences. Fernyhough, Bland, Meins, and Coltheart found that children with ICs were more likely to report hearing words when exposed to ambiguous and meaningless auditory stimuli compared to children

³⁰Kidd, Rogers, and Rogers, above n 24, 163.

³¹Gleason, Jarudi, Cheek, above n 5, 721.

³²Brinthaup and Dove, above n 18, 326.

³³Gleason, above n 11, 979.

³⁴Brinthaup and Dove, above n 18, 326.

³⁵Krafft and Berk, above n 10, 637; Matuga, above n 22, 267.

without ICs.³⁶ Similarly, Merckelbach and van de Ven reported that undergraduate students higher in orientation to fantasy were more likely to report hearing a song in response to white noise.³⁷ These findings therefore provide a possible avenue for future research.

The study experienced a few limitations that may have implications for the results obtained. First, as this study was conducted as part of a psychology course, prior knowledge of what the experiment was about may have biased participants' responses to what they expected them to be. Second, as this study was not longitudinal, it is unable to determine for certain if fantasy proneness truly carries over into adulthood i.e. that an adult predisposed to fantasy now was also predisposed to engage in fantasy as a child. Therefore, a longitudinal study is needed to ascertain this.

Overall, this study demonstrated that having an imaginary companion in childhood is associated with higher fantasy proneness but not self-talk frequency, and that fantasy proneness and self-talk is correlated.

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³⁶Charles Fernyhough et al, 'Imaginary companions and young children's responses to ambiguous auditory stimuli: Implications for typical and atypical development' (2007) 48(11) *The Journal of Child Psychology and Psychiatry* 1094.

³⁷Harald Merckelbach and Vincent van de Ven, 'Another white Christmas: fantasy proneness and reports of 'hallucinatory experiences' in undergraduate students' (2001) 32(3) *Journal of Behavior Therapy and Experimental Psychiatry* 137.

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The role of ideology in post-Cold War development: Argentina under Carlos Menem

Thomas Ginty

This essay explores the role of ideology in the development policies of Carlos Menem, President of Argentina from 1989 to 1999. In doing so, the essay challenges the notion that ideology ceased to influence development following the end of the Cold War, an idea advocated by scholars such as Francis Fukuyama. The exploration focusses on the ideologies of liberal democracy and neoliberalism, which are shown to have been intrinsic to the policies that Menem pursued. The position of Fukuyama is revealed as untenable, with ideology having played a major role in the post-Cold War development of Argentina.

With the end of the Cold War a notion of development freed from ideology became widespread, with claims that technical assistance had superseded beliefs and values as the primary driver for change. This essay examines such notions in the case of Argentina, from the inauguration of President Carlos Menem in 1989 to the economic crisis of 2001. Writing in 1992, Fukuyama characterised the Menem reforms as an acceptance of “the need for market competition and openness to the world economy”,¹ presided over by dispassionate technocrats who “[understood] the nature of their country’s economy”.² Here I argue that, far from a passive acceptance of technical economic facts, the Menem reforms were a deeply ideological process, with inherent contradictions that led to their rapid and destructive implosion in the crisis of 2001. Ideology and ideological conflict were fundamental to the reforms, in contradiction to the dispassionate and technical picture presented by Fukuyama.

The Menem reforms were infused with the ideologies of democratisation and neoliberalism, as will be shown in the main part of this essay. The first stage of this will illustrate the presence of democratisation in the reforms, as seen in their implementation, promotion, and contents. The second stage will demonstrate the role of neoliberalism, through an analysis of the commentary and contents of the reforms.

¹ Francis Fukuyama, *The End of History and the Last Man* (Penguin Books, 1992) 42.

² Ibid 106.

A smaller third stage will examine the 2001 Argentinian economic crisis, revealing it as an outcome of the contradictions between these two ideological streams. Through these stages, it will be shown that ideology and ideological conflict were intrinsic factors within the reforms, in contradiction to the dispassionate and technical picture that is presented by Fukuyama.

The Menem reforms represented a distinct stage in the development of Argentina. They were a radical departure from the oligarchic and state-centric paradigm that had dominated the country since the 1940s,³ bringing about an unprecedented level of privatisation, marketisation, and deregulation.⁴ They were a reflection of the so-called “Washington Consensus”, the idea that democratisation, limited governance, and free markets were mutually reinforcing elements, and that implementing them together was the surest path in creating a free and prosperous society.⁵ This set of ideals and aspirations gave shape and purpose to the Menem reforms, and underlay the radical changes that they were intended to produce in Argentina.

In echoing the ideals of the Washington Consensus, the Menem reforms were infused with the ideologies of democratisation and neoliberalism. The ideology of democratisation, in the sense of a break with the state-centric policies of the pre-democratic era, is evident in the implementation, promotion, and contents of the reforms. In contrast, the ideology of neoliberalism, in the sense of privatisation of the economy, is more easily identified in the commentary and contents of the reforms. In an analysis of these elements, which will be carried forward in the following paragraphs, the following section will show that the Menem reforms were reflective of the ideologies of democratisation and neoliberalism that were inherent within the Washington Consensus.

The Menem reforms were envisaged as a permanent break from the policies of the pre-democratic era. Along with their contingency upon mass support, the reforms contained a deeper goal deconstructing a state-based economic system that had lent itself to political instability.⁶ Democratisation was evident in the implementation of the reforms, in that their acceptance was dependent upon mass acceptance. The advocacy of the reforms also reflected their democratic component, as this was done by groups with an interest in the preservation of the democratic system. Finally, the contents of the reforms were a theoretical abolition of a fundamental cause for Argentina’s political instability, and thus solidified the hold of democracy over the

³Edwin Williamson, *The Penguin History of Latin America* (Penguin Books, 2009) 466.

⁴Kurt Weyland, *The Politics of Market Reform in Fragile Democracies: Argentina, Brazil, Peru, and Venezuela* (Princeton University Press, 2004) 148.

⁵George Philip, *Democracy in Latin America: Surviving Conflict and Crisis?* (Polity Press, 2003) 97.

⁶Klaus F Veigel, *Dictatorship, Democracy, and Globalization: Argentina and the Cost of Paralysis, 1973-2001* (Pennsylvania State University Press, 2009) 15.

country. In these ways, the implementation, promotion, and contents of the Menem reforms reflected the intrinsic role of the ideology of democratisation.

The Menem reforms were implemented in a quasi-autocratic manner, but one which remained contingent upon democratic precepts. As a starting point, Menem came to power following a democratic election in 1989, in which he gained twenty percent more of the vote than did his nearest rival.⁷ Menem's reforms and his style of rule, which one writer describes as "bordering on arbitrariness and showing signs of despotism"⁸ were in conflict with his election promises and the spirit of Argentinian democracy, yet he was again victorious in the 1995 presidential election.⁹ Menem's electoral victories, and the prevention of mass opposition during the most radical period of reforms, were a result of the mass appeal of both himself and of the Peronist machine to which he could turn for support.¹⁰ Although Menem challenged the processes of Argentinian democracy in the implementation of his reforms, the contingency of these upon electoral support demonstrates the presence of democratic ideology. Menem never resorted to a coup or dictatorship in implementing his reforms, and this willingness to defer to the electorate is indicative of the presence of democratic ideology in the process of implementing Menem's reforms.

Menem's reforms were promoted by a coalition of domestic and international groups with an interest in strengthening Argentina's democracy. As discussed in the previous paragraph, Menem himself gained and maintained power through the democratic process; if the democratic system weakened, so too would the legitimacy of Menem's administration. In another sector, business groups and leaders had gained substantially from deregulation and privatisation, as well as from concerted policies that aimed to end inflation and produce economic stability. Businesses were uncertain of retaining these benefits in the event of a return to military or populist dictatorship, and therefore supported the democratic institutions that legitimised Menem's hold on power.¹¹ Internationally, the United States under the Clinton administration intervened in two Latin American countries to establish democratic governance,¹² clearly signalling that it would oppose any Argentinian relapse into dictatorship. Other international actors, including the World Bank and the Inter-American Development Bank, openly promoted the Washington Consensus

⁷Susan C Stokes, *Mandates and Democracies: Neoliberalism by Surprise in Latin America* (Cambridge University Press, 2001) 136.

⁸Edward Epstein, David Pion-Berlin, *Broken Promises? The Argentine Crisis and Argentine Democracy* (Lexington Books, 2006) 170.

⁹John Peeler, *Building Democracy in Latin America* (Lynne Rienner Publishers, 2009) 122.

¹⁰Philip, above n 5, 126.

¹¹Weyland, above n 4, 181.

¹²Peter H Smith, *Democracy in Latin America: Political Change in Comparative Perspective* (Oxford University Press, 2005) 122.

and the democratic values that this contained; in the words of researcher George Philip “democratization of some kind was seen as a prerequisite for being allowed to participate fully in the global financial environment.”¹³ In these ways, both domestic and international actors came to promote democratisation in Argentina at the time of Menem’s reforms. Concurrently, the Washington Consensus had conflated the neoliberal and democratic sides of the reforms, creating a coalition of interests that promoted democracy as a corollary of economic reform, and as a legitimising factor for the Menem administration.

The Menem reforms were also theoretically democratic in their content, in that they deconstructed an economic system often blamed for Argentina’s history of undemocratic rule. At the heart of this is the idea of a fundamental split in Argentinian society, between an economically powerful rural class and a numerically powerful urban class. In the system described by historian Edwin Williamson, the numerical power of the urban class combined with an overpowered state apparatus to exploit the rural population during periods of democracy. In order to prevent such exploitation, and to maintain the economic viability of themselves and the nation, the rural class was periodically obliged to seize power and suspend democracy - a task made easier by their domination within the higher levels of the military.¹⁴

Menem shattered this system by overturning the role of the state. Neoliberal reforms stripped the state of its capacity to shape the economy, removing its ability to exploit the rural class, and thus ending the incentive for this class to periodically oppose democracy. This impact of the reforms, which was an inherent part of their neoliberal content, again shows the role of democratising ideals within the process of the Menem reforms.

The reforms under Menem were inspired by the ideology of liberal democracy, as demonstrated by their implementation, promotion, and content. The reforms were implemented by a democratically elected president, a president who won a second election after the reforms had been put in place. They were promoted by a coalition of domestic and foreign groups, all of which had interests in the advance of liberal democracy. The role of this ideology can also be seen in the content of the reforms, as they abolished a political and economic paradigm seen as responsible for the history of dictatorship within the country. These aspects of the Menem reforms show the key role played by liberal democratic ideology, which was evidenced by the implementation, promotion, and content of the reforms.

As well as democratisation, the Menem reforms were heavily influenced by the ideology of neoliberalism. This set of ideas constituted the main part of the Washington Consensus, and holds that the rapid and total privatisation of an economy, combined

¹³Philip, above n 5, 98.

¹⁴Williamson, above n 3, 459.

with the removal of as many aspects of state control as possible, is the most effective way to stimulate economic growth. In the case of Menem's reforms, the role of neoliberalism is obvious. Virtually every piece of writing about the reforms has described them as fundamentally neoliberal, and an analysis of their contents adds to the validity of this assessment.

In every relevant piece of writing that the author of this essay has encountered, the Menem reforms are described as neoliberal. In *The Penguin History of Latin America*, Menem's reforms are described as "his neo-liberal policies", with attention being drawn to the programme of "deep cuts in state spending, reductions in the Argentine bureaucracy, the privatisation of... the huge public sector, and the opening of the economy to foreign investment."¹⁵ Another book, written by Klaus Veigel and published by The Pennsylvania State University Press, describes the Menem period as a "decade of neoliberalismo."¹⁶ and similar sentiments are expressed by scholars such as Smith,¹⁷ Stokes,¹⁸ and Weyland¹⁹ among others. There is thus a clear consensus among academic commentators that the reforms in Argentina under Menem were infused with the ideological precepts of neoliberalism.

The central elements of neoliberalism, "self-interest rules, market fundamentalism, the minimal state, low taxation", emphasised the minimisation of state-based policies and the promotion of individualised market economics.²⁰ Of these characteristics, three out of four were present in the Menem reforms. The programme of privatisation put businesses into the hands of individuals or private groups, who were motivated by self-interest to maximise earnings from the entities that they controlled. The roll-back of state spending and employment, as described by Williamson,²¹ left the market to take up the economic slack, and accorded with the minimisation of the Argentinian state. Taxation was reformed²² but not necessarily lowered, as Menem's policy required a balanced budget and the ability to service Argentina's international debt.²³ Thus, the necessity of servicing sovereign debt notwithstanding, the Menem reforms contained each one of the central elements of neoliberal ideology.

The influence of neoliberalism represents the second ideological component of the

¹⁵Williamson, above n 3, 48.

¹⁶Veigel, above n 6, 200.

¹⁷Smith, above n 12, 324.

¹⁸Stokes, above n 7, 45.

¹⁹Weyland, above n 4, 94.

²⁰Alastair Greig, David Hulme and Mark Turner, *Challenging Global Inequality: Development Theory and Practice in the 21st Century* (Palgrave Macmillan, 2007) 103.

²¹Williamson, above n 3, 483.

²²Weyland, above n 4, 149.

²³Veigel, above n 6, 173.

Menem reforms. The presence of this ideology is reflected in the academic consensus that neoliberalism was fundamental to the reforms, and by the correlation between the content of the reforms and the ideals of neoliberalism.

As has been argued in the previous paragraphs, the ideologies of liberal democracy and neoliberalism were central elements within the Menem reforms. The role of liberal democracy, meaning a decisive move away from a state-based authoritarian paradigm, is evident in the implementation, promotion, and content of the reforms. The role of neoliberalism, meaning a radical programme to deconstruct the state-based economic system, is also evident in the scholarship on, and content of, the reforms. Thus the Menem reforms were infused with ideology, with liberal democracy and neoliberalism acting in concert so long as the Washington Consensus remained viable.

The Washington Consensus ceased to be viable in Argentina following the crisis of 2001, when the country defaulted on debt repayments and descended into hyperinflation and political chaos. As described by Veigel,²⁴ the contradictions between market reform and democratic viability had led to structural weaknesses in the Menem period, which came to the fore after he left office in 1999. Labour laws made the country uncompetitive in the global marketplace, and when the bounties of privatisation were exhausted there was nothing left to power economic growth. Attempts at further reforms in the early 2000s led to political deadlock, accompanied by economic and social chaos and a default on international debts. The peak of this crisis came in 2001, and had resulted from a conflict between neoliberalism, which promoted further reforms, and democratisation, which empowered those who opposed them. The clash revealed the inherent flaw in the Menem reforms and the Washington Consensus, that they were founded upon ideologies that could become explosively contradictory, as they did in the lead up to 2001.

This essay has argued that the Menem reforms in Argentina contradict the notion advanced by scholars such as Fukuyama. Rather than the dispassionate creations of well-informed technocrats, the Menem reforms grew out of an intense and ultimately contradictory set of ideological forces. The first of these was liberal democracy, meaning democratic procedure and a reduction of state power, and was evident in the implementation, promotion, and content of the reforms. The second was neoliberalism, meaning the deconstruction of state-based structures within the economy, and was evident in the scholarship on, and content of, the Menem reforms. These two ideologies could be complementary, but the possibility of a clash was realised in the disastrous crisis of 2001. In this crisis, the two ideological strands that had made up the Menem reforms came into conflict, and the result was the paralysis of the Argentinian government, the shattering of its economy, and the pushing of

²⁴Veigel, above n 6, 190.

society to the verge of collapse.

The discourse of Fukuyama is contradicted by the reality of the Menem reforms in Argentina. Menem's project of national development was shaped by the ideologies of liberal democracy and neoliberalism. While scholars like Fukuyama may claim that the ideologies were complementary and thus inconsequential, the 2001 crisis showed that this was not the case. Development in Argentina did not become free from ideology with the end of the Cold War, and the methods attempted under Menem were shaped more by ideology than by any kind of dispassionate technical assistance.

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The Ongoing Megafauna Debate: humans, climate or something in between?

Bronnagh Norris

I. INTRODUCTION

The cause of megafauna extinction is one the most hotly debated topics in Australian archaeology and palaeontology. The two major theories (hunting and climate change) go in and out of style depending on the evidence available. This essay explores the foundation of each theory through a discussion of the most recent evidence available (2009-2013). This essay will show that although clear connection between megafauna extinction and human hunting has not been found, it is a more probable cause than that of climate change. This will be done through discussion of the theoretical background for each model and will involve a case study of Cuddie Springs will be included in discussion.

Alongside the origins of the first Australians, megafauna extinction is one of the most enduring mysteries in Australian archaeology. The debate started in 1877 with Sir Richard Owen suggesting that these large animals became extinct through the hostile agency of man, namely Indigenous Australians.¹ This theory was met with opposition, with other scientists claiming climate change was the cause of the extinction. Arguably, scientists are caught in the same unresolved debate as they were in 1877, although much has changed in the understanding of evidence.

II. DATING

Many of the conflicts occur due to issues with chronology and preservation of megafauna/Indigenous sites. Australia is notorious for its poor preservation of ancient/prehistoric objects due to the harsh and erosion prone environment. Radiocarbon dating is one of the most common methods used on archaeological sites. It measures the degradation of C¹⁴ in the given object to give a time span of life. Radiocarbon is problematic when dating megafauna as samples with a real age over 45ka have lost almost all C¹⁴ in the sample, there is also an issue with contamination

¹Christopher Johnson, 'Hunting or climate change? Megafauna extinction debate narrows' <<http://theconversation.com/hunting-or-climate-change-megafauna-extinction-debate-narrows-10602>>.

of the material and the need for pretreatment before testing. Another dating method frequently used is Optically Stimulated Luminescence (OSL) which dates unheated quartz grains in a sample and gives a date of last exposure to sunlight. This dating method, however, can be effected by disturbance within the soil and inclusion of later material into earlier levels.

The tracking of the *Sporomiella* fungus in the dung of megaherbivores has been used as a means of dating the extinction of megaherbivores across Australia.² The evidence for *sporomiella* fungus dropped abundantly approximately 41,000 years ago.³ U-Series dating has also been conducted on the teeth of megafauna for Cuddie Springs to give a date range of extinction from 50-41ka.⁴

III. THEORY ONE: CLIMATE CHANGE

Until recently, climate change was the leading explanation for the death of Australian Megafauna. Although many archaeologists and palaeontologists now accept the human model, some, like Field and Wroe, still argue for the climate change model. Using this theory, one can access the following information.

Wroe et al argues that there has been a growing consensus that Sahul (Australia and New Guinea) had been subject to progressive drying from 700ka, notably 350-400ka.⁵

Antarctic ice cores revealed a distinct change in the impact of glacial-interglacial cycles after 450ka, with the last five interglacial cycles being on average warmer.⁶

Between 60,000 - 40,000 ya there was a warm phase, marked by aridity and lower sea levels.⁷ This is expected to be the interval in which the first humans arrived.⁸

The majority of megafauna were extinct by the end of the Last Glacial Maximum, approximately 20-18 kya.⁹ It has been suggested this was predominately due to increased aridity.¹⁰ During the subsequent 5 millennia, surface water became scarce

²Matt McGlone, 'The Hunters Did It' (2012) 335(6075) *Science* 1452.

³Ibid; James Freeman, 'Study Suggests Humans Caused Extinction of Australian Megafauna', <http://www.sci-news.com/paleontology/article00229.html>.

⁴Rainer Grun et al, 'ESR and U-series analyses of faunal material from Cuddie Springs, NSW, Australia: implications for the timing of the extinction of the Australian megafauna' (2010) 29 *Quaternary Science Reviews* 596.

⁵Stephen Wroe et al, 'Climate change frames debate over the extinction of megafauna in Sahul (Pleistocene Australia-New Guinea)' (2013) 110(22) *Proceedings of the National Academy of Sciences*.

⁶Ibid.

⁷Ibid.

⁸Ibid.

⁹Stan Florek, 'Megafauna extinction theories - patterns of extinction' <<http://australianmuseum.net.au/megafauna-extinction-theories-patterns-of-extinction>>.

¹⁰Ibid.

on the continent, and inland lakes dried up permanently or during the warmer seasons.¹¹ This change in water supply, as well as the effects of altered vegetation, had a dire effect on large browsing animals, and they were forced to retreat to a narrow band in eastern Australia that provided a permanent water source and better vegetation.¹²

The issue of water availability is a defining feature of the climate change theory. From 50–46ka, sea levels around Australia fell by approximately 30cm.¹³ From 50ka, water levels and river flows declined in northern and eastern Australia.¹⁴ There was an increase in ephemeral water systems, as indicated by Lake George (ACT).¹⁵

In Northern Australia there was a progressive decline in mega lake phases and an increase in continental dust levels beginning at 35ka from off the eastern seaboard.¹⁶

There was a shift during the Penultimate Glacial Maximum towards more sclerophyllous and fire promoting vegetation throughout Australia.¹⁷ The decreases in temperature also contributed to the falling of CO² levels of 20–40%.¹⁸ This CO² availability effects the competition between C3 and C4 grasses and impacts on the distribution of flora and fauna.¹⁹ The distribution of ranges was not only due to the constraint of plants by drainage and nutrient requirements, but an analysis of Australian plant endemism suggests that falling temperatures and CO² changes limited vegetation and habitat refugia.²⁰ The evidence may be there and the argument may be sound but coming from a non-horticultural background it was difficult to fully understand the information being presented.

These influences restricted much of the vegetation to more mountainous and coastal regions.²¹ Megafauna were likely repeatedly limited to small refugia through successive glacial cycles.²² The limiting of refugia meant population had to recede, and isolation, low relief, the landmass area and low rainfall further restricted the size

¹¹Ibid.

¹²Ibid.

¹³Stephen Wroe and Judith Field, 'A review of the evidence for a human role in the extinction of Australian megafauna and an alternative interpretation' (2006) 25 *Quaternary Science Reviews* 2692.

¹⁴Ibid 2694.

¹⁵Ibid 2695.

¹⁶Ibid 2695.

¹⁷Ibid 2695.

¹⁸Ibid 2700.

¹⁹Ibid 2700.

²⁰Ibid 2700.

²¹Ibid 2700.

²²Ibid 2700.

and distribution of refugia in Australia, all being effects of climate change.²³ There was an increase in charcoal and grasses relative to Eucalyptus from 200ka and 185ka found in pollen and charcoal data from the Lombeck Ridge core.²⁴

Increasing body size is a common response to the effects previously outlined as a result of climate change.²⁵ Gigantism is evident in a number of Pleistocene lineages and may have been an adaption to the increasingly arid and erratic climate of Australia.²⁶ These larger fauna species demanded a greater habitat area to maintain viable populations but, as discussed previously, the decline beyond minimum thresholds meant large species would become extinct first.²⁷ If species were adapting to the climate with an increasing chance of habitat loss (and this was a legitimate cause of extinction), then why would they grow in size and put their species at higher risk rather than shrinking in size to those mammals that survived the extinction? It seems odd that an adaption that would have taken generations to breed in through "erratic" conditions would be undermined so easily in an ice age at a similar level to those before it.²⁸

A particular issue seen in the last couple of papers from Wroe et al is the tendency to try to debunk all claims from supporters of the human caused extinction theory, with sometimes unconvincing and unsupported evidence, rather than putting out new evidence for the climate change model. As will be seen later, new research is coming in to disprove much of the climate evidence these theorists rely on and not much has been done except rehashing old information and arguing for the reliance on ESR/U-series over radiocarbon. This is seen clearly through their 2012 and 2013 publications, however these papers are engaging and easy to read and would have reached wide audience, the lack of new evidence is disappointing. Another critique on Wroe et al is that although their papers clearly show research, there is a lot of repetition within the papers and makes it difficult to remain engaged.

IV. THEORY TWO: HUMANS

Currently, human caused extinction of megafauna is the most popular theory. Tim Flannery is possibly the most well-known palaeontologist in Australia and his overkill theories through the 1990s until present have been the centre of debate. Flannery proposes that the 'Blitzkrieg Hypothesis'²⁹ is as applicable to Australian

²³Ibid 2700.

²⁴Ibid 2694.

²⁵Ibid 2699.

²⁶Ibid 2699.

²⁷Ibid 7000.

²⁸Tim Flannery, *The Future Eaters* (Reed Books, 1994) 184.

²⁹Developed by Martin, the 'Blitzkrieg Hypothesis' basically argues that extinctions occurred almost immediately (within a few hundred years) of the first arrival of humans in any one place.

megafauna as that of American megafauna.³⁰ The human impact on megafauna species is many and varied, and as Brook notes, they usually fall under four categories - overhunting, habitat destruction, negative interactions with non-native species, and the effects of the loss of keystone species.³¹ Across the globe, the Late Quaternary showed the spread of human-hunter gatherers which were top-level vertebrate predators and competitors.³² Due to the poor preservation of remains in Australia and no direct evidence of kill sites,³³ much of the evidence for human impact comes from the misdating of sites and the argument that humans had been in Australia for more than the conservative estimate of 40,000 years. There is also a reliance on patterns seen elsewhere for the proposal and support of theories, and the human impact theorists spend just as much time disproving the climate change model rather than proving their own model.

V. A CRITIQUE OF THE EXTINCTION DEBATE

In recent decades, a lot of the debate has centred on redating megafaunal sites and what this means for extinction theories. There has been a lot of back and forth between scientists, mostly Flannery and Field (2013). It should be stated early that the climate change theory has not had a lot of new supporting evidence in the last five or so years and tends to rehash a lot of the same information. Equally, solid evidence for the human impact on megafauna has not been found.

As discussed previously, there is a whole variety of evidence used to show climate change as a leading cause of megafauna extinction. Though this is the case, recent research has disproved a lot of the previously held notions of the climate change model.³⁴ In 2013, De Deckker challenged the climate change model based on analysis of a sediment core taken from the sea bed off the coast of Kangaroo Island in offshore canyons of the Murray Basin.³⁵ From this core, it was ascertained that sea-surface temperature at the time of extinction varied by three degrees, which is comparatively small compared to early climatic changes.³⁶ The shift in vegetation occurred after

³⁰Ibid 181.

³¹Barry W Brook, 'Synergies between climate change, extinctions and invasive vertebrates' (2008) 35(3) *Wildlife Research* 249.

³²Ibid 251.

³³Johnson, above n 1.

³⁴Jane O'Dwyer, 'Giant Australian animals were not wiped out by climate change' <<http://news.anu.edu.au/scapa/jane-odwyer-director/>> ; Freeman, above n 3; Brook, above n 31, 249; Flannery, above n 28, 181; Timothy F Flannery et al, 'Would the Australian megafauna have become extinct if humans had never colonised the continent? Comments on 'A review of the evidence for a human role in the extinction of Australian megafauna and an alternative explanation' by S.Wroe and J.Field', (2007) 26 *Quaternary Science Reviews* .

³⁵O'Dwyer, above n 34.

³⁶Ibid.

(not during) megafauna extinction.³⁷ This idea of climate change occurring post-megafauna is common in debate against the climate change theory.

Another common theme that opposes the idea of climate change is that the long-term climatic events were not as serious as made out. Flannery notes that 16 out of 17 ice ages passed without causing any dramatic extinction in Australia, and there is no firm evidence about the last ice age being particularly special.³⁸ The world's fauna are used to living and adapting quickly to changes, many through migration or surviving in relict suitable areas.³⁹ Climate change occurred roughly contemporaneously worldwide and so it is logical to expect that the same or similar effect on large animals elsewhere yet widespread extinctions did not occur.⁴⁰ It is acknowledged that climate change does not affect each continent in the same way. Australia's regular climate is different to that of northern Europe, so this desire for a synchronous extinction may be a criticism rather than a well-founded argument.

Building on this notion that extinction cannot be related to climate change, Flannery shows the earliest extinctions seemed to have occurred before the height of the last ice age.⁴¹ There are also some species that did not become extinct, such as the hairy nosed wombats and some kangaroos.⁴² The hairy nose wombat in particular lives in burrow complexes around the margins of the arid zone and cannot readily migrate in response to climate change.⁴³ Wroe et al consistently argues, however, that most of the megafauna taxa was extinct by human arrival, footnote Wroe et al, above n 5, 36. but this has heavy reliance on the conservative human arrival estimate given at 40-35ka, when it is fairly widely accepted that humans have been in Australia from approximately 60ka. As will be shown through the case study of Cuddie Springs, the current trend makes it seem highly unlikely that climate change had a huge impact on the extinction of megafauna.

Although the climate change model seems improbable, there is currently no proof for human caused extinction. Thus far there is no direct evidence of humans preying on megafauna in Sahul and no evidence of an appropriate tool kit⁴⁴ Dating continuously comes back as a major issue for the reason behind extinction. As the arrival date of humans has not been fixed, the human involvement in megafauna extinction

³⁷Ibid.

³⁸Flannery, above n 28, 184.

³⁹Ibid.

⁴⁰Ibid.

⁴¹Ibid.

⁴²Ibid 186.

⁴³Ibid 186.

⁴⁴Ibid.

does not have particularly strong legs to stand on. Wroe et al notes that there is a complete lack of evidence for predation and consumption of megafauna based on statistical analysis of seven sites⁴⁵ Four of these sites have no published data and are not available for scrutiny.⁴⁶ At Menindee Lake, the megafauna remains are 10,000 years older than the archaeological material found there.⁴⁷ Simply put, there are no kill-sites known in Australia and so it makes it very difficult to argue in support of the overkill, 'Blitzkrieg hypothesis' theory. This being said, Flannery notes that an "absence of evidence for kill sites is not evidence of absence."⁴⁸

VI. CASE STUDY: CUDDIE SPRINGS

When applying the megafauna extinction debate to a physical example, there is no better site than Cuddie Springs. Cuddie Springs is one of the most important, if not the most important, megafauna sites in Australia. Cuddie Springs is a large ephemeral lake within a large shallow lake basin located in western NSW.⁴⁹ It is not connected to any river systems from the past and it fills from a small catchment after localised rain storms.⁵⁰ The fossil fauna sequence was accumulated over hundreds of thousands of years, with the Pleistocene deposits being capped by a pavement of artefactual stones that date to the beginning of the Lower Glacial Maximum (LGM).⁵¹ There is also a record of the vegetation of the site from a fossil pollen record.⁵²

Cuddie Springs is the only place in Australia that provides evidence for an overlap of human and megafauna remains, which only increases the controversy of the site.⁵³ The overlap of human and megafauna remains is commonly used by climate change theorists to disprove the notion of quick overkill and Roberts' idea of an "extinction

⁴⁵Wroe et al, above n 5, 8778.

⁴⁶Ibid.

⁴⁷Ibid.

⁴⁸Flannery et al, above n 34, 562.

⁴⁹Stephen Wroe and Judith Field, 'Aridity, faunal adaptations and Australian late Pleistocene extinctions', (2012) 44(1) *World Archaeology* 420 ; Judith Field et al, 'Looking for the archaeological signature in Australian Megafaunal extinctions', (2013) 285 *Quaternary International* 83 .

⁵⁰Ibid.

⁵¹Ibid.

⁵²Ibid.

⁵³Wroe and Field, above n 49, 420; Melanie Fillios, Judith Field and Bethan Charles, 'Investigating human and megafauna co-occurrence in Australian prehistory: Mode and causality in fossil accumulations at Cuddie Springs', (2010) 211(1) *Quaternary International* 141 ; Clive N G Trueman et al, 'Prolonged coexistence of humans and megafauna in Pleistocene Australia', (2005) 102(23) *Proceedings of the National Academy of Sciences* 8383 ; Flannery et al, above n 34, 560.

window" again.⁵⁴ The dates provided by each side of the extinction theory coin have only increased debate between theorists.

Judith Field, probably the most vocal of the climate change theorists, has been excavating at Cuddie Springs for a number of years and has written multiple papers and has done a variety of interviews on her finds. As stated previously, megafauna and cultural remains have been found in close physical existence. The age of the artefacts and the temporal overlap has been dated by Field and colleagues to be much younger than the proposed extinction window (around 45-40ka), with eleven radiocarbon determinations producing ages from 28-32ka.⁵⁵ These dates place the megafaunal remains of Cuddie Springs as coinciding with significant environmental shifts, key technological developments in the archaeological record and the loss of megafauna taxa.⁵⁶ Fillios and others argue that most megafauna cannot be placed within 100,000 years of human arrival.⁵⁷

Cuddie Springs has a number of key features that assist in assessing the likely impact of aridity both on megafauna and the wider environment.⁵⁸ Basically, layers 6A and 6B provide strong evidence for climate change again.⁵⁹ 6A and 6B provide a contrast in environmental information, and it is assumed that layer 6A is the period prior to the onset of the LGM again.⁶⁰ It documents the final appearance of some species of megafauna and indicates that the changing environmental conditions in the lead up to the LGM may have resulted in a local extinction event again.⁶¹ Animals may have become tied to the diminishing water supply and their physiology and habits reduced their chances of survival again.⁶²

The discovery of a *Diprotodon* mandible and a *Genyornis* tarso-metatarsus with a flaked stone tool wedged between them provides the bulk of evidence for a late survival of Megafauna with human interaction.⁶³ Similar associations are found in further excavations.⁶⁴ The concentration of stone artefacts from the early period is not high but appears consistent with the palaeoenvironment of the time.⁶⁵ The artefacts

⁵⁴Wroe and Field, above n 49, 420.

⁵⁵Field et al, above n 49, 83.

⁵⁶Trueman et al, above n 53, 8384.

⁵⁷Fillios, Field, and Charles, above n 53, 141.

⁵⁸Wroe and Field, above n 49, 420.

⁵⁹Ibid 66.

⁶⁰Ibid 66.

⁶¹Ibid 66.

⁶²Ibid 66.

⁶³Field et al, above n 49, 83.

⁶⁴Ibid.

⁶⁵Ibid.

were in the early stages of manufacture and discarded after use, with a study of use wear patterns indicating that they were predominately used for butchering.⁶⁶

Cuddie Springs puts climate theorists back at the forefront of an explanation of megafauna extinction as it disproves the theory of overkill (but not entirely the involvement of humans) and shows that climate must have had a strong influence on the extinction of megafauna. This would be the case if recent dating methods did not disrupt the idea of a secure stratigraphy for the site. Grun et al conducted the first (at least published) dating on the actual megafaunal remains, rather than dating through association with other remains.⁶⁷ Through ESR/U-series dating on the teeth of the megafauna, Grun et al showed the bones to be considerably older than the archaeological remains, roughly 51-40ka rather than 30ka.⁶⁸ Through these renewed dates comes the proposition that the association of megafauna and cultural material was a result of site disturbance and brings the megafauna remains into agreement with the 51-40ka extinction interval.⁶⁹ Other sites which provide late survival ages, such as Nombe Rockshelter, Seton Rockshelter and Cloggs Cave, cannot be taken seriously until the dating of bones actually occurs.⁷⁰

Roberts and Brook note that the radiocarbon dating method that Field uses so frequently cannot be used on the fossils due to a lack of preserved collagen.⁷¹ The argument Field makes that ESR/U-series dates should not be exclusively used Wroe which one ⁷² is fair but the only current date for the actual fossil material has been gathered from these methods and should not be so readily dumped for the preference Field has for radiocarbon dating that cannot be used on bones anyway. The stratigraphy also provides an issue at Cuddie Springs, as although the ages range 40-30ka there is no indication of increasing age with depth.⁷³ Field's OSL dates on the sand grains revealed that some were incorporated in the past 12,000 years (something that was conveniently left out of her paper) which suggests an intrusion of sediment, making the dating unreliable.⁷⁴ From this case study, the unlikelihood of a climate change cause for the megafauna extinction is seen once more.

⁶⁶Ibid.

⁶⁷Grun et al, above n 4, 597.

⁶⁸Ibid.

⁶⁹Ibid.

⁷⁰Richard G Roberts, Barry W Brook, 'And Then There Were None?' (2010) 327(5964) *Science* 421.

⁷¹Ibid.

⁷²Field et al, above n 49, 84.

⁷³Roberts and Brook, above n 70, 421.

⁷⁴Ibid.

VII. CONCLUDING THOUGHTS

The megafauna extinction debate has been in existence since the mid-1800s. Through the research and evaluation of the two major schools of thought it can be seen that results are still hotly disputed. From a focus predominately on research from the last seven years, one can argue that human caused extinction is the strongest and most widely supported cause for the megafauna extinction. Authors such as Flannery consistently support their arguments with new evidence and interpretations, giving gravitas to their theories. Climate change is still a viable argument, but the shortcomings frequently found in papers written by authors such as Wroe and Field (mostly the repetition of the same argument with less evidence each time) make it harder to accept. Although there is little evidence now for climate change as a cause of extinction, the overkill theory has not provided any evidence for which it can be justly proved. At this stage, it is difficult to argue for or against one particular theory because of issues like preservation and dating, but following the trend taken in the last couple of years, it can be argued that a certain amount of widespread megafauna extinction was the result of human influence, perhaps used in conjunction with the changing environment.

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Wroe, Stephen and Judith Field, 'Aridity, faunal adaptations and Australian late Pleistocene extinctions', (2012) 44(1) *World Archaeology* 420

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The Conceptual Problem of Anarchy

Alice Zhang

I. INTRODUCTION

Anarchy has been conventionally understood as the defining structural condition of the international system. Indeed, the operation of the self-interested state in an inherently anarchical system has often been the starting point of international relations theory. Generally, the 'problem of anarchy' is understood to be how best to order the international system in the absence of a central government.¹ Different theoretical traditions have debated anarchy's role, with classical realism grudgingly accepting it as an inevitable problem best dealt with by states, and liberalism seeking hierarchy and organisation as a way to ameliorate it. One of the most prominent challenges to these conceptions of anarchy is Kenneth Waltz's neorealism. As a body of thought, it favoured a systemic, objective approach to the realities of international relations. It reformulated and renewed the idea of anarchy as a solution rather than the problem; for Waltz, anarchy was the ordering principle of the international system that is most conducive to peace.²

This essay will provide a critique of the neorealist attempt to solve the problem of anarchy, and will argue that Waltz's characterisation of anarchy as a desirable ordering principle was misguided and presumptuous in its acceptance of anarchy as a defining structural condition. The 'problem of anarchy' lies in the very way it has been conceptualised in theory as an assumption and starting point. Crucially, Waltz and other international relations theorists have failed to acknowledge that there is no necessary 'logic' of anarchy, and that our understanding of it is a consequence of the processes that shape the identities and interests of states.³ His analysis rests heavily on the relationship between anarchy and self-help, and is reductive in its ignorance of other influences in the international system such as identity and interdependence. "Anarchy is an important condition of world politics, but it is not the only one"⁴ It will be contended that definitional issues and Waltz's entrenchment of hierarchy and

¹Helen Milner, 'The Assumption of Anarchy in International Relations Theory: A Critique' (1991) 17(1) *Review of International Studies* 67.

²Kenneth N Waltz, *Theory of International Politics* (Waveland Press, 2010) .

³Alexander Wendt, 'Anarchy is what States Make of it: The Social Construction of Power Politics' (1992) 46(3) *International Organization* 391.

⁴Milner, above n 1, 67.

anarchy as mutually exclusive ordering principles compromise the persuasiveness of his insight into the virtues of anarchy. It will be posited that constructivism offers a way to overcome this conceptual 'problem of anarchy', as constructivism opens the possibility of multiple understandings of anarchy, with "multiple meanings for different actors based on their intersubjective practices"⁵ Ultimately, "anarchy is what states make of it"⁶

II. DEFINITIONAL ISSUES WITH ANARCHY

International relations theory traditionally "underestimates the ambiguity of the concept"⁷ of anarchy. Dominant theories such as classical realism and liberalism have also sidelined the academic roots of the concept in anarchism, an ideology that has had a "historically marginalized status"⁸ For the anarchists, anarchy is "not only a genuine social possibility, but the supreme ethical goal of humanity" where "the condition of war can only be overcome once the sovereign state has been transcended"⁹ These roots of anarchism have significant implications for mainstream international relations theory, and may have the effect of deconstructing these theories from the inside out. For instance, both classical realism and liberalism perceive anarchy as a dangerous condition that requires amelioration through the responsibility of a sovereign state, or through international governing structures. The primacy of the state's role in maintaining order and peace is a core tenet in classical realism, yet anarchism illustrates the extent to which states are themselves the issue - indeed, classical realism engages in a highly idealistic, pacified view of the state.¹⁰ Idealism and utopianism are not views conventionally ascribed to classical realism - yet anarchy threatens to be "more 'realist' than realism itself".¹¹

The attempts to solve the problem of anarchy are undermined by definitional inconsistencies where anarchy may simply mean a lack of order, chaos and an inclination toward warfare, or may be more specifically defined as lack of effective central government. As Milner points out, it does not seem to be "that chaos, lack of order and constant threat of war is what scholars mean by the anarchy - persistent elements of order in international politics have been noted by many".¹² It has been

⁵Ted Hopf, 'The Promise of Constructivism in International Relations Theory' (1998) 23(1) *International Security* 171.

⁶Wendt, above n 3, 391.

⁷Milner, above n 1, 67.

⁸Saul Newman, 'Crowned Anarchy: Postanarchism and International Relations Theory' (2012) 40(2) *Millennium - Journal of International Studies* 259.

⁹Ibid.

¹⁰Ibid.

¹¹Ibid.

¹²Milner, above n 1, 67.

suggested that anarchy has the status of a trope, as the discourse of international politics “employs a particular conception of anarchy that portrays the international system as ‘primitive’” in its characterisation of states as self-interested and obsessed with power.¹³ These definitional inconsistencies permeate all schools of international relations theory, and complicate any attempts to solve the problem of anarchy, on theoretical, conceptual and policy levels.

III. THE PROMISE OF NEOREALISM

Amidst this definitional ambiguity, the rise of neorealism was characterised by its departure from classical realist theory, which intertwined state behavior and human nature in its analysis of international relations. While classical realist ideas like “international politics, like all politics, is a struggle for power”¹⁴ also feature in neorealism, importantly, neorealism sought to redefine the focus of international relations theory away from philosophical abstractions (such as humanity’s innate desire for power) toward a more methodological, scientific approach.

The neorealist conception of anarchy significantly redefined its standing in international relations. Understanding anarchy as the absence of government or rule,¹⁵ Waltz contends that anarchy is preferable to hierarchy as an ordering principle due to the “costs”¹⁶ associated with maintaining international organisations such as the susceptibility of their internal structure to disorder and imbalances of power. Accordingly, he believed that “self-help was necessarily the principle of action”¹⁷ in the international system. Essentially, self-help and balances of power follow anarchy as a matter of logic and structure in motivating state action in international relations. In founding his theory upon the assumption of anarchy, Waltz is able to provide an argument with more “theoretical elegance and methodological rigor”¹⁸ than is offered by classical realism (typified by Morgenthau in *Politics Among Nations*), which grounds its analysis in human nature.

However, Waltz’s attempt to solve the problem of anarchy is founded upon a conceptual error, where “anarchy and hierarchy are construed as dichotomous political ordering principles”.¹⁹ The problem with imposing binaries is that the

¹³ Aaron Beers Sampson, ‘Tropical Anarchy: Waltz, Wendt and the Way We Imagined International Politics’ (2002) 27(4) *Alternatives: Global, Local, Political* 429.

¹⁴ Hans Morgenthau, *Politics Among Nations* (McGraw-Hill, 1993) .

¹⁵ Waltz, above n 2.

¹⁶ Ibid.

¹⁷ Ibid.

¹⁸ Julian Korah-Karpowicz, ‘Political Realism in International Relations’ in Edward N Zalta (ed), *The Stanford Encyclopedia of Philosophy* (Stanford University, Summer Edition 2013) .

¹⁹ Jack Donnelly, ‘Sovereign Inequalities and Hierarchy in Anarchy: American Power and International Society’ (2006) 12(2) *European Journal of International Relations* 139.

nuances of the international system are lost - this will be discussed further in the next section. Importantly, Waltz does not outright reject the idea of order and hierarchy in the international system, and does attempt a more nuanced argument when he suggests that despite the "fact of anarchy",²⁰ modern states have formed an international society.²¹ He is happy to concede that "the existence of this international society is not as such disproved by the fact of international anarchy"²² Axelrod and Keohane support this notion of an international society, albeit with the concession that it is "a fragmented one".²³ Nonetheless, Waltz allows his argument to be dictated in terms of its antithesis - he builds his analysis of anarchy on this very basic binary. Indeed, the scope of his analysis centres on the pitfalls of international organisations - he asserts that "the prospect of world government would be an invitation to prepare for world civil war"²⁴ thereby rejecting the merits of hierarchy. The role of international organisations in maintaining stability, he posits, is ironically susceptible to instability and imbalances of power within their own internal governing structures. At best, "the order provided within modern international society is precarious and imperfect".²⁵ What the reader is left with is a muddled argument about how anarchy and hierarchy are not mutually exclusive concepts, but still establishes a mutually constitutive binary where each concept is defined in terms of the other.

Despite his reformulation of classical realism, Waltz also suffers from some of the same definitional inconsistencies when conceptualising anarchy. This is due to his association of anarchy with sovereign equality; he asserts that "formally, each [state] is the equal of all the others"²⁶ in the anarchic international system, and that this equality turns on the norm of state sovereignty which renders all states functionally equal. But such an association is encumbered by contradiction; after all, anarchic orders need not be equal, and "formal inequalities are standard features of almost all historical international societies".²⁷ Moreover, Waltz acknowledges that while states are equal in function, states have varying capabilities and one's capabilities shape one's functions.²⁸ Hence, they are not actually 'like' or 'equal' units. The self-contradictory nature of Waltz's theory reveals a normative gap, wherein Waltz

²⁰Waltz, above n 2; Hedley Bull, *The Anarchical Society: A Study of Order in World Politics* (New York Columbia University Press, 1977).

²¹Waltz, above n 2.

²²Ibid.

²³Robert Axelrod and Robert O Keohane, 'Achieving Cooperation Under Anarchy: Strategies and Institutions' (1985) 38(1) *World Politics* 226.

²⁴Waltz, above n 2.

²⁵Ibid.

²⁶Ibid.

²⁷Donnelly, above n 19, 139.

²⁸Milner, above n 1, 67.

has failed to consider not only the varying capabilities of states in his imposition of a rigid theory of state interaction and anarchy, but also the nature of

sovereignty and other principles on his narrow, methodological construction of international relations.

IV. ANARCHY AS A CONSTRUCT OF THE STATES IN THE SYSTEM: TOWARD A MORE NUANCED APPROACH

The norm-based approach of constructivism is grounded in the idea that all international systems have developed sets of norms,²⁹ and that the norms inherent in the international system inform state actions, and play a crucial role in shaping identity, power and change. There is a tendency for theorists to view the state as an idealised and abstract decision-making subject, rather than understanding the historical particularities that might shape its actions.³⁰ This is symptomatic of a widespread complicity in theory to assume certain concepts without adequately engaging in questioning and re-conceptualisation as appropriate.³¹

As a theoretical tradition, constructivism undermines a number of fundamental assumptions, as its analysis of world politics is not derived “from imposed homogeneity, but from an appreciation of difference”.³² In particular, the constructivist challenge of neorealism advances the idea that to begin with anarchy as a foundational, self-evident axiom is flawed, particularly without consideration of the constitutive power or norms:

Since structure is meaningless without some intersubjective set of norms and practices, anarchy, mainstream international relations theory's most crucial structural component, is meaningless.³³

The constructivist answer to the problem of anarchy comes from Wendt, a leading constructivist scholar, who asserts that:

There is no ‘logic’ of anarchy apart from the practices that create and instantiate one structure of identities and interests rather than another; structure has no existence or causal powers apart from process.

²⁹Erika Cudworth and Stephen Hobden, ‘Anarchy and Anarchism: Towards a Theory of Complex International Systems’ (2010) 39(2) *Millenium - Journal of International Studies* 399.

³⁰Richard K Ashley, ‘Untying the Sovereign State: A Double Reading of the Anarchy Problematic’ (1988) 17(2) *Millenium - Journal of International Studies* 227.

³¹James N Rosenau, *Calculated Control as a Unifying Concept in the Study of International Politics and Foreign Policy* (Princeton University Center for International Studies, 1963) .

³²Hopf, above n 5, 171.

³³*Ibid.*

Self-help and power politics are institutions, not essential features of anarchy. Anarchy is what states make of it.³⁴

Wendt rejects the idea of anarchy as an inherent structural system of the international system, but rather understands anarchy more as an umbrella term under which various institutions and structures are encompassed.³⁵ Identity, state interest, and self-help are just some of the institutions subsumed under the concept of anarchy. While all are important, none are singularly defining.

In neorealism, it is the “totalising standpoint of a theorist” that is valorised, and “self-help and competitive power politics are simply given exogenously by the structure of the state system”.³⁶ Constructivism on the other hand takes into account historically significant factors, and acknowledges that many of the ‘truisms’ and assumptions in international relations theory are in fact socially constructed by the system, rather than being intrinsic to it. This is why constructivism is able to better address this conceptual problem of anarchy - it provides a more nuanced and holistic interpretation of the international system.

V. CONCLUSION

As has been discussed, traditional international relations theory diverges in its evaluation of anarchy, and the ways to ameliorate or accommodate it. While neorealism offers a valuable contribution to the discourse in its reconfiguration of anarchy as a meritorious condition, it has failed to engage with the conceptual limitations of its response. Its assumption of anarchy as the defining structural condition of the international system is deeply flawed, and its conceptual errors and definitional inconsistencies reveal a significant normative gap. Constructivism strongly emphasises the constitutive power of norms, and it is this relational, intersubjective analysis that allows us to most effectively navigate the conceptual problem of anarchy. By challenging the base assumption of anarchy as an inherent and defining structural condition, and illuminating that anarchy is merely one of the many conditions of the international system, constructivism shows itself to be the most promising way forward.

Acknowledgements

Many thanks to Ken Fraser for his nuanced insight into international relations theory, and for his guidance in improving this essay.

³⁴Wendt, above n 3, 391.

³⁵Ibid.

³⁶Ibid.

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Relational Objects #1 - #5

Janis Lejins

Only a thoughtless observer can deny that correspondences come into play between the world of modern technology and the archaic symbol-world of mythology.¹

Early in the process of conceptualising what would become *Relational Objects* #1-5, I stumbled upon a challenge set in 1972 by German Fluxus and Conceptual Artist Joseph Beuys. Beuys wrote: "Only art is capable of dismantling the repressive effects of a senile social system that continues to totter against the death-line: to dismantle in order to build A SOCIAL ORGANISM AS A WORK OF ART"² Captivated by this creed I researched socially aware approaches to art. This research lead me past a slew of influential art-theoretical philosophies, including Guy Debord's 'Situationists',³ Umberto Eco's 'Open Work',⁴ Jean Baudrillard's 'Hyper-reality'⁵ and inevitably to Nicolas Bourriaud's 'Relational Aesthetics'⁶.

Ultimately I identified that I wanted to make artworks that took "as their theoretical and practical point of departure the whole of human relations and their social context, rather than an independent and private space"⁷. Put simply, I wanted to make a body of work that placed 'art' clearly in constitutive social relation to the contemporary environment in which it sat. From the beginning I conceptualised

¹Walter Benjamin, *The Arcades Project* (Harvard University Press, 1999) . Edited by Rolf Tiedemann, Translated by Howard Eiland and Kevin McLaughlin.

²Joseph Beuys, 'I Am Searching For Field Character' in Clare Bishop (ed), *Participation* (Whitechapel, 2006) 125.

³Guy Debord, *Society of the Spectacle* (Black and Red, 2 1977); Tom McDonough, *Guy Debord and the Situationist International: Texts and Documents* (MIT Press, 2002)

⁴Umberto Eco, *The Open Work (Opera Apera)* (Harvard University Press, 1989) .

⁵Jean Baudrillard, 'The Hyper-realism of Simulation' in Charles Harrison and Paul Wood (ed), *Art in Theory 1900-2000* (Blackwell Publishing, 2003) 1018-1020.

⁶Nicolas Bourriaud, *Relational Aesthetics* (Les Presses du réel, 2002) 16, 113.

⁷Ibid.

my desire to socialise the art object as a *détournement*,⁸ or 'rerouting' of traditional associations and expectations we have of the Artworld,⁹ and the experience of a gallery. I wanted to make work that stood at odds with the traditionalist, plastic, view of Art History. Thus I sought for my works to reconstitute and re-enliven the process of periodisation; where one visual trend or impulse simply supersedes another, I wanted them to "struggle against the historical schema"¹⁰ and engender a sense of "fictive co-presentness of a multiplicity of times."¹¹ I wanted to make art that was truly contemporary, in this sense I sought to make something perpetually active and productive. It's meaning ever-changing in direct social relation to the context in which I had placed it. As much as I wanted to create a work of art I wanted also to be able to facilitate an on-going dynamic social aspect for each artwork. I sought to make a work that was constantly changing and perpetually present in the contemporary moment.

As a result, my project has culminated in the production of five *tableaux vivant* studio photographs. Each image has been reconstructed from art historical imagery from Baroque period (the earliest is *Narcissus*, 1597 and the latest is *Vanitas*, 1671). Each image addresses one of five 'meta' art-world themes from Ego, Partnership, Conflict, Idolisation and Death. Combined, these images are a broad spectrum or frieze of different human experiences. I chose the Baroque as a site for appropriation because I identified it as a movement that sought to blur the lines between art and life. The Baroque is often cited as the first western movement that actively sought to develop the concept of virtual reality that so dominates contemporary life today.¹² Works by Baroque artists like Caravaggio, Bernini and Pozzo from today's perspective can be read as 'the real and the imaginary confounded in the same operational totality'.¹³ They effaced the distinction between life and the image world.¹⁴ My work seeks to the distinction between simulative experience and lived experience. Each of the scenes are individually printed onto two layers of transparency film and

⁸I am using the Situationists definition here: The integration of present or past artistic productions into a superior construction of a milieu. In this sense there can be no situationist painting or music, but only a situationist use of those means. In a more elementary sense, *détournement* within the old cultural spheres is a method of propaganda, a method which reveals the wearing out and loss of importance of those spheres. *Internationale Situationniste* # 1, *Definitions* (1958). Translated by Ken Knabb.

⁹I define Artworld as the complex of institutions and discourses which help define the perceived parameters of the art concept; this is in keeping with institutional theory as it was first proposed in Arthur Danto, 'The Artworld', (1964) 61(19) *The Journal of Philosophy* 575 .

¹⁰Frantz Fanon, *Black Skin, White Masks* (Grove, 2008) 167.

¹¹Peter Osborne, *Anywhere or Not at All: The Philosophy of Contemporary Art* (Verso, 2013) 23.

¹²Angela Ndalanian, *Neo-Baroque Aesthetics and Contemporary Entertainment* (MIT Press, 2004) .

¹³Baudrillard, above n 6, 1018.

¹⁴Mieke Bal, *Quoting Caravaggio: Contemporary Art, Preposterous History* (University of Chicago Press, 1999) .

housed within five purpose designed Perspex housings. The prints must be precisely aligned. As a result, the design for the housing was produced using the precision of computer-aided design. My design was then fabricated externally. This approach required learning a combination of Computer Aided Design (CAD) programs. The use of CAD also enabled the simulation of in-situ installations of my final work within a scale 3D model of the School Of Art gallery I built from architectural plans. This visualisation technique helped create productive and formative critiques for my proposed installation despite time and economic constraints precluding more than one attempt at any project stage.

Each Relational Object also contains a micro-controller computer. Each of these five computers runs a unique set of operating protocols (written in C++ Language). These operating protocols function in synchronistic relation to my online server that is running server side scripting. Each of these scripts harvests a vast amount of data from online sources. The micro-controllers synthesise the collated data and then print the data using a small receipt printer. This complex computational undertaking serves the simple outcome of rendering physical an ever-expanding range of online social transactions. In each relational object a printer is situated in indirect juxtaposition to the tableaux vivant image. In this way the symbolic content of each image can be read in equivalence to the dynamic crowd-sourced social context depicted by the receipt printer. When the machine prints more information it draws power from the LED lights that illuminate the object, this creates a flickering effect. Thus a clear power relationship metaphorically is established between each of the constituent parts of the Relational Object; there is a degree of co-habitation and co-dependency.

In this installation it is clear that an experience of the 'art' is established as the formal experience of the visual artefact in relation to the descriptive experience of the information provided. Here 'art' becomes as a "place that produces a specific sociability".¹⁵ In each individual object, and in the installation as a whole, my cohesive use of technology and appropriation has in a relational way made the audience "the embodiment of the signifier"¹⁶ by ensuring that "every reception of a work of art is both an interpretation and performance of it, because in every reception the work takes on a fresh perspective for itself".¹⁷ I have made 'art' Contemporary - this project is a perpetually active, continually engaged, ever changing, constituent of the world around it. This project took it's theoretical and practical point of departure the whole of human relations and their social context but in a way has moved beyond this common conception of Relational Aesthetics as a reactive or transitory philosophy; this work makes plain the possibility of an artworks degree of

¹⁵Bourriaud, above n 7, 113.

¹⁶Jacques Alain Miller, 'The Symptom of the Body Event' (2001) 19 *Lacanian Ink* 46.

¹⁷Eco, above n 4.

social integration and relation can transcend the moment of conception and creation. This work places the social performance of contemporary art beyond the artist's control.

When the notion of reality changes, so does that of the image, and vice versa.¹⁸

¹⁸Susan Sontag, 'The Image World' in (ed), *On Photography* (Penguin, 2002) 153-183.

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'Relational Objects #1 - #5'
Installation (2013)



'Relational Object #1 - The Selfie. (Narcissus)'

Generative installation. Transparency, Perspex, LED lighting, Microcontroller computer programmed with custom operating protocols, Ethernet cable, breadboard, electrical tape, DC adaptor, thermal printer, receipt paper and web server side scripting hacking data from the Artist's Facebook.com account.

Starting dimension: 40 × 49 × 150cm



'Relational Object #2 - @justinbieber. (The Deposition of Christ)'

Generative installation. Transparency, Perspex, LED lighting, Microcontroller computer programmed with custom operating protocols, Ethernet cable, breadboard, electrical tape, DC adaptor, thermal printer, receipt paper and server scripting retrieving tweets directed at pop star Justin Bieber live.

Starting dimension: 40 × 49 × 150cm



'Relational Object #3 - We Got Him. (The Head of Holofernes)'

Generative installation. Transparency, Perspex, LED lighting, Microcontroller computer programmed with custom operating protocols, Ethernet cable, breadboard, electrical tape, DC adaptor, thermal printer, receipt paper and web server side scripting retrieving data from National Priorities.org, The New York Times.com, Yahoo Finance.com, National Security.gov.au and MI5.gov.uk.

Starting dimension: 40 × 49 × 150cm



'Relational Object #4 - I am seeking a life partner who I can marry and raise a family with. (The Abduction of the Sabine Women)'

Generative installation. Transparency, Perspex, LED lighting, Microcontroller computer programmed with custom operating protocols, Ethernet cable, breadboard, electrical tape, DC adaptor, thermal printer, receipt paper and web server side scripting retrieving live profile data from the 'Elena's Models', an online dating connecting eastern European women with potential Western husbands.

Starting dimension: 40 × 49 × 150cm



'Relational Object #5 - Recent Tributes, Obituaries and Funeral notices. (Vanitas)'

Generative installation. Transparency, Perspex, LED lighting, Microcontroller computer programmed with custom operating protocols, Ethernet cable, breadboard, electrical tape, DC adaptor, thermal printer, receipt paper and web server side scripting retrieving recent tribute, Obituaries and Funeral notices from Various Newspaper websites.

Starting dimension: 40 × 49 × 150cm

Defending the Ability Hypothesis

Minh Nguyen

In the first part of this essay, I will provide a detailed breakdown of Frank Jackson's thought-experiment about Mary, the human colour vision scientist who was held captive in a black-and-white room. This thought-experiment is also known as the Knowledge Argument against physicalism, and the goal of the argument is to demonstrate that complete physical knowledge fails to capture some aspect of the actual world. This "aspect" of the actual world, then, is presumed to be non-physical. Therefore, physicalism fails. In the second part of the paper, I will reconstruct and analyse the Ability Hypothesis, which is David Lewis' solution to this thought-experiment in defense of physicalism. In the final part of the paper, I will defend Lewis' solution against some objections made by Michael Tye.

I. THE KNOWLEDGE ARGUMENT

First, a quick paraphrase of the original Mary thought-experiment. Mary is a colour scientist, and through years of research and experiments, she comes to know everything there is to know about human colour vision (that is, the knowledge of all physical facts). However, Mary has been held captive in a black-and-white room all her life, and Mary herself is painted over such that she has never seen colour before. However, if Mary gets released and sees colour for the first time, does she, in that moment, gain any new knowledge? The obvious, intuitive answer is that she does gain new knowledge - the knowledge of "what it's like to see colours." However, since we previously stipulated that Mary has complete knowledge of all physical facts about human colour vision, what is this new knowledge of "what it's like to see colours" supposed to be? It must be knowledge of a non-physical fact. If there is non-physical knowledge, then the world might not be all "physical" as the physicalist thinks, though how the conclusion to the Mary thought-experiment affects physicalism needs to be spelled out in more detail. For now, it suffices to say that such a conclusion spells trouble for the physicalist, in the sense that the physicalist must now provide an explanation for this non-physical knowledge in such a way that is compatible with physicalism.

To break down the details of the Knowledge Argument and to show how it directly

affects physicalism, I will borrow from Stanford Encyclopedia of Philosophy¹ the following reconstruction of the argument:

P1: Mary has complete physical knowledge about human colour vision before her release.

C1: Therefore, Mary knows all the physical facts about human colour vision before her release.

P2: There is some (kind of) knowledge concerning facts about human colour vision that Mary does not have before her release.

C2: Therefore (from **P2**), there are some facts about human colour vision that Mary does not know before her release.

C3: Therefore (from **C1** and **C2**), there are non-physical facts about human colour vision.

A fact picks out some part of the actual world (and is therefore ontological). Knowledge refers to the specific knowledge-state that we occupy with respect to the fact (and is therefore epistemic). We can occupy several knowledge-states with respect to the same fact. A simple example: I only know my weight in pounds and not in kilograms. Upon finding out my weight in kilograms, I have gained a new 'knowledge-state' with respect to my weight, but I have not learned any new ontological fact about the world (my weight in kilograms and my weight in pounds are essentially the same physical property of the actual world). For a more complicated example, we can have a situation where I know that Superman is standing on top of a building. I have Superman's location, but not Clark Kent's, because I do not know that they are the same person. However, upon discovering that Clark Kent is Superman, I do not discover any new 'fact' about the location of anyone, because Clark Kent and Superman both pick out the same part of the actual physical world (they're the same person), and I already knew the location of the Superman-Clark Kent entity.

However, since the relationship between fact and knowledge is not one-to-one, what can we say about the completeness of facts given the completeness of our own knowledge? What warrants the move from **P1** to **C1**? Assuming that every fact can be known by humans, we can understand the term 'complete physical knowledge' mentioned in **P1** as "having full access to all the facts about the actual world, such that, if we were to try to use our knowledge of the physical facts about the actual world to build a duplicate world (in a computer stimulator, etc.), the duplicate world would be identical simpliciter to our actual world." Since we are building the notion of complete physical facts into our definition of complete physical knowledge, if we were to stipulate the former (**P1**), the latter (**C1**) would automatically follow.

¹Martine Nida-Rümelin, 'Qualia: the knowledge argument' in Edward N Zalta (ed), *The Stanford Encyclopedia of Philosophy* (Stanford University, Summer Edition 2010) .

Note that this definition of complete physical knowledge does not require having all the possible knowledge-states in relation to all the possible physical facts about the world. As I have shown, there is more than one knowledge-state for each physical fact (e.g., my weight can be understood in terms of pounds or kilograms). What is important for our notion of complete physical knowledge is that we have at least one knowledge-state about each physical fact (i.e., it does not matter if my weight is captured in terms of pounds or kilograms, or both, as long as it is captured by some measurement system). Some may object the move from **P1** to **C1** by way of definition as I have done, but this discussion is irrelevant to Lewis' response, which is the main focus of the paper.

Before we get to Lewis' response, I want to say a few more words about how the Knowledge Argument refutes physicalism. One popular conception of physicalism is Supervenience Physicalism. Daniel Stoljar provides the following definition for Supervenience Physicalism:

"Physicalism is true at a possible world *w* iff any world which is a physical duplicate of *w* is a duplicate of *w* simpliciter."²

As a result of Supervenience Physicalism, "there is no possible world which is identical to the actual world in every physical respect but which is not identical to it in a biological or social or psychological respect."³ However, if the Knowledge Argument holds true for our world, then we have proof for the existence of non-physical facts about human colour vision. Lewis believes that one explanation for such non-physical facts about the world is the Phenomenal Information Hypothesis, where non-physical facts are now posited to be irreducible first-person phenomenal experience.⁴ The irreducible first-person phenomenal experience is the object of our non-physical knowledge, i.e., phenomenal information. If the PIH is true, then even if we duplicate all the physical aspects of our world and get a very good look-alike, this look-alike world may still differ with respects to the phenomenal information, and there is no identity simpliciter. An example of such a possible world is a world that is exactly like us in every way, except instead of having sentient beings like the actual world, this possible world is full of (philosophical) zombies. These zombies behave exactly like the sentient beings of our planet but they don't have any first-person phenomenal experience. Thus, if the PIH is true, there exists a possible world which is identical to the actual world in every physical aspect but is not identical to it simpliciter. Therefore, Supervenience Physicalism fails.

²Daniel Stoljar, 'Physicalism' in Edward N Zalta (ed), *The Stanford Encyclopedia of Philosophy* (Stanford University, Fall Edition 2009) .

³Ibid.

⁴David Lewis, 'What experience teaches' (1988) 13 *Proceedings of the Russellian Society* 29.

II. THE ABILITY HYPOTHESIS

Lewis does not directly reply against the PIH, but he wants to reject it because it is incompatible with physicalism⁵. Lewis' strategy is to accept **P2** but deny **C2**: to argue that Mary did learn new knowledge but not a new fact upon seeing colours for the first time after her release. Because there is no new fact to be accounted for, one has no reason to believe in the PIH, and the Mary case presents no problem for Physicalism.

To accept **P2**, Lewis wants to make the distinction between knowing-that and knowing-how, and show that **P2** is an instance of Mary acquiring knowing-how, which is compatible with Physicalism.

Knowing-that is the acquisition of facts or information. I know that George Washington was the first U.S. President. I know that this rose is red. In contrast, knowing-how is the acquisition of some ability to do something. Abilities, in turn, can be understood as physical properties of an object: birds' ability to fly, humans' ability to walk upright, etc. So, we can understand **P2** as stating that Mary has acquired a new ability upon seeing colours for the first time. More specifically, Mary acquired the ability "to remember, imagine, and recognize" colours.⁶ Together, these abilities constitute the notion of "what it's like to see red." And whereas we hesitate to say that "what it's like to see x" is a physical entity/property (hence the trouble for physicalism), we can say with confidence that "the ability to do x" is nothing but a physical property belonging to some individual (e.g., flying is an ability belonging to birds). Since we are able to explain "what it's like to see red" in terms of abilities, and to explain abilities in terms of physical facts, there is nothing non-physical and mysterious about **P2**, the fact that Mary has acquired a new ability that is a knowing-how-to-see-red.

Having established **P2** as being compatible with physicalism, the next move is to argue that we cannot conclude **C2** from **P2**. To better explain why **C2** does not follow from **P2**, I want to suggest that we understand the notions of knowing-that and knowing-how in terms of different knowledge-states that an agent can occupy in relation to the same facts about the world. To know what walking involves (know-that) and to know how to walk yourself (know-how) is to occupy two different knowledge states about the same fact of you walking - the ontological "entity" or "event" that is a part of the actual world.

So, according to **P2**, it is true that Mary acquired a new knowledge-state (the knowing-how to remember, imagine, and recognise red). However, **P2** itself can be a

⁵Ibid.

⁶David Lewis, 'Postscript to "Mad Pain and Martian Pain"' in David Lewis (ed), *Philosophical Papers (Volume 1)* (Oxford University Press, 1983) .

knowledge-state that stands in relation to a physical fact. This is exactly the analysis of knowing-how that I gave earlier: knowing-how is nothing but having some ability, and having some ability is nothing but having certain physical properties (or having certain physical events, if you are exercising your ability). **P2** itself also does not imply **C2**, because a person can occupy several knowledge-states in relation to the same physical fact, and knowledge-states and facts are not one-to-one. Without going into details whether the same knowledge-state can stand in relation to two different facts about the world (though I think in principle this is possible), it is clear that the introduction of new knowledge-states do not necessitate that we further posit the existence of new facts about the world. The new knowledge-state can simply stand in relation to facts that were already captured by our other knowledge-states. So, that Mary gains a new ability - a new knowledge-state - does not warrant that Mary has discovered a new fact about the world that wasn't already captured by her complete physical knowledge. Because Mary's new ability can be explained completely in terms of physical terms and theories, the physicalist need not posit that Mary's new ability points to some new, non-physical fact about reality. However, as it is possible that the same knowledge-state refer to more than one fact about the world, it is conceivable that "knowing how to remember, imagine, and recognize,"⁷ and other abilities that capture first-person phenomenal experience, also refer to some non-physical fact about the world. However, it is not the job of the physicalist to argue against such possibilities. Rather, it is the job of the anti-physicalist and PIH proponents to establish that these knowledge-states do in fact imply such non-physical facts.

III. THE ABILITY HYPOTHESIS DEFENDED

I want to review Michael Tye's objection to Lewis' solution. The objection is as follows:

"What is the new ability that Mary acquires here? She is not now able to recognise things that are red₁₇ as red₁₇ by sight. *Ex hypothesi*, Mary is one of us, a human-being. She lacks the concept red₁₇. Nor is she able to recognise things other than the rose as having that very determinate colour (whatever it is). She has no mental template that is sufficiently fine-grained to permit her to identify the experience of red₁₇ when it comes again. Presented with two items, one red₁₇ and the other red₁₈, in a series of tests, she cannot say with any accuracy which her earlier experience of the rose matches. Sometimes she picks one; at other times she picks the other. Nor is she able afterwards to imagine things as having hue, red₁₇, or as having that very shade of

⁷Ibid.

red the rose had; and for precisely the same reason.”⁸

I was originally unmoved by Michael Tye’s objection. It seemed to me that Tye is, without justification, demanding supernatural human abilities from Mary. The original Lewis Ability Hypothesis simply states that Mary acquires the abilities to “remember, imagine, and recognise”⁹ in so far as these are human abilities that regular human beings can attain and exercise. Human beings are incapable of the kind of accuracy that Tye demands - to recognize red₁₇ as red₁₇ by sight, to identify red₁₇ from red₁₈, and to imagine the exact shade of red₁₇. Tye himself observes that we lack a “mental template that is sufficiently fine-grained”¹⁰ for such activities. But why must we require such fine-grained abilities?

I think the following reconstruction of Tye’s objection helps us understand why Tye was concerned with the fine-grained abilities. It also helps to strengthen Tye’s position, but in my opinion, it is still inadequate to refute the Ability Hypothesis:

1. We can distinguish between the experience of seeing red₁₇ and the experience of seeing red₁₈.
2. There is no difference in abilities gained from the experience of seeing red₁₇ and from the experience of seeing red₁₈ (either one gives us these coarse-grained abilities to distinguish, imagine, and identify colours).
3. Therefore, the experience of seeing red is not completely reducible to the abilities gained.

I will now elaborate the Tye objection according to this reconstruction.¹¹ Lewis originally identified “what it’s like to see red₁₇” (the experience of seeing red₁₇) as the ability to “remember, imagine, and recognize red₁₇.” Empirical testing as Tye mentioned will show that this is clearly not the case, such that Mary cannot, with accuracy, “remember, imagine, and recognize red₁₇.” The same will go for Mary’s ability to “remember, imagine, and recognize red₁₈.” So it seems that the abilities that Mary has gained from her experiences of seeing red₁₇ and red₁₈ are the same abilities. However, if presented with red₁₇, followed by red₁₈, it is clear that Mary can distinguish the experiences of seeing these two colors. So there is a difference in the experiences, but no difference in the abilities gained from the experiences.

⁸Michael Tye, ‘Knowing what it is like: the ability hypothesis and the knowledge argument’ in (ed), *Consciousness, Color, and Content* (The MIT Press, 2000) .

⁹Lewis, above n 6.

¹⁰Ibid.

¹¹I owe this reconstruction of Tye’s argument to Daniel Nolan

Therefore, the experience of seeing red17 is not completely reducible to the ability to “remember, imagine, and recognize red17.”

I will now defend the Ability Hypothesis by refuting the second premise in Tye’s objection. I want to argue that, given a revised, more detailed account of the abilities that Mary acquired, we can show that the abilities gained from seeing red17 and the abilities gained from seeing red18 are different.

Abilities are gained and lost. They are strengthened through training and they deteriorate through lack of use. These are the two ways in which we can think about the abilities gained upon seeing any shade of colour for the first time. One way is to think of these abilities as two different types of abilities - one that is retained long after we stop looking at the colour, and one that is lost quickly after we stop looking at the colour. The ability that is retained long after is the ability to remember, imagine, and recognise colours within a range of error. After looking at a certain shade of red, we can remember, imagine, and recognise red. We just won’t be able to pinpoint that exact shade of red. However, I argue that seconds after we stop looking at red17, we are still able to pinpoint this colour accurately, and it is this very ability that distinguishes the experience of seeing red17 from the experience of seeing red18. We just don’t retain this more accurate and precise colour identification ability for very long, due to our biological/neurological makeup. Another way to think about these abilities is that we start out with a ‘strong’ ability to “remember, imagine, and recall” a specific shade of colour, which quickly deteriorate with time, such that we can only “remember, imagine, and recall” some random shade of colour within a margin of error. Either way, there is a difference in ability that would account for the difference in the two experiences of seeing red17 and seeing red18.

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Vaccination - Attitudes, Perceptions and Behaviour

Alexandra Fogg

The introduction of vaccines has arguably had the greatest positive impact on health and health care worldwide, alongside clean water.¹ According to the World Health Organisation (WHO), vaccines against diphtheria, pertussis, tetanus and measles save 2-3 million lives per year.² Why then does the topic of vaccination provoke such a continuum of conflicting views and attitudes within our society? Ironically, this public health intervention has been so successful at preventing disease, that public focus has shifted away from the risk of vaccine-preventable diseases, to perceived risks posed by vaccines themselves.³ As a result, rates of vaccine exemption, refusal and delay are increasing, leading to outbreaks of previously controlled diseases.⁴ A study in the United States from 1985-1992 found that children with non-medical exemptions for the measles vaccine were 35 times more likely to contract measles than those who were vaccinated.⁵ In 2012, an outbreak of pertussis in the United Kingdom, linked with dropping rates of vaccine coverage, infected 10,000 people, 10 times more than in previous years, and resulted in the deaths of 14 babies under 3 months old.⁶ Continued success in disease prevention requires consistent and wide-reaching vaccination coverage, which hinges upon individuals' willingness to vaccinate.⁷ In the following report, the complex and context-specific influences and

¹Joanne Yarwood, 'Communicating vaccine benefit and risk - lessons from the medical field' (2006) 117 *Veterinary Microbiology* 71.

²Alina Sadaf et al, 'A systematic review of interventions for reducing parental vaccine refusal and vaccine hesitancy' (2006) 24 *Vaccine* 4041.

³Deborah A Gust et al, 'Parental perceptions surrounding risks and benefits of immunization', (2003) 14 *Seminars in Pediatric Infectious Diseases* 207 ;Irene M Shui et al, 'Parents concerned about vaccine safety', (2006) 31 *American Journal of Preventive Medicine* 244 .

⁴Katelyn B Wells and Omer Saad Bin, 'The financial impact of a state adopting a personal/philosophical belief exemption policy: modelling the cost of pertussis disease in infants, children and adolescents', (2012) 30 *Vaccine* 5901 ; Sadaf et al, above n 2, 4293

⁵Elizabeth L Thorpe, 'Homeschooling parents' practices and beliefs about childhood immunizations' (2012) 30(6) *Vaccine* 1149.

⁶Oxford Vaccine Group, 'Vaccines in Pregnancy: Pertussis (whooping cough)' <<http://www.ovg.ox.ac.uk/pertussis-vaccine-in-pregnancy>>.

⁷Sadaf et al, above n 2, 4293.

cognitive processes which shape parental decision-making regarding vaccinating their children will be explored, as well as the current communication environment surrounding this issue and the potential for values-based, rather than facts-based, approaches to increase vaccine uptake.

A multitude of factors exist which are associated with suboptimal vaccine uptake or that encourage pro-vaccination decisions. Both demographic factors and parental attitudes play a role, to varying degrees, with a continuum of perceptions, attitudes and behaviours spanning from parents who accept vaccinations to those who refuse. The determinants of this decision are complex and context-specific.

Some barriers to vaccination which arise from the literature include perceptions of potential harm,⁸ fear of adverse effects,⁹ perceived pain inflicted upon the child by the injection,¹⁰ thinking that vaccination is no longer necessary in our current society in which incidence of vaccine-preventable diseases has decreased,¹¹ a distrust of the medical community, pharmaceutical companies or of the government, seen to be acting in their own self-interest,¹² logistical issues in terms of lack of transport to a medical clinic, time constraints or general lack of access to vaccines,¹³ lack of knowledge regarding, or concerns associated with, the recommended vaccination

⁸Edward J Mills et al, 'Systematic review of qualitative studies exploring parental beliefs and attitudes toward childhood vaccination identifies common barriers to vaccination', (2005) 58 *Journal of Clinical Epidemiology* 1081; Heidi Jane Larson et al, 'Addressing the vaccine confidence gap', (2011) 378 *The Lancet* 526; Jeroen Luyten et al, 'Vaccination policy and ethical challenges posed by herd immunity, suboptimal uptake and subgroup targeting', (2011) 4 *Public Health Ethics* 280 .

⁹Mills et al, above n 8, 1081; Lucy Serpell and John R Green, 'Parental decision-making in childhood vaccination', (2006) 24 *Vaccine* 4041 .

¹⁰Mills et al, above n 8, 1081; Beth Elverdam, "It is only a pinprick" - (or is it?) - childhood vaccinations in general practice as 'matter out of place', (2011) 18 *Anthropology and Medicine* 339

¹¹Mills et al, above n 8, 1081; Kavita Bhat-Schelbert et al, 'Barriers to and facilitators of child influenza vaccine - Perspectives from parents, teens, marketing and healthcare professionals', (2012) 30 *Vaccine* 2448 .

¹²Mills et al, above n 8, 1081; Julie-Anne Leask et al, 'What maintains parental support for vaccination when challenged by anti-vaccination messages? A qualitative study', (2006) 24 *Vaccine* 7238 ; Serpell and Green, above n 9, 4041; Anna Kata, 'Anti-vaccine activists, Web 2.0, and the postmodern paradigm - An overview of tactics and tropes used online by the anti-vaccination movement', (2012) 30 *Vaccine* 3778 .

¹³Mills et al, above n 8, 1081; Kostas Danis et al, 'Socioeconomic factors play a more important role in childhood vaccination coverage than parental perceptions: a cross-sectional study in Greece', (2010) 28 *Vaccine* 1861 ; Heidi Jane Larson et al, 'Understanding vaccine hesitancy around vaccines and vaccination from a global perspective: A systematic review of published literature, 2007-2012', (2014) 32 *Vaccine* 2150 .

schedule,¹⁴ unpleasant past experiences and moral or religious views.¹⁵

Conversely, factors which encourage vaccination include trust in health care professionals and thus a willingness to follow their advice,¹⁶ personal experience with, or exposure to, the disease the vaccine protects against,¹⁷ perceiving vaccination to be a social norm or social responsibility,¹⁸ recommendation by a trusted source, convenience,¹⁹ an increased knowledge about the process, risks and benefits of vaccination,²⁰ favourable attitudes towards vaccination²¹ and perceived access to information.²²

It is important to note that the above is not an exhaustive list, with individual factors carrying more or less weight in certain cultural, political or social contexts, varying across time, place and for specific vaccines.²³ In addition, a perceived barrier for one individual may in fact act as a vaccine promoter for another. A review of peer-reviewed papers on vaccination hesitancy published between January 2007 and November 2012 by Larson and colleagues²⁴ outlined the contextual, individual and social factors that act as barriers or promoters to vaccination across different geographical locations. In Greece it was found that low-levels of paternal education are linked with low uptake with longer distances to medical clinics also a barrier. While in this context parental attitudes were not found to play a significant role, attitudes and beliefs have been found to be one of the main predictors of vaccination

¹⁴Mills et al, above n 8, 1081; Allison Kempe, 'Prevalence of parental concerns about childhood vaccines: The experience of primary care physicians', (2011) 40 *American Journal of Preventive Medicine* 548.

¹⁵Mills et al, above n 8, 1081.

¹⁶Leask et al, above n 12, 7238; Torbjörn Callréus, 'Perceptions of vaccine safety in a global context', (2010) 99 *Acta Paediatrica, International Journal of Paediatrics* 166; Larson et al, above n 13, 2150.

¹⁷Leask et al, above n 12, 7238; Larson et al, above n 13, 2150.

¹⁸David C Burgess, Margaret A Burgess and Julie-Anne Leask, 'The MMR vaccination and autism controversy in United Kingdom 1998-2005: Inevitable community outrage or a failure of risk communication?', (2006) 24 *Vaccine* 3921; Leask et al, above n 12, 7238; Callréus, above n 16, 166.

¹⁹Bhat-Schelbert et al, above n 11, 2448.

²⁰Alexandra Zingg and Michael Siegrist, 'Measuring people's knowledge about vaccination: Developing a one-dimensional scale', (2012) 30 *Vaccine* 3771; Larson et al, above n 13, 2150.

²¹Katrina Fiona Brown et al, 'Attitudinal and demographic predictors of measles, mumps and rubella (MMR) vaccine acceptance: Development and validation of an evidence-based measurement instrument' (2011) 29 *Vaccine* 1700.

²²Deborah A Gust et al, 'Parent attitudes tower immunisations and healthcare providers: The role of information' (2005) 29 *American Journal of Preventive Medicine* 105.

²³Larson et al, above n 13, 2150.

²⁴*Ibid.*

acceptance in Australia.²⁵ A high-level of caregiver education, while a promoting factor in Greece, acts as a vaccine barrier in the United States.²⁶ In addition, personal experience plays a fundamental role, as opposed to rational assessment of risks or benefits.²⁷

Just as individual differences in learning styles, personalities and preferences abound, we each have different, and sometimes overlapping or even competing, contextual influences and pressures from our social, cultural and political spheres. The majority of parents hold questions and concerns,²⁸ yet it is the interaction of one or more influencing factors within an individual's specific context and framework of experience that informs their risk perception, and eventual choice.

Complexity increases when you consider that individuals draw unique conclusions from the same data or information given to them, depending upon their value set.²⁹ When dealing with risk and uncertainty, people generally rely on heuristic reasoning, employing mental shortcuts, with variance in risk perception tending to align with the individual's group membership or cultural worldview.³⁰ Kahan and colleagues' cultural cognition thesis proposes that when faced with a divisive issue, individual risk perception will align with group membership, social or cultural, which is integral to their identity. This phenomenon is amplified when a certain stance becomes symbolic of group affiliation.³¹ Members will, influenced by biased assimilation and credibility heuristics, display a preference for evidence which conforms to their prior views, disregarding those which may lead to alienation from their support network, and attribute credibility accordingly. While this may seem an irrational process of risk assessment, especially when the outcome contradicts with empirical evidence, while a 'wrong answer' empirically has no obvious negative consequences for the individual in the immediate future, a 'wrong answer' regarding their group's standpoint does, affecting their group membership or social standing, and thus identity. There is a perceived greater benefit on an individualistic level to promote identity-congruent beliefs, and thus actions, with cultural conflict disabling

²⁵Douglas J Opel et al, 'Characterizing providers' immunization communication practices during health supervision visits with vaccine-hesitant parents: A pilot study' (2012) 30 *Vaccine* 1269.

²⁶Larson et al, above n 13, 2150.

²⁷Leask et al, above n 12, 7238.

²⁸Mary Mason McCauley et al, 'Exploring the choice to refuse or delay vaccines: A national survey of parents of 6-through 23-month-olds' (2012) 12 *Academic Pediatrics* 375.

²⁹Dan M Kahan, 'Why we are poles apart on climate change' (2012) 488 *Nature* 255.

³⁰Dan M Kahan et al, 'Who fears the HPV vaccine, who doesn't, and why? an experimental study of the mechanisms of cultural cognition' (2010) 34 *Law and Human Behaviour* 501.

³¹Dan M Kahan et al, 'Motivated numeracy and enlightened self-government' (2013) *Yale Law School, Public Law Working Paper* 307.

an individual's ability to make sense of empirical evidence.³² Disagreements regarding the risks and benefits of vaccinations thus arise, compared to topics for which no divisive cultural conflict occurs and views are consistent with the best evidence available.³³

This phenomenon was demonstrated by Kahan and colleagues³⁴ in a study in the United States, in which participants were given a set of data which was said to be attributed to either the effect of skin cream on a rash or the effect of gun control on crime, and were asked whether the intervention caused an increase or decrease in severity. The first condition was benign, while the second held partisan significance. Individuals with greater numeracy skills, and thus assumed to have a greater capacity to accurately interpret the data given, showed greater polarisation of interpretation in the gun control condition, with higher numeracy only improving performance when the correct answer aligned with the individual's political view. While numeracy predicted accuracy of interpretation for the skin cream condition, it was group membership which determined interpretation for the polarising issue of gun control. This pattern is consistent with the cultural cognition thesis, with cognitive ability used opportunistically to promote individuals' identity-protective beliefs.

As a result, an emerging consensus among scientists on a particular topic, like vaccination, will often fail to achieve the same among the public. Geographical pockets of vaccine exemption continue to emerge within our society,³⁵ seemingly perpetuated by specific social or cultural norms within that community or population. In Australia this is seen in areas such as Mosman, Sydney, thought to be attributed to an increased mistrust in scientific information regarding vaccine safety and perceptions that parents are able to mitigate disease risk through other lifestyle choices,³⁶ and Fremantle, near Perth, where alternative or 'natural' health care options are valued.³⁷

³²Ibid.

³³Ibid.

³⁴Ibid.

³⁵James A Gaudino and Steve G Robison, 'Risk factors associated with parents claiming personal-belief exemptions to school immunization requirements: Community and other influences on more skeptical parents in Oregon, 2006' (2012) 30 *Vaccine* 1132.

³⁶Amy Taylor-Kabbaz, 'Low vaccination rates in wealthiest parts of Sydney' <www.abc.net.au/local/stories/2013/04/11/3734694.htm>.

³⁷Immunisation Alliance Western Australia, 'I immunise' <<http://immunisationalliance.org.au/projects/i-immunise/>>.

Another proposed model for decision making is termed 'fuzzy trace theory'.³⁸ Information, or meaningful input, is thought to be encoded into memory in parallel as both verbatim and gist representations. The former is an objective account of facts and details regarding the event or idea, while the latter is a subjective interpretation of the underlying meaning or basic message. Though initially impressionistic, shaped by experience, values and perspective, gist memory is more stable and less subject to interference, though one needs to have an adequate and established knowledge base to be able to extract a meaningful gist in the first place. It is the gist of information which guides reasoning, judgement and thus decision making, not facts or precise details. Reyna³⁹ proposes that the meaning of vaccination decisions can be described as the simple categorical gist of 'feeling ok' versus 'not feeling ok'. As vaccination is a preventive measure used for prophylactic purposes being asymptomatic is the status quo. The risk-benefit analysis for this situation is, as a result, both psychologically and computationally difficult. In addition, it involves the health of an individual's child, possible serious negative outcomes regardless of the decision and thus anticipation of regret, and often overwhelming amounts of conflicting information. The 'right' choice is often not obvious, with individuals having to deal with the processing of risks and emotions, working out how to incorporate the information and experiences they are exposed to into a reasoned course of action.⁴⁰

The family doctor or local health care professional has been shown to be a trusted source of information regarding vaccination, with most parents following advice given.⁴¹ Communication is integral to the vaccination process,⁴² with a relationship based on trust imperative.⁴³ McCauley and colleagues⁴⁴ found that for parents who considered deviating from the recommended vaccination schedule, the majority chose to follow recommendations following a talk with their doctor. Some parents, however, feel that their doctor does not care about, or listen to, their concerns, questions or fears⁴⁵ with low confidence in doctors found to be linked with a low confidence in vaccine safety.⁴⁶ Strong patient-doctor relationships, built upon a

³⁸Valerie F Reyna, 'Risk perception and communication in vaccination decisions: A fuzzy-trace theory approach' (2012) 30 *Vaccine* 3790.

³⁹*Ibid.*

⁴⁰Terry Connolly and Jochen Reb, 'Toward interactive, Internet-based decision aid for vaccination decisions: Better information alone is not enough' (2012) 30 *Vaccine* 3813.

⁴¹Gust et al, above n 22, 207; McCauley et al, above n 28, 375.

⁴²*Ibid.*

⁴³Leask et al, above n 12, 7238.

⁴⁴McCauley et al, above n 28, 375.

⁴⁵Michelle S Nicholson and Julie-Anne Leask, 'Lessons from an online debate about measles-mumps-rubella (MMR) immunization' (2012) 30 *Vaccine* 3806.

⁴⁶Gust et al, above n 3, 207.

foundation of trust, are essential in mediating the decision-making process, holding great potential to ensure that parents are receiving adequate, reliable and correct information, and to respond to concerns and questions. However, time constraints of consults, competing demands, the belief of doctors that parents are unable to understand the mechanisms of vaccination, and the feeling that they themselves do not fully understand the risks, are barriers to this process.⁴⁷

An emerging postmodern paradigm of medicine and health care has emerged within our society, with individuals seeking to engage on a deeper level with their own, and their family's, health care decisions.⁴⁸ Due to this, the advice and recommendations given by doctors is no longer acted upon unquestionably. A transfer of power in decision-making to patients, the questioning of science and its findings, and the redefining of expertise by patients, is involved in this phenomenon, with an increasing emphasis placed upon values rather than facts, and a partnership dynamic between patient and doctor.⁴⁹ Within the vaccination context, parents take upon themselves a greater responsibility to be informed, with individuals feeling that they need to learn more about the process of vaccination, and engage with decision making. For some this extends to accepting the advice of a trusted doctor, yet for others this causes philosophical, religious or anecdotal objections to shape behaviour, with this contributing to decreased vaccination uptake.⁵⁰ This active patient role has been facilitated by an ease of access to information via the internet, and dissemination and sharing of this information via social media sites and other online forums.

Despite it being suggested that media and the internet are mistrusted by parents as information sources,⁵¹ these popular and pervasive mediums impact upon vaccination decisions.⁵² From interviews of thirty parents conducted via telephone by Downs and colleagues,⁵³ it was found that 93% of participants answered 'yes' to whether they would use the internet to find information regarding vaccination, with 93% of this group stating that they would use a general search engine. The researchers then went on to conduct a web-search using 44 distinct search terms given by participants. From this, it was found that 93% of this group, if they went ahead with their search, would find anti-vaccination sites in the top ten hits. Media discourse from the perspective of anti-vaccination alludes to deep-seated anxieties

⁴⁷ Kempe, above n 14, 548.

⁴⁸ Kata, above n 12, 3778.

⁴⁹ Ibid.

⁵⁰ Connolly and Reb, above n 40, 3813.

⁵¹ Serpell and Green, above n 12, 4041.

⁵² Kata, above n 12, 3778

⁵³ Julie S Downs, Wändi de Bruin and Baruch Fischhoff, 'Parents' vaccination comprehension and decisions' (2008) 26 *Vaccine* 1595.

and social issues which resonate with a large cross-section of the population, such as the perceived profit-driven nature of pharmaceutical companies, coverups or conspiracies by the government, and emotionally charged stories of adverse effects thought to have resulted from the act of vaccination.⁵⁴

Anti-vaccination groups have taken advantage of this paradigm shift, framing exemption as an informed choice.⁵⁵ Kata found that looking at an anti-vaccination website for 10-15 minutes caused participants to increase their attention towards vaccination risks, and decrease attention towards risks associated with non-vaccination and vaccine-preventable diseases. Even parents who are favourable towards vaccination report that the overwhelming amount of conflicting information regarding vaccination creates confusion.⁵⁶ The compelling nature of the anti-vaccination message stems from the coherent and comprehensive gist that is created through an often emotionally charged narrative framework. This is salient in the decision-making process as the bottom-line meaning is emphasised rather than facts and details, facilitating greater engagement and ease of reading compared to official information sources.⁵⁷ Common tactics employed to further the anti-vaccination point-of-view include skewing scientific data by attributing weight according to previously held views and reinterpreting evidence in alignment with their own agenda, a continuous cycle of proposing new theories once previous ones are disproved and thus demanding more research, censoring their websites by removing criticisms or pro- vaccination views and directly attacking the opposition.⁵⁸ In addition, the anti-vaccination message is wrapped up in unobjectionable rhetoric, "I'm not anti-vaccination, I'm pro-safe-vaccination",⁵⁹ and appeals to parental sensibilities, "I'm an expert on my own child".⁶⁰ Arguments directly address concerns held by parents, satisfying a longing for clarity as to why their child developed autism, for example, exploiting a human bias for identifying meaningful patterns in random noise.⁶¹ Unexplained adverse effects disturb the status quo expected from preventive interventions, with the search for meaning extending beyond, and often to the point of disregarding, the facts. Published in 1998 by Andrew Wakefield in the United Kingdom, a paper suggesting a link between the measles, mumps and rubella vaccination and development of autism in children continues to influence parental concerns and consequent risk perceptions of vaccination, despite being retracted from publication due to dishonesty

⁵⁴Leask et al, above n 12, 7328.

⁵⁵Kata, above n 12, 3778

⁵⁶*Ibid.*

⁵⁷Nicholson and Leask, above n 45, 3806.

⁵⁸Kata, above n 12, 3778

⁵⁹*Ibid.*

⁶⁰*Ibid.*

⁶¹Reyna, above n 38, 3790.

and professional misconduct and numerous studies having since found no causal link to exist.⁶²

Controversies such as the above are often sensationalised by the media, regardless of whether a sound evidence base exists or not, with equal consideration given to unfounded anecdotes alongside peer-reviewed research.⁶³ This skews perceptions as to the credibility of the anti-vaccination movement, warping views as to the likelihood of certain events occurring,⁶⁴ and influences the social norm perceived.⁶⁵ Anti-vaccination supporters are vocal and active, especially on online forums and social media, however they represent a minority within the wider population.⁶⁶ The majority of parents choose to vaccinate their children.⁶⁷ Those who fall in the middle of the continuum of views, and those who have a limited understanding of the underlying mechanisms of vaccination, are vulnerable to misinformation or disinformation, especially if they rely on internet-based sources.⁶⁸

How then, can public health communication maintain, and increase, vaccination uptake in the face of the above? What needs to be implemented to ensure a positive science communication environment surrounding the topic of vaccination which will counter misinformation and enable parents to make fully informed decisions regarding the health of their children? Many communicators believe that simply providing parents with more information will cause them to make optimal health decisions, however there is no evidence that this approach is effective.⁶⁹ Facts alone discount the underlying values and context which inform decision-making. The science communication environment surrounding vaccination thus needs to change its focus from providing content, to addressing the core issues and concerns which arise from the vaccination debate, looking to increase trust and public confidence. Information founded upon conclusions which affirm identity-defining values are more likely to be considered open-mindedly, as well as when presented via pluralistic advocacy, with the audience perceiving there to be experts with diverse values aligning with the same argument.⁷⁰ Yes, it is essential that flawed arguments are corrected, and accurate and credible information provided regarding vaccination

⁶² Marian Olpinski, 'Anti-vaccination movement and parental refusals of immunization of children in USA' (2012) 87 *Pediatrica Polska* 381.

⁶³ Burgess, Burgess and Leask, above n 18, 3921; Larson et al, above n 13, 526.

⁶⁴ Cornelia Betsch et al, 'Opportunities and challenges of Web 2.0 for vaccination decisions' (2012) 30 *Vaccine* 3727.

⁶⁵ Burgess, Burgess and Leask, above n 18, 3921.

⁶⁶ Nicholson and Leask, above n 45, 3806.

⁶⁷ Opel et al, above n 25, 1269.

⁶⁸ Downs, de Bruin and Fischhoff, above n 53, 1595.

⁶⁹ Serpell and Green, above n 12, 4041.

⁷⁰ Kahan et al, above n 30, 501.

and disease risk, however this cannot stand alone.⁷¹

Utilising a narrative framework by presenting a pro-vaccination stance from the perspective of disease prevention and risks associated with vaccine-preventable diseases, for example, has the potential to have a powerful effect within the overall discourse. Narratives are memorable as they are easy to understand, resonate with the individual, and are given credibility by the parent due to their first hand nature.⁷² Public health messages need to be memorable and interesting - not only their content, but their design will influence their efficacy. The intertwining of narrative with evidence-based research can provide parents with the visceral motivation required to enact protective behaviours, in this case vaccinating their children.

It is important, in light of the cultural cognition theory, that communications are protected from divisive cultural meaning, to prevent polarisation of perceptions, attitudes and behaviour.⁷³ The quality of this environment will also work towards ensuring that the topic of vaccination does not become vulnerable to controversy, which causes decreasing rates of uptake.⁷⁴ The cultural meaning and context of health care and general levels of trust in authority need to be considered as well as scientific content.⁷⁵ Identifying and counteracting influences which may undermine evidence-informed risk communication, or spread ungrounded fears, via proactive studies of target populations may help alleviate specific concerns. Information discussed relevant to the social, cultural and political influences which shape decision-making for those individuals would also increase efficiency of communication and use of resources, as well as depth of understanding able to be generated, due to the fact that the core of the uncertainty or questioning is being addressed, rather than briefly touching on elements of the complex issue which may be irrelevant for that individual.

While printed or online material can provide a foundation of knowledge, parents benefit from having someone to discuss their concerns with, in order that they can process the information gained, fitting it into their mental model of reality.⁷⁶ Personalised advice from health care professionals has been found to have a greater impact than generalised information.⁷⁷ Rather than being detached and impersonal, it is this human engagement, and the belief that your own concerns, needs, fears and context are being heard and considered, that encourages parents to trust in the advice

⁷¹Kata, above n 12, 3778.

⁷²Betsch et al, above n 65, 3727.

⁷³Kahan et al, above n 29, 255.

⁷⁴Kahan et al, above n 31, 307.

⁷⁵Kahan et al, above n 30, 501; Kata, above n 12, 3778.

⁷⁶Yarwood, above n 1, 71.

⁷⁷Brown et al, above n 21, 1700.

and recommendations being given to them by their doctor. Improving the physician-patient relationship via educational interventions to improve communication skills and strategies, placing a greater emphasis on listening to concerns, being aware that engagement on a deeper, values-based level is required, has been proposed to not only increase trust, but to lead to greater acceptance of medical advice and thus increased vaccine uptake.⁷⁸ The American Academy of Pediatrics propose the following recommendations for physicians when communicating with parents who are hesitant to vaccinate their child: listen carefully and respectfully to concerns; share honestly what is, and is not, known regarding the risks and benefits; attempt to correct misperceptions; assist parents in understanding that risks should not be viewed in isolation; discuss concerns about each vaccination separately; explore the possibility that cost may be a barrier for the parent, and; respect and document every refusal.⁷⁹ Betsch and colleagues⁸⁰ propose a foundation of communication which includes the following: first, one must decide what the gist of the message being communicated is, and communicate it clearly, and second, one must understand the needs and abilities of the audience, and tailor the message accordingly.

One such campaign is *i immunise*, designed by the Western Australia Immunisation Alliance, targeting the Fremantle community and launched at the beginning of 2014. This community has a lower than average rate of vaccination, with many parents engaging in parenting practices seen to be alternative, such as homeopathy, home-birth, breast-feeding and using organic foods.⁸¹ These shape a socially reinforced image of ethical and informed parenting. Concerns about vaccination, however, are pervasive, and an anti-vaccination stance is often presented as being linked to this identity and the community's social norms. Leading with values rather than facts, the *i immunise* campaign aims to provoke discussion in a safe and supportive environment, through providing stories of individual parents who, while leading an alternative lifestyle, all trust in and accept vaccinations. Vaccination is framed as an ethical choice, which is crucial to not only the wellbeing of an individual's family, but also that of their community.

To prevent the transmission of potentially fatal vaccine-preventable diseases within our society, high levels of vaccine uptake need to be maintained. Measles, for example, requires 95% of the population to be vaccinated before herd immunity can take effect, with lower levels rendering communities at risk of outbreaks and epidemics.⁸²

It is therefore imperative to continue to explore new avenues of communication,

⁷⁸Gust et al, above n 22, 105.

⁷⁹Olpiniski, above n 62, 381.

⁸⁰Betsch et al, above n 65, 3727.

⁸¹Immunisation Alliance Western Australia, 'I immunise' <<http://immunisationalliance.org.au/projects/i-immunise/>>.

⁸²Brown et al, above n 21, 1700.

dialogue and engagement with all stakeholders.⁸³ To allow individuals to recognise the benefits of vaccination, and the contributions that this public health initiative has on their, and their family's well-being,⁸⁴ a values-based approach to communication, which is firmly entrenched in research findings, needs to be taken. No blanket statement will be effective.⁸⁵ Concerns need to be addressed in a relevant manner which is meaningful to the individual and their unique situation, attitudes and knowledge base. Otherwise, as Louis Pasteur purportedly stated, "It is the microbes who will have the last word".⁸⁶

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⁸³Larson et al, above n 13, 526.

⁸⁴Kahan et al, above n 31, 307.

⁸⁵Gust et al, above n 3, 207.

⁸⁶Luyten et al, above n 8, 280.

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The Chance - The Choice

Josephine Ginty

I. CREATIVE PIECE

It was on a Tuesday afternoon that I saw him, staring at me where I sat in the gutter with a dead body beside me.

"Money," I said when he got closer, "Money for an old man to rest in peace."

The man stopped, but I wasn't surprised. He was still staring at me - at my face and my clothes - as if he was vacuuming my looks up and swallowing them down. So I stared back at his huge bulk, his fierce face, the light in his eyes that seemed mismatched with the rest of him.

"I've only got beer," he replied stupidly, "I've spent all my money on beer."

I eyed the six-pack in his hand. I didn't drink that sort of stuff often, but it seemed like too good of an offer to refuse. So I grinned and coyly said, "I'd settle for a beer."

The man sat down beside me, tearing open the beers and handing me a can. I hooked off the ring-pull and took a long sip, glad for the feeling of moisture in my mouth. It was hot out here on the footpath and I'd spent the whole day thinking wistfully of my cool house by the water. But suffering was something I'd have to get used to, or so I was told, so this type of thing was good practice. It likened me to the Lumpen Proletariat I was going to become.

"Shit," I swore, "I needed that."

I could feel the man's eyes on my hands and my mouth. He still wouldn't stop staring. He muttered something about the corpse beside me, about how he was sorry for me, and I rolled my eyes.

"I got him from the morgue," I explained, but the man frowned, confused. "I bought him for 3 IGs. Best investment I've ever made."

The man was completely perplexed and it made me laugh that someone who looked to be so close to the evils in our world had no clue about the crimes that went on. Did he think that because of my skin and my smile I was incapable of doing wrong? Or had I maybe judged him too quickly based on the way he looked?

My laughter made some passers-by jump, but I only laughed harder when the man gave them the finger.

He was tough, this guy, he didn't take shit from people, and I liked that. It made me wonder where he'd come from, what his story was, who he was. I wanted to grab him and ask him so many questions, to look into those strange eyes that

didn't match up with his body and find out if he was like me - trapped in a body that was too real, too wrong for his mind.

I swallowed down the last of my beer, chucked the empty can onto the street and sat on my hands to stop myself from moving. I chattered on about the corpse - talking shit about stuff I didn't understand, because I wasn't a part of that world, not yet - but the man nodded along patiently. He'd kept on staring as it had fallen dark. I'd thought he was trying to see something in me that wasn't there, not while I still had that body.

Turns out that wasn't it at all.

Paul hadn't seen me right, back then. But you'll see that it wasn't just him, fooling himself into thinking things were a certain way. I didn't figure out until later that I'd tricked myself into seeing something in Paul that made me stay, that made me talk, that made me stupidly think he'd accept my life and love me for it.

People never see things right, I'd thought to myself back then, sitting in the gutter with a beer in my hand, Paul on one side of me and a dead body on the other. And my resolution had been there in my head, as strong as ever, even as I talked to the very man who would try with all his might to make me take back my pledge to the Lumpen Proletariat.

People never see things right, I'd thought - that's why I needed to change.

II. JUSTIFICATION

In his short story, *The Chance*, Peter Carey conjures a bizarre and dispiriting world, inhabited by characters who, somewhat ironically, are fundamentally different from how they appear to be. The story's world is a dystopia, in which a lottery system has been introduced by the Fastalogians, an alien species. For a price, people can have a chance to "go in the Lottery and come out with a different age, a different body, a different voice".¹ The main characters, Paul and Carla, clash over their opinions about their alien rulers: Paul "[doesn't] give a damn about politics",² while Carla is a member of a revolutionary group called the Hups, who seek to overthrow the Fastalogians. Complementing this thematic basis, Carey's prose emphasises the disparity between appearance and self - or "physiognomy"³ and "ideas"⁴ - adopting a writing style that both conveys a comprehensive narrative and explores the deeper implications of the story's world. It was this balance that I found most difficult to achieve when imitating Carey's style, as it required understanding the world and the characters of *The Chance*, as well as the writing with which they were created.

¹Peter Carey, *Collected Stories* (University of Queensland Press, 1994) 273.

²Ibid 278.

³Ibid 279.

⁴Ibid 280.

The story's world exists in the not-too-distant future - a place that is paradoxically familiar and bewildering.⁵ The "Genetic Lottery" that is the centre of Carey's fictional society contradicts what Hassall⁶ calls nature's sanctity, allowing people to literally be reborn, while "still carry[ing]... memories (allowing for a little leakage)"⁷.

Similarly, gambling becomes a liberating process in the story's world rather than a damaging addiction, and yet Carey expresses clear resentment for these changes: "[The Chance] was, of course, a trick"⁸. I found that capturing this style of prose, which simultaneously informs readers about The Chance's world and conveys aversion to it, was very difficult to do. Since my creative piece is from Carla's perspective and she occupies a different part of Carey's world to Paul, I tried to use similar techniques to describe this different milieu. Carla's contemplation of her thirst while she sits on the footpath is one such attempt, as she naively compares it to the suffering that the Hups are preparing for. I also mimicked Carey's use of vernacular, emphasising Carla's adoption of the word "beer" from Paul, as well selecting "shit" as Carla's choice expletive.

Beyond these basic developments however, I had trouble finding any sections in The Chance that offered a good exploration of Carla's character. Part of this resulted from Paul's dominant perspective,⁹ something made all the more frustrating by the fact that little else in the story conforms so adamantly to tradition. Indeed, gender roles are subverted, identities are by definition temporary, and Paul and Carla's archetypal roles as lovers are built up for much of the story and then utterly destroyed at the end.¹⁰ This made conjuring Carla's first-person perspective a particular challenge for me, as most of what I had to base her off were essentially contradictions: "[a woman] who, whilst being conventionally feminine... exhibited certain behavioural traits more commonly associated with men"¹¹. In trying to capture this particular characteristic, I used quite plain prose, utilising "and" instead of commas and "but" instead of more varied vocabulary. In my creative piece, Carla also doesn't think of herself as an attractive woman, rather as an attractive person. Her femininity was something I consciously kept out of the writing, while references to her political identity and beliefs were something I inserted wherever possible.

⁵ Anthony J Hassall, *Dancing on Hot Macadam: Peter Carey's Fiction* (University of Queensland Press, 1994) ; Mary Ellen Snodgrass, *Peter Carey: A Literary Companion* (McFarland and Company Incorporate Publishers, 2009) ; Bruce Woodcock, *Peter Carey: Contemporary World Writers* (Manchester University Press, 1996).

⁶ Hassall, above n 5.

⁷ Carey, above n 1, 273.

⁸ Ibid 272.

⁹ Hassall, above n 5.

¹⁰ Andreas Galle, *Rewriting History: Peter Carey's Fictional Biography of Australia* (Amsterdam-New York, 2010) ; Hassall, above n 5; Snodgrass, above n 6.

¹¹ Carey, above n 1, 277.

Carey, too, focuses on political identity and how this can detract from personal identity, portraying a conflict between love and duty.¹² This clash is stated outright when Paul asserts that he “would fight for a beer, a meal, a woman, but never an idea”.¹³ Yet, the story’s world itself trivialises retaining anything bodily, as the Lottery and the Hups both prioritise “ideals”¹⁴ over appearances.¹⁵ In Paul’s narration, however, Carey extensively deploys metaphors and similes, which normalise the idea of things, and especially people, not being what they seem: a man’s face is “wrinkled like a walnut”,¹⁶ people committing suicide fall “like overripe fruit”,¹⁷ and Paul himself is “not like ... [a] beggar (which I was) but like a prince”,¹⁸ “like a sailor on leave”,¹⁹ “like an old guitar”.²⁰ Thus, while others are dehumanised, Paul himself is often transformed by simile into just another person - a symbolic expression of the literal mutability of his physical self. Yet I didn’t use these techniques to such a great extent in my prose, as characters other than Paul are notable for their lack of metaphorical language and thought in *The Chance*. Indeed, I was pointedly not imitating the text in this respect, as I took the substantial use of metaphors and similes to be an influence of Paul’s character and not a feature of Carey’s prose. Comparatively, my choice to have the retrospective voice intrude on the present narrative and to address readers in second-person was an imitation of Carey’s writing style, as that feature highlights the conflicts that underpin the whole story.

In this way, closely analysing *The Chance* helped me to make judgements on what features and techniques of Carey’s writing belonged in my creative piece. Writing Carla’s perspective in a more masculine way than my usual portrayal of women mimicked Carey’s characterisation of her as someone “strong”²¹ yet “vulnerab[le]”.²² Additionally, I tried to emulate Carey’s use of reflective passages as a means to contemplate the story’s world, rather than explore characters’ emotional states. It was this utilisation of reflection, combined with my own instincts of how to balance

¹²Hassall, above n 5; Snodgrass, above n 6.

¹³Carey, above n 1, 280.

¹⁴Ibid 290.

¹⁵Carolyn Bliss, “‘Lies and Silence’: Cultural Masterpolts and Existential Authenticity in Peter Carey’s *The True History of the Kelly Gang*” in Andreas Gaile (ed), *Fabulating Beauty: Perspectives on the Fiction of Peter Carey* (Amsterdam-New York, 2005) ; Hassall, above, n 5; Paul Kane, ‘Introduction’ in Andreas Gaile (ed), *Fabulating Beauty: Perspectives on the Fiction of Peter Carey* (Amsterdam-New York, 2005) .

¹⁶Carey, above n 1, 274.

¹⁷Ibid 271.

¹⁸Ibid 277.

¹⁹Ibid 281.

²⁰Ibid 281.

²¹Ibid 294.

²²Ibid 277.

stillness with actions, that I feel most contributed to achieving a believable and comprehensive imitation of *The Chance*.

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The Mérida Initiative: a transnational effort to curb drug-related crime, or another case of US interference in Latin America?

Laura Burfitt

I. EXECUTIVE SUMMARY

The Mexican drug industry is estimated to comprise between one and three per cent of Mexico's total GDP.¹ Drug-related crime and violence have consistently been fundamental threats to both Mexico and the United States. A responsive and collaborative strategy entitled 'The Mérida Initiative' has thus been developed between the two nations to destabilise and control the drug cartels. However research indicates that in the years following the launch of the initiative, drug-related violence has increased rapidly and progress has been marginal, suggesting a potential ulterior motive of the United States and the need for a revised initiative.

II. INTRODUCTION

This policy brief will investigate the impact the collaborative Mérida Initiative has had on drug-related crime in Mexico. It is understood that under the Obama administration, certain amendments have been made to the initiative. However the scope of this brief will narrow its focus to the strategies pursued under the Bush and Calderón administrations. Addressed to the Federal Government of Mexico, this policy brief will recommend a more holistic approach, rather than a military approach, to eliminating drug-related crime.

III. CONTEXT

The Mexican drug trade has an estimated net worth of US \$23 billion per annum.² Mexico is one of the main centres in Latin America for the cultivation, production and trafficking of illicit drugs. It is the primary exporter of methamphetamine to

¹Julien Mercille, 'Violent Narco-Cartels or US Hegemony? The political economy of the 'war on drugs' in Mexico' (2011) 32(9) *Third World Quarterly* 1637.

²Steven E Hendrix, 'The Mérida Initiative for Mexico and Central America: The New Paradigm for Security Cooperation, Attacking Organised Crime, Corruption and Violence' (2008) 5(2) *Loyola University Chicago Law Review* 108.

the United States (US) and 90% of all cocaine that enters the US is via the Central America-Mexico Corridor.³ The presence of powerful drug trafficking organisations (DTOs) throughout Latin America has led to a high rate of drug-related crime and violence. A report released by the United Nations Office on Drugs and Crime found that, despite a global decrease in homicide rates, the rate of homicide in Mexico had increased from 19.9 homicides per 100,000 people in 2003 to 32.6 per 100,000 in 2008.⁴ In addition, the National Drug Intelligence Centre identified Mexican DTOs as the 'greatest identified crime threat to the United States' in 2008.⁵

In March 2007, US President George Bush and Mexican President Felipe Calderón revealed plans for 'The Mérida Initiative', a cooperative agreement combating drug-related threats to national security.⁶ This partnership would see Mexico receive \$US 1.4 billion in assistance over a three year period.⁷ The initiative was signed into law on the 30th October 2007, dictating a 24% increase in security spending in Mexico and renewed efforts on the behalf of the US on border security.

IV. APPROACHES

Following President Calderón's 'Crusade against Crime' strategy paper in 2007, the Mérida Initiative was an expansion on Calderón's declaratory strategy targets and a demonstration of the growing cooperation between Mexico and the United States.⁸

The policy targets of the Mérida Initiative were to:⁹

1. Destabilise crime syndicates and bring them to justice.
2. Improve air, maritime and land border control.
3. Reform Mexico's judiciary.
4. Reduce the trafficking and consumption of drugs in the region.

³Clare Ribando Seelke, *Latin America and the Caribbean: Illicit Drug Trafficking and U.S. Counterdrug Programs* (Congressional Research Service, 2010) 2.

⁴Sabrina Abu-Hamdeh, 'The Mérida Initiative: An Effective Way of Reducing Violence in Mexico?' (2011) 4(5) *Pepperdine Policy Review* 38.

⁵National Drug Intelligence Centre, U.S. Department of Justice, 'National Drug Threat Assessment (2009)' <<http://www.justice.gov/archive/ndic/pubs31/31379/31379p.pdf>>.

⁶Abu-Hamdeh, above n 4, 38.

⁷Ibid.

⁸John Bailey, 'Combating Organised Crime and Drug Trafficking in Mexico: What are Mexican and US Strategies? Are They Working?' in Eric L Olson, David Shirk and Andrew Selee (ed), *Shared Responsibility: U.S.-Mexico Policy Options For Confronting Organised Crime* (University of San Diego Trans-Border Institute, 2010) 331,340.

⁹Ibid 341.

Significantly, a central strategy employed in combatting drug-related crime in the early stages of Calderón's presidency was that of 'reaction-repression-adaptation'.¹⁰

This approach was not dissimilar to the military 'surges' exercised by the US in Iraq and Afghanistan.¹¹ The strategy saw military personnel posted at different 'trouble spots' where they would forcefully control gangs whilst simultaneously learning and developing the most effective way of dealing with crime organisations.¹²

V. RESULTS AND IMPLICATIONS

Despite rigorous attempts to curb drug-related violence, figures indicate that violence is on the rise in Mexico. This is clearly demonstrated by the sharp rise in the homicide rate since 2007, as depicted in Figure 1. After decades of a downward trend, intentional homicides have risen from 8,867 in 2007 to 27,199 in 2011.¹³

The Mexican National Security System believes 40 to 50% of all homicides to be attributable to organised crime syndicates.¹⁴ Due to the absence of a legal definition of 'drug-related violence' or 'drug-related homicide' in the Mexican judicial system, exact numbers of drug-related homicides are disputed.¹⁵ Nevertheless, a recent study conducted by the University of California identifies drug trafficking as the single leading cause of intentional homicide.¹⁶ The study also found that 28,228 of the homicides that were documented between 2007 and 2011 were reported to be drug-related.¹⁷

The rise in intentional homicides is largely, but not exclusively, attributable to the Mexican government's 'reaction-repression-adaptation' strategy. This strategy was ineffective for a number of reasons. First, the notion of the 'enemy' is extremely ambiguous.¹⁸ The criminals who make up the drug syndicates and who are thus the 'enemy' are inconspicuous in the Mexican economy and civil society.¹⁹ The enemy cannot be found in one confined location. The criminals are scattered throughout Mexico, neighbouring countries and even distant countries.²⁰ As a result, the armed forces find themselves 'fighting' an invisible enemy. This then

¹⁰Ibid 330.

¹¹Ibid 330.

¹²Ibid 330.

¹³Cory Molzahn, Octavio Rodriguez and David A Shirk, *Drug Violence in Mexico: Data and Analysis through 2012* (University of San Diego Trans-Border Institute, 2012) 5.

¹⁴Ibid 16.

¹⁵Ibid 6.

¹⁶Abu-Hamdeh, above n 4, 38.

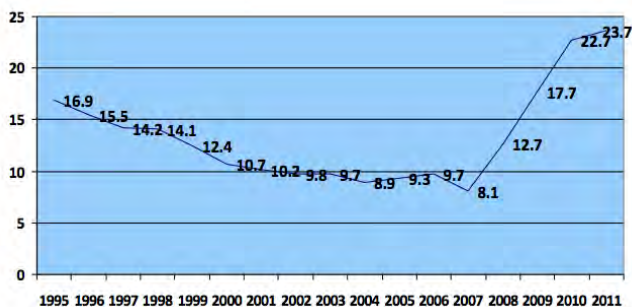
¹⁷Ibid.

¹⁸Bailey, above n 8, 330.

¹⁹Ibid.

²⁰Ibid.

Figure 1: Homicide Rate in Mexico, 1995-2011. Source: *Drug Violence in Mexico: Data and Analysis through 2012*



leads to a second reason for the strategy's ineffectiveness. Due to the ineffectual and enduring nature of the fight between the armed forces and the drug cartels, many of the civilian police and military have been inclined to practise extra-judicial methods such as torture, arbitrary detention and disappearances.²¹ These personnel have been inevitably exposed and condemned not only for operational failure and human rights abuses, but also for corruption.²² Finally, Mexico's attempt to extensively reform the military, judiciary and police and intelligence systems needs to be accompanied by a competent and incorrupt police-judiciary system.²³ This unfortunate paradox has ultimately led to the failure of the destabilisation of crime syndicates in Mexico.

Corruption in the Mexican judicial system and armed forces is both created and perpetuated by the drug cartels. The state no longer holds supremacy. Rather it is forced to remain constantly guarded in its actions so as not to incite conflict from the cartels.²⁴ The financial power of the drug cartels facilitates bribery and allows them to generate corruption in the judiciary and police forces and secure loyal partisans.²⁵

In 2005, an investigation carried out by Due Process of Law Foundation (DPLF)

²¹Ibid.

²²Ibid.

²³Ibid 331, 335, 338, 339.

²⁴ Diana Villiers Negroponete, 'The Mérida Initiative and Central America: The Challenges of Containing Public Insecurity and Criminal Violence (Working Paper No. 3, 2009)' <http://www.wfp.org/assets/documents/05_merida_initiative_negroponete.pdf>.

²⁵Ibid.

found numerous indications of systemic corruption in the Mexican judiciary.²⁶

These included 'malicious misinterpretations of the law, receptions of false testimonies, irregular assignments of cases (despite the use of an automated system that 'guarantees' random assignment)' and various tactics used to delay proceedings.²⁷

Judicial inefficiency approximating that which is expressed here, has been on the rise in Mexico and other South American countries since 2002.²⁸

Omitting the influence of the drug syndicates, the Mexican judicial system remains inherently corrupt. There is a widespread understanding throughout both Mexico and Central America that the judiciary is inefficient and dependent on political or wealthy patrons.²⁹ Judges are often elected by politicians, often with fixed terms and enforced loyalty.³⁰ National distrust of the judicial system has thus been compounded by the prevalence of corruption and erroneous prosecution. As a result, citizens are less inclined to report crimes against them.³¹ In fact, increases in the level of violence have been met with equal decreases in the level of victimisation.³² This trend reflects the general consensus that the credibility of the justice system weakens as the power of criminal organisations grows stronger.³³ Consequently, many citizens now take justice into their own hands and lynch the malefactor who has wronged them.³⁴ This further contributes to the high levels of violence effected by the cartels and undermines the government's endeavour to reform the judiciary.

The United States' contribution to the Mérida Initiative has similarly fallen short of the original policy targets and suggests an ulterior motive for participating in the initiative. The US has failed to address domestic factors which continue to severely impact the success of the initiative. Whilst generous funding has been directed toward the Mexican military, very little to no efforts have been made to reduce weapon trafficking from the US to the criminal organisations in Mexico. Between 2006 and 2010, "915 municipal police, 698 state police and 463 federal agents have been killed at the hands of criminal gangs in Mexico."³⁵ In May 2010, estimates made by the Mexican government revealed that approximately 60,000 of the firearms

²⁶Ibid 28.

²⁷Ibid 28, 29.

²⁸Ibid.

²⁹Ibid 24.

³⁰Ibid.

³¹Ibid 20.

³²Ibid.

³³Ibid.

³⁴Ibid 30.

³⁵Eric L Olson, David Shirk and Andrew Selee, 'Introduction' in Eric L Olson, David Shirk and Andrew Selee (ed), *Shared Responsibility: U.S.-Mexico Policy Options For Confronting Organised Crime* (University of San Diego Trans-Border Institute, 2010) 16.

that were seized from criminal organisations between 2007 and 2009 were supplied by the US.³⁶ This figure does not include the rounds of ammunition that were also seized and that were also from the US.³⁷ Both the legal and illegal flow of weapons from the US to Mexico has supported the US arms industry.³⁸ One investigation into the weapon trafficking revealed a scandal where US agents were allowing the movement of weapons to Mexico in order to “learn more about the cartels, operations and networks”.³⁹ Though this approach may afford intelligence, it also threatens the lives of Mexican officials and citizens. Thus the US has not strengthened border control and evidence suggests it has even weakened it.

A crucial element absent from the Mérida Initiative is the reduction of drug consumption in the US.⁴⁰ The section of the initiative aimed at reducing the consumption of drugs directed only at Mexico, despite the enormous market for drugs in the US.⁴¹ A study carried out by Carnevale Associates found that between 2002 and 2008, the consumption rate of illegal drugs in the US did not change and stayed at 8% for citizens aged twelve years and above.⁴² The study also found that whilst the government initiated a 64% increase in funding for supply reduction, funding for demand reduction was increased by only 9%.⁴³ In 2009, officials estimated that 3.5 million Mexicans had tried illegal drugs at least once in their lifetime.⁴⁴ This statistic compares to the 22 million US citizens who are regular drug consumers.⁴⁵ Without the US market for illegal drugs, “Mexico’s problem would diminish dramatically, even with its own domestic consumption remaining.”⁴⁶

The significant shortcomings of the US in achieving the policy targets of the Mérida Initiative suggest that the US’ main priority is not to reduce drug-related crime. Mercille suggests that the formation of the Mérida Initiative was a vehicle for the

³⁶ Ibid.

³⁷ Ibid.

³⁸ Ibid.

³⁹ Mercille, above n 1, 1643.

⁴⁰ Diana Villiers Negropte, ‘The Mérida Initiative and Central America: The Challenges of Containing Public Insecurity and Criminal Violence (Working Paper No. 3, 2009)’ <http://www.wfp.org/assets/documents/05_merida_initiative_negropte.pdf>.

⁴¹ Clare Ribando Seelke, (2010), ‘Mérida Initiative for Mexico and Central America: Funding and Policy Issues’ (CRS Report for Congress, R40135, January 21) 2.

⁴² Abu-Hamdeh, above n 4, 43.

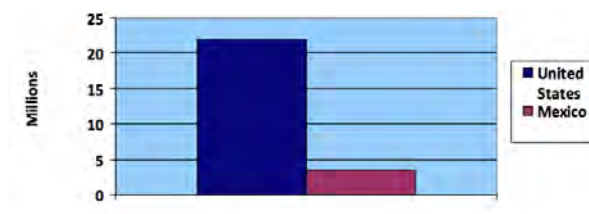
⁴³ Ibid 38.

⁴⁴ Sylvia Longmire, ‘Mexico’s Rising Drug Use and Addiction - Who is to Blame?’ <<http://mexidata.info/id2430.html>>.

⁴⁵ Ibid.

⁴⁶ Peter Reuter, ‘How Can Domestic US Drug Policy Help Mexico?’ in Eric L Olson, David Shirk and Andrew Selee (ed), *Shared Responsibility: U.S.-Mexico Policy Options For Confronting Organised Crime* (University of San Diego Trans-Border Institute, 2010) 121.

Figure 2: Drug use in Mexico and the United States, 2009. Source: data retrieved from Mexi-data.info



US to consolidate their hegemony in Latin America.⁴⁷ Through the development of bilateral military relations with Mexico, the US has gained a foothold in plans for future economic reform and the advancement of the North American Free Trade Agreement⁴⁸ This underhand motive was demonstrated by the former US assistant secretary of state for western hemisphere affairs in a speech in 2008 when he stated that the Mérida Initiative “creates a space for economic reform to take root over the \$15 trillion economy” that is Canada, the US and Mexico.⁴⁹ He also referred to the military funding by the US, saying “to a certain extent... we’re armouring NAFTA”:⁵⁰

Previous neoliberal economic reforms espoused by the US have had a negative impact on the expansion of the Mexican drug trade.⁵¹ The neoliberalisation of the Mexican economy in the 1980s decelerated economic growth rates.⁵² Between 1960 and 1979, the economic growth rate of Mexico stayed at approximately 3.5%.⁵³

After the implementation of neoliberal reforms, the growth rate slowed to 0.1% in the 1980s and then 1.6% between 1992 and 2007. The loss of approximately 2.3 million jobs in the agricultural sector forced peasants into the drug trade in search of work.⁵⁴ Now, 30% of Mexico’s agricultural land is used for drug cultivation,

⁴⁷ Mercille, above n 1, 1640.

⁴⁸ Ibid 1645.

⁴⁹ Ibid 1645.

⁵⁰ Ibid 1645.

⁵¹ Ibid 1642.

⁵² Ibid 1642.

⁵³ Ibid 1642.

⁵⁴ Ibid 1640, 1642.

both legal and illegal.⁵⁵ Additionally, the increased movement of capital and goods across the US-Mexican border under neoliberal reforms facilitated the transfer of drugs between the two countries.⁵⁶ Thus in addition to the US' underprovision of non-military resources and their failure to address domestic factors, past relations between the US and Mexico have also contributed to the rise of the drug trade and in turn the rise of drug-related crime.

VI. CONCLUDING RECOMMENDATIONS

This brief suggests that the Mexican government turn its focus away from military funding and embrace a holistic approach. The original policy targets of the Mérida Initiative (as specified in the approaches section) are penetrative and comprehensive, however they have not been addressed effectively. The United States needs to revise its 'shared responsibility' in the initiative and address its own domestic factors. This brief recommends an increased focus on:

- *Lethal weapon trafficking between the US and Mexico and anti-drug programs in the US*

A tightening of border control is imperative. Not only does the ease with which drugs move across the border afford the drug cartels financial power, the flow of illegal weapons from the US also gives the cartels military power. The growing supremacy of the cartels is increasingly threatening the authority and of the Mexican government and the armed forces.

- *The development of strong institutions in Mexico, the eradication of corruption and renewed efforts toward national judicial reform*

The heavy presence of military personnel, funded and provided by the United States, has not achieved its goal of destabilising the drug cartels and reducing violence. Rather than offering reassurance and safety to the Mexican civilians, the corruptness of the armed forces has exacerbated the existing distrust of government officials and has further undermined the unstable judicial system.

- *Development programs offering alternative employment to lower classes*

A redirection of United States funding toward development programs would be extremely beneficial for Mexican society. Social and economic reforms including but not limited to job creation, education and subsidised day-care would allow an opportunity for both current and future generations to avoid

⁵⁵Douglas Farah, 'Money Laundering and Bulk Cash Smuggling: Challenges for the Mérida Initiative' in Eric L Olson, David Shirk and Andrew Selee (ed), *Shared Responsibility: U.S.-Mexico Policy Options For Confronting Organised Crime* (University of San Diego Trans-Border Institute, 2010) 151.

⁵⁶Mercille, above n 1, 1642.

the inevitable immersion into the drug industry. In this way, long-term social development may reduce both the consumption and trafficking of drugs.

Acknowledgements

Many thanks to the inventors of Nescafe and Marvellous Creations. These delicacies accompanied me on many a late night in the library.

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Biosensing with All-dielectric Silicon Nanoparticles

Henry Orton

Abstract

Silicon nanoparticles are currently an area of high interest due to their demonstration of high scattering efficiencies and non-toxicity when compared to the adjacent and well understood field of metal nanoparticles. This paper investigates the biosensing application of heptamer, disk and sphere shaped silicon nanoparticles. Initially analysis of transmission spectra in varying refractive index environments are used to judge biosensing quality. Results measured as Figure of Merit values showed similar sensitivity to metal nanoparticles. A demonstration of biosensing was then conducted using the high affinity of the protein streptavidin for a biotin-silane linker molecule immobilised on the surface of the silicon nanoparticles. Results were promising with a discussion of improvements and further applications following.

I. INTRODUCTION

All-dielectric silicon nanoparticles have recently captured high interest from their discovered optical properties having shown to challenge the widely known light scattering of metal nanoparticles.¹ Metal nanoparticles have seen applications in molecular sensing devices for many years whereby a phenomenon known as Surface Plasmonics causes interactions between the electric field component of incident EM waves and metal surface charges.² The physics of this interaction causes the metal particle surface to be very sensitive to changes in the refractive index of the surrounding environment. Consequently, the surface can be functionalised with an immobilised molecular receptor, which upon binding to a specific molecule changes the optical properties and thus the spectra of the particle.³ However, metal nanoparticles are known to have characteristically high absorbance to scattering ratios (meaning low scattering efficiency) and the toxicity of their prolonged exposure

¹Yuan Hsing Fu, Andrey Miroshnichenko et al, 'Directional visible light scattering by silicon nanoparticles' (2013) 4 *Nature Communications* 1527.

²Kathryn Mayer and Jason Hafner, 'Localized surface plasmon resonance sensors' (2011) 111 *American Chemical Society* 3828.

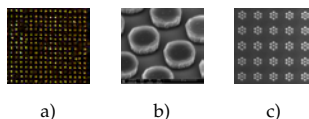
³Ibid.

to biological systems are unknown, giving metal nanoparticles potential limitations for use as a biological marker *in vivo*.⁴

Silicon nanoparticles interact with EM waves by different physical principles. The dielectric properties of silicon allow both electric and magnetic components of incident EM waves to excite displacement currents within the particle.⁵ The physics of Mie theory then explains that resonant frequencies interfere to produce an extinction spectra.⁶ Consequently, silicon nanoparticles have a high scattering efficiency, and their apparent non-toxicity could see them as an ideal application for biosensing.⁷

Silicon nanospheres, nanodisks and heptamer arrays (see Figure 1), were investigated for their biosensing capacities. The nanodisks and heptamer particles were fabricated as arrays of crystalline silicon nanoparticles on an SiO_2 substrate via electron beam lithography and plasma etching. The heptamer nanoparticle sample consists of six outer disks of constant radius and one central disk of varying radius. The nanodisks and nanospheres are of varied radius between each array.

Figure 1: a) Visual Dark Field Microscope Image of Silicon Nanospheres, b) SEM Image of Silicon Nanodisks, c) SEM Image of Silicon Heptamers



The paper is in three sections. The first section establishes a quantitative method for measuring sensing quality based on the sensitivity of silicon nanoparticles to changes in the surrounding refractive index. This is then measured by embedding the particles in optical oils of different refractive indices. The second section is a demonstration of biosensing with the protein streptavidin on the heptamer nanoparticles. The paper concludes with a discussion of results and further applications.

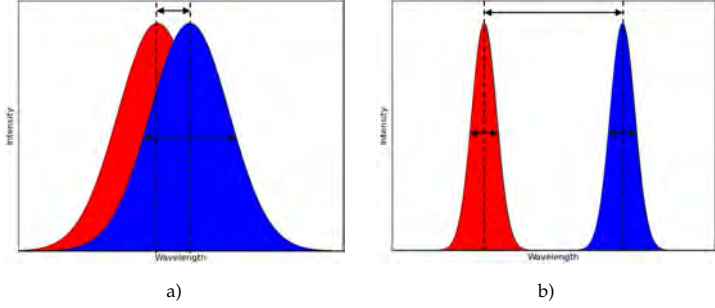
⁴Hueiwan Jeng and James Swanson, 'Toxicity of metal oxide nanoparticles in mammalian cells' (2006) 14 *Journal of Environmental Science and Health*.

⁵Arseniy Kuznetsov, Andrey Miroshnichenko et al, 'Magnetic light' (2012) 492 *Nature: Scientific Reports* 1.

⁶H C van de Hulst, *Light Scattering by Small Particles* (Dover Publications, 1957).

⁷Yiling Zhong, Fei Peng, et al, 'Large-scale aqueous synthesis of fluorescent and biocompatible silicon nanoparticles and their use as highly photostable biological probes' (2013) 135 *Journal of the American Chemical Society* 8350.

Figure 2: Spectra Shift From Change in Refractive Index (Red→Blue), Two Cases: a) Small spectra shift and large FWHM implies low FOM and poor sensing quality, b) High spectra shift and small FWHM implies high FOM and good sensing quality



II. MEASURING BIOSENSING QUALITY

When measuring the sensing quality of a biosensor there are many factors to consider, however the most important are the sensitivity and precision of measurements. These factors can be quantitatively measured and compared using the Figure Of Merit (FOM) measurement.⁸ This is given in Equation 1 where a high FOM indicates high sensing quality.

$$FOM = \frac{\Delta\lambda}{\Delta(R.I.U.)} \frac{1}{w} \quad (1)$$

The first term $\frac{\Delta\lambda}{\Delta(R.I.U.)}$ gives the rate of change of peak wavelength with respect to a change in surrounding Refractive Index Units (R.I.U.). This is a measure of sensitivity of the particle's spectra to a change in the surrounding refractive index environment. This is calculated as the slope from a linear regression of spectra peak wavelength vs R.I.U. and is proportional to the horizontal shift seen in Figure 2. The second term, where w is the Full Width Half Maximum (FWHM), measures the precision of a peak. A shift in a sharp peak with a small FWHM is easily distinguishable and therefore its reciprocal is taken in Equation 1.

However, from a phenomenon known as Fano Resonance in silicon Heptamer nanoparticles, an asymmetric spectra is produced making it unclear as to how to

⁸Leif Sherry, Shih-Huo Chang, et al, 'Localized surface plasmon resonance spectroscopy of single silver nanocubes' (2005) 5 *Nano Letters* 2034.

calculate the FWHM value.⁹ A new method for calculating FWHM was devised where by the peak was vertically split down the maximum and each half considered separately. Demonstrated in Figure 3, the height h_1 is the difference between the peak and left trough intensity. The corresponding width w_1 is located at $h_1/2$. The same calculation is made for the right trough giving the total FWHM = $w_1 + w_2$. This method was used to calculate FOM values.

Figure 3: Asymmetric Peak Showing Calculation for FWHM

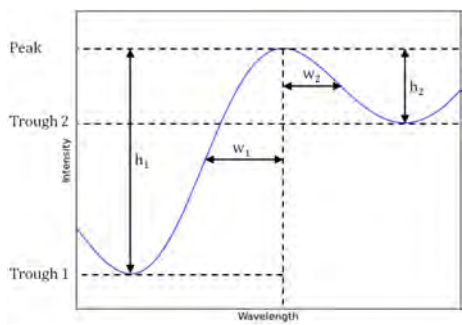
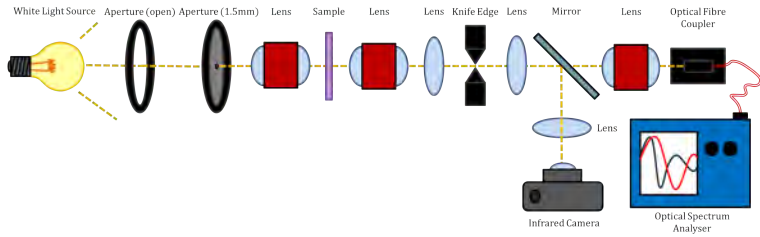


Figure 4: Optical Oil Embedding



⁹Katie Chong, Isabelle Staude, Ben Hopkins, et al, 'Observation of fano resonances in all-dielectric nanoparticle oligomers' (2014) 10(10) *Small* 1985.

Figure 5: Experimental Setup For Recording Transmission Spectra



III. OIL EMBEDDING AND FOM VALUES

To calculate FOM values, it was necessary to surround the nanoparticles with a media of varying refractive index. This was done by embedding the nanoparticles in optical oils of varying refractive index. The FOM data obtained was then indicative of which particles may be useful for molecular biosensing and further experimentation.

METHODS: REFRACTIVE INDEX SENSING

Three silicon heptamer and three disk nanoparticle arrays of varying radius of were embedded in ten optical oils ranging from 1.4600 R.I.U to 1.6400 R.I.U. between glass slides (see Figure 4). The sample was washed with acetone and isopropanol between trials.

The experimental set-up (see Figure 5) was used to record the transmission spectra of only the nanoparticles. This was done by recording the spectra through the nanoparticles on the substrate then subtracting the spectra recorded through only the substrate. A white light lamp at 12.3V was used with an aperture of 1.5mm. Resonance for these particles occurs in the infra-red region thus the spectra was recorded from 1000nm to 1700nm with a sensitivity of 10pW and resolution band width of 10nm. The removable mirror directs the beam to the infra-red camera and the knife edge can be adjusted to isolate the spectra to a single array of nanoparticles.

RESULTS AND FOM VALUES

The extinction spectra for the Heptamers and Nanodisks embedded in optical oils were plotted (see Figure 6 and 7) and show a systematic shift to higher wavelengths with increasing refractive index. The peak around 1150nm for the Heptamers is sharp and could display high biosensing quality. This is also the case for the Nanodisk peaks around 1275nm. The wavelength corresponding to these peaks was then plotted against R.I.U. with a linear regression (see Figure 8).

The nanodisk plots observed in the right column of Figure 8 show for this range of refractive indices, the spectra shift is highly linear as supported by an R^2 value of 0.989 and above. The linear model is not so strongly supported by the Heptamers with an R^2 value of 0.978 and above which may be due to asymmetric Fano Resonance. The linear relationship is significant to apply the gradient to Equation 1 combined with the FWHM to calculate the FOM. These values are given in Table 1.

Table 1: Heptamer FOM Values

Array	Heptamer FOM	Nanodisk FOM
1	4.29	14.1
2	5.23	16.7
3	4.86	17.5

The FOM values for the nanodisks are significantly higher than the Heptamers by a mean factor of approximately three. This suggests that the nanodisks will outperform the heptamers for biosensing quality.

IV. STREPTAVIDIN BIOSENSING FOR HEPTAMERS

The FOM values obtained for the heptamers and nanodisks show promising sensing potential when compared to silver-metal nanocubes that achieve FOM values of around 3.0.¹⁰ To validate this claim, an actual biosensing assay was conducted using the streptavidin-biotin binding interaction.

Streptavidin is a 54kDa homotetramer protein, making it a similar size to most human proteins of order 40kDa.¹¹ Streptavidin has a high affinity for biotin (or vitamin B₇) with four binding sites per protein unit.¹²

The surface of the silicon nanoparticles has a self-limiting layer of SiO₂ and in the presence of alkyl silanes, forms a covalent siloxane bond.¹³ This biosensing assay used a silane-PEG-biotin linker molecule (Nanocs Life Research) to functionalise the surface of the nanoparticles (see Figure 9). Using Cabridgesoft Software, it was

¹⁰Sherry, Chang, et al, above n 8, 2034.
¹¹Wayne Hendrickson, Arno Pahler, et al, 'Crystal structure of core streptavidin determined from multiwavelength anomalous diffraction of synchrotron radiation' (1989) 86 *Proceedings of the Natural Academy of Science USA* 2190.
¹²Jason DeChance and Houk K N, 'The origins of femtomolar protein-ligand binding: Hydrogen-bond cooperativity and desolvation energetics in the biotin-(strept)avidin binding site' (2007) 129 *American Chemical Society* 5419.
¹³Ahmed Arafat and Muhammad Daous, 'Silicon and Silicon-Related Surfaces for Biosensor Applications' in Vernon Somerset (ed), *Environmental Biosensors* (Intech, 2011) .

Figure 6: Heptamer Extinction Spectra Arrays 1, 2 and 3 (from top to bottom) Embedded in Optical Oils

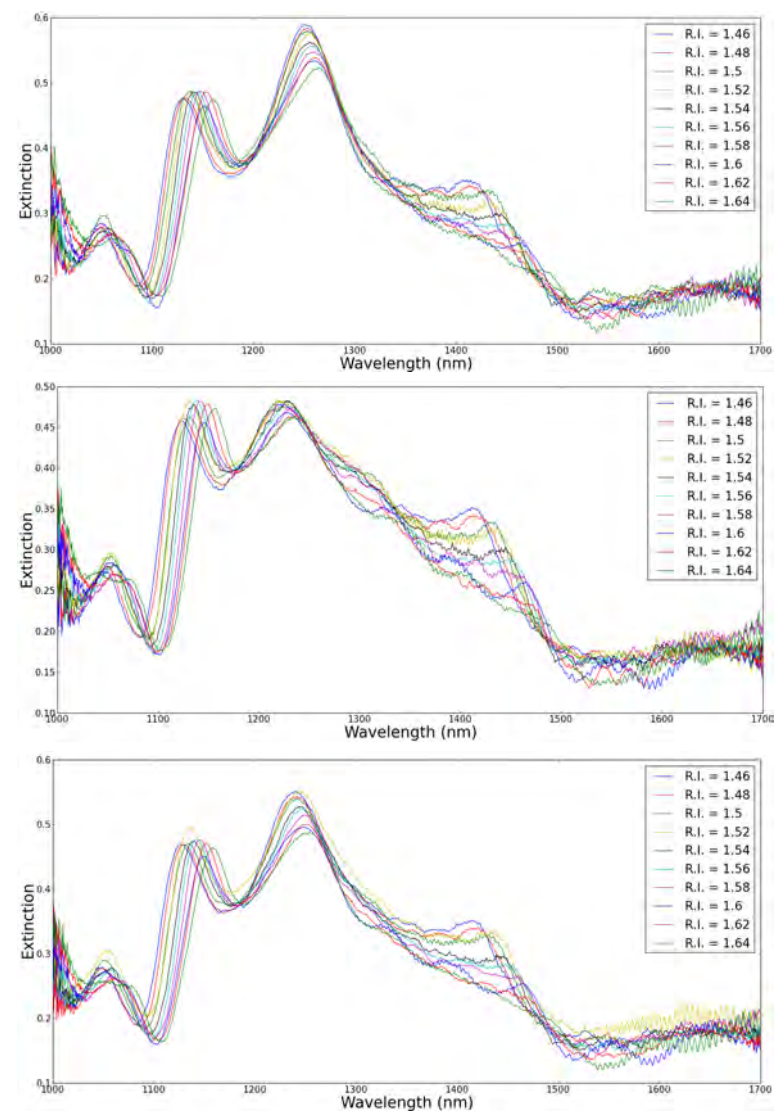


Figure 7: Nanodisk Extinction Spectra Arrays 1, 2 and 3 (from top to bottom) Embedded in Optical Oils

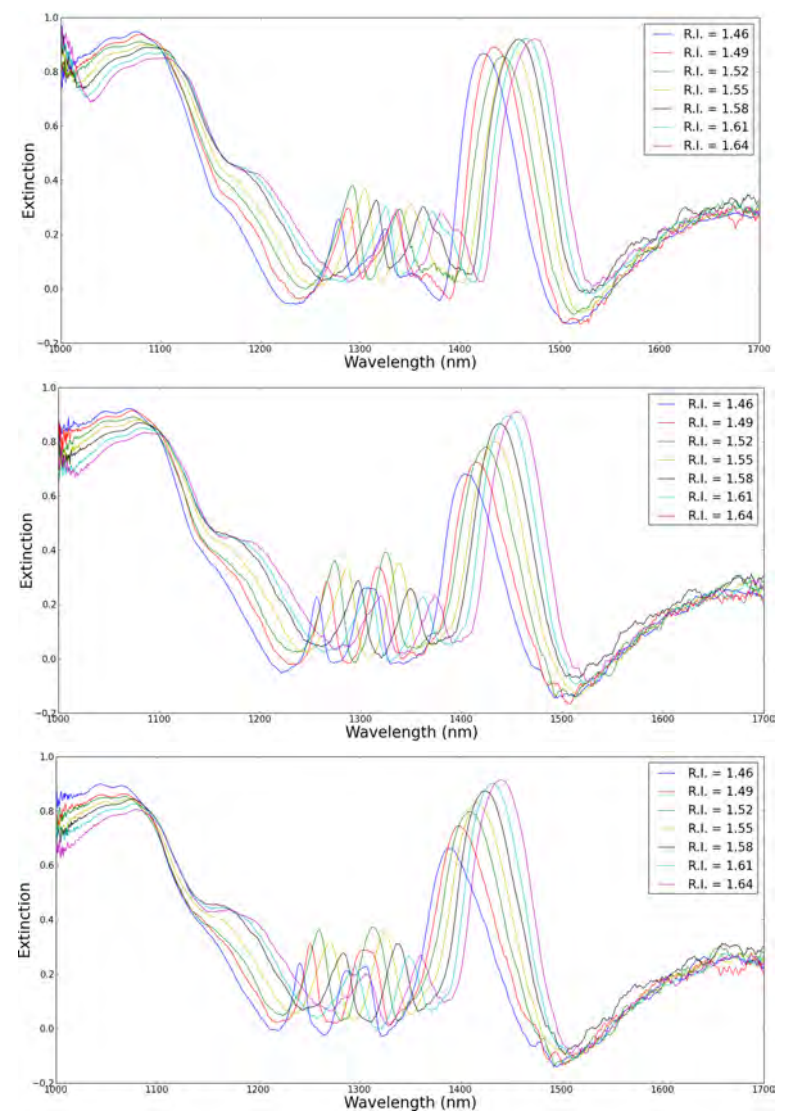
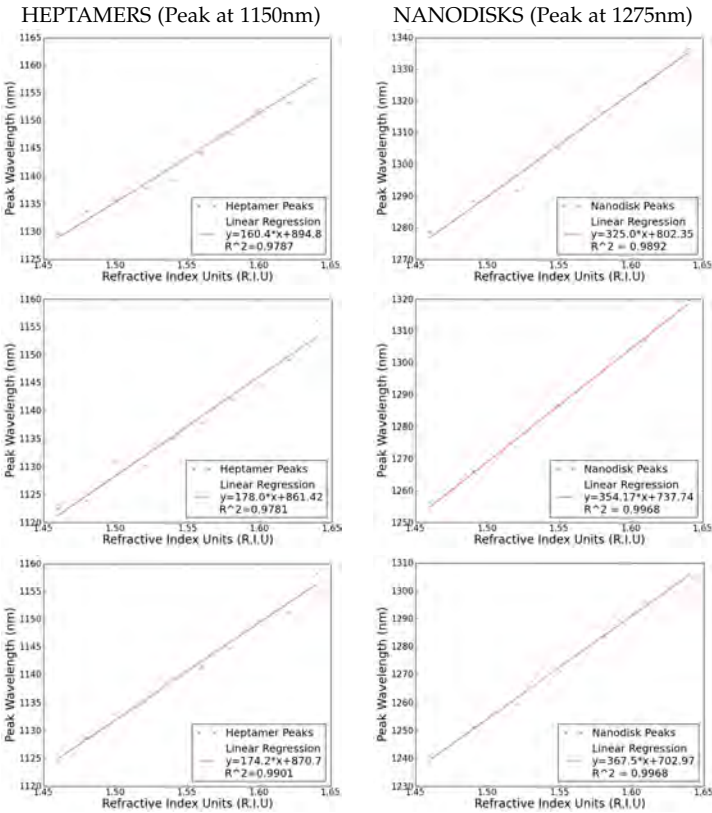


Figure 8: Heptamer and Nanodisk Peak Wavelengths Against R.I.U. with Linear Regression. Row 1 = Array 1 etc.



predicted that the linear molecule is 5.68nm in length. Thus assuming a perfect monolayer of the linker on the surface of the nanoparticle, it would form a maximum thickness of 5.68nm.

After surface functionalisation with the linker molecule, varied concentrations of streptavidin were deposited on the sample and allowed time to bind to the exposed biotin. This induced a shift in the spectra of the nanoparticles allowing the effective “sensing” of the streptavidin.

METHODS: STREPTAVIDIN BIONSENSING

Six heptamer arrays of varying radius were tested with three dilutions of streptavidin (two for each dilution).

Essentially salt free Streptavidin was obtained from Sigma Aldrich and dissolved in 1X Phosphate Buffered Saline (PBS) at 7.0pH. These concentrations are summarised in Table 2.

Table 2: Streptavidin Concentrations in PBS

Label	Concentration (g.L ⁻¹)
I	5.0
II	1.0E-1
III	2.0E-3

Due to close proximity of heptamer arrays on the single substrate, a PMMA mask was spin coated at 3000rpm for 90sec onto the sample with a small drop of Fixo Gum glue covering arrays 1a and 1b (see Figure 11). The glue was then removed to leave only the arrays to be tested exposed . The sample was baked on a hotplate at 170°C for 60sec then washed with isopropanol.

The Sample was then placed in a barrel etcher with oxygen plasma at 200W for 15sec to create oxygen radicals at the surface, then quickly transferred to millipore water where it was left for 30min to form terminal *–OH* groups. This process supports the silane bonding reaction.

1.5mg of Silane-PEG-Biotin Linker (Nanocs Life Research) was dissolved in 1.5mL of 0.95 : 0.05 ethanol:water solution. 100µL of this solution was placed on the exposed sample area and left at 40°C for 10min. The sample was then rinsed in an ethanol:water solution of the same ratio and blow dried with compressed air.

The transmission spectra was then recorded using the experimental setup in Figure 5.

100 μ L of streptavidin solution I (see Table 2) was then applied to the sample and given 10min to bind to the exposed biotin. The sample was then rinsed with 50mL of 0.1M PBS to remove excess protein and blow dried with compressed air. The spectra was then recorded again.

The PMMA mask was then removed by soaking in acetone at 80°C for 15min and then washed with isopropanol. A new mask was then created with different heptamer arrays exposed and the process repeated for protein concentration II and III.

The nanodisks were not included in the biosensing assay. Instead a CST (Computer Simulation Technology) simulation was conducted to observe how the thickness of an organic layer on the surface of the nanodisks shifts the spectra (see Figure 10). An electric permittivity of $\epsilon = 3.0$ was used for the organic layer:¹⁴

RESULTS: STREPTAVIDIN BIOSENSING

Results for the Heptamer streptavidin biosensing assay are shown in Figure 12, 13 and 14. Measured shifts for concentrations I and II are small but observable. The final concentration III has an anomalous spectra with a significantly higher extinction spectra recorded for the Streptavidin bound relative to the spectra for just the linker.

Results for the simulation of a varied thickness organic layer coating on a silicon nanodisk (see Figure 15) demonstrate a sharp peak with high potential sensing quality about 1300nm and 1425nm. The shift also appears linear even for high thickness layers at 15nm.

V. DISCUSSION

HEPTAMER BIOSENSING

Results from the streptavidin biosensing assay are promising with observable shifts for dilutions I and II (see Figure 12 and 13). The result for dilution III however is anomalous (see Figure 14) where the streptavidin bound extinction spectra can be seen to be higher at extreme wavelengths. This may be due to random error in the recording of the background spectra. This is supported by Figure 11 where dark particles that may have interfered with the spectra can be observed for some dilutions. Currently there is no confirmed method for removing the silane-PEG-biotin linker, making this experiment non reproducible with the same sample.

¹⁴Librero Zuppioli, L si-Ahmed et al, 'Self-assembled monolayers as interfaces for organic opto- electronic devices' (1999) 11 *The European Physical Journal* 505.

An acid hydrolysis mechanism is known for siloxane bonds that could be further investigated.¹⁵ Application of this could see a recyclable biosensor.

Despite the systematic vertical shift seen for the anomalous spectra in dilution III, the peak at 1300nm still shows an observable horizontal shift of similar magnitude to dilution I. The clearest shift occurred for streptavidin dilution II which corresponds to the heptamer particles with the highest FOM value (see array 1 Table 1). This suggests that regardless of the streptavidin concentrations used, the number of protein units were in excess of the number of biotin sites available for binding on the nanoparticle surface. Streptavidin-biotin binding is well known to be one of the strongest non-covalent interactions in nature, capable of 50% binding at femtomolar concentrations.¹⁶ Thus if enough streptavidin units are present in solution, almost all of them shall bind to every available biotin site. This could be confirmed by further testing more dilute concentrations of streptavidin until no shift is observed.

Figure 9: Silane-PEG-Biotin Linker Molecule. Red = Silane, Blue = Biotin, M.W. = 1000 \Rightarrow PEG monomer unit $n \approx 12$

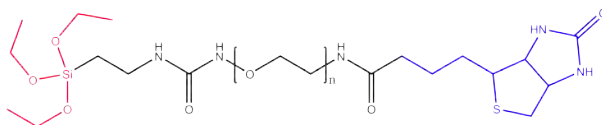
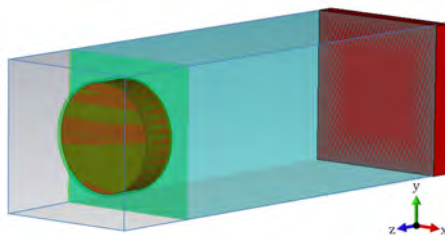


Figure 10: CST Simulation Schematic for Varied Organic Layer Thickness on Silicon Nanodisks



¹⁵Marie-Christine Brochier Salon and Mohammed Naceur Belgacem, 'Hydrolysis-condensation kinetics of different silane coupling agents' (2011) 186 *Phosphorous, Sulfur, and Silicon* 240.

¹⁶DeChancie and Houk, above n 12, 5419.

Figure 11: Microscope Images of Heptamer Arrays with PMMA Mask and Labels (Nanoparticles appear pink through PMMA leaving exposed arrays grey in colour)

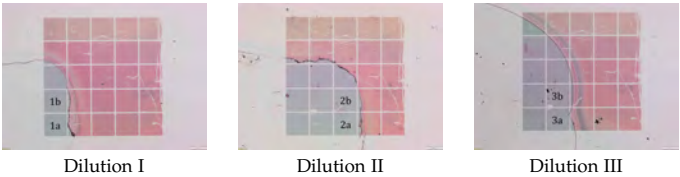


Figure 12: Heptamer Extinction Spectra Comparing Surface Functionalised with Silane-PEG-Biotin Linker against Addition of Protein Dilution I ($5.0\text{g}\cdot\text{L}^{-1}$)

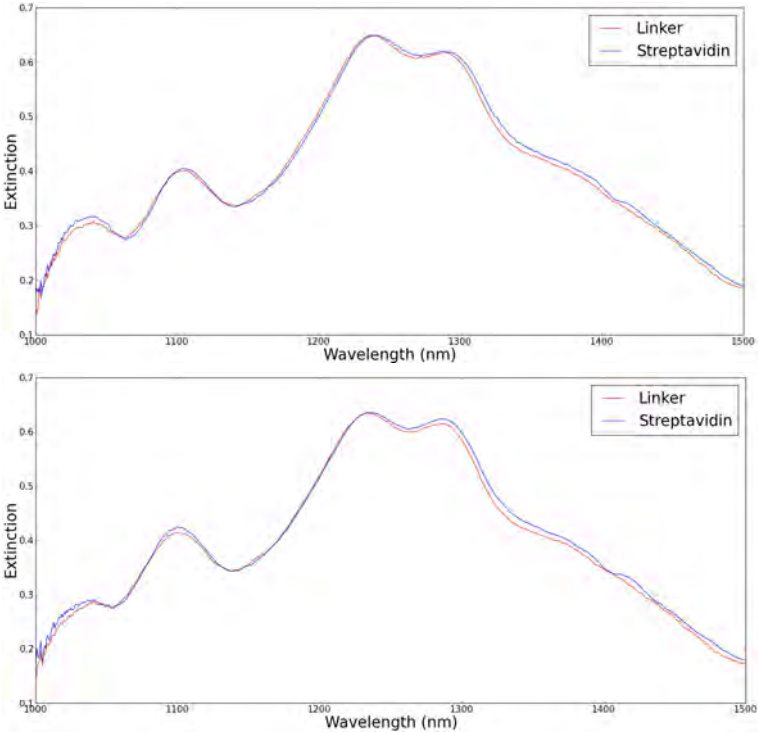


Figure 13: Heptamer Extinction Spectra Comparing Surface Functionalised with Silane-PEG-Biotin Linker against Addition of Protein Dilution II ($1.0E-1\text{ g.L}^{-1}$)

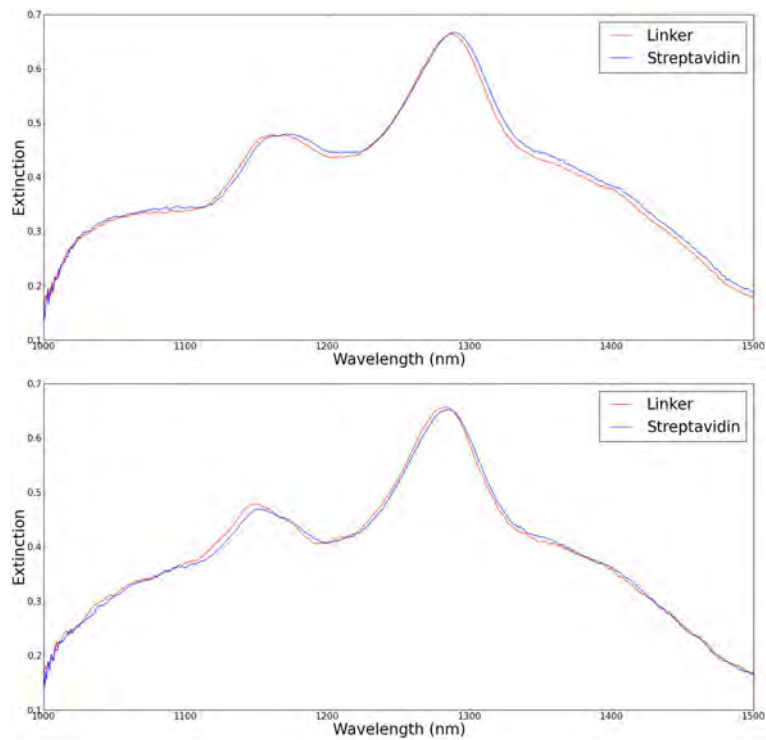


Figure 14: Heptamer Extinction Spectra Comparing Surface Functionalised with Silane-PEG-Biotin Linker against Addition of Protein Dilution III ($2.0\text{E-}3\text{ g.L}^{-1}$)

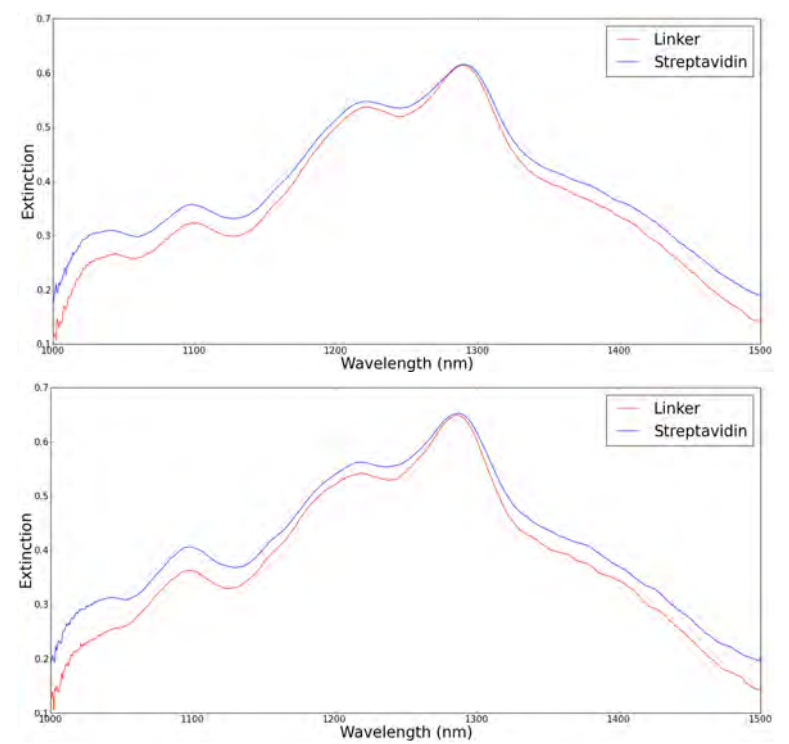


Figure 15: Nanodisk CST Simulations of Extinction Spectra for Varied Organic Layer Thickness

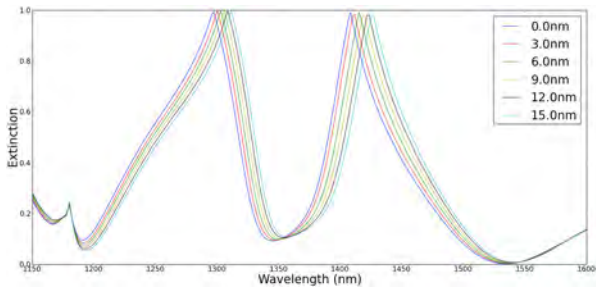
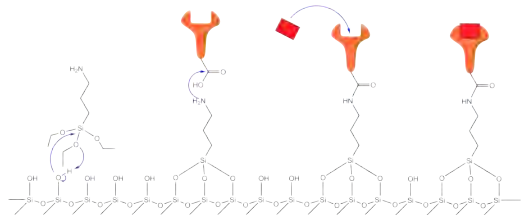


Figure 16: Proposed Mechanism for SiO₂ Surface Functionalisation with (3-aminopropyl)-trethoxysilane and Peptide Link to Arbitrary Antibody



IMPROVEMENTS AND MOLECULE SENSING GENERALISATION

The heptamer nanoparticles examined in the biosensing assay are not optimised for biosensing. From the calculated FOM values we would expect higher sensing quality from the silicon nanodisks and other particles demonstrating ultra-sharp Fano-Resonance peaks could show even better biosensing quality.¹⁷ The nanoparticle structure has not been fully exploited for its sensitivity to the surrounding refractive index environment thus there is still much capacity for development in this area.

Many biosensors employ further chemical techniques for amplifying sensitivity. These methods usually involve some form of branching antibody (see Figure 17) that induces the formation of a multilayer of the target molecule with additional

¹⁷C Wu, N Arju, G Kelp et al, 'Silicon-based Infrared Metamaterials with Ultra Sharp Fano Resonances' (2013) *ArXiv e-prints* .

enzymes (termed enzymatic precipitation).¹⁸ Instead of a monolayer of protein (as with this experiment), a dense protein-antibody multilayer on the sensor surface induces a greater change in the surrounding dielectric environment and a larger signal is observed. This is the basis for molecular recognition of Human Chorionic Gonadotropin (hCG) protein in the common pregnancy test.¹⁹

In this biosensing assay, the streptavidin with the silane-biotin linker was used as a reliable method to prove a principle. In theory, a silane group could be linked to any functional receptor such as an antibody and be used in the sensing of any protein or other large molecule. For example (3-aminopropyl)triethoxysilane is a commonly used coupling agent in thermoplastics and can also be used to functionalise SiO₂ surfaces.²⁰ This leaves a monolayer of exposed amine groups that has also been shown to be non-toxic.²¹ Exposed amine groups can then undergo a condensation reaction with a carboxylic acid to form a covalent amide link to any desired molecule such as an antibody or receptor. This could see its application in areas of rapid and simple medical diagnosis or use *in vivo*. Alternative methods for surface functionalisation that have shown varied stability include self assembled monolayers that form by a radical alkene addition to create direct Si–C covalent bonds.²²

VISIBLE SPECTRUM NANOPARTICLES AND FURTHER APPLICATIONS

All nanoparticles considered thus far have been active in the infra-red spectrum. For biosensor applications in the visual spectrum there exists silicon nanospheres on the order of 300nm in diameter. The intensely bright colour of silicon nanospheres can be tuned to any visible frequency through variation of the radius (see Figure 18). Nanospheres are easily and cheaply fabricated to a precise radius using the method of laser ablation.²³ Furthermore they are produced and can be utilised in solution if necessary. This increases functionalised surface area of the particle as it is no longer immobilised on a substrate which could also increase sensitivity.

¹⁸Tae-Han Lee, Seung-Woo Lee, et al, 'Signal amplification by enzymatic reaction in an immunosensor based on localized surface plasmon resonance (lspr)' (2010) 10 *Sensors* 2045.

¹⁹Alan Weiss, 'Concurrent engineering for lateral-flow diagnostics' <<http://www.ivdtechnology.com/article/concurrent-engineering-lateral-flow-diagnostics>>.

²⁰V Sunkara, DK Park, et al, 'Simple room temperature bonding of thermoplastics and poly(dimethylsiloxane)' (2010) 11 *Lab on a Chip* 962.

²¹A Natarajan, C Chun, J J Hickman and P Molinar, 'Growth and electrophysiological properties of rat embryonic cardiomyocytes on hydroxyl- and carboxyl-modified surfaces' (2008) 19 *Journal of Biomatter Science*.

²²Steffen Onclin, Bart Jan Ravoo, and D N Reinhoudt, 'Engineering silicon oxide surface using self-assembled monolayers' (2005) 44 *Angewandte Chemie* 6282.

²³Urs Zywietz, Audrey B Evlyukhin, et al, 'Laser printing of silicon nanoparticles with resonant optical electric and magnetic responses' (2013) 5 *Nature Communications* 3402.

Figure 17: Image from Mayer et al showing enzyme free sensing (right) and multilayer enzymatic precipitation (left)

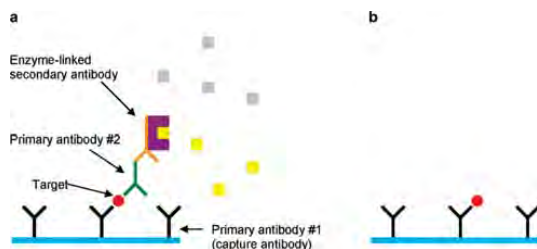
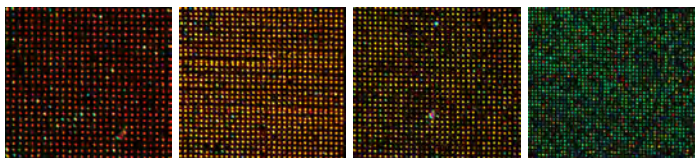


Figure 18: Dark-Field Microscope Images of Silicon Nanospheres Showing Range of Colours (Decreasing Radius Left→Right)



One potentially novel application of silicon nanoparticles in the visible spectrum is their use as a genetically specific marker. Silicon nanospheres can be functionalised with DNA causing gene specific binding.²⁴ If this interaction could be coupled with a significant shift in the silicon nanoparticle spectra to induce a colour change, this could be used as a visible marker to differentiate between cells with a specific mutation (e.g. cancerous cells). One problem presented in cancer removal is making sure all cancerous cells have been removed, which can be difficult as the tissues can look similar. Injection of DNA functionalised silicon nanoparticles would allow a clear differentiation to be made between cancer cells and normal tissue by colour during operations and ensure all traces are identified and removed within the one procedure.

Successful passive cellular uptake of silicon nanoparticles up to 400nm has been shown.²⁵ Still larger particles could be utilised as a marker on the cell surface.

²⁴Todd Strother, Wei Cai, et al, 'Synthesis and characterization of dna-modified silicon (111) surfaces' (2000) 122 *American Chemical Society* 1205.

²⁵Zhiqin Chu, Yuanjie Huang, Qian Tao et al, 'Cellular uptake, evolution and excretion of silica nanoparticles in human cells' (2011) 3 *Royal Society of Chemistry* 3291.

Many cancerous cells show increased expression of growth factor receptors. These integral membrane proteins on the cell surface are a transducer for signals to induce cell reproduction. For example, 67.8% of all invasive human breast cancers have been shown to express elevated levels of Epithelial Growth Factor Receptor-viii (EGFRviii).²⁶ A silicon nanoparticle functionalised with an antibody to this receptor could be used to diagnose this type of cancer, or as a marker to aid its surgical removal.

Figure 19: *Lab-on-a-chip* Gold-nanoparticle Ultra-sensitive Medical Diagnostic Device (from Acimovic et al)



A current area of high interest is the so called *Lab-on-a-chip* technology for medical diagnosis. Recently, a group developed an ultra sensitive blood diagnostic device using functionalised gold nanoparticles in a convenient chip-like structure (see Figure 19).²⁷ Materials for fabrication of these devices is expensive and mass production would require implementation of new large scale technology. Fabrication of a similar device with silicon as an alternative material is much more feasible as silicon nano-technology is highly compatible with current CMOS (Complementary Metal-Oxide-Semiconductor) technology used in the electronics industry.

²⁶H Ge, X Ghong and CK Tang, 'Evidence of high incidence of egfrviii expression and co-expression with egfr in human invasive breast cancer by laser capture microdissection and immunohistochemical analysis' (2002) 98 *International Journal of Cancer* 357.

²⁷The Institute of Photonic Sciences, 'Ultra-sensitive nano-chip capable of detecting cancer at early stages developed' <<http://phys.org/news/2014-05-ultra-sensitive-nano-chip-capable-cancer-early.html>>.

VI. CONCLUSIONS

Silicon nanoparticles show high and measurable sensitivity to their surrounding environment as evident from calculated FOM values and their comparison to nanoplasmonics. When applied to the streptavidin biotin biosensing, results were promising with observable shifts in the spectra due to the theorised binding of a monolayer of streptvidin.

There is still large scope for development of silicon nanoparticles as biosensors with more sensitive structures and many chemical amplification techniques available. Furthermore their cheap and simple fabrication combined with generalised surface functionalisation techniques mean they can be applied to biosensing of a broad range of molecules.

The high scattering efficiency and non-toxicity of silicon nanoparticles makes them highly applicable as a biological marker with their potential application in medical diagnosis and genetic or environmental cell differentiation. Furthermore, their compatibility for fabrication within the current CMOS industry makes their mass production easy to implement. Continued research and development of silicon nanoparticles could therefore produce many novel and improved technologies.

VII. FUTURE DIRECTIONS

From the results of the streptavidin-biotin sensing with the heptamers, the next step is to find the limit of sensitivity and compare this to current sensing devices. The nanodisks are predicted to have a high biosensing quality based on the FOM calculations, thus these should also be included in further experimentation. Investigation into silicon nanoparticle structures that are more sensitive to the surrounding refractive index could also be made.

Surface functionalisation to nanoparticles in solution such as the silicon nanospheres is an important step towards creating an injectable marker and should be further investigated.

Currently there is no confirmed method for removing the silane-PEG-biotin linker, making this experiment non reproducible with the same sample. Further investigation into a reliable method for this process is important for future repetition of trials and to produce a recyclable sensing device.

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Keystone of Extermination: The Role of the Educated Elite in the Holocaust and the Armenian Genocide

Mingji Liu

Genocide is not possible without the active participation and compliance of the educated elite. Drawing upon evidence from the Holocaust and the Armenian Genocide, this essay argues that professions such as doctors, lawyers, and teachers were crucial to success of these genocides. Firstly, they provided credibility and legitimisation to the genocidal ideologies of the Nazis and Young Turks. Secondly, they were complicit in process of demonisation and dehumanisation that precedes genocide. Thirdly, they were instrumental to the organisation, evolution and sustenance of the genocide machinery itself. Furthermore, many were enthusiastic participants and possessed full knowledge of their genocidal actions. In light of this, this essay argues that the belief that education is fundamental to preventing the horrors of racism, mass killings, and genocide is a misguided one. This belief stems from the problematic idea that genocide is irrational and that education, in the sense of knowledge and technical skills accumulation, has a moralising effect on its subject.

As Israel Charny argues: “Genocide is too serious and vast a matter to spring up in a vacuum of nondefinition or nonideology”¹ Ordinary people do not commit mass murder without good reason. The attempted annihilation of an entire race or ethnic group requires a legitimate ideology as a precondition. The genocidal ideologies of the Nazis and Young Turks were crafted and promoted by educated elites who were influenced by the theories and intellectual philosophies of their time. Although many of these intellectuals did not explicitly advocate genocide, their work lent credibility to the genocidal ideologies and therefore they were crucial in the preconditions that necessitate genocide.

For there to be a ‘Final Solution’ there first needed to be a ‘Jewish Problem’. One dimension of this problem was scientific claims on Jewish inferiority and the importance of racial purity in Germany. At the turn of the 20th century, German intellectuals were complicit in the construction and promotion of these ideas. For example,

¹Israel W Charny, *How can we commit the unthinkable? Genocide, the human cancer* 1st ed (Westview Press, 1982) 323.

Eugen Fischer, a director of the Kaiser Wilhelm Institute of Anthropology, Human Heredity, and Eugenics and a member of the Nazi Party, argued in his 1913 study on the 'Rehoboth Bastards' that interracial children produced between Europeans and 'inferior races' such as Africans were inferior. This study would come to influence Nazi policies on racial hygiene such as the Nuremberg Laws.² German physician Otmar Freiherr von Verschuer, another director of the Kaiser Wilhelm Institute, was a prominent advocate for Aryan supremacy and saw Jews as a threat to the health of the German race.³ The influential publication 'Authorisation for the Destruction of Life Unworthy of Life' by jurist Karl Binding and psychiatrist Alfred Hoche argued that society should kill its mentally handicapped.⁴ These ideas were canonical with notions of eugenics and theories of biological racism that existed in North America and Europe at the time, and were coupled with pre-existing European traditions of anti-Judaism to form a political ideology based on race. Ideas such as the need for racial purity and the notion of 'life unworthy of life' would be used by the Nazis to justify to the destruction of 'racially inferior' people such as the Jews on the grounds that they were a threat to the racial hygiene of the nation.

Similarly, Turkish intellectuals aided the government of the Committee of Union and Prosperity (CUP), popularly known as the Young Turks, by legitimising the need to eliminate the Armenians in the Ottoman Empire. Like the Jews in Europe, the Armenians had historically held an inferior and despised position in Turkish society and were often subject to extreme violence. But it was the rise of ethno-nationalism which would prove the tipping point into outright genocide. Political Turkism or Pan-Turkism spread to the Ottoman Empire in the late 19th and early 20th century and would come to heavily influence the thinking of Turkish intellectuals and the nation-building policies of the CUP.⁵ Intellectuals such as Yusuf Akcura, considered the father of Turkic nationalism, linked the concept of race to a united Turkic geopolity.⁶ Likewise, Ottoman sociologist Mehmet Ziya conceived of the nation as being comprised of Turkish Muslims.⁷ Dr Nazim, a trained physician and prominent ideologue in the CUP, argued that:⁸

The pretensions of the various nationalities are a capital source of annoyance for us. We hold linguistic, historical and ethnic aspirations

²Henry Friedlander, *The Origins of Nazi Genocide: From Euthanasia to the Final Solution* (London: The University of North Carolina Press, 1995) 11.

³Ibid 12.

⁴Ibid 14.

⁵Stephan Austerlitz, 'The Armenian Genocide: An Interpretation' (1990) 23(2) *The History Teacher* 131.

⁶Ibid 132.

⁷Ibid 132.

⁸Mecheroutiette, *Constitutionnel Ottoman no. 38* (Imprimerie A. G. l'Hoir, 1913) 27.

in abhorrence. This and that group will have to disappear. There should be only one nation on our soil, the Ottoman nation, and only one language, Turkish.

Moreover, Turkish ethno-nationalism borrowed from understandings of nations based on European race-based Darwinian theories of the 19th century.⁹ The CUP saw the Armenians that inhabited Anatolia as an obstacle to their aspirations of ethno-religious homogeneity. This aspiration was exacerbated by anxieties about the Armenian nationalist movement and fears of Armenian betrayal during the First World War. Thus it was the creation and legitimisation of ideas of national homogenisation by Turkish intellectuals which helped build the CUP's genocidal ideology.

Not only did the educated classes aid in the creation and promotion of genocidal ideologies, they were also complicit in the dehumanisation and demonization of the target group prior to the actual genocide. This is a crucial stage that prepares society for the elimination of the target group. Educated members of society such as lawyers, educators, and bureaucrats helped define and normalise the notion of certain people as a dangerous 'Other' that need to be eradicated.

In Germany, professional organisations such as teachers' associations and bar associations were taken over by Nazi professional leagues and made to comply with Nazi ideology.¹⁰ The legal profession was particularly complicit in the dehumanisation of Jews. Under the leadership of lawyers such as Hans Frank, jurists were taught to reject the individualistic legal traditions and instead develop a new notion of criminal and civil law in terms of "racial, biological, and communitarian values".¹¹

In the spring of 1933, Nazis began a campaign of intensive legal discrimination against Jews, starting with the barring of "non-Aryans" from the legal and civil service profession.¹² In September of 1935, the Nuremberg Laws were introduced which stripped German Jews of their citizenship and prohibited marriage and sexual relations between Jews and Germans.¹³ Likewise, laws were introduced which forced Jews to change their family names, wear yellow star as a mark of shame in

⁹Taner Akçam, *From Empire to Republic: Turkish Nationalism and the Armenian Genocide* (Zoryan Institute, 2004) 66.

¹⁰Konrad H Jarausch, 'The Perils of Professionalism: Lawyers, Teachers, and Engineers in Nazi Germany' (1986) 9(1) *German Studies Review* 111.

¹¹Ibid 114.

¹²Ronald J Berger, 'The "Banality of Evil" Reframed: The Social Construction of the "Final Solution" to the "Jewish Problem"' (1993) 34(4) *The Sociological Quarterly* 605.

¹³Ibid.

public, among numerous other discriminatory measures.¹⁴ These laws served to isolate, humiliate and ultimately dehumanise the Jewish people. The creation and enforcement of these laws required the complicity and cooperation of the German judiciary and policymakers. Likewise, the education profession was complicit in the demonisation of Jewish people. Anti-Semitic teachings pervaded throughout all levels of the German education curriculum. Teachers were required to transmit knowledge that promoted Nazi national consciousness, through topics such as Germanic mythology and racial science,¹⁵ and teach from textbooks which explored themes of racial purity and emphasised the inferiority of Jews.¹⁶ Furthermore, German bureaucrats disseminated anti-Semitic propaganda to the public. The Reich Ministry of Public Enlightenment and Propaganda "systematically promoted and crystallized popular anti-Jewish sentiments through the radio, press, arts, and schools".¹⁷

In the Ottoman Empire, policymakers were complicit in the implementation of policies which sought to dehumanise the Armenians. These included acts of exclusion and humiliation such as economic nationalisation policies in 1914 which stripped non-Muslim groups such as the Armenians of their property and barred them from participating in the Turkish economy.¹⁸ Furthermore, Turkish bureaucrats were complicit in the demonisation of the Armenian people. The Young Turks sought to incite hatred towards the Armenians through the use of religious propaganda. Armenians were demonised in mosques during Friday prayers and according to Dadrian, these appeals to religious fanaticism were coordinated and "controlled by administrative fiat".¹⁹ Moreover, because of martial law during the First World War, all forms of communication were under strict state control of the Interior Ministry and War Office. This meant that all anti-Armenian propaganda in the media was "either inspired or sanctioned by these authorities".²⁰

As well as being involved in the preparation stage of genocide, the educated members of society are also instrumental to the genocide proper. They are crucial to the bureaucratic organisation of the mass killings, as well as to the evolution and

¹⁴Mecheroutiette, above n 8,27; Michael Stolleis, *The Law Under Swastika: Studies on Legal History in Nazi Germany* (Thomas Dunlap, University of Chicago Press, 1st edition 1998) Studien zur Rechtsgeschichte des Nationalsozialismus (1997) .

¹⁵Jaraus, above n 10, 115.

¹⁶James M Glass, 'Against the Indifference Hypothesis: The Holocaust and the Enthusiasts for Murder' (1997) 18(1) *Political Psychology* 131.

¹⁷Berger, above n 12, 602.

¹⁸Akçam, above n 9, 141.

¹⁹Vahakn N Dadrian, 'The Secret Young-Turk Ittihadist Conference and the Decision for the World War I Genocide of the Armenians' (7) 2(186) *Holocaust Genocide Studies* .

²⁰Ibid 191.

sustenance of the genocidal machinery. Although this essay will not delve into the debate on the validity of the 'Banality of Evil' thesis, i.e., whether or not they were indifferent and morally unimaginative participants, this essay asserts that many professionals involved in the genocidal machinery of the Holocaust and Armenian Genocide were enthusiastic participants with full awareness of their actions. As Glass argues, "their work reflected not blindness but a wide-ranging enthusiasm".²¹

Anti-Semitism seeped through all facets of Nazi society and people were given every reason, scientific or otherwise, to eliminate the Jews for the good of the German collective. The same could be said with regards to the Armenians and the fear that they would undermine Turkic ethno-nationalistic aspirations.

The Holocaust was an immense feat of bureaucratic organisation. The collection, transportation, extermination, and disposal of six million Jews required precise coordination of the civil administration, railway systems, local police, among other administrative units.²² It was an enthusiastic and technocratic bureaucracy that ensured an efficient extermination of the Jewish people. These were the so-called 'desk killers', educated bureaucrats that coordinated the deportation and transportation of the Jews and administered the genocidal policies of the Nazi government.²³ One highly important profession in the Holocaust were accountants. The accounting profession was not only complicit in the use of slave labour by German industries,²⁴

but also in the organisation and implementation of the Holocaust proper. For example, German accountants used cost-benefit analysis to conclude that it was cheaper to incinerate children alive than to first gas them.²⁵ Funnell argues that accountants also helped hide the human side of the Holocaust by anonymising those the bureaucracy helped exterminate.²⁶

The Armenian Genocide also required the participation and complicity of competent bureaucrats. Following the April 1915 arrests of Armenian intellectuals and leaders in Istanbul, the Turkish government began to systematically deport, imprison, and massacre the Armenian population.²⁷ According to the report made by a German employee working on the Baghdad Railway: "The number of deportees who have

²¹Glass, above n 16, 130.

²²Berger, above n 12, 607.

²³Samuel Totten and Paul Robert Bartrop, *Dictionary of Genocide: A-L, Volume 1* (Greenwood, 2008) 110.

²⁴Ellen J Lippman and Paula A Wilson, 'The Culpability of Accounting in Perpetuating the Holocaust' (2007) 12(3) *Accounting History* 287.

²⁵*Ibid* 288.

²⁶Warwick Funnell, 'Accounting in the Service of the Holocaust' (1998) 9(4) *Critical Perspectives on Accounting* 450.

²⁷Donald Bloxham, 'The Armenian Genocide of 1915-1916: Cumulative Radicalization and the Development of a Destruction Policy' (2003) 181(1) *Past & Present*.

passed through here and through Aintab has so far reached the figure of 50,000. Nine-tenths of these received the order to leave the following morning, the night before".²⁸ Such descriptions are testament to the efficiency of the undertaking. In 1919, a Turkish government document dubbed 'The Ten Commandments' was discovered by British officials. This was a draft outline on the steps needed to be carried out in order to annihilate the Armenians.²⁹ One such step was:³⁰

Leave all executive to the people in the provinces such as Erzeroum, Van, Mamuret ul Aziz, and Bitlis, and use Military disciplinary forces (i.e., Gendarmerie) ostensibly to stop massacres, while on contrary in places as Adana, Sivas, Broussa, Ismidt and Smyrna actively help the Moslems with military force.

This step shows how the Armenian Genocide was carefully premeditated and organised according to specific procedures such as a plan to send military forces to certain regions under the guise of massacre prevention, but actually using them to help with the killings. Likewise, it highlights the fact that the deportation and massacres required coordination between provincial governors, army commanders, and the Turkish ministries.

Notable among the educated elites who helped in the organisation of the Armenian Genocide were two trained physicians, Dr Nazim and Dr Behaeddin Sakir, who were central to the formation and deployment of 'Special Organisation units' that were responsible for many of the massacres that took place.³¹ In fact, several other Turkish doctors played an active role in initiating and organising mass killings. Most were graduates of the Imperial Military Medical School in Istanbul which has close ties to the CUP.³² According to Dadrian, the medical profession closely represented the socio-economic status and aspirations of the Committee and many "abandoned their profession and became provincial commissars and administrators overseeing the macabre details of the mass slaughter".³³

As well as being involved in its organisation, professionals were also involved in the evolution of the genocidal machinery. This is shown most clearly in the Holocaust. Whereas in the Armenian Genocide, victims were killed through "manual slaughter",

²⁸Johannes Lepsius, *Rapport secret sur les massacres d'Arménie* (Payot, 1987) 168.

²⁹Dadrian, above n 19, 173.

³⁰Ibid 174.

³¹Vahakn N Dadrian, 'The Role of Turkish Physicians in the World War I Genocide of Ottoman Armenians' (1986) 1(2) *Holocaust and Genocide Studies* 171.

³²Austorian, above n 5, 128.

³³Dadrian, above n 31, 179.

such as by clubs and hammers,³⁴ the Holocaust implemented new methods of industrial killing. It was educated technicians and engineers that helped design and improve the designs of the gas chambers and crematoria ovens. It was building planners that ensured that the facilities at concentration camps such as Birkenau were carefully laid out as to maximise the extermination and body disposal process.³⁵

For example, Nazi engineers redesigned the multi-person crematoria ovens in concentration camps to be more efficient. The industrial furnace company Topf and Sons redesigned their ovens to allow for higher capacities and more efficient body burnings.³⁶ On January 29th, 1943, Major Bischoff of the Auschwitz construction department reported the following: “Crematorium No. 2. The completed furnaces have been started up in the presence of the Engineer Pruefer from Messrs. Toepf (or Erfrut)”³⁷ This indicates that engineers even came specifically to the death camps to aid in the technical implementation of the mass killings. Likewise, physicians and scientists advised the Nazi government and helped to manage the killings. For example, the chemist and SS officer Dr August Becker made the following assessment in May 16th, 1942 with regards to gas vans in Kiev:³⁸

The application of gas is usually not undertaken correctly... My directions have proved that by correct adjustment of the levers death comes faster and the prisoners fall asleep peacefully. Distorted faces and excretions, such as could be seen before, are no longer noticed.

This is an example of how educated professionals participated in the genocide by not only assessing the efficacy of the equipment used, but also by making direct recommendations on how to improve the efficiency of the killings and improve the psychological impact of the killings easier on those who had to carry them out.

Finally, it must be noted the educated elite helped sustain the Holocaust by supplying the tools the death camps needed to continue mass murder. For example, in *The Zyklon B Case* held by the British Military Court in March 1946, the German chemist and co-inventor of Zyklon B, Bruno Tesch was sentenced to death for having

³⁴Vahakn N Dadrian, ‘The Convergent Aspects of the Armenian and Jewish Cases of Genocide. A Reinterpretation of the Concept of Holocaust’ (1988) 3(2) *Holocaust and Genocide Studies* 164.

³⁵Eric Katz, ‘On the Neutrality of Technology: the Holocaust death camps as a counter-example’ (2005) 7(3) *Journal of Genocide Research* 416.

³⁶Eric Katz, ‘The Nazi Engineers: Reflections on Technological Ethics in Hell’ (2011) 17(1) *Science and Engineering Ethics* 575.

³⁷Gerald Reitlinger, *The Final Solution: The Attempt to Exterminate the Jews of Europe, 1939-1945* (Barnes and Company, 1968) 150.

³⁸*Ibid* 139.

knowingly supplied poison gas used in concentration camps.³⁹ Likewise, during the Nuremberg Military Tribunal, the directors of IG Farben, a German chemical industrial conglomerate, were found guilty of numerous indictments, including supplying the pharmaceuticals used in concentration camp medical experiments, using slave labour, and selecting the workers that were no longer useful to be sent to be exterminated.⁴⁰

From the evidence shown, it seems dubious that education by itself is the key to preventing the horrors of racism, genocide, and mass killings. Educated members of society were instrumental to the success of the ideological and organisational dimension of genocide. Then why do we believe that education helps society prevent such horrors? This essay posits that the notion of education acts as a preventative force is based on the belief that genocide is an irrational and insane act and that education fosters the moral reasoning necessary to combat this. This belief is problematic for a number of reasons.

For many people, the brutal and systematic destruction of an entire race or ethnic group are actions of the irrational and the insane. Such a view is understandable. Perhaps this view resonates because it is easier and more comforting for people to think of genocide in pathopsychological terms rather than accept the notion that genocide was committed by perfectly rational human beings like them. But in adopting this view of genocide, we risk denying the agency of those who commit genocide and therefore risk denying that they had responsibility for their actions. The idea that genocide is irrational does not hold up to scrutiny. Levene argues that if genocide was the result of madness then this would not only suggest that a long list of genocide instigators, such as Mao and Milosevic, were insane, but that their accomplices and significant domestic support base were also to some extent delusional.⁴¹ It seems implausible, or at least disingenuous, to generalise the psychological state of irrationality or insanity over such a significant sample of the humanity. Genocide is a rational project in the sense that it is deliberately planned and executed by the political, intellectual, and social elites within a society for a particular purpose. As the sociologist Zygmunt Bauman argues, “At no point of its long and tortuous execution did the Holocaust come in conflict with the principles of rationality. The ‘Final Solution’ did not clash at any stage with the rational pursuit of efficient, optimal goal-implementation. On the contrary, it arose out of a genuinely

³⁹ *Law Reports of Trials of War Criminals*, United Nations War Crimes Commission (ed), volume I-V (William S Hein & Co, 1997) 93.

⁴⁰ *Trials of War Criminals Before the Nuernberg Military Tribunals*, volume VII (United States Government Printing Office, 1953) 54.

⁴¹ Mark Levene, ‘Why is the Twentieth Century the Century of Genocide?’ (2000) 11(2) *Journal of World History* 323.

rational concern ..."⁴² From the evidence this essay has drawn upon, it is undeniable that the Holocaust and the Armenian Genocide were carefully coordinated, with coherent ideologies underpinning them, and made use of various technocratic and scientific means to ensure the exterminations were as efficient as possible.

Furthermore, the notion that education provides the moral reasoning needed to prevent these horrors from happening is also flawed. This belief that education attainment is linked to moral development may have its roots in Enlightenment ideals. For example, the philosophy of the Enlightenment proposed that the "propagation of knowledge" provided a means of "overcoming social and political evils".⁴³ Education was viewed as an emancipating force that would lead people to think rationally and consequently help people overcome social conflict and promote benevolence. But education should not be immediately equated with moral education. This essay has shown how numerous highly educated people were directly involved in genocidal activities. For example, it was two trained physicians, Dr Nazim and Dr Sakir, professionals trained in the very act of saving life, who were two of the primary architects of the Armenian Genocide. Likewise, both German and Turkish doctors performed horrific medical experiments on Jews and Armenians.⁴⁴

Perhaps professional education, in the sense of the accumulation of specialised skills and technical knowledge, is held in too high regard without critical scrutiny. If so, then where might a moralising dimension in education come from? McPhail argues that professional education such as accounting, engineering, medicine and accountancy should be aligned with an ethical education. According to McPhail, ethical education is not only about providing ethical guidelines to follow, but it is also about encouraging people to develop the critical ability to be aware of their values and assumptions as well the ability to challenge them.⁴⁵ Furthermore, he argues that ethical education needs to help people develop moral sympathy and realise the effects that their actions have on others.⁴⁶ While this essay makes no comprehensive pedagogical claims, perhaps there is some significance in these observations. Lippman and Wilson, for example, note that at the time of the Holocaust accounting tests did not include ethical considerations whereas today

⁴² Zygmunt Bauman, 'Sociology after the Holocaust' (1988) 39(4) *The British Journal of Sociology* 484.

⁴³ Michalina Clifford-Vaughan, 'Enlightenment and Education' (1963) 14(2) *The British Journal of Sociology* 135-143.

⁴⁴ Friedlander, above n 2, 14; Dadrian, above n 19, 171.

⁴⁵ Ken McPhail, 'The Other Objective of Ethics Education: Re-humanising the Accounting Profession - A Study of Ethics Education in Law, Engineering, Medicine and Accountancy' (2001) 34(3/4) *Journal of Business Ethics* 282.

⁴⁶ *Ibid* 291.

“ethics are a focus of professional certifying organizations”⁴⁷

The Armenian Genocide resulted in the death of approximately one million Armenians in Turkey between 1915 and 1916 and the Holocaust resulted in the death of approximately six million Jews throughout Europe in 1939 and 1945.⁴⁸ It could not have been accomplished without the active participation and complicity of the educated classes. Professionals helped lend credibility and legitimacy to genocidal ideologies, they helped dehumanise and demonise the target group, and they aided in the organisation and implementation of the genocidal itself. Moreover, the belief that education prevents racism, mass killings, and genocide comes from misguided notions of the irrationality of genocide and the moralising effect of education. However, it must be noted that this essay is limited by the fact that it only draws upon the Armenian Genocide and Holocaust. Future considerations on the issue would therefore demand a broader analysis on the role of the educated classes in genocides throughout history. Furthermore, future research could also be conducted on the role that educated elites such as academics and policymakers play in perpetuating genocide through other means such as genocide denial. In conclusion, this essay ends with the disconcerting thesis that genocide requires the complicity and participation of the educated in society. This suggests that those among us who are members of the educated professions may have a greater responsibility than most to exert ethical self-reflection and moral imagination.

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⁴⁷Lippman and Wilson, above n 24, 299.

⁴⁸Bradley Campbell, ‘Genocide as Social Control’ (2009) 27(2) *Sociological Theory* 151.

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