A Direct Realist Understanding of Memory Errors

Li Mei Chew

B. A. PGDip. Psych.

Submitted in fulfilment of the requirements of a degree of Doctor of Philosophy (PhD),

Department of Psychology,

Macquarie University.

Table of Contents

Copyright Notice 1

Abstract 2

Statement of Authentication 3

Acknowledgements 4

Introduction 5

Direct Realism 5

Organism-environment relations 6

Embodied cognition 7

Extended cognition 10

Enactive cognition 12

Bringing Direct Realism to the Embodied Cognition Discussion 14

Challenges for Direct Realism 15

Memory Errors 16

The Aim of the Thesis 17

Chapter One: Anti-Representationalism and Realism 19

Introduction 19

Representationalism 19

Classical representationalism 20

Anti-representationalism in Psychology and Cognitive Science 22

Anti-representationalism and Realism 23

Enactivism and anti-realism 24

Addressing the arguments against objectivity and realism 28

Radical embodied cognitive science and entity realism 31

Anti-Representationalism and Direct Realism 35

Summary 36

Chapter Two: Situational Realism 38

Introduction 38

A Short History of Situational Realism 38

Philosophy of John Anderson 39

Core features of Situational Realism 40

Ontological egalitarianism 40

The Logic of Relations 41

The logic of motivation 49

Situating Situational Realism 52

Summary 54

Chapter Three: The Problem of Memory 56

Introduction 56

The Problem of Memory: Direct Awareness of the Past 56

Challenges from Memory *59*

The Problem of Co-temporality 59

Temporal Gap 62

The Problem of Action at a Distance 63

A Situational Realist Account of Remembering 71

Summary 74

Chapter Four: The Problem of Error 76

Introduction 76

Types of Errors of Omission and Commission 76

Errors of Omission 76

Errors of Commission 78

Arguments from Illusion and Hallucination 80

Principles employed in the arguments from illusion and hallucination 81

Summary of the arguments from illusion and hallucination 88
Solutions from Situational Realism 89
Errors as asymmetrical relations 89
Errors in the Absence of Cognition 91
Errors of Omission 97
Errors of Commission – The Illusory Case 99
Errors of Commission – The Hallucinatory Case 101
Limitations 102
A Partial Solution to the Problem of Hallucination 103
Summary 106
Chapter Five: A Contribution to the Realist Understanding of Memory Errors 108
Introduction 108
Types of Memory Errors 108
Errors of Omission in Memory 109
Errors of Commission in Memory 111
Errors of Commission in Memory – The Illusory Case 111
Errors of Commission in Memory – The Hallucinatory Case 114
Situational Realist Approach to Errors of Omission and Commission of Memory Errors 116
Errors of Omission in Memory 117
Errors of Commission in Memory – The Illusory Case 120
Errors of Commission in Memory – The Hallucinatory Case 123
Some Notes and Limitations 126
Summary 127
Conclusion 129
Making the case for direct realism 129
Situational Realism 130
The Problem of Memory 131

The Problem of Error 133

A Situational Realism Account of Memory Errors 136

Is it possible to logical account for memory error from a direct realism perspective? 138

Copyright Notice

Under the Copyright Act of 1968, this thesis must only be used under the normal conditions of scholarly fair dealing. In particular no results or conclusions should be extracted from it, nor should it be copied or closely paraphrased in whole or in part without the written consent of the author. Proper written acknowledgement should be made for any assistance obtained from this thesis.

I certify that I have made all reasonable efforts to secure copyright permissions for third-party content included in this thesis and have not knowingly added copyrighted content to my work without the owner's permission.

Abstract

Memory errors are part and parcel of everyday remembering. While memory and errors in general, present as some of strongest evidence in support for representationalism, memory and error are also two of bigger challenges for direct realism. In fact, critics regard both memory and errors as insurmountable logical problems for direct realism, which makes memory error a unique challenge for direct realism.

With regards to memory, firstly, the problem is if the direct realist claims that remembering is a direct relation to a past event, how does the subject who is engaged in the present act of remembering have direct relation to a past event that no long exists? With regard to error, the problem is that if there is a direct relation to the object of cognition as direct realism claims then what is the object of cognition when we are in error? In the case of memory errors then, the challenge is that not only is the act of remembering taking place separate from the initial time the event has occurred but the direct realist needs also to account for how the subject, who has a direct independent relation to the event, can be mistaken about the past event he or she is remembering.

The present thesis aim is to take steps to show how direct realist will take the first steps to address the problems of memory error. It will be shown that a variety of direct realism known as situational realism that defines psychology as the study of organism-environmental relations and the interactions involving cognition, emotion, and motivation will be able to address the challenges. It will be argued that it is only by taking into consideration both memory and error together that a greater sense of error can be understood from a direct realist perspective.

Statement of Authentication

The work presented in this thesis is, to the best of my knowledge and belief, original except as acknowledged in the text. I hereby declare that I have not submitted this material, in full or in part, for a degree at this or any other institution.

Li Mei Chew

Signature: _____ Date: 20/07/2016

Acknowledgements

There are many people without whom this thesis would not be possible. I would like especially thank my supervisors, Dr Simon Boag and Prof John Sutton for their guidance, patience, kind support and encouragement all these years. I would also like to thank Dr Agnes Petocz, Dr Nigel Mackay, Assoc. Prof Joel Michell, Dr Terence (Terry) McMullen and the rest of the Sydney Theory Group based at the University of Sydney for their continual support and lively discussions. I would also like to give special thanks and mention to the late Assoc. Prof Doris McIllwain for all the animated discussions sitting on the floor in the blue room.

I would also like to thank the staff from both the Department of Psychology and the Faculty of Human Sciences for their encouragement and support in the background and in making the experience at Macquarie University an enriching and fruitful one. I would like to specially thank Avril Moss, Radha Pathy, Novello Alday, Elizabeth Corbett and Ginny Daldalian for all the work opportunities. It has been a pleasure working with every one of you.

Lastly, I must thank my family and friends for all the encouragement and support through the journey, especially Claudine Michael, Janet Tse, Susannah Raffe, Olivia Ng, Herry Basuki and Cheryl Goh. I cannot list everyone but would like to specially mention Trisha Nowland, Dr Timothy Marsh, Dr Kathleen Mairet and the rest of the many wonderful people that I have met through the Department of Psychology. It has been a really long process and I could not have done this without all of you.

Introduction

Direct Realism

There are many varieties of realisms (e.g., Bhaskar, 1975, 1979; Harré, 1986; Hartwig, 2007; Varela & Harré, 1996; Holt et al., 1910; Tonneau, 2004, 2011, 2013; etc.; see Mackay & Petocz, 2011a, 2011b; Petocz & Mackay, 2013) of which, the focus of the discussions will be on direct realism. Like most realisms, direct realism shares the common view that there are mind-independent things or states of affairs in the world (i.e., the mind does not constitute the world) (Mackay & Petocz, 2011b), but direct realism further proposes that organisms know this mind-independent in the world directly (MacKay & Petocz, 2011a, 2011b; Laird, 1920, 1932; Woozley, 1949). Direct realism is often conflated with a similar position known as naïve realism. Naïve realism, broadly defined, is the view that maintains that there is a mind-independent world (see Genome, 2016). The difference between direct realism and naïve realism is that direct realism maintains the ontological position that there is a mind-independent world and the epistemological position that knowers can apprehend the world directly without appealing to mediations viz. representations (Genome, 2016; see also Mackay & Petocz, 2011b, Petocz & Mackay, 2013).

The version of direct realism that will be defended throughout the thesis is the one known as situational realism (see Chapter 2 for more in-depth discussion). Situational realism is "probably the least known of realisms" (Greenwood, 2007, p. 605) and is derived from the empirical philosophy of John Anderson, Challis Professor of Philosophy at the University of Sydney from 1927 to 1958 (see Baker, 1986 for a more general introduction to Anderson's philosophy). Situational realism can trace its roots to Ancient Greek philosophy (particularly Heraclitus), the Scottish Common Sense School of Realism, and also from the American New Realist tradition including William James (Petocz & Mackay, 2013). From this perspective, there are common themes with the ecological approach of J. J. Gibson, as well as his predecessor E. B. Holt as well as with radical cognitive science (Chemero, 2009, 2013) and neorealism (Tonneau, 2004, 2011, 2013) (Petocz & Mackay, 2013).

Situational realism defines psychology as the study of organism-environmental relations and the interactions involving cognition, emotion, and motivation (Petocz & Mackay, 2013). In the light of the changing landscape in cognitive science and psychology, it is proposed that situational realism be considered as a possible alternative to other non-representationalist theories to understanding psychological phenomena.

In the following paragraphs, the chapter will examine how the organism-relation is defined and conceptualised in contemporary theories of embodied cognition in contrast to the standard cognitive science framework. It will be argued that given the shift in perspectives regarding how organism-environment relations are conceptualised and the changing perception towards anti-representationalism, direct realism can present as a possible alternative. However, direct realism understandably faces a number of challenges. In order to present the case for direct realism, the chapter will broadly outline the challenges from memory and errors and single out memory errors as a test subject. Given the numerous challenges to memory and error respectively, it would seem that memory errors would be an insurmountable challenge for direct realism. Therefore, if it can be shown that it is logically possible to account for memory errors from a direct realist perspective then there is no reason why direct realism cannot be considered as an alternative to the study of cognition in general.

Organism-environment relations

The landscape of cognitive science and psychology has been shifting and one of the more notable movements that has come to dominate the landscape is the embodied cognition movement (see Shapiro, 2011). The embodied cognition movement is a response to the traditional framework of standard cognitive science involving representationalism. The standard cognitive science framework here refers to the view that cognition is a centralised processing system with mental representation at its core, according to which, "mental processes proceed algorithmically, operating on symbolic representations" (Shapiro, 2011, p. 27; see also Wilson & Foglia, 2011/2016). Examples include the representational theory of

mind and computationalism. The representational theory of mind thesis states that "[m]ental states are relations between organisms and internal representations" (Fodor, 1975, p. 198). Against the traditional cognitive science, embodied cognition instead makes the organism-environment relation and interaction take centre stage in the discussion (Hutto & McGivern, 2015). While a detailed chronological history of ideas is not possible to plot in this chapter (see, however, Järvilehto, 1998; 2000; 2009 for a historical overview of organism-environment systems), the next few sections will instead examine the embodied, extended and enactive cognition approaches to understanding the organism-environment relation. Before proceeding, however, the working definitions for the organism and environment terms require clarification. While the organism term has been conceived in various manners throughout history (see Huneman & Wolfe, 2010), for the purposes of this chapter, we take the organism term to be referring to the living person and the knower that engages in cognition (at least within the context of human). With the environment term, what will be referred to here as the environment is the surrounding context that is external to the subject's nervous system.

Embodied cognition

Research programs under embodied cognition are wide-ranging and incorporate work from robotics, developmental psychology, perception, motor control, evolutionary studies, etc. It is therefore not surprising that there is no universal consensus on what 'embodiment' means (R. A. Wilson & Foglia, 2011, 2016; M. Wilson, 2002; see also Anderson, 2003; Shapiro, 2011, 2014), leading to debates about what is and what is not embodied cognition (A. D. Wilson & Golonka, 2013). The different theories of embodied cognition are based on either conservative or more radical interpretations of embodiment. In the next few sections, a general overview of some of the more prominent theories will be examined while radical interpretations of embodied cognition will be taken up in Chapter 1.

Weaker interpretations of embodiment seek to reconcile the features of embodiment but within the standard cognitive science framework that includes the computational approach to mind and cognition. For example, Goldman and de Vignemont (2009) propose an interpretation of embodiment where both the body (except the brain) and the environment gets excluded from the embodied formulation, leaving only body representations, which can be described as B-formatted representations. Embodiment therefore is only realised in the bodily representation of states of the body and in distinctive neural formats that would enable the organism to interface directly with certain neural machinery (Goldman, 2012, 2013; Goldman & de Vignemont, 2009; see also Gallagher, 2011; Hutto & McGivern, 2015). Theories of this kind attempt to embrace the standard unifying theme of embodiment that the body has a significant role in contributing to cognitive processes while trying to preserve the standard cognitive science computational approach that maintains that cognition is fundamentally representational and in the brain (Hutto & McGivern, 2015).

In contrast to the weak interpretations above, there are theories that view the enterprise of embodied cognition to be not only a response but also an alternative to the standard cognitive science framework (e.g., Hutto, 2013; Hutto & Myin, 2013; Thelen, Schöner, Scheier, & Smith, 2001; A. D. Wilson & Golonka, 2013. see also Thelen & Smith, 1994; Varela, Thompson, & Rosch, 1993). Moving towards stronger interpretations of embodiment, the biological embodiment view of embodied cognition views a tight coupling of anatomy and movement that in turn shapes subsequent brain processing of information (e.g., Chiel & Beer, 1997) (Gallagher, 2011; see also Shapiro, 2004). On this view, the sort of physical bodily constitution of the organism will determine the type of cognitive activity and processing that is available to the organism (Dawson, 2014). For example, Thelen and colleagues (2001) write:

> To say that cognition is embodied means that it arises from bodily interactions with the world. From this point of view, cognition depends on the kinds of experiences that

> come from having a body with particular perceptual and motor capabilities that are inseparably linked and that together form the matrix within which reasoning, memory, emotion, language and all other aspects of mental life are meshed. (p. 1)

The role of bodily constitutions can be seen when comparing the movements of a fish and a dog swimming in a pond. A fish, compared to a dog has a body that is more streamlined with scales, fins and a tail making it easier and more efficient to propel its body through the water compared to a dog. While some dog breeds like the Labrador have webbed feet and a dense water resistant coat that enables them to swim in the water, their bodily constitutions mean that their paddling movements are different from that of a fish whose natural environment is the water and so has physical constitutions enabling it to glide and cut through the currents more efficiently. Consequently, while both animals can swim, due to their differences, the dog and fish are described to have different cognitive processes in order to engage in the same task. As Shapiro (2004) notes, "the point is not simply that perceptual processes fit bodily structure. Perceptual processes *depend on and include* bodily structures" (p. 190, emphasis in original).

Broadly speaking, the embodied cognitive research domain is wide-ranging with research programs ranging from artificial intelligence, to evolutional psychology, to work in developmental psychology, etc. (see Shapiro, 2011, 2013). The point about outlining embodied cognition is that there is a growing body of research that is moving away from the standard cognitive science framework that view the mind as a centralised computational processing system to one that emphasises the role of the organism's body in explaining cognitive activities. Embodied cognition tends to be more concerned with the 'how' of explaining cognitive activities (Leitan & Chaffey, 2014) but it is not sufficient enough to described the body's role in cognition. There is a need to also take into consideration the role of non-bodily environment, material or otherwise that can also explain cognition, which brings us to extended cognition.

Extended cognition

Extended cognition states that cognition is not bounded by the physical limitation of the brain and that cognitive process extends into the environment (Clark, 1997, 1998, 2008; Clark & Chalmers, 1998; Haugeland, 1998; Menary, 2007; Port and van Gelder, 1995; Rowlands, 2006, 2010; Wheeler, 2005). That is, according to the hypothesis of extended cognition, cognitive systems would sometimes include aspects of non-bodily environment such as the road, one's mobile devices, chopsticks, etc. (Chemero, 2009; Clark & Chalmers, 1998). In this respect, unlike embodied cognition in the previous section and enactive cognition (see next section), which both discuss "how" cognition occurs, extended cognition is more concerned with "what" should be considered cognition (Leitan & Chaffey, 2014).

The original formulation of the extended mind by Clark and Chalmers (1998) is a constitutive version of active externalism where "the human organism is linked with an external entity in a two-way interaction, creating a coupled system that can be seen as a cognitive system in its own right" (p. 29). This form of constitution is different from the sort of bodily constitution that was discussed previously where the body prescribes the sort of cognitive processes the organism will engage in and instead, cognitive processing is the interactive link formed in the coupled system (Menary, 2010). While some do not agree (see Sutton, 2010), however, it is argued that what makes the coupled system a cognitive system is dependent on the parity principle. The parity principle states that:

> If, as we confront some task, a part of the world functions as a process which *were it done in the head*, we would have no hesitation in recognizing as part of the cognitive process, then that part of the world is (so we claim) part of the cognitive process. (Clark & Chalmers, 1988, p. 29, emphasis in original)

That is, so long as some aspect of the world is deemed to have a cognitive function, then it does not matter where it is located. All that matters is that the world and its components play the right sort of role and is causally integrated with other cognitive processes in a way that is taken to be part of the system of processes that constitute what is necessary for a person to complete a cognitive task (Menary, 2010).

One example used to demonstrate the extended mind thesis involves the hypothetical case of Inga who has normal memory functioning and Otto who has Alzheimer's disease. Both Inga and Otto separately learn about an exhibition at the Museum of Modern Art and set out to attend the exhibition utilising their respective memory systems. Inga makes her way to 53rd Street by recalling the location of the museum from her ordinary biologically-based memory system. In contrast, Otto who has Alzheimer's, depends upon information in the environment to help structure his life, and for this, Otto has a notebook that he carries with him everywhere he goes. When he learns new information, the information gets recorded, and when he needs to retrieve the information, he consults the notebook. When Otto heads to the exhibition, he consults the notebook for the address and proceeds to the museum's location. It can be argued that both Otto and Inga walk to 53rd Street because each wanted to go to the museum and believed that the museum's location is on 53rd Street. That is, in both cases, the argument is that in terms of functions, Inga's biologically-based memory and Otto's notebook plays the same and the only difference is where the information is initially located. Thus, the story of Otto and Inga is meant to show how fluid the mind is in terms of how it can integrate various physical and non-physical components from the environment to perform roles that will enable Otto to complete a task just as well as Inga who has an intact and well-functioning memory system.

Extended cognition thus shows that organisms can couple with non-physical aspects of the environment to form systems to perform tasks and opens up new areas of research such as understanding how the organism can integrate and modify their actions in the world by incorporating tools from simple everyday items like pens to the robotic limbs used by limb

amputees in the osseointegration procedures to regain mobility (see Khemka, Frossard, Lord, Bosley, & Al Muderis, 2015). However, the understanding of how limb amputees integrate robotic limbs does not require appealing to theories of extended cognition because a version of embodied cognition can also account for how a person learns to adapt and extend the range of cognitive tasks and activities that s/he can do with robotic limbs versus when they do not have robotic limbs. Similarly, while the story of Otto and Inga is meant to show how fluid and adaptable a memory system can be in integrating various tools and other information-carrying vehicles, the issue is that extended cognition serves to show that the organism is capable and adaptive in using tools in the environment to extend one's range of capabilities beyond her/her organic range or to compensate for the lack of certain abilities to perform certain cognitive activities. In other words, extended cognition illustrates that the mind is not confined to the skin and bone and that what is involved in cognitive activities goes beyond bodily constitutions.

Enactive cognition

Enactive cognition also approaches the mind and cognition as a dynamic interaction between an organism and environment (Gallagher, 2011; Gallagher & Varela, 2003; Thompson, 2007; Thompson & Varela, 2001; Verala, Thompson & Rosch, 1991), and so, similar to other embodied approaches discussed so far, cognition is not confined "in the head" but is distributed across brain, body, and environment (Gallagher, 2011). Accordingly, Varela, et al. write:

> We propose as a name enactive to emphasize the growing conviction that cognition is not the representation of a pregiven world by a pregiven mind but is rather the enactment of a world and a mind on the basis of a history of the variety of actions that a being in the world performs. (1991, p. 9)

That is, what Varela et al. are proposing is that cognition depends on particular experiences from the body as it moves and interact in an ever dynamic context (i.e., embodied action), rather than just the organism-environment relation (Menary, 2006). Cognition emerges from an interplay of sensorimotor, perception and action in a way that they are not only contingently linked but as also having evolved together (Varela et al., 1991), which consists of two points where firstly, perception guides actions and secondly, where cognitive structures emerge from recurrent sensorimotor patterns that allow action to be perceptually guided (Varela et al., 1991). Cognition thus requires that a cognitive agent have a body and the cognitive agent as a whole is embedded in the environment in a way that it can interact and guide its activity in its local situation (Menary, 2006; Maturana & Varela, 1992; Varela et al. 1991).

The concept of autopoiesis meaning that components within a system "must be dynamically related in a network of ongoing interactions" (Maturana & Varela, 1992, pp. 43-44). That is, the components must interact in ways that is continuously changing, but simultaneously, these continuous interactions are what enables the system to continue to exist (Maturana & Varela, 1992). Specifically, for Varela and colleagues, enactive cognition is the view that one's biological-based underpinnings, including organismic and affective processes, have a permeating effect on cognition and these processes, as well as sensorimotor processing, all partake in "structural coupling" (Maturana & Varela, 1992). However, more recent enactive approaches such as found in Nöe (2004), as well as Hutto and Myin's more radical approach (see Chapter 1) do not hold that autopoiesis is central for enactive cognition (Menary, 2006).

Enactive approaches to cognition brings to the discussion that cognition involves tight coupling with the environment and what is inclusive of the environmental context includes one's personal history, experiences, socio-cultural factors. What is emphasised there is that not only is the role of body important, the continuous interactions with the systems and that sensorimotor processes, perception and action all contribute and guide the organism's

cognitive activity. By emphasising subjective experiences as brought about by sensorimotor, perception and action, enactive approaches go against the standard cognitive science framework that cognition is only in the head. However, enactive account such as Varela et al.'s that has autopoiesis at the core, the issue is that the knowledge loses the subject-object distinction and so there seems to be that there is no mind-independent world (see Chapter 1).

Bringing Direct Realism to the Embodied Cognition Discussion

Overall, the embodied cognitivist approaches discussed above show the range of research available to researchers in psychology and cognitive science. Each position has its merits and limitations. However, what this thesis wishes to propose is that there is space and valid reason to consider direct realism alongside embodied, extended and enactive cognition. While direct realism is considered old-fashioned, the motivation to defend a direct realist position is that issues that were once considered untenable are no longer issues today. For example, previously direct realism was regarded to be improbable because direct perception is not logically coherent. However, in recent decades, theories in perception have made the case for direct perception, of which the most well-known of all is Gibson's (1966, 1979) theory of direct perception that is a version of direct realism (Heil, 1979). To a lesser degree but related to the topic of realism, there is considerable research in disjunctivism that has also defend a version of naïve realism where in some cases of perception, phenomenal experiences are constituted by mind-independent states of affairs (Martin, 1997, 2002, 2006).

While there have been attempts to discuss the compatibility of realism with non-representationalist accounts (see Chapter 1), the truth is that non-representationalist accounts are not necessarily realist (Zahidi, 2014). Theorists may be dissuaded from engaging with direct realism tenets because of the difficulties relating to accounting for memory and error (Chemero, 2000, 2009; Michell, 1988/2011). Therefore, in order to argue the case for direct realism, challenges concerning memory and errors will be examined.

Challenges for Direct Realism

In order to tackle the specific problem of memory errors, the direct realist has to respond to distinct and broader challenges concerning both memory and error. While there have been attempts to develop a direct theory of memory (e.g., Alexander, 1920; Bergson, 1896/1990; Laird, 1920; Reid, 1785; Russell, 1912; Woozley, 1949), the challenges concerning memory – the problem of co-temporality, temporal gap and action at a distance – are issues that are still being debated (see Chapter 3). Briefly, the problem of co-temporality is the challenge of accounting for how a past event can be present in a current act of remembering. In other words, in remembering, it appears that the past event must come to co-exist in the present in order to be cognised. The temporal gap is the challenge of accounting for the gulf between past events and present acts of remembering without appealing to some kind of mediating mechanism (such as mental representations). Lastly, the challenge from action at a distance is to show how a past event can causally affect present remembering without appealing to some kind of causal mechanism such as memory trace.

The problem of error, on the other hand, is accounting for how the subject who is able to perceive the world directly is still able to be mistaken (Galloway, 2000; Michell, 1988/2011). The problem of error is different from the arguments from illusion and hallucination (see Chapter 4). While both the problem of error and the arguments from illusion and hallucinations are aimed at showing that direct realism is false, the chief difference is that the latter arguments aim to provide evidence for indirect perception (i.e., what is perceived is not the actual material thing but sense-data) and to argue that what is inevitably perceived is something mental like sense-data (Austin, 1964; Dancy, 1995/2009; Reynolds, 2000; Robinson, 2003; Smith, 2002). In contrast, the problem of error is aimed at the ontological status of the false object of cognition and does like this: according to direct realism if there is a *direct* relation between a knower and the situation known, in the case of errors, there must be a direct relation to a false situation (i.e., non-existent situation) which is not possible. In that case, if *S* falsely believes that *X* is *Y*, then *S* cannot be related to the false

situation of *X*'s being *Y*, for there is no such situation (Michell, 1988/2011). Therefore, direct realism is taken by critics to be false (see Michell, 1988/2011).

Memory Errors

According to Elizabeth Loftus, "memory, like liberty, is a fragile thing[1]" (Loftus, 2013; Loftus & Calvin, 2001). That is, while precious, memory is subject to influence, malleable, and at times, and more often than one would like to admit, inaccurate and unreliable. The fragility of memory of which Loftus speaks of is exemplified in the examples of mistaken identity where an innocent person has been falsely identified, convicted and even jailed solely on a witness' testimony (e.g. Loftus, 1979). We also find examples of memory errors in patients with brain injuries and lesions, with some patients reported with memory confabulations (e.g. Conway & Tacchi, 1996). However, memory errors are not, of course, only confined to the realm of forensic, clinical and experimental psychology. Everyday examples are found everywhere, such as in incidences of not being able to recall where we parked the car or a person's name.

Given the challenges from both memory and errors, it is not surprising that direct realism does not necessarily come to mind when one is considering theoretical frameworks for study memory errors. Memory error provides a unique challenge for direct realism because memory error as a test subject for direct realism involves addressing issues from memory and error respectively. The general challenge is that not only is the act of

---

[1] Loftus first mentioned the phrase in an interview by *Psychology Today* (2001). *Memory's future*. Retrieved from Psychology Today website: https://www.psychologytoday.com/articles/200103/memorys-future
and in her presentation from the TED Global 2013 Conference held in Edinburgh, Scotland (2013, June). The fiction of memory. Podcast retrieved from http://www.ted.com/talks/elizabeth_loftus_the_fiction_of_memory?language=en

remembering apparently taking place separately from the initial time that the event has occurred, but the direct realist needs also to account for how the subject, who has a direct, independent relation to the event, can be mistaken about the past event s/he is remembering. While it may seem improbable, this thesis aims to show that some memory errors can be logically accounted for from a direct realist perspective.

The Aim of the Thesis

The aim of the present work is to take steps to show how direct realist will take the first steps to address the problems of memory error. In order to address the challenge in the case of memory errors, the thesis will adopt a two-prong strategy and tackle the challenges from memory and error separately so as to tackle the challenge of memory error.

In order to address the challenge in the case of memory errors, the thesis is divided into three sections: Chapter 1 examines the notion of anti-representationalism and explores reasons the relationship between anti-representationalist accounts and realism. The chapter shows there is no particular reason for incompatibility between anti-representationalist accounts and realism and establishes the case for direct realism. Chapter 2 outlines the conceptual framework of situational realism and lays the foundations for how the direct realism will respond to the challenges of accounting for memory error.

Chapter 3 examines the problem from memory and in particular, three challenges: the problem of co-temporality, the temporal gap, and action at a distance, which each aim to show that a direct theory of memory is not possible, as well as a relational account of remembering from a situational realist perspective.

Chapter 4 will examine the problem of error and the arguments from illusion and hallucination and it will be argued that while the arguments serve to highlight issues for direct realism, they are not fatal challenges for direct realism. Instead, the chapter will focus on the fundamental difficulty known as the problem of error. The problem of error is the problem of

accounting for how a subject can be directly related to a false situation. The section will conclude with the examining of the situational realism response to the challenges from error.

Chapter 5 introduces the topic of memory errors and examines the different types of memory errors. The chapter argues that given that cognition is motivated, it is not surprising that some errors are motivated. The chapter shows from a situational realist point of view how it is logically possible to account for memory errors.

Chapter One: Anti-Representationalism and Realism

Introduction

Since the shift from behaviourism, the cornerstone of the "cognitive revolution" has been the concept of representation, and specifically that of mental representation (Ramsey, 2007). In fact, such is the acceptance of the representational framework that it is widely assumed that "representational attributions are not the result of, but the prerequisite for, theoretical development. Representations are invoked even *before* the theory starts" (Tonneau, 2011/2012, p. 338). In recent years, however, anti-representationalist approaches in cognitive science have steadily been making their mark on the landscape of cognitive science (Ramsey, 2007; e.g., Hutto, 2011; Tonneau, 2011. e.g., Chemero, 2009; Hutto, 2013; Hutto & Myin, 2013; Thelen & Smith, 1994; Varela, Thompson, & Rosch, 1991, etc.). Two of the more notable anti-representationalist accounts are the radical approaches to embodied cognition – radical embodied cognitive science and radical enactivism. Despite the shift in trends, however, not all anti-representationalist approaches are necessarily realist in nature, and there is some reluctance to commit to a thoroughgoing realist view that there is a mind-independent world (Zahidi, 2014). In fact, there appears to be a reluctance to engage with direct realism. In order to make the case for direct realism (i.e., the view that we can directly cognise the mind-independent world), this chapter will first examine what it means to be anti-representationalist. The chapter then examines reasons why some cognitive science theories resist realism and objectivity, before finally making the case for direct realism.

Representationalism

The concept of representation requires some consideration in order to show what we mean by anti-representationalism. The notion of representation is a complex one, however, and not easy to define (Rowlands, 2015), and several authors contend that there is no unifying definition of representation because "representations are slippery characters that come in a veritable plethora of different forms" (Wheeler, 2005, p. 6; cf. Rowlands, 2015; see also

Ramsey, 2007). Furthermore, debates of representations have shifted from the content of the representation to the role of the representation (Kirchhoff, 2011; see also Chemero, 2009). While there are newer varieties of representationalism such as distributed representationalism (e.g., Hinton, 1984; Hinton, McClelland, & Rumelhart, 1986; Porter & van Gelder, 1995), action-oriented representations (Clark, 1997), the next section will focus on illustrating the classical understanding of representationalism as a good portion of anti-representationalist (and more recent representationalist) accounts are in response toward the classical understanding of representationalism.

Classical representationalism

The classical understanding of representation is based on the idea that representations are inner mental entities that symbolise some object or event in the external world (e.g., Fodor, 1975, 1981). In many of these accounts, the subject does not know the world directly but rather indirectly, and the representation is the object of cognition, which mediates the relation between the subject and the world – such as with Locke's (1690/1788) 'ideas'. Another example is Fodor's representational theory of mind (e.g., Fodor, 1975) that maintains that "[m]ental states are relations between organisms and internal representations" (Fodor, 1975, p. 198), where, more specifically, propositional attitudes such as believing, desiring, wishing, etc. are relations between a subject and a mental representation (Chemero, 2009; Milkowski, 2013). As Fodor writes:

> To have a certain propositional attitude is to be in a certain relation to an internal representation. That is, for each of (typically infinitely many) propositional attitudes that an organism can entertain, there exist an internal representation and a relation such that being in that relation to that representation is nomologically necessary and sufficient for (or nomologically identical to) having the propositional attitude. (1975, p. 198)

Mental representation, therefore, are symbols that have causal roles in virtue of their formal properties, and propositional attitudes inherit their semantic properties from those of the mental representations that function as their objects (Fodor, 1981). Consequently, cognition is a matter of symbol manipulation, and one specific version of representational theory of mind that illustrates how minds can manipulate symbols is the classical computational theory of mind.

In general, the classical computational theory of mind is based on the idea that the mind is a computer (Chemero, 2009; Haugeland, 1985; Milkowski, 2013). On this account, "cognitive processes are *computations*, which is to say cognitive processes are operations defined over constituent structures of mental representations of the concepts and propositions that they apply to, which they may supplement, delete, or other rearrange" (Fodor & Pylyshyn, 2015, p. 11, emphasis in original). Propositions are assumed to be structured objects of which concepts are the constituents in the same manner that English sentences are structured objects of which words are constituents (Fodor & Pylyshyn, 2015).

The classical understanding in such propositional models views representations as being discrete, local static structures that are relatively unchanging (Gallagher, 2008). Against the classical understanding of representationalism, we find responses from both anti-representationalists and representationalist alike, albeit for different reasons. For example, embodied cognitivists and ecological psychologists alike would find agreement in their arguments against the disembodied conception of the organism and the idea that cognition is confined to only the brain (see Introduction). However, there would be disagreements towards the representations, representationalism and notion of computationalism. That is, while anti-representationalist would object to varying degree the role of representations, some embodied cognitivists like Goldman (2012, 2013; see also Goldman and de Vignemont, 2009) preserves the concept of representationalism and others like Chemero (2009, 2013) have maintained that computationalism has its value in explaining cognition.

Anti-representationalism in Psychology and Cognitive Science

Anti-representationalist approaches can be found throughout the history of cognitive science and psychology. Some of the more prominent figures that argued against representationalism were phenomenologists such as Heidegger and Merleau-Ponty, analytical philosophers like Wittgenstein and Ryle, as well as pragmatists such as Rorty and Quine (Chemero, 2009). Other anti-representationalist approaches from a more realist persuasion include the New Realists led by Holt, and from psychology, examples of anti-representationalist approaches can be found in Skinner's radical behaviourism and Gibson's ecological psychology.

Within contemporary theories, examples of anti-representationalist approaches can be found in enactivist approaches such as Varela, Thompson, and Rosch (1991), Thelen and Smith (1993) as well as in radical approaches such as radical embodied cognitive science (Chemero, 2009, 2013) and radical enactive cognitive science (Hutto, 2013; Hutto & Myin, 2013; Myin & Hutto, 2013; Hutto, Kirchhoff & Myin, 2014). Also to be included are the neorealist approaches (e.g., Tonneau, 2004, 2011, 2013; see also Charles, 2011) that follow in the tradition of Holt's New Realism.

With anti-representationalism, there is a distinction between advancing either a metaphysical or an epistemological anti-representationalism, although these two separate claims are not necessarily mutually exclusive (Chemero, 2000, 2009; see also Steiner, 2014 for varieties of representationalism and anti-representationalism). With the metaphysical claim, the focus is on the nature of cognitive systems, where the claim is that there is nothing within cognitive systems that resembles a representation (Chemero, 2000, 2009). This is a very radical claim and one that even radical enactivism proponents do not endorse given the implications of advancing a *really* radical enactive or embodied cognition that denies any role of 'content' (e.g., Hutto & Myin, 2013). To show the contrast between really radical and radical enactivism, radical enactivism is only radical insofar that the position aims to break

from the tradition of the representational framework and views basic cognition as constituted by and understood in terms of concrete patterns of environmentally situated organismic activity (Hutto & Myin, 2013). However, radical enactivism does posit the role of content in the mastery of language and tasks that require abstract reasoning such as arithmetic problems (see Hutto & Myin, 2013).

The epistemological claim, on the other hand, focuses on the methodology to explain or account for how cognitive systems work. According to anti-representationalist positions, the best models or explanations do not involve representations (Chemero, 2000, 2009). For example, radical embodied cognitive science aims to develop a theory that combines Jamesian functionalist thought with a computational theory of mind. What makes radical embodied cognitive science 'radical' is its anti-representationalist objection to sentence-like semantic representationalism, as found in classical representationalism. Therefore, rather than viewing itself as a radicalisation of embodied cognitive science, the suggestion is that standard embodied cognitive science (see Introduction) is the watered-down version of radical embodied cognitive science (Chemero, 2009).

In terms of similarities between the epistemological and metaphysical claims, Chemero (2000, 2009) believes that the truth of the epistemological claim might be evidence for the truth of the metaphysical one, and vice versa, though to a lesser extent. For example, if natural cognitive systems do not have anything that resembles representations in them, then explanations of natural cognitive systems should not employ the use of representations (Chemero, 2000, 2009). On the other hand, to describe a methodology of how natural cognitive systems work (or ought to work), one has to begin with what natural cognitive systems are in the first place and a theory about what natural systems are would be incomplete without a methodology to examine how the natural system work (Chemero, 2000, 2009).

Anti-representationalism and Realism

If we want to advance the case for direct realism, we need to examine if realism is really incompatible with the anti-representational approaches to cognitive sciences. We will begin by examining two embodied cognitivist accounts and their respective objection and acceptance of realism – enactivism (Varela, Thompson, & Rosch, 1991) and radical embodied cognitive science (Chemero, 2009). Varela, Thompson and Rosch (1991) argue that enactive cognition is incompatible with realism, while others (e.g., Clark, 1997; Clark & Mandik, 2002) argue that realism is at least compatible with the idea of embodiment and that environmental interactions are necessary for understanding cognition (Zahidi, 2014). Given that realism and direct realism do share the same ontological commitment to the view that there is a mind-independent world, the goal of this section is to address the claims for anti-realism in order to build the case for direct realism.

Enactivism and anti-realism

Tight structural coupling and against objectivity and realism

One of the claims that enactivism is incompatible with realism stems from the motive to reject representations. Enactivists such as Varela, Thompson and Rosch (1991) argue that cognition is explained by the organism's tight structural coupling to environment, and the history of mutual determination of the organism-environmental interaction is what will govern the behaviour of the organism (Zahidi, 2014). As such, there is no need to appeal to representations because what the organism knows is enacted from one's interaction with the environment (see also Maturana & Varela, 1992). The influence from Merleau-Ponty (1945/2002) is evident here, who writes that: "[t]he world is inseparable from the subject, but from a subject which is nothing but a project of the world, and the subject is inseparable from the world, but from a world which the subject itself projects" (pp. 499-500). And so, rather than there being the idea of separate independent worlds that the organism engages with, worlds are brought forth via isolated sensorimotor interactions between the organism and the environment (Clark, 1998; cf. Thompson, 2007).

To illustrate, Varela et al. (1991) introduce an automaton cell named Bittorio. Imagine that Bittorio encounters two alternatives (0s and 1s) that have the potential to replace the state of the cell by perturbation. Bittorio's internal state is dynamically determined by a prescribed rule. In a random milieu of 1s and 0s, when Bittorio is not coupled, it goes back to a previous stable homogenous state. However, when Bittorio is coupled to the environment, its stable patterns are only affected in the case when Bittorio encounters an odd number of perturbations (Zaihidi, 2014). In the case of Bittorio of rule '1001000', Varela et al. note that the encounter with one perturbation changes its state but the encounter with a second perturbation at the same cell undoes the previous change, since any odd sequence of perturbation at the same locus will lead to a change in its state but any even sequence of perturbation will lead Bittorio unchanged. Therefore, out of all the different odd and even perturbation, Bittorio of rule '1001000' discriminates and singles out from the milieu a specific subset of odd sequences, and becomes an odd recogniser (Varela et al., 1991). As Varela et al. (1991) write:

> [w]e did not design Bittorio to be an odd sequence recognizer; we simply provided Bittorio with certain internal dynamics and then dropped it into a random milieu. Nevertheless, given the history of coupling between the internal dynamics and the milieu, *odd sequence* becomes a significant distinction for Bittorio. (p. 156, emphasis in original)

That is, rather than a represented pregiven world, Bittorio's world is one that is enacted through a historical structural coupling. Consequently, Bittorio provides a means of showing how a system with operational closure (autonomy) and structural coupling brings forth a world of relevance (Varela et al., 1991).

One implication is that because cognition is embodied, perception is always organism-dependent, and so we never know whether what is perceived is a product of the outside world

or from interactions with the environment (Zahidi, 2014). For instance, Varela et al. (1991) claim that because of the tight structural coupling of the organism, what one is presented with is a world where "the organism and environment enfold into each other and unfold from one another in the fundamental circularity that is life itself" (p. 217). As Varela and colleagues explain:

> In cognitive science and in experimental psychology, the fragmentation of the self occurs because the field is trying to be scientifically objective. Precisely because the self is taken as an object, like any other external object in the world, as an object of scientific scrutiny – precisely for that reason – it disappears from view. That is, the very foundation for challenging the subjective leaves intact the objective as a foundation. In an exactly analogous fashion, challenges to the objective status of the world depend upon leaving the subject unproblematical. To espouse that an organism's (or scientist's) perception is never entirely objective because it is always influenced by past experience and goals – the scientist's top-down processes – is precisely the result of taking an independent subject as given and then discovering and arguing from the subjective nature of his representations. (p. 230)

That is, the authors believe that the self can neither be objectively studied without taking into consideration one's past histories of interactions and experiences, and nor can cognition be considered without taking into account the embodied subject. As a result, one cannot help but always be entangled in the web of scepticism because there is no corresponding objective truth to one's subjective experiences. This directly challenges the premise of epistemological realism, where knowledge of the world is objective insofar as it corresponds to reality (Zahidi, 2014). Instead, by focusing on the constructive and interpretative actions of the organism, Varela et al. (1991) propose that the:

> …emphasis on mutual specification [is what] enables us to negotiate a middle path between the Scylla of cognition as the recovery of a pregiven outer world (realism) and the Charybdis of cognition as the projection of a pregiven inner world (idealism). These two extremes both take representation as their central notion: in the first case representation is used to recover what is outer; in the second case it is used to project what is inner. (p. 172)

In this way, the idea is to bypass the need to view the inner and outer distinction by studying cognition as embodied action where cognition depends on the kinds of experience that come from having a body with various sensorimotor capacities that are themselves embedded in a biological, psychological and cultural context (Varela et al., 1991).

Groundlessness

One last component regarding Varela et al.'s (1991) objection to realism and objectivity lies in the notion of groundlessness. Varela et al. (1991) argued for the notion of groundlessness whereby they argue that one of the troubles of representationalism is the problem of navigating between an inner and outer world, and this 'Cartesian anxiety' is due to the need to ground one's theories in order for discourse to take place. According to Varela et al., the subject-object distinction is a human-made one, and one that belongs to the history of human sciences, but this distinction does not actually paint an accurate picture of the phenomenal experience since all things experienced always involve the individual. Once we avail ourselves of the need to 'grasp' for a foundation or ground to centre itself, we can start to appreciate that all phenomena are free of absolute ground and that such 'groundlessness' is the very basis of the human experience (Varela et al., 1991). That is, groundlessness is the 'common sense' way world to make sense of one's interaction with the environment (Varela et al., 1991).

Addressing the arguments against objectivity and realism

One problem with Varela et al.'s (1991) argument is that the notion of tight structural coupling between the organism and the environment places an unnecessary "epistemological leash" (Zahidi, 2014, p. 467) that limits the possibility of organism's knowledge of the world (see also Clark, 1997). However, it is one thing to say that cognition is organismically sensitive, but it is another to say that the organism limits our knowledge of the world. As several authors note, the argument does not take into account that the organism is more than capable of transcending boundaries by adapting and using resources from the environment to extend and scaffold one's knowledge beyond the usual boundaries of what the organism could achieve without the tools (Clark, 1997; Zahidi, 2014).

For example, consider two subjects, one blindfolded and the other not, and both tasked to navigate a maze. Let us say that the one without the blindfold is instructed not to tell the other that they are walking through a maze but is allowed to assist and guide the blindfolded one through the maze. Suppose then, that the two of them were able to navigate the maze successfully without any of them bumping into any obstacles and so the blindfolded one despite being sensitive to his environment, is still ignorant about the maze. While only one of them is able to perceive and experience and interact with the maze structure, this does not mean that the maze exists for only one subject and not for the blindfolded one. The enactive account that is based on constructivism (i.e., that the organism only need to enact a world as and when it needs to) is not valid because the maze exists mind-independently regardless of whether the organism 'knows' about the maze.

With regard to the case of Bittorio, Varela et al. (1991) posit that Bittorio of rule '1001000' shows that Bittorio has a particular organismic sensitivity and appears to discriminate and select its own preferences for odd over even sequences. Bittorio thus provides a means of showing how a system with operational closure (autonomy) and a history of structural coupling brings forth a world of relevance (Varela et al., 1991). The case of Bittorio is meant to present evidence against the idea of the mind as an input-output device

and that organisms and their repeated sensorimotor interactions with the environment form the basis of what constitutes Bittorio's world (Varela et al., 1991). However, Bittorio's world cannot be constituted by the regularities of repeated sensorimotor interactions with the environment because that involves a reification of what is in fact relational (Hibberd, 2014). As Hibberd explains, "[l]ogical dependence is not the same as *causal dependence*" (p. 170, emphasis in original) and Hibberd exemplifies this with the existence of buildings. While buildings are causally dependent upon a number of antecedents such as the actions of the builders, architects, engineers and quantity surveyors, etc., the antecedents of these people's actions are logically independent of the building itself. The building in this sense cannot be reduced to the builder, and the building is distinct from the builder's actions. Accordingly, therefore, "[n]o building is constituted *in the act of building*" (Hibberd, 2014, p. 170, emphasis in original). Thus, Bittorio's world cannot be constituted by the regularities of repeated sensorimotor interactions with the environment because such interactions are unable to constitute the object of cognition.

Lastly, the problem with the idea of groundlessness is that it seems to advocate idealism which is not what Varela et al. (1991) propose. At times, it also does not seem like Varela et al. want to abandon realism altogether (Zahidi, 2014). As Varela et al. (1991) write:

> To think otherwise would be to deny not only "metaphysical realism" but empirical, everyday commonsense realism, which is absurd. But this current philosophical assumption confuses two very different senses that the term *empirical realism* can have. On one hand, it might mean our world will continue to be the familiar one of objects and events with various qualities, even if we discover that this world is not pregiven and well grounded. On the other hand, it might mean that we will always experience this familiar world as if it were ultimately grounded, that we are "condemned" to experience the world as if it had a ground, even though we know philosophically and scientifically that it does not. This latter supposition is not

> innocent, for it imposes an a priori limitation on the possibilities for human development and transformation. (Varela et al., 1991, p. 218, emphasis in original)

The issue with empirical realism, according to Varela et al. seems to be with the latter notion where the dynamical aspect of the human experience may become limited by the empiricist approach that is hardwired into the human physiology and so, as a result, creates an asymmetry between knowledge of acquaintance (i.e., a world that we are "condemned" to experience) and the knowledge-about (i.e., a world as described in scientific terms) that does not reflect the open-minded communication between the world and experience that Varela et al. (1991) advocates (Meyer, 2003).

The idea that realism sets a leash on what can be experienced in the world is a false one. The problem with the resistance and objection to realism appears to be due to a confusion between objective knowledge and an "*absolutionist* view of truth" (Mackay, 2011, p. 548). What is meant by this is that if one commits to objectivity, then some believe that this would mean that there is no possibility of error. However, that is not the case. The commitment to objectivity does not have anything to do with "indisputability or with a foundationalist quest for certainty" (Mackay & Petocz, 2011a, p. 84). Rather the possibility of objective knowledge is to posit that something believed may be true, in which case it may also turn out to be false. Consequently, objective knowledge does not mean that error is not possible (Mackay & Petocz, 2011a). If anything, a world that is grounded in realism actually opens up possibilities because entities and states of affairs exist independently of us and so the pursuit of discovery is possible. However, what is more important about the commitment to realism is that discourse is not possible without a principle of logic in place (Petocz, 2011; see also Shenefelt & White, 2015). That is, as Henry (2009) writes:

> …realism is concerned essentially with the very simple foundation of logic required for coherent, intelligible discourse – the either/or true/false logic inherent in any

> coherent assertion. It is not some arcane, invented, authoritarian, closed-minded logic. It is not about indubitable knowledge or higher truths, indeed it is opposed to any such concepts. (pp. 5-6).

When one is speaking of objective truth, what is meant is an accurate description of physical facts. When speaking of logic, what is being spoken of are the connections between statements, propositions, or assertions (Shenefelt & White, 2015). Therefore, the importance of realism lies in its commitment to logic because one's attempt to understand the world depends on logic (Shenefelt & White, 2015). As Petocz (2011), notes, "[w]hatever *must* be assumed in order to say anything at all cannot be coherently be gainsaid – for the very attempt to *gainsay* anything *presupposes* the principle of non-contradiction" (p. 614, emphasis in original; see also Maze, 1983). That is, a subjectivist that declares that objective knowledge is impossible must, in practice, contradict that very premise in saying anything else (Maze, 1983). Even the statement that "objective knowledge is impossible" is being put forward as an objective truth (Maze, 1983; Petocz, 2011). Further to that, any reasons for subjectivism would also need to make statements about the independently existing world (Maze, 1983). As a result, from the realist perspective (at least from situational realist one, see Chapter Two), "logic is not merely a set of rules or notations; it is embedded in the world, part of the structure of reality" (Petocz, 2011, p. 614). Therefore, not only is realism the only logically coherent basis for knowledge, but any attempt to say anything about anti-realism would inevitably be doomed to incoherence (Petocz, 2011). In short, there is no particular reason for incompatibility between realism and anti-representational embodied cognitive science (Chemero, 2009; see also Zahidi, 2014).

Radical embodied cognitive science and entity realism

Given the different varieties of realism, not all varieties of realism are necessarily incompatible with anti-representational cognitive science. If anything, there is no reason to go

against realism and depending on what cognitive science theories calls for, some form of realism would be suitable for cognitive science (Chemero, 2000, 2009; Zahidi, 2014). One example that demonstrates how a variety of realism can be suitable for an anti-representationalist account of cognitive science is seen in a modified version of Hacking's (1982, 1983) entity realism for radical embodied cognition (Chemero, 2009).

Entity realism is a version of scientific realism that states that the existence of theoretical entities such as electrons is real on the basis of our ability to manipulate them during experiment (Hacking, 1983). Theoretical entities are real insofar as they can be manipulated (Hacking, 1983), and so, for example, experimentalists justify their beliefs in electrons because they build equipment that exploits the properties in electrons to investigate something else. Hacking here writes that the "vast majority of experimental physicists are realist about some theoretical entities, namely the ones they *use*" (1983, p, 262, emphasis in original). That is, experiments only need for the entity to be real for the purposes of manipulation, since:

> [u]nderstanding [of] some causal properties [would enable] you to guess how to build a very ingenious complex device that enables you to line up the electrons the way you want, in order to see what will happen to something else. Once you have the right experimental idea you know in advance roughly how to try to build the device, because you know that this is the way to get the electrons to behave in such and such a way. Electrons are no longer ways of organizing our thoughts or saving the phenomena that have been observed. They are ways of creating phenomena in some other domain of nature. Electrons are tools. (Hacking, 1983, p. 263)

So, once one starts from the position that electrons are real and manipulates them according to some causal properties, the electrons that may be theoretical in the beginning become real because they become ways and means for the study of other phenomena in nature.

Entities are real insofar as they can be perceived

Expanding on Hacking's (1982, 1983) entity realism, Chemero (2009) attempts to apply this form of realism to accommodate radical embodied cognitive science by extending the position from entity realism about scientific entities observable by specialised equipment to a more general realism and, in line with Hacking's original framework, treat affordances as theoretical entities. Accordingly, if experimentalists are justified in believing in entities they use, then one is able to justify the existence of affordances because the perceiving of affordances is what guide one's action towards successful practice (Chemero, 2009). For example, in a study that explores the perception of events related to gap crossing, Chemero, Klein and Cordeiro (2003) hypothesise that the combination of anthropometric measures (e.g., leg length, flexibility, etc.), postures (e.g., sitting, standing, walking, etc.) and environmental properties (e.g., gap size, gap depth, ground stability) would enable them to make gap-crossing affordances appear and disappear in real time and measure subjects' reaction accordingly. In the dynamic trial, participants are given a handheld device and instructed to indicate whether or not the moving platform has reached the point where they judge themselves unable to cross the gap successfully (i.e., when the gap-crossing affordance has disappeared). The researchers found that subjects did constantly perceive ecological event changes in the layout of the affordances of the organism-environmental system and were able to tell when the gap-crossing affordances disappeared. Consequently, the results demonstrate that organisms are able to perceive events as changes in the layout of the environment.

Non-representational cognitive science and manipulability

In a bid to extend Chemero's (2009) entity realism to account for non-theoretical entities, Zahidid (2014) proposes the notion of manipulability. Accordingly, if entity realism is real insofar as theoretical entities can be manipulated (i.e., purpose-driven activity), and if what can be manipulated is dependent on the organism's body type, then for an entity *x* to be real for a certain organism type *Y* would mean that *x* is real for *Y* if and only if *x* can be

manipulated. Therefore, in a world of organism type *Y*, all entities of *x* are real for *Y*. By this set up, a form of objectivity is achieved because the "world-for-organism is (synchronically) independent of the individual organism" (Zahidi, 2014, p. 471), since although the manipulation thesis is relativised for organism type *Y*, it is not relativised to any individual organism. Therefore, what is real is not dependent upon an individual species but the whole class of species (Zahidi, 2014). While this may create many 'worlds' for different classes of organisms (e.g., the world as experienced by a bee, and the world as experienced by a human), Zahidi argues that this does not mean that these different worlds are screened off from other living organisms. For example, humans might not be able to experience tetrachromatic colour vision but this does not mean that the world of tetrachromatic colour is sealed off from human beings. The fact that we can discover that other certain organisms have tetrachromatic colour vision provides proof that humans do have access to other worlds (see Thompson et al., 1992). Therefore, to some extent then, organisms can be said to know a mind-independent world, even if they have various sensory capabilities

Limitations

Both Chemero (2009) and Zahidi (2014) admit that this form of entity realism will not satisfy those who are seeking a more universal kind of realism since it does not claim that reality is a universally accessible one, or assume that there is fundamental reality that underpins the universal measure of reality. In other words, while entity realism is shown to be compatible with embodied cognition, it is not far-reaching enough to describe the reality that surrounds the embodied subject such that two embodied subjects are able to perceive a mind-independent situation. Both cases where theoretical and non-theoretical entities are involved, both Chemero (2009) and Zahidi (2014) lend support to epistemological realism on the basis that the entities are useful but not necessarily essential, and so realism is selective. The problem with this, however, is that it does not address the concerns of the ontological status

of things and states of affairs in general (Zahidi, 2014). Therefore, it does not help the case of defending realism or a commitment to realism in general.

Anti-Representationalism and Direct Realism

While not all anti-representationalists are realists, most, if not all, direct realist positions are anti-representationalists. Discussions about realism have shown that there is no reason that realism is incompatible with anti-representationalist approaches but a commitment to realism is a commitment to logic for discourse. However, in order to argue for the case from realism to direct realism, there are certain things that need to be addressed. Namely, it is one thing to commit to the idea that there is a mind-independent world, it is another to commit to the idea that we can directly apprehend this mind-independent world. However, the main reason argued here for why one should consider direct realism lies in the premise that logic is to be found in the fabric and structures of reality, and because logic is necessary to understand to world. Realism, with its commitment to logic for the purposes of discourse means that the only way an organism can know the world is directly through observation and discovery (Michell, 2013). To do so otherwise would result in solipsism or scepticism. Understandably though, there are challenges to the notion that organisms can know the world directly.

Some of the bigger challenges to direct realism lie in accounting for: (i) direct perception; (ii) direct theories of remembering, and; (iii) direct realist accounts of errors. The challenge concerning direct perception in that possibility of error. The challenge of direct remembering lies in the problem of direct awareness of an object that no longer exists in the present. The challenge of accounting for error is showing how direct realism can accommodate the possibility of error in a direct epistemological relation between an organism and the mind-independent world. The aim over the next few chapters is to show that while difficult, it is logically possible to account for memory error and as such, research programs

in psychology and cognitive science should not discount direct realism in the study of psychological phenomena.

Summary

Anti-representationalist theories have been present throughout the history of psychology and cognitive science. However, of these, direct realism has not been taken seriously as a positive alternative position due to the perception that there are insurmountable ontological and epistemological issues. However, the landscape of psychology and cognitive sciences has seen a rise in anti-representationalism positions that share overarching concerns with the logical issues with representations and the role of representations in general. While anti-representationalist approaches are united by the response to representationalism, different anti-representationalist approaches are generally concerned with either metaphysical or epistemological claims. While metaphysical claims that there is nothing in the nature of cognitive systems that resembles a representation (Chemero, 2000, 2009), epistemological claims that explanations of cognitive systems do not involve the use of representations (Chemero, 2000, 2009). The chapter then examined reasons for why anti-representationalist approaches might be anti-realist and also the case for where realism enjoys some acceptance in cognitive science theories. The chapter shows that commitment to realism does not stand in the way of a dynamic interaction between organism and the world. If anything it opens up possibilities of discoveries because there is a mind-independent world to be explored. In addition, the importance of the commitment to realism lies in the commitment to logic for discourse, without which theories and positions would inevitably end up incoherent. The chapter also shows that if one is interested in committing to realism, the form and variety of realism needs to be encompassing enough to ground entities and be universally applicable to other mind-independent things and states of affairs. Lastly, the chapter also shows that if one commits to ontological realism then the only logical way to know the world is directly and it

will be shown in the next few chapter how direct apprehension of the world and states of affairs is possible from a realist perspective.

Chapter Two: Situational Realism

Introduction

The aim of this chapter is to outline the theoretical position known as situational realism. The chapter will discuss briefly the history of situational realism and outline the main features that are central to the discussion to the problem of memory, error, and ultimately, memory error.

A Short History of Situational Realism

Situational realism has its sources from different realisms in history, the foundations and core of which can be traced back to the world of the Scottish-Australian philosopher John Anderson, Challis Professor of Philosophy at the University of Sydney from 1927 to 1958 (Mackay & Petocz, 2011a). As such, situational realism is also sometimes known as Andersonian realism or Sydney realism or Australian realism.[2] While most of Anderson's own papers were only published in Australian journals, readers in philosophy are likely to have encountered Anderson's influence indirectly through the works of the late David Armstrong, John Passmore, John L. Mackie, Eugene Kamenka, A. J. Baker, as well as David Stove amongst others (Armstrong, 2005; Mackay & Petocz, 2011a). In fact, Anderson's influence lives on through his students, many of whom went on to be established philosophers and other prominent figures in other areas such as journalism and the arts (e.g., Clive James).

Situational realism's extension to psychology was initiated by the then Head of Department of Psychology at the University of Sydney (1945 to 1965), W. M. O'Neil (Turtle, 1997), who wrote that Anderson's "influence upon [his] own basic psychological views has been greater than that of any psychologist I have encountered, either in the flesh or through

---

[2] Note that this form of realism is not to be confused with a more widely known 'Australian realism' that more broadly refers to positions adhering to an Armstrong-like combination of realist metaphysics and materialist theory of mind (see Oppy & Trakakis, 2014).

the printed page" (O'Neil, 1958, p. 71). The dissemination of Anderson's philosophy was aided by John Maze who studied under Anderson alongside Armstrong (Mackay & Petocz, 2011a; Turtle, 1997). Since then, situational realist research has addressed cognition, psychometrics, social psychology, personality and individual differences, clinical psychology, etc., culminating in a collection of essays published in 2011 (Mackay & Petocz, 2011).

Philosophy of John Anderson

Anderson's philosophy developed from a rejection of idealism, the thesis that "ordinary things or 'outside objects' (apart from other minds) depend for their existence on being known—their *esse* is *percepi*, or in Bradley's words 'Reality is experience'" (Baker, 1986, p. 4). In contrast to idealism, Anderson held to a commonsense position that we never know 'ideas' that mediate knowledge of the world, but rather independent things or states of affairs (Anderson, 1927/1962). The central tenet of Anderson's philosophy is:

> …*whatever exists* – combustion machines, polar ice-caps, wattle leaves, human enterprise; the mental and non-mental; the 'important' and the 'trivial'; the permanent and the ephemeral – is real, that is to say that it is a spatial and temporal situation or occurrence that is on *the same level of reality* as anything else that exists. (Baker, 1986, p. 1, emphasis in original)

That is, everything that exists, including both psychological and non-psychological processes is located within the one spatial-temporal universe.

Anderson's philosophy accompanied the revival of naïve realism that was defended by the likes of G. E. Moore and Bertrand Russell, as well as others such as the American New Realists such as E. B. Holt (Baker, 1986; see also Michell, 2011 for Holt's link to situational realism). Anderson was greatly influenced by a number of philosophers such as William James, Hegel as well as Greek philosophers like Heraclitus (Baker, 1986; see also Cole,

2012). Outside of philosophy, Sigmund Freud's work on psychoanalysis, Marx and the 'political pluralists' of Orage's journal, *New Age*, all left impressions on Anderson (Baker, 1986; O'Neil, 1979). These authors all influenced Anderson in some way or another, though his interpretation of their works showed that he followed none in detail (O'Neil, 1979).

Core features of Situational Realism

The common feature of most realisms is the thesis that the world and all its facts exist independently of any mind's apprehension of them (Mackay & Petocz, 2011, p. 34). Likewise, situational realism maintains an ontology of independence that specifies that things exist whether or not we ever come to know of them. Accordingly, Anderson writes that:

> What exists because of me nonetheless *exists*, apart from or independently of me. The houses which would not have existed, had not men planned and built them (i.e. but for their mind and bodies), are physical and are not private to these men; they stand for other men to see them and may remain when no one perceives them at all. (1927/1962, p. 33, emphasis in original)

That is, objects of knowledge according to Anderson, are real world situations that exist prior to and independently of being known (Anderson, 1927/1962).

Ontological egalitarianism

One of the defining features that sets situational realism apart from other realisms is its ontological egalitarianism, the claim that there is only *one single way of being* (Anderson, 1962). That is, according to Anderson, all that exists does so in the one and the same spatio-temporal universe.

By denying the existence of other realities, Anderson's position is anti-dualist and this extended beyond the mind-body dualism to any form of other realms of realities. As Medlow notes:

> …[situational] realism denies that there are different realms of existence, as well as the associated claim that some realms exist only relatively to others, either below or above them, as subservient or supervenient; these facts being reflected in the logical conditions of discourse. (Medlow, 2008, p. 81)

That is, there can be no higher or lower realms as Anderson reasons that any theory that attempts to postulate different realms or levels of reality would have to demonstrate how these different realms interact and relate with each other. As Anderson writes, "[i]t is worth noting that all theories of higher and lower realities are stated in terms of the common reality we all know – and, indeed, can be stated in no other way" (Anderson, 1935, p. 90). That is, there is no way of knowing the relation between any two supposed realms of being without breaking down the distinction between them or postulating another realm to which the relations between these different realms or truths are subsumed (Anderson, 1927; Mackay & Petocz, 2011; McMullen, 1996; see also Heil, 2003; Kim, 2002 on difficulties in postulating levels of reality). Consequently, all that can be known must exist on the same level of reality and no matter how trivial or grand, whether it be physical, psychological, etc., situations of all kinds all exist in the same spatio-temporal universe (Baker, 1986; Mackay & Petocz, 2011a, 2011b; Petocz & Mackay, 2013).

The Logic of Relations

One feature of situational realism is the logic of relations. The logic of relations states that a relation by definition involves two or more terms of the relation (the relata), each logically distinct from the other (Anderson, 1927/1964; Maze, 1983; Medlow, 2008; Michell, 1988/2011). That is, each of the terms must be independently existing and characterisable

prior to entering the relation (Petocz, 1999, 2011). For example, while every husband is a man and every husband has a wife, it does not imply that every man has a wife. And while the husband-wife relation implies that there is no husband without a wife and no wife without a husband, one is not the other and the relation involves two distinct and different people in any one marriage (Anderson, 1927/1962; cf. Hume, 1739). If a thing had no nature other than its relationships, there would be nothing for the word 'its', in 'its relationships', to refer to (Maze, 1983; McMullen, 1996, Michell, 1998/2011. see also Boag, 2008a; 2011, 2012). As Maze writes (1987/2009):

> Anything that can stand … in any relation at all, must have at least some intrinsic properties [of its own]. If that were not the case, then we could not understand what it was that was said to have those relationships. A relation can only hold between two or more terms, and a part of what is involved in seeing those terms as related is being able to see them as distinct, that is, as each having each own intrinsic properties, so that we can say what the terms *are* that are related. This means that each term of the relation must be in principle to be described without the need to include any reference to its relation to the other. (p. 24, italics in original; cf. Anderson, 1930/1962. See also Boag, 2008; 2011, 2012; Maze, 1954, p. 231; Michell, 1988, p. 234)

Aside from the terms, the relation, too, is independent. All relations are external, meaning that nothing is (partially or wholly) constituted by its relations with other things, and we cannot discover a thing's relation to something else by examining the thing itself (Petocz, 2011; Petocz & Mackay, 2013). In the same respect, one must not confuse relations as entities (i.e., as having their own properties and qualities). While the relation does not obtain without the related terms, relations are not constituted by the terms that relations are in with. Relations are "not the kind of *stuff* that binds the terms but rather, the relation informs how the terms are with respect to each other" (Michell, 1988/2011, p. 294, emphasis in original; see also

Medlow, 2008). Consequently, "all relations are real … but they are neither objects nor substances" (Hibberd, 2009/2011, p. 135). This notion of relation is shared with New Realism, as reflected in words of Walter Taylor Marvin who writes, "[i]n the proposition, "the term *a* is in the relation *R* to the term *b*, '*aR* in no degree constitutes *a*, nor does *R* constitute either *a* or *b'* (1912, p. 473). For example, the glass of water on the table denote the spatial relation of *being on* in the situation. The relation of *being on* is external to the glass and the table, in that the relation cannot be found internal to either. All the relation is how the glass and the table are standing with respect to each other in the situation. Neither the glass nor the table are constituted by the relation and are spatially characterisable entirely without reference to their spatial location or each other (Petocz, 2011).

The implication of the logic of relations for psychology is that like the embodied cognitive view, cognition must take into account the larger organism-environment relation and the dynamic interaction between the two. Just as no amount of searching within the glass will yield a discovery about the table, no amount of searching within the brain will give the full picture of what cognition is (Petocz, 2011). This is not, however, to deny the role of neural processes in cognition, but neural processes, while necessary, are not sufficient for mental processes because they pertain to only the subject term of the cognitive relation (Petocz, 2006).

While not all relations are cognitive, cognition can be seen as a particular type of relation between a cognising subject and a cognised object term that involves knowing about or referring to states of affairs (Maze, 1983).

The subject term

With regards to the subject term of the cognitive relation, the question of what precisely is doing the knowing remains an empirical one. The subject term (the 'knower') generally refers to the living organism. There are, however, also debates about the existence of a plurality of knowers within an individual as being necessary to account for mental

conflict (cf. Anderson, 1934/1962; Maze, 1983. See also Boag, 2005, 2008a, 2012; McMullen, 1996). In Anderson's view the hypothesis that there is a plurality of knowers derives from the considerations that firstly, knowing is a relation between two independent entities, and secondly, that in some cases we know our own mental activities (i.e., we know that we know) (Anderson, 1934/1962; see also Boag, 2005, 2008). According to Michell (1988/2011), Anderson following MacDougall (1908) thought this quality was feeling or emotion and hence, conceives the mind as being "a society or economy of impulses or activities of an emotional character" (Anderson, 1934, p. 74) where there is no ultimate self to which the motives belong. However, two difficulties arise with Anderson's "minds as feelings" account (Michell, 1988; O'Neil, 1934). Firstly, feelings are relations between minds and the things felt about and so they cannot be qualities of mind. Secondly, feelings "spring up and end, providing no basis for such time-spanning activities such as remembering" (O'Neil, 1958, pp. 69-70; see Boag, 2008, 2012).

On the other hand, Maze's view of cognition is part of his conception of the subject matter of psychology as a whole and is to some extent a synthesis of Freudian theory and situational realism. Following O'Neil (1934), Maze conceives of the knowers as drive substructures within the central nervous system. While it is tempting to think of drives as homunculi, Maze does not view these knowers as homunculi but rather as biologically-based neural structures. Interchangeably referred to as 'instinctual drives', Maze states that it is "the drive structures which, through their connections with the perceptual system, enter into those cognitive relations" (Maze, 1983, p. 162). Hence, for Maze, the subject matter of psychology is the study of how cognition shapes behaviour in the service of instinctual drives (Michell, 1988/2011). However, as discussed above, it must be noted that while brain processes are involved and the knower could be a neural system one must not give in to the temptation to reduce *knowing* to neural states. While it is without doubt that neural processes constitute at least some part of the subject term, the cognitive relation cannot be reduced to only the subject term (Boag, 2008a).

The object term

The object term (i.e., what is known) refers to states of affairs, or otherwise situations that a subject (i.e., the knower) cognises (Mackie, 1962, p. 265). Situations involve propositionality, which is not to be confused with linguistic entities such as 'statements' and instead involves a subject having a predicate and so refers to something being the case in space and time which also includes psychological situations (see Mackay & Petocz, 2011). As Passmore writes:

> [e]very proposition for Anderson, is about things of a certain description and offers a further description of them. Both subject and predicate … are things of a certain description; but the primary function of the subject, Anderson argues, is to "locate" i.e. to be the centre of reference which a predicate describes. The function of the predicate is, on the other hand, to describe. These are not two classes of entities pure locations ("particulars" or "substances") and pure descriptions ("universals"). And entity is both specific and general. It occurs somewhere and somewhen but it also behaves in a regular way and stands in certain relations to other entities; it is of a variety of descriptions. To talk of an "entity", a "fact", an "occurrence", or to describe a proposition as "true", is in each case to say that something happens in a certain place or in certain places. (Passmore, 1962, p. xvi)

That is to say, propositionality has nothing to do with whether or not someone has proposed something to be the case (McMullen, 2011). Rather propositionality refers to the logical structure of a situation – the subject-copula-predicate unity where any terms can be considered in two ways: either it is indicating or referring to certain object(s), or that it is indicating or referring to certain quality (or qualities) that which the object possess (McMullen, 2011). For example, the propositions that all "wombats are mammals" –

'wombats' has an extension where it is referring to all animals that are wombats and 'wombats' also has intension because it is referring to a quality or attribute of wombats, which is that they are mammals. Therefore, to describe a certain quality or attribute to a term is to conceive the term to be of a certain sort and kind (McMullen, 2011; cf. Armstrong, 1997, 2010). That is, each situation is both a universal and a particular.[3] As such, situations are complex and pluralistic since nothing less than a proposition can be cognised (McMullen, 1996; see also Hibberd, 2009/2011).

For Anderson (1926/1962), there is no correspondence between true propositions and true states of affairs, because, as Baker (1986) explains, true propositions do not represent or refer to situations, they *are* situations:

> …the class of true propositions is not identical with the class of situations, for while all true propositions are situations, it is only the case that all situations are *potentially* true propositions; not all of them have in fact yet come to be believed or 'proposed' by somebody, and in view of what Anderson calls 'the infinite complexity of things', not all of them ever will be. (Baker, 1986, p. 15, emphasis in original)

In Anderson's universe of infinite complexity, it is the case that not all situations have yet to be believed or proposed to be by someone; it is the case that these situations may never be (Anderson, 1927/1962; see Baker, 1986).

The cognitive relation

---

[3] A detailed description of Anderson's theory of situation requires invoking the categories of being (see Baker, 1986; see also Hibberd, 2013; Michell, 2011b). However, in this case, the understanding of what situations are follows Armstrong's (1997, 2010) view where universals and particulars are united in states of affairs (see also Edwards, 2014).

With the terms of the cognitive relation specified, some things need to be said about the actual cognitive relation. Given that the terms and the relation exist independent of each other, the cognitive relation then would exist independent of its constituents. If such is the case, Maze (1983) proposes that in some situations the cognitive relation is directly observable (Michell, 1988/2011).

While uncontroversial in the contemporary cognitive and psychological literature especially embodied cognitive research, Maze's thesis that cognition is directly observable in behaviour was in stark contrast to the standard cognitive science framework that conceptualised cognition as a centralised processing system with representation at its core. This is because the traditional view maintained that the only mental processes that one can know directly are our own and only via introspection (Michell, 1988/2011). The mental processes of others can only be known indirectly via observing their behaviour and inferring from our own mental processes (Michell, 1988/2011). Such a view inevitably leads to scepticism since the argument assumes that mental processes are inner and so there is no basis for asserting that anyone other than oneself has these mental processes (Michell, 1988/2011; cf. Maze, 1983). As Maze writes:

> [t]he belief that it is *in principle* impossible to observe another's thoughts is a consequence of that conception of mental processes … [whose] objects are entities of a shadowy non-physical nature whose existence is constituted by the subject's having or knowing them, i.e. they exist only in 'their' relation to the subject, so by definition they cannot stand in that relation of being the object of knowledge to any other subject. But, as I have argued, the objects of mental acts are not constituted even in part by standing in that relation; they are states of affairs that exist independently of their being known and which therefore can *in principle* be observed by anyone with adequate opportunity to do so. (Maze, 1983, p. 99, emphasis in original and added emphasis)

That is, against the claim that mental processes are inner, Maze argues that cognition is external (i.e., cognition is an event external to the subject's nervous system) (Michell, 1988/2011). Cognition is external because the object in the cognitive relation is always external to the organism's nervous system.

Similar to Holt's (1915) observability thesis that cognition is a relation between an organism and an object where in some instances the relation may be observed in the coordination of behaviour to its environment (see Michell, 1988/2011, 2011), if the object in the cognitive relation is always an event external to the subject's nervous system, then in the instances when it's external to the subject's body, cognition is directly observable in so far as the subject is spatially related to the objective situation via the subject's behaviour (Maze, 1983; Michell, 1988/2011). Maze states that one can observe another's cognition because we are able to identify the other person's belief via the causal texture of his or her movements in relation to the environment (Maze, 1983). That is, according to Maze:

> [while] I cannot physically observe your cognitive relation something as I can observe your spatio-relation to it ('standing within 5 ft of it'). Your knowing something only becomes apparent to me (leaving aside for the moment the special matter of your taking to me about it) when it becomes embodied, as it were, in your behaviour with regard to the thing in question. (Maze, 1983, p. 99)

Whilst embodied here for Maze is only a metaphor, the idea is similar to the embodied cognition movement where cognition involves an organism engaging in activities, such as gap-crossing (Chemero, Klein, & Cordeiro, 2003) or skilful movement in sports athletes and yogis (e.g., McIlwain & Sutton, 2014; Sutton, 2007; Sutton, McIlwain, Christensen, & Geeves, 2011).

What Maze means by causal texture is not entirely clear but Michell (1988/2011) speculates that causal texture refers to the conditions in which movements are coordinated to environmental situations. That is to say that cognitive activities are context-sensitive and changes in the environmental context can influence the fine-tuning of an organism's finger or hand relative to the object's size, shape or even speed. For example, Sutton et al. (2011) describes a scenario involving a professional cricket player. Now while self-conscious thinking can disrupt a well-practiced action, professional athletes that are reliant on their habitual memory to execute actions acknowledge that there must be flexibility in their movement. No playing context is alike and so in order to utilise their experience and memory reliably to execute a successful batting movement, the professional cricket player must also not only dynamically appraise and update one's knowledge of the current situation but also set into motion the necessary adjustments to execute the shot. The dynamic on-the-fly adjustments and awareness of the context are possible examples of what Maze meant by causal texture.

The cognitive relation is, however, a psychological one, and not simply physical (Michell, 1988/2011), and with that in mind, we can adjust our understanding of the cognitive relation to be a particular type of relation between a cognising subject and a cognised object term that involves knowing about or referring to states of affairs where cognitive activities involves organismic sensitivity to the environmental context.

The logic of motivation

The logic of motivation is the idea that cognition is motivated and so, not policy-neutral. What is meant by this is that the organism in its environment is not a passive participant in the cognitive relation, but rather an active one who is driven by particular wants and wishes (Anderson, 1927/1962). For example, the perceiving of factual information is policy-neutral because perceiving the fact that the earth is round does not initiate or influence behaviour unless the fact comes to be relevant to an organism's existing policies (Maze, 1993;

see also Maze, 1955; 1987). That is, unless the fact or belief is "relevant to the performance of an action pattern which will gratify some currently instinctual drive" (Maze, 1993/2009, p. 209). We will return to the notion of instinctual drives but for now, the point here is that the perceiving of some fact or belief is not adequate for cognition. What this means is the studies of cognition involving the subject and object has to take into account that the subject comes with a set of policies that will inevitably affect the way an organism will behave in different situations. As Passmore (1962) writes, knowledge or knowing:

> …is never ... the bare reception of a given object by an act of awareness. Rather, it is an attempt to come to terms with ourselves (in self-knowledge) or the things around us … In any adequate theory of knowledge the knowing mind must be regarded as a complex entity with its own demands, which are partly satisfied by, partly encounter obstacles in, the complex behaviour of other things, including other people and other tendencies within the same mind. (p. xiii)

In knowing, there is an active participant that is engaging with the world and the environment and thus knowledge involves more than simply apprehension of the object in a given environment:

> Organisms discover facts about things in their environment, and that when these facts bear upon the means of getting to a target-object, they will modify the behaviour of the organism in a way that will bring the target-object more quickly and directly than otherwise have been (other things being equal). (Maze, 1983, p. 61)

This is not to deny objectivity, although any theory of knowing must take into consideration the motivation that the subject brings into the cognitive relation (Maze, 1983). For the situational realist, motivation is a relation between an organism's biological drive(s) and

various situations. The organism's biologically-based drives causally guide behaviour and cognition.

Psychological determination for Maze (1983) is not 'purposive' or 'goal-seeking' and teleological explanations referring to the actor's desire for some state of affairs needs to instead be construed deterministically (arising from causal antecedents):

> …the concept of desire must be turned around from 'striving towards' something to 'being driven' by something else, and the nature and the number of these driving engines be discovered, if we are to avoid that instantly available and completely trivial form of pseudo-explanation, 'Because he wanted to'. (Maze, 1983, p. 7)

The driving engines that Maze is referring are related to his notion of 'biological engines under the hood' namely instinctual drives that are regarded as no more "metaphorically suspect (though it is a great deal more complicated) than the motors that drive the mechanical monsters in Disneyland" (1983, p. 7). For Maze, the drives as biological engines are regarded as "subsets of neural substrates (biomechanical systems utilizing cognition), which are the smallest units comprising the 'knowers'" (Boag, 2012, p. 164). That is, rather than a whole 'person', each individual is made up of a community of drives with each drive that is both "a knower and a doer" (Maze, 1987; see Boag, 2005, 2008, 2012). It is Maze's belief that a theory of primary or instinctual drives is a logical necessity to fill the gap in the philosophical action theory that is more than mere 'desire'.

Maze's (1983) account is reminiscent of some behaviourist S-R learning paradigms (Medlow, 2008) and Maze does concede that his viewpoint is similar in the sense that behaviour is always a response to environment. However, the crucial difference entails the causal role of beliefs in action, which eventuates "through the formation of beliefs about the locations of the objects on which the consummatory actions are performed, about the likely

effects of the actions on the objects in the present environment and the relation of those effects to the getting of the goals objects" (Maze, 1983, p. 70).

Motivation is also tied to the notion of selectivity (paying attention to some things and not others) and while often associated with the concept of wishing and wanting (e.g. Freud, 1900; Holt, 1915), motivation is not necessarily tied to the fulfilment of desires or wishes, instead, one should view motivation as primarily a driving force that guides the behaviour of organisms whether it is for the fulfilment of basic needs or rewards. The importance of motivation thus cannot be denied. Of course, not only is cognition necessarily motivated, what this section wishes to emphasise is that in the consideration of remembering or error, some motivation needs to be taken into account, which may potentially explain why sometimes the organism accurately or successfully remembers an event and when s/he does not. However, while motivation is important, the environment itself also influences the interaction and the organism's behaviour.

Situating Situational Realism

In terms of where situational realism sits in the current cognitive science and psychology landscape, situational realism shares commonalities with other known positions such as neorealism and ecological psychology. This may be due to similar influences from New Realists such as E. B. Holt and William James. In this respect, situational realism has similar features to situated cognition.

Situated cognition gained momentum over the last few decades and rose in response to the approach that largely ignored the context in which cognitive activities occur, such as methodological solipsism (Bechtel, 2009). Methodological solipsism is an individualistic conception of the mind and cognition where the organism is cut off from the world and representational states within the mind have a causal role for cognitive activity (Wilson & Clark, 2009; Bechtel, 2009). Against such a notion, the situated cognitive movement states

that cognition cannot be separated from the environmental context (Robbins & Aydede, 2009).

Philosophically, antecedents to situated cognition derives from many sources such as anthropology, education and psychology (Gallagher, 2009). In particular, there were a number of psychologists such as Lev S. Vgotsky, Frederic Bartlett, James J. Gibson, etc. as well as philosophers such as John Dewey, Martin Heidegger, Maurice Merleau-Ponty and Ludwig Wittgenstein that also had a significant impact on situated cognition (Gallagher, 2009). As a term, situated cognition is more like a genus (Robbins & Aydede, 2009; cf. Anderson, 2003; Clancey, 1997; M. Wilson, 2002) or a "loose-knit family of approaches to understanding mind and cognition" (R. A. Wilson & Clark, 2009, p. 55), but the essence of situated cognition is that it recognises the importance of the role of the environment in contrast to embodied cognition that emphasises the role of bodily constitutions for cognitive processing (Fencini, 2012). For example, Dewey recognises that there are important lessons from biological sciences and one of the most important one is the conception of the organism, such that:

> [i]n psychology this conception has led to the recognition of mental life as an organic unitary process developing according to the laws of all life, and not a theatre for the exhibition of independent autonomous faculties, or a *rendezvous* in which, isolated, atomic sensations and ideas may gather, hold external converse, and then forever part. Along with this recognition of the solidarity of mental life has come that of the relation in which it stands to other lives organized in society. The idea of environment is a necessity to the idea of the organism, and with the conception of environment comes the impossibility of considering psychical life as an individual, isolated thing developing in a vacuum. (1884, p. 285, emphasis in original)

Dewey is thus, making the claim that experience is not an isolated affair but rather that experience is biological insofar as it involves an organism in an environment, and social insofar as that environment is intersubjective (Gallagher, 2009).

There are, however, some differences between situational realism and situated cognition. Firstly, situational realism also maintains the importance of bodily factors such as motivation and so in this respect has some similarity with embodied cognition. Secondly, situational realism also maintains the subject-objective distinction due to its ontological of independence. That is, nothing can be constituted by terms or the relation, or else a fallacy of constitutive relations ensues. What situational realism brings to the discussion is a systematic view of the organism-environment relations to the understanding of psychological phenomena.

Summary

Situational realism defines psychology as the study of organism-environmental relations as embodied in interactions involving cognition, emotion, and motivation (Petocz & Mackary, 2013). Like other realisms, situational realism maintains that there is a mind-independent world. What stands situational realism apart is its commitment to ontological egalitarianism that claims everything exists in the same spatio-temporal universe. Other characteristics of situational realism include the commitment to the logic of relations. The logic of relations states that a relation by definition involves two or more terms of the relation, each logically distinct from the other. The relation itself is also independent of and external to the terms. In the case of cognitive relations, if the object of cognition is external to the subject's nervous system, then the cognitive act is also external and so in instances where the object is external, cognition may be directly observable via the organism's interaction with the object. Lastly, situational realism is also committed to a logic of motivation – the idea that cognition is motivated. The implication of this is that any study of cognition has to take into

account that a complex subject term and that the organism is an active participant in the cognitive relation.

With the foundation of situational realism laid, in the next few we will examine the challenges concerning memory and error before taking on the challenge of memory error.

Chapter Three: The Problem of Memory

Introduction

Direct realists view cognition as a direct relation between a knower and a known situation (Michell, 1988/2011). The direct realist proposes that remembering, unlike perceiving the present, involves a direct knowledge of the past (Earle, 1956; Reid, 1785; Laird, 1920; McMullen, 2000; Michell, 1988/2011; Woozley, 1949). This view is considered particularly problematic by many, due to their reluctance to accept that we can have direct access to the past events (Michell, 2004). Consequently, memory is commonly considered to be one of the major hurdles for a satisfactory direct realist account of cognition. As Taylor writes, "[m]emory is commonly held along with hallucinations and imagination to be one of the chief difficulties in the way of complete realism" (1938, p. 218). The difficult problem of memory is to account for how a knower who is engaged in the *present* act of remembering is able to have *direct access* to a past event that no longer exists. In order to address the problem of memory, this chapter examines three of the more well-known challenges – the problem of co-temporality, the temporal gap and action at a distance in accounting for memory that relates to the problem of explaining direct awareness of the past from a direct realist perspective. The chapter examines a relational account of remembering which forms the basis for understanding how memory errors can be accounted for.

The Problem of Memory: Direct Awareness of the Past

According to Bernecker, "[o]ne of the notorious problems of direct realism is to explain our direct acquaintance with, or experience of past events" (2008, p. 68). The view that we may know the past directly is by no means new. Writers, such as Samuel Alexander, Henri Bergson, Bertrand Russell, A. D. Woozley and William Earle, have also defended versions of direct realism about memory (Bernecker, 2008). One of the more well-known proponents of the idea that memory is the direct knowledge of the past is Reid (1785) who wrote, "[i]t is by memory that we have an immediate knowledge of things past" (p. 200).

However, the notion of "immediate knowledge of things past" can refer to either basic knowledge of past situations (i.e., semantic memory) or direct awareness of or acquaintance with past objects or events (i.e., episodic memory) (see Van Cleve, 2015). Reid appreciates this distinction, writing:

> Suppose that once, and only once, I smelled a tuberose in a certain room where it grew in a pot, and gave a very grateful perfume. Next day I relate what I saw and smelled. When I attend as carefully as I can to what passes in my mind in this case, it appears evident that the very thing I saw yesterday, and the fragrance I smelled, are now the immediate objects of my mind when I remember it … Philosophers indeed tell me, that the immediate object of my memory … in this café, is not the past sensation, but an idea of it, an image, phantasm, or species of the odour I smelled: that this idea presently exists in my mind, or in my sensorium; and the mind contemplating this present idea, finds it a representation of what is past, or of what may exist; and accordingly calls it memory ... Upon the strictest attention, memory appears to me to have things that are past, and not present ideas, for its object … I beg leave to think with the vulgar, that when I remember the smell of the tuberose, that very sensation which I had yesterday, and which has no more any existence, is the immediate object of my memory … I am conscious of a difference in kind between sensation and memory … I find … also, that memory [compels] my belief of its past existence … If you ask why I believe that [the smell] existed yesterday, I can give no other reason but that I remember it. (1764, pp. 44-47)

On the one hand, there is direct awareness of semantic memory of smelling the tuberose in the room (Van Cleve, 2015). On the other hand, direct awareness of the past can also mean that remembering is not mediated and that what is remembered is not a representation but the

actual smell of the tuberose itself, which Reid believes is possible (Malcolm, 1977; Van Cleve, 2015). However, critics have been swift to object to the notion of direct apprehension or awareness of past events. For example, in a response to Reid's (1785) manuscript, Thomas Reid's editor, William Hamilton, commented that:

> An *immediate* knowledge of a *past* thing is a contradiction. For we can only know a thing immediately, if we know it in itself, or as *existing*; but what is past cannot be known in itself, for it is *non-existent*. (Hamilton, 1785, p. 200, emphasis in original)

That is, the objections to the notion that there is direct awareness of past events stems from an assumption that we can only directly know a thing as it exists presently. Given that past events are no longer in the present (i.e., the events no longer exist), one cannot then have direct awareness of past events. Hamilton is not alone. Others like Malcolm (1976, 1977) and in response to Reid specifically, Andy Hamilton (2003) have made similar claims that there cannot be direct awareness of past events (Van Cleve, 2015; see also Copenhaver, 2009). For example, while Malcolm acknowledges that there can be "immediate knowledge of things past" in the sense that knowledge need not be based on inference, the second sense involving direct acquaintance with past events is difficult to reconcile since it requires explaining how past, non-existent things can co-exist with the act of remembering (Van Cleve, 2015; see also Hamilton, 2003; Bernecker, 2008). For the purposes of this chapter, the issues about knowledge will be put aside and we will focus on the problem of addressing the issues concerning direct awareness of the past.

While defenders of direct remembering like Laird (1920) regards the need to explain how remembering occurs as a non-issue, stating that "[w]e can perceive the present and recollect the past; [and so] we are not required to explain the inexplicable" (p. 59), nonetheless this chapter examines how direct remembering is conceptualised. In order to examine the notion of direct remembering, the chapter begins by addressing three of the

biggest hurdles concerning memory and shows that these issues while challenging are not insurmountable obstacles for defenders of direct realism.

Challenges from Memory

Three challenges for an account of direct remembering that will be considered in the next few sections are: (i) the problem of co-temporality; (ii) the temporal gap, and; (iii) action at a distance. This list of challenges is by no means exhaustive, but it is the biggest hurdle for defenders of direct realism. Each challenge touches on very complex issues that are very much on-going in contemporary debates. The sections proceed thus: the problem of co-temporality will be shown not to be a fatal challenge for direct realism. Then the problem of the temporal gap and action at a distance are outlined and it will be shown that while direct realists do object to the notion of memory traces, causal theories of remembering can be compatible with theories of remembering that do not appeal to traces.

The Problem of Co-temporality

Also known as the 'argument from time', the problem of co-temporality (or co-existence) is that if one has direct awareness of a past event, it appears that the object in question comes to co-exist with the 'present' act of remembering (Bernecker, 2008; Malcolm, 1977; cf. Broad, 1925). In other words, when *S* knows *P,* where *P* is some past event, both *S* and *P* co-exist temporally such that the past must come to be in the present (Hamilton, 2003; Van Cleve, 2015; see also Alexander, 1920; Bergson, 1999; Malcolm, 1977). In Malcolm's (1976) terms, "if B is 'directly' aware of X, then B and X coexist … The implication, in philosophical language, of this would be that if Robinson *now* remembers last week's earth tremor, then the tremor *now* exists" (p. 5, emphasis in original). For example, when Eva remembers her late grandmother, it appears that her late grandmother is brought forth from a time before and therefore, appears to exist in the present moment.

"Specious" present

The problem of co-temporality hinges on the assumption that we can only cognise things if they exist in the present. There are two parts to addressing the problem of co-temporality: firstly, there is an assumption that once the event passed, the object of cognition ceases to exist. Secondly, that cognition can only occur in the present.

With regard to the first assumption, the idea that an event or object ceases to exist once it has passed is not a valid one. While it is true that the World Trade Towers in New York are no longer present for a person to perceive due to the tragedy that brought the buildings down and we might believe that the apparent sun is present because we are seeing it presently (Laird, 1932). However, the experience of seeing the sun now does not necessarily mean that the sun has to exist now. Moreover, there is no reason why we cannot perceive past events. We do so all the time, such as when we see a star that exploded millions of years ago presently (Laird, 1920; Michell, 2004). There is a difference between what has ceased to persist and what has ceased to exist (cf. Broad, 1925). Take for example, presentism. Presentism is the view that "present time is ontologically privileged … all that exists, exists at the present time; and an object only has those properties it exemplifies at the present time" (Merricks, 1995, p. 523. see also Dainton, 2001; Merricks, 1999; Zimmerman, 1996, 2011). However, an immediate problem arises with presentism: without truth-makers for the past, presentists would have to analyse statements about the past via statements of the present. If new evidence emerges, the presentist would not be able to maintain their statements (Bernecker, 2008). For example, a presentist would run into difficulties affirming the statement that there were once dinosaurs while also denying that there were once unicorns (Bernecker, 2008). As Bernecker (2008) notes, the problem is that in order to affirm a past statement, the presentist has only statements about the present to work with, such as there *are* dinosaurs, or there *are* no unicorns. Inductively, however, the statement that there are dinosaurs *now* does not mean there *were* dinosaurs or unicorns (Bernecker, 2008).

The point is that there is no reason to object to the idea that things can continue to exist after it has passed. All things exist in space and time but more importantly, rather than a 'present', cognition involves the past. More specifically, cognition involves viewing events and cognitive acts as being temporally extended in space and time, which brings us to the next point.

With regard to the second assumption, the direct realist response to the problem of co-temporality is that there is no real 'present' to be perceived and that all acts of perceiving involve the perceiver viewing time as being temporally continuous and extended. As William James writes:

> Let anyone try, I will not say to arrest, but to notice or attend to, the *present* moment of time. One of the most baffling experiences occurs. Where is it, this present? It has melted in our grasp, fled ere we could touch it, gone in the instant of becoming (1890, p. 608).

The "specious" present is a term coined by E. R Clay to state that what is perceived as the 'present' is a *false* present, where "specious" literally means false (Power, 2012). There is a difference between the perception of duration and the experience of duration but the claim is that we never experience an instance of time in isolation, since there is never a completely unextended 'now'. Instead, experience always involves duration across the past and future (Gibson, 1979; James, 1890; McMullen, 2000; Pockett, 2003). Gibson similarly notes that:

> The stream of experience does not consist of an instantaneous present and a linear past receding into the distance; it is not a "traveling razor's edge" dividing the past from the future. Perhaps the present has a certain duration. If so, it should be possible to find out when perceiving stops and remembering begins. But it has not been possible. There are attempts to talk about a "conscious" present, or a specious present, or a

> "span" of present perception, or a span of "immediate memory," but they all founder on the simple fact that there is no dividing line between the present and the past, between perceiving and remembering (1979, p. 253)

That is, the perceiving of the so-called 'present' is inseparable from the past. Consequently, it becomes "obvious that unless we can perceive a duration, we can perceive nothing" (Taylor, 1938, p. 229). Therefore, given that all events and acts of cognition are extended in space and time and cognition involves viewing time as being temporally continuous and extended, there is no difficulty to say that when a person is remembering about the World Trade Towers, their object of memory is the actual past event. The World Trade Towers does not have to come to co-exist in the present because remembering can occur across time. In short, the problem of co-temporality is not a threat to direct realism.

Temporal Gap

Similar to the time-lag argument, the challenge of the temporal gap for direct realism is how a subject in remembering can be in direct contact with the remote past (Sutton, 1998). The time-lag argument is aimed at providing support for the conclusion for indirect perception and proposes the following: as a result of the finite rate that it takes for information to reach one's sensory apparatus, a subject *S* who (directly) perceives a physical event at time *t* is at best able to perceive directly the physical event up to the point of time *t*. In other words, the "[e]vents we perceive might have occurred before we perceive them, and the states of objects which we perceive might be temporally prior to their states at the exact time we perceive them" (Sutton, 1998, p. 304). The time-lag argument contradicts the idea that things that one perceives exist at the time when we perceive them. For example, one may think that one may see one's reflection in the mirror but there is a delay when the light bounces off the reflective surface and hits one's retina before the information is being transmitted through the

optic nerve. This is akin to viewing Orion that is centuries old (Laird, 1920; Michell, 2004; see also Houts, 1980).

The anti-representationalist response to the time-lag argument has been to state that what we are directly aware of is the event existing or occurring at a time earlier than the present (Woozley, 1949) or that what is directly apprehended is not necessarily the thing that is in front of them (Le Morvan, 2004; see also Laird, 1920). However, unlike the time-lag argument, the temporal gap in memory is much more complex since it can involve an object that does not exist anymore. As Sutton writes:

> It is not just that the temporal gulf in memory can be much greater than the barely perceptible gap between a distant axe striking its target and the sound of the blow reaching our ears: it is that the causal connections between remote past and current remembering are often more devious and twisted, enmeshed in more mixed causal fields and passing through more media, than the simple transmission of light or sounds over time through a single medium. (1998, p. 304)

While some may choose to disregard the temporal gap as a challenge to the notion that there is direct awareness of past events (e.g. Malcolm, 1977), the temporal gap is regarded as an obvious problem that cannot be ignored (see Warnock, 1987; Sutton, 1998).

The Problem of Action at a Distance

The problem of action at a distance follows on from the temporal gap. If we acknowledge that there is a temporal gap between the past event and present remembering, then without something to bridge the gap, action would occur at a temporal distance (Sutton, 1998). Action at a distance is often seen as being "magical and irrational" (Malcolm, 1977, p. 182) because it appears to defy common sense. For example, imagine being able to punch the air with clenched fists and hoping that somehow that would result in our foe who is standing

some metres away receiving a deserving punch in the face (action at a spatial distance), or imagine that we should punch a wall without any reaction today only to find that the wall has collapsed a year after the punch (action at a temporal distance) (Malcolm, 1977).

With regard to memory, the problem of action at a distance presents the challenge of explaining how a past event can bring about a present act of remembering. According to Sutton (1998), the difficulty for direct realists is that without causal continuity, not only does the past event have to leap into the present in order to cause the memory activity but somehow the past event also has to track through the spatio-temporal path to ensure that it could at any time become causally active. In light of the long-distance tracking, it seems unlikely that remembering can be 'direct' (Sutton, 1998; see also Bernecker, 2008). That is, unless direct realism is able to account for causal continuity over a temporal distance, it is difficult to account for not only how a past event can overcome long spatio-temporal distances to affect remembering event causally, but also how remembering can be direct if it involves tracking over long spatio-temporal distances. Moreover, unlike in perception, the pathway for past event to track to remembering event involves pathways that are often more convoluted and so, the idea that remembering is direct seems to be implausible (Sutton, 1998; Bernecker, 2008).

With the problem of action at a distance and the temporal gap outlined, we can begin to examine whether or not memory traces and causal theories of remembering do accommodate the two problems concerning memory and remembering.

Memory traces and causal theory of remembering

While there are different forms, the idea of a 'trace' acquired in past experience as somehow representing that experience, or carrying information about it, are what are at the heart of the dominant framework of 'representative' or 'indirect' realism (Sutton, 2003/2016). Memory traces are proposed to accommodate the temporal gap and to be causal mediators between the past event and present remembering. In other words, traces are meant to ensure

causal connectedness between a past experience and present remembering. However, memory traces cannot only be a connector between past and present. Take for example, Rosen (1975) who in arguing for the logical notion of the trace, suggests that trace theorists need not be committed to the view that memory traces must represent the experiences that instantiated traces in the first place. Instead, what is only required is an establishment of a causal link between past learning experiences and the present act of remembering. The memory trace is said to provide this causal role, but in doing so, the memory trace is reduced to the role of providing a link that on its own is unable to explain remembering because it requires "a representational-calling card" (Heil, 1978, p. 70) without which, there is no way of knowing which trace refers to which memory experience. Thereby, leaving the actual trace uncharacterised and incapable of explaining memory (see Heil, 1978; see also Barba, 2001, 2002; Braude, 2006).

The issue here is that memory traces are often posited to fill an explanatory role that is not often questioned (Dalla Barba, 2001, 2002; Braude, 2006; Heil, 1978; Watkins, 1990). That is, a lot of time a trace theory about memory would posit how a trace explains how memory works and so the focus is on the functional analysis of the trace and not on the existence of the trace within the theory (Braude, 2006). As Heil writes:

> Traces are postulated just because it is thought that their postulation provides an explanation for the phenomenon of memory and perhaps other psychological processes as well. I mention this simply because traces are typically regarded as items which must exist: it is the functioning not the existence of traces which most psychological theories set out to explain. Anyone holding such a view will undoubtedly regard difficulties pointed out about traces as nothing more than temporary setbacks, problems perhaps for one sort of trace theory but not for trace theories in general. (1978, p. 62; see also Dalla Barba, 2001,2002; Braude, 2006; Watkins, 1990)

In other words, the trace exists because the theory demands that it does, which leads to issues of circularity (Heil, 1978). Memory traces cannot help but need to be representational (Heil, 1978).

Let us consider another trace theory that posits memory traces that do provide more than just a causal link in representational theories. In particular, memory traces in causal theories of remembering appear to perform a causal mechanistic role. While the idea of causal remembering is not new (e.g., Anscombe, 1981; Armstrong, 1978; Bernecker, 2008, 2010; Deebus, 2010; Michaelian, 2011a; Shoemaker, 1970, etc.), Martin and Deutscher's (1966) account is different in that the paper aimed to reconceptualise what it is to remember – from "remembering events, to remembering facts, to remembering how and remembering a scene" (Deutscher, 1989, p. 53). Martin and Deutscher's (1966) causal theory of remembering proposes that past experience must be causally operative in bringing about stable intervening states that are in turn causally operative to bring about present recollective experiences. Accordingly, while some prompting is required, the basis of the causal theory of remembering is that the present recollective state must causally derive from states that are also, in turn, derived from that experience (Sutton, 2003/2005). That is, there is causal connection between the subject's past observation of event A and his or her present representation of A and a connection between that act of perceiving A that is causally related to the present representation and the subject remembering A (Martin & Deutschener, 1966). Prompting here is where complete prompting is when a person cannot correctly recall any more than what was supplied by the prompting, and strict prompting is when a person not only has to tell what had happened in the past but that s/he has also experienced the event (Martin & Deutscher, 1966; see also Deutscher, 1989)It is from this view of causal connectedness that the causal theory of remembering appears to suggest that there is an inbuilt reliance on the existence for a memory trace of some kind to act as a continuous bridge across the temporal

gap that will causally connect past events and present experiences (Sutton, 2003/2010; see also Deutscher, 1989).

The concept of the trace in Martin and Deutscher's (1966) account of causal remembering is an integral part of their idea of memory for according to the authors, for "[o]nce we accept the causal model for memory, we must also accept the existence of some sort of trace, or structural analogue of what was experienced" (P. 189). What the authors are not speaking of are isomorphic structural analogues such as grooves on gramophone records where there are "perfect" one-on-one mirroring of the original experience, but instead the idea of a structural analogue that contains features that will provide the person with the details to relate about the event s/he has experienced (Martin & Deutscher, 1966; see also Sutton & Windhorst, 2009; cf. Bernecker, 2008). This adds to the final criterion for remembering that the "state or set of states produced by the past experience must constitute a structural analogue of the thing remembered, to the extent to which he can accurately represent the thing" (Martin & Deutscher, 1966, p. 191). That is, the trace presents as something that is more like a conceptual condition where what was:

> …required [of the trace is] that there be *some* sort of continuous causal relationship between past experience and the present 're-presentation' of it. (or at least, between the past experience and the capacity presently to 're-present' it.) Naturally, we imagined that something in the brain would supply the required basis for such continuous relationship. But, as 'investigators of the everyday concept', we took care not to make the existence of some as yet scarcely understood physiological trace, the actual *conceptual* condition of the success of everyday claims to remember something. (p. 59, emphasis in original)

That is, the trace is presented as a conceptual condition where the trace remains as a "relatively stable condition which persists just so long as a person's brain is neither damaged

nor deteriorates too much" (Deutscher, 1989, p. 61). That is, the memory trace in Martin and Deutscher's (1966) account is meant not only to ensure causal connectedness is maintained from past experiences to present remembering but that the right sort of connections would give rise to genuine acts of remembering over memories for events that one has heard about (Sutton & Windhorst, 2009). In other words, the memory trace here is meant to determine content (Robins, 2016). As noted by Martin and Deutscher (1966), causal connectedness is not sufficient enough for remembering because the past experience must be operative in subsequent remembering in that the past experience must give rise to stable mental records (Sutton & Windhorst, 2009). However, as a result, the memory trace must still store or at least act as reference for the individual whether in the condition where prompting is given or not in order to ensure accuracy. Without which, there is no way of differentiating between genuine acts of remembering and instances where the remembering is from a different source other than one's past experience.

The problem of action at a distance is used to argue that direct realism is hard-pressed to demonstrate how a past event A can bring about remembering event C without positing some kind of mechanism that brings about causal connectedness B. The idea of positing some kind of mechanism that brings about causal connectedness is the basis for causal theories of cognition. With regard to memory, the causal theory of remembering is the view that to remember something is to be in a mental state or mental episode that stands in an appropriate kind of causal connection to one or more of the previous mental states or episodes (Hoerl, 2012; see also Sutton, 2003/2016). Accordingly, casual theories of memory typically involve the role of a memory trace to bring about the appropriate kind of causal connectedness (Hoerl, 2013; see also Bernecker, 2008). However, contrary to the idea that causal theories of cognition are incompatible with direct realism, there are ways to go about showing causal connectedness without sacrificing the need to posit memory traces.

For example, Tonneau (2011, 2013) proposes that direct memory be conceived as temporally extended patterns rather than in terms of isolated events (cf. Wilcox & Katz,

1981). To illustrate, when an organism remembers, an environmental event (A) at t_0 causes a change in the nervous system (B) at t_1. The neural system is modified as a result and after a period of time, if the change continues to persist, this would cause a change of behaviour (C) at t_2. This change can arise either spontaneously or under the influence of other side conditions, such as retrieval cues or in Tonneau's case, a contextual cue (X). The theory thus deals with the problem of action at a distance with causation from A to C because there is an immediate link in B (the change in the nervous system), so (B) bridges the gap between (A) to cause (C). Causation in this view is assumed to be transitive such that the causal chain allows the influence from the initial event A to have more far-reaching implications. That is, when a subject perceives event (A), it is the mechanism of response to (A) and this response mechanism is itself extended in time. Representations are consequently not needed from a neorealist point of view because cognitive explanations are in terms of behaviour as directly caused by the past event. Nevertheless, one might ask how the neorealist accounts for the temporal gap. According to Tonneau (2013):

> In cases of veridical remembering, neorealism identifies the remembrance of A with event A itself (or some part of it). Event A becomes behaviorally available not at the moment it occurs (say *t*) but at some later time *t* + x. (p. 239)

The temporal gap is thus tackled because delays from the perception of the environment and the organism's response are expected, and so from the neorealist perspective, whether it is a simple reflex or remembering, the organism's response to some aspect of the environment would involve some kind of a delay x.

Behaviour is context-dependent with neorealism specifying that cognitive explanation requires identifying with the aspect of the environment that is causally related to the current behaviour (Tonneau, 2011; cf. Holt, 1914). To borrow a simplified version of Tonneau's example of Pavlovian conditioning, imagine a set-up where the behavioural effects of the

conditional stimulus (CS) changes as a result of a previous correlation with an unconditional stimulus (US), thereby leading to a scenario where the CS-US pairing will cause the CS to cause a conditional response (CR).This set-up assumes that there is a hierarchy of causal relations with the first-order causal relation being CS to CR caused by the second-order causal relation by the CS-US pairing. From the neorealist standpoint, instead of assuming that the conditioning of CR is caused by a representation in an associative memory model, the neorealist posits that it is the US that is directly causing the CR when the CS is presented, where the CS assumes the role of a contextual cue (Tonneau, 2011).

While neorealist explanation is reminiscent of the stimulus-response framework (cf. Maze, 1983), the difference is that, rather than an image of the object, it is the actual past object that is causing the remembering (Tonneau, 2004, 2011). Similar to the mechanism proposed by Martin and Deutscher (1966) when they proposed the causal theory of remembering using memory traces as a mechanism (discussed above; see also Deutscher, 1989), the response mechanism in the form of causal chain is appealing since it provides an underlying mediating mechanism in the form of neural changes at (B) at t_1 that bridges the two events (A) at t_0 and (C) at t_2. Accordingly, memory is direct because there is no "looking back" or time travel because the subject's body and eyes are extended in time.

One limitation of the theory of remembering from the neorealist position is that it does not differentiate between different kinds of memories such as factual, semantic and episodic memories and how they can be derived from the neorealist model. Another potential issue, however, is that Tonneau's (2011, 2013) account may run into the problems of deviant causal chains, where some causal chains are not appropriate to bring about remembering.

In short, the problem of action at a distance would be particularly difficult for direct realists and other memory theories that do not believe in positing causal mechanisms (e.g., Squires, 1969) or causal processes that would account for how a past event would influence remembering. However, as shown, there is no incompatibility between the causal theory of remembering and direct realism. The challenge for defenders of direct realism and non-

representationalists alike is to devise accounts of causal remembering without appealing to the use of memory traces.

A Situational Realist Account of Remembering

While there have been previous attempts at non-representative accounts of remembering either from a direct realist persuasion (Bergson, 1896; Earle, 1956; Laird, 1920; McMullen, 2000; Michell, 1988/2011; Reid, 1785; Russell, 1912; Wilcox & Katz, 1981; Woozley, 1949; see also Ben-Zeev, 1986) or not (e.g., Alexander, 1920), a relational account of remembering from the situational realist perspective is restricted to the writings of McMullen (2000) and Michell (1988/2011, 2004) and Maze (1983). Situational realism views remembering as a relation between the organism and some past environmental situation that was once perceived by that organism (Michell, 2004). In terms of memory, situational realism views:

> …memory [as] a mode of cognition and thus a relation between a knower and some independently existing event. In the case of memory, the object of cognition will be some past event that has already been perceived. As with the direct realist view of cognition, memory does not involve cognitive representations or "memories" stored in the mind or brain. It is an epistemically direct relation to past events. (Michell, 1988/2011, p. 302 see also McMullen, 2000)

Situational realism maintains that representations are not necessary for remembering since remembering is a direct epistemic relation to past events. An individual remembers a particular past event because there is a direct epistemic relation between the organism and some previously perceived past environmental situation in which the person is sensitive to the propositional structure and content of that past situation (Michell, 2004).

The relational account of remembering posits is that there is a plurality of situations that the organism is situated in. However, unlike the notion of extensive mind, situational realism posits that the complexity of the organism's relation to the environment (that is anything external to the subject's nervous system) is illustrated by the unlimited number of relations a subject can be engaged with at any point of time. Such complexity is possible because "[t]here is no problem with the idea of there being relations between objects or events located at different times" (Michell, 2004, p. 5). For example, when a girl perceives the photograph of her late grandfather, she is engaged in, firstly, a perceptual relation with the photograph and also remembering the past object, which in this case is her late grandfather. A subject, thus can easily be involved with multiple objects in different cognitive relations. What is important to note, too, is that the subject does not have to be reflectively conscious of these relations in order for the relations to exist (i.e., the psychological relations, themselves, may be unconscious).

As discussed in Chapter 2, situational realism states that cognition involves organismic sensitivity to propositional structure and content of situations. Organismic sensitivity is sensitivity to a situation's spatial and temporal character and content. Every situation is located in space and time and when engaging in cognitive acts, organisms directly apprehend situations and in doing so, are sensitive to each situation's spatio-temporal characteristics. In the case of veridical remembering, the organism is sensitive to the propositional structure of past events (i.e., how the events are located in space and time). Remembering does not require appealing to representations because of causal relations. According to Michell (2004):

> …causal relations sustain both perception and memory … a remembered situation is always one that was perceived by the organism involved. Thus, remembering depends upon the causal processes of perception, plus additional causal processes. For remembering to occur, the causal processes of perception must produce relatively

> permanent neural changes in the organism involved, changes which, in their turn, under appropriate conditions, result in the required kind of neural sensitivity to that past situation. Of course, in remembering, as in perception, we are not directly aware of any of these mediating causal processes. We are directly aware of those situations, the propositional structure and content of which we are sensitive to. (Michell, 2004, p. 5)

That is, in remembering, causal processes take place like they would in perceptual acts. For instance, an event A would cause neural changes in the brain B resulting in neural sensitivity to the past event. When an organism engages in remembering, the past event A sets off a chain of causal processes such as neural sensitivity at B causing remembering at C. For example, returning to the example of the girl with the photograph of her grandfather, rather than representations, the girl perceives the photograph of her grandfather and remembers the actual person that is her grandfather who exists in the past. When the girl remembers about her grandfather, this sets off a chain of causal processes that starts from the past memory of her grandfather when he was alive at A, to the chain of causal processes such as neural sensitivity at B that causes remembering at C. Every event from the past event of when her grandfather was alive, to the chain of causal processes, to the girl with the photograph remembering about her grandfather, are events that are extended in space and time. Therefore, when the remembering process occurs, the process occurs *across* space and time.

Limitations of situational realism's relational account of remembering

Appealing to neural changes as the mediating process is not an appeal to representational memory traces (see also Maze, 1983; cf. Tonneau, 2011, 2013) because what the organism is aware of is not the mediating causal processes taking place but rather the sensitivity to the propositional structure and content of the past event itself. However, as with the neorealist's account of remembering, situational realism does not maintain distinctions

between the kinds of remembering. However, this is because the situations perceived and remembered are complex and comprise of episodic, semantic and factual memories nested amongst and within situations. However, as will be discussed, it is possible to show how different varieties of memory types can arise from a relational account of remembering.

The way to modify this is to see that remembering is a new relation where we have the original perceiving event, *S* perceiving *X* at t_0 which is causally related to the remembering event t_2 via neural changes in the organism at t_1. The distinction between memory types may depend on the context of remembering and other psychological, motivational and emotional factors, which possibly determines whether the person perceives the original relation as a semantic memory (e.g., I remember the day the exam results were released was a Friday). That is, *S* remembers [*S* perceiving *X* at t_0], or as an episodic memory (e.g., I remember feeling nervous the day the exam results were released), where *S* remembers [perceiving *X*], or as a factual memory where *S* remembers [perceiving *X* at at t_0]. This shows that it is possible to maintain distinctions between memory types from a situational realist position.

Summary

There are a number of challenges for defenders of direct realist accounts of remembering and three of the main ones discussed here are the problem of co-temporality, temporal gap and action at a distance. Out of the three, the temporal gap and action at a distance are more problematic than the problem of co-temporality. However, as discussed, the two challenges – the temporal gap and action at a distance – are also noted challenges for both representative and non-representative accounts of remembering. This chapter also examined a relational account of remembering from a situational realist perspective. Situational realist maintains that representations are not necessary for remembering since remembering is a direct epistemic relation between the organism and some previously perceived past environmental situation in which the person is sensitive to the propositional structure and

content of that past situation. In the next chapter, we will examine the problem of errors and show how errors can be logically accounted for from a direct realist perspective.

Chapter Four: The Problem of Error

Introduction

In general, errors are viewed as one of the biggest challenges for direct realism. This is due to a common but incorrect assumption that direct realism, committed to the idea that because perception or belief is correct, it cannot be wrong (Mackay & Petocz, 2011a). And since beliefs can be false, direct realism is thus mistaken (Mackay & Petocz, 2011a). In other words, because the direct realist commitment to the view that there is a *direct* relation between a knower and the situation known is seen to render "errors impossible because an external state of affairs corresponding to what erroneously appears to be the case does not seem present at the time the error is made" (Galloway, 2000, p. 606). In order to address the problem of error, this chapter will focus on perceptual errors of omission and commission, and will begin by outlining the types of errors including the two sub-categories of illusion and hallucination. The chapter then examines the arguments from illusion and hallucination and demonstrates that the arguments are not fatal for direct realism. Lastly, in preparation for addressing the challenge of memory errors, the chapter will critically examine the extant situational realist solutions to accounting for error.

Types of Errors of Omission and Commission

Errors of Omission

There are two general types of errors – *errors of omission* and *commission*. According to Rantzen (1993/2011), errors of omission involve instances where a subject fails to behave appropriately according to a set criterion of correctness (Rantzen, 1993/2011; cf. O'Neil, 1958). For example, when a naïve subject perceives the Müller-Lyer illusion (see Figure 2) and reports that one line is longer than the other. However, an issue with defining errors of omission in terms of failing to produce the appropriate or correct behaviour is that the definition does not show that the organism did or did not perceive objects in the first place. For example, persons with previous knowledge about the Müller-Lyer illusion, when

presented with the same set-up, may still report that they still see that one line is longer from the other even though they are aware that the lines are of the same length. This is because they may not have been able to inhibit the initial response (i.e., that one line is longer than the other) and adjust it to match the knowledge that they had about the Müller-Lyer illusion (i.e., that the two lines are, in fact, the same). That is, subjects might see the lines as unequal (error), and yet behaviourally act as if they are equal given prior knowledge. Accordingly, a different way of conceptualising errors of omission is needed.

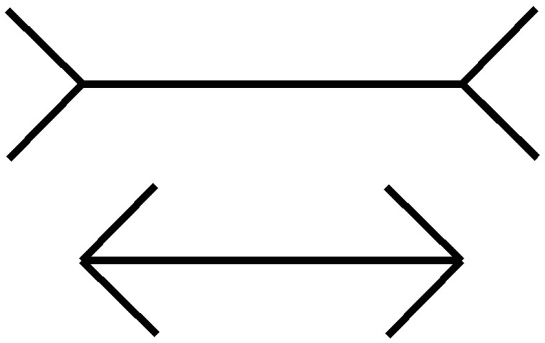

Figure 2. Muller-Lyer illusion

Gibson (1966b) proposes that errors of omission are instances where there is a *failure of information pick-up*. In this respect, errors occur due to absences of perception (Rantzen, 1993/2011; cf. Reid, 1785), and Gibson (1966b) writes, "[i]n the theory of information pickup, clearly, the pickup may fail when the available information is inadequate, or it may fail when the information is adequate but is not picked up" (pp 287-288). In other words, the failure to pick up information may be due to the environment or the fault may lie with the organism (Rantzen, 1993/2011; see also Michaels & Carello, 1981; Heil, 1983). For example, an instance where error may be due to environmental conditions is when a person accidentally walks into a lamp post because the fog obstructed his or her ability to accurately perceive the layout of the street that he or she was walking in. On the other hand, in the case when the error lies with the organism, a person may walk into the lamp post because he or she has a

visual defect that prevents him or her from cognising the object, or in Gibson's term to pick up information about the lamp post.

For the situational realist then, errors of omission are the instances where "the organism fails to stand in the requisite cognitive relation" (Rantzen, 1993/2011)[4] and as a result, the organism does not perceive part(s) or even whole situations, which can be described as an absence of cognition. For example, subjects driving a car may not be able to fully cognise the car accident on the side of the road that they drove past because their attention had to be kept on the road in front of them. That is, the driver was able to cognise the car accident but because he was not in an appropriate cognitive relation to perceive the car accident fully, he was not able to perceive all aspects of the situation.

Errors of Commission

Errors of commission are errors where the organism holds a false belief about a situation (O'Neil, 1958; Rantzen, 1993/2011). Within errors of commission, there are two varieties of errors of commission: errors of illusion and hallucination.

The illusory case of errors of commission

With errors of illusion, *S* falsely believes that *P* is *Q* where both *P* and *Q* may exist. In this case *S mistakes P* for *Q*:

S knows *P*.

---

[4] This is actually Rantzen's (1993/2011) solution for how direct realism accounts for errors of omission. However, it is more suited for defining what errors of omission are from a situational realist viewpoint since errors as defined as when the subject fails to behave appropriately according to a set criterion of correctness does not reflect genuine instances of errors.

S knows *Q*.

S mistakes *P* for *Q*, where *P* and *Q* are both situations that exist.

For example, in the case where a subject perceives a yellow ovoid-like object such as a lemon but mistakes it for a tennis ball, both 'yellow ovoid-like' things and 'tennis balls' exist, and the error can only arise if the subject knows both 'yellow ovoid-like' things and 'tennis ball' (i.e., cognition is necessarily involved) (cf. Byrne & Logue, 2009; Haddock & Macpherson, 2008). Such errors are a case of *mis*-cognising and failing to recognise the fact at that moment that the yellow ovoid-like thing is really not a tennis ball. Nevertheless, the ontological status of the yellow ovoid-like thing and tennis ball is not in question. Instead circumstances conspire to cause the subject to remain unaware of the misperception that the yellow ovoid-like object is being mistaken for a tennis ball instead of being recognised as a lemon. Usually, this sort of error can be corrected with further evidence, with either the knower recognising that the yellow ovoid-like object is not a tennis ball or with the knower finding out in some other fashion about the error made.

The hallucinatory case of errors of commission

In the second case of errors of hallucination, *S* falsely perceives *P* is *Q*, where *P* and *Q* exist but the relationship *PRQ* does not:

S knows *P*.

S knows *Q*.

S mistakenly believes *PRQ*, where *PRQ* involves *P* being the property of *Q*.

For example, in the case where the subject perceives a yellow ovoid-like object as a lemon, this type of error would occur if there is no actual object to be perceived (cf. Byrne & Logue, 2009; Haddock & Macpherson, 2008; Macpherson, & Platchias, 2013). Epistemologically,

such errors of commission remain problematic for the direct realist, and particularly so for the case of hallucination illustrated above, since the false object of cognition needs to be accounted for: there appears to be "an object of such and such properties before us and yet where other, especially later, experience convinces us that there was no such thing confronting us" (O'Neil, 1958, p. 350. cf. Galloway, 2000; Rantzen, 1993/2011). Between errors of omission and commission, errors of commission present as the bigger challenge of the two. In particular, in the case of hallucinatory errors, the direct realist is faced with the problem of how an organism apprehending is directly related to an object that does not exist.

With the types of errors laid out, we will now turn to the arguments from illusion and hallucination. The motivation for examining the arguments from illusion and hallucination is to show that the occurrence of errors is not, itself, reason enough to discount direct realism. In addition, the argument from hallucination is of interest because the argument reflects the problems analogous to the problem of memory for direct realism (Bernecker, 2008). Namely, if direct realism embodies the thesis that one is directly related to past events, then how does direct realism account for the frequency and degree of erroneous recall. In examining the arguments from illusion and hallucination, the section will show that that there is no logical objection to direct perception here so as to set up the grounds for showing how errors can be accounted for from a situational realist point of view.

Arguments from Illusion and Hallucination

While varied in forms, the aim of the arguments from illusion and hallucination is to show that the physical world can appear to us differently in perception from the way it really is, and it is this basis that the argument from illusion and hallucination claims direct acquaintance with the world is not possible (Crane & French , 2015/2016; Dancy, 1995; Reynolds, 2000; Robinson, 1994; Smith, 2002, 2006). The general premise of the arguments from illusion and hallucination can be formulated as such: in some cases of perception,

physical objects appear to possess some quality *F* that the physical object perceived does not actually possess. In this respect, the argument asserts that what the subject *S* perceives is not the material thing, but rather the subject's immediate awareness is of qualities such as *F* associated with *X*. Therefore, it is claimed, direct realism must be false. For instance, in the case of illusion, consider Austin's (1964) example where a subject perceives a stick, partially submerged in water, to be bent. In this example, there is no actual material object that is bent but the object of cognition is a bent stick. Therefore, it stands to reason, argue proponents of this position, direct realism is not possible, because what the subject perceives is not an actual situation but something mental and intrinsic to his or her experience. That is, illusions show that there is a disparity in terms of reality and appearances, which direct realism cannot account for if the object of cognition is the world itself (Smith, 2002).

In order to address the arguments from illusion and hallucination, the next section examines two principles—the phenomenal principle and the indistinguishability principle (also known as the common core factor)—underlying the arguments from illusion and hallucination. It will be shown that the arguments from illusion and hallucination are not threats to the direct realist position.

Principles employed in the arguments from illusion and hallucination

In this section, we will refer to the argument from illusion in the discussion of the phenomenal principle. As discussed in the previous section, the argument from illusion is this: in some cases of perception, physical objects appear to possess some quality *F* that the physical object perceived does not actually possess. When the subject perceives something with the quality *F*, there appears to the subject, a sensible quality *F* that the subject is aware of, but since the physical object in question does not actually possess the quality *F*, the subject cannot be aware of the actual physical object. This is because what the subject perceives is a sensible quality *F* that the physical object does not possess, and so the perceived thing with quality *F* and the object's actual physical quality are not identical.

Therefore, it follows, claim proponents of this view, in some cases of perception, the subject is aware of something other than the physical object. Several argue that since there must be continuity between illusory and veridical experience, the same analysis as before must apply to both cases. Therefore, one is not aware of physical objects in veridical experience either, and consequently, one is not aware of physical objects in either veridical or illusory experience, and so we are never aware of physical objects (cf. Crane, 2016; Robinson, 1994; see also Crane, 2011; Smith, 2002).

From this, Robinson (1994) argues that the weight of the argument of illusion rests on the stance that when the subject perceives something with the quality *F*, there appears to the subject, a sensible quality *F* that the subject is aware of, phenomenally. Robinson consequently refers to this as the 'phenomenal principle', and the aim of the following section is to show that the phenomenal principle is not a threat to direct realism.

Phenomenal principle

The phenomenal principle states that "[i]f there sensibly appears to a subject to be something which possesses a particular sensible quality then there is something of which the subject is aware which does possess that sensible quality" (Robinson, 1994; cf. Broad, 1925). That is, when a subject *S* perceives an object *X*, then it can be said that subject *S* is aware in object *X*, a certain quality *F*. The idea behind the phenomenal principle is that direct realism's commitment to a direct perceptual contact with the external world means that the thesis cannot accommodate the varying or changing appearances of the object in front of them, which while varied in appearance, is not changing intrinsically (Robinson, 1994). For example, Broad's (1925) example of the elliptical penny highlights the observation that the penny can look different depending on the viewing positions the observer takes and so, the penny can 'look' or 'appear' to be more or less elliptical. As H. H. Price writes:

> When I see a tomato there is much that I can doubt. I can doubt whether there is a tomato that I am seeing, and not a cleverly painted piece of wax. I can doubt whether there is any material things there at all. Perhaps what I took for a tomato was really a reflection; perhaps I am even the victim of some hallucination. One thing however I cannot doubt: that there exists a red patch of a round and somewhat bulgy shape, standing from a background of other colour-patches, and having a certain visual depth, and that this whole field of colour is directly present to my consciousness. What the red patch is, whether it is physical or psychical or neither, are questions that we may doubt about. But that something is red and round then and there I cannot doubt. (1932, p. 3)

With regard to phenomenal principle, the direct realist response is that even if the quality *F* is not apparently present in the physical object, the point is that the subject is always aware of an object. As all objects are external to the subject, what may be the case is that the subject is aware of something related to the object. As discussed earlier, situational realism proposes that the object of cognition is always a complex situation. When a subject directly perceives a situation, it does not mean that the subject perceives every aspect of the complex situation (Anderson 1927/1962; Laird, 1932; see also Armstrong, 1955; cf. Le Morvan, 2004). On the flipside, when we perceive things, we perceive them "*in three-dimensions* and under *complex* conditions" (Baker, 1986, p. 13, emphasis in original). When a subject perceives something that possess a quality *F*, what the claim does not say is whether or not the subject only aware of *F*. In some cases, the subject is aware of *both* the physical object and something that possess quality *F* (Crane & French, 2015/2016; see also French & Walters, unpublished manuscript; cf. Ben Zeev, 1984). The false belief holds because we fail to distinguish between the conditions of how we come to know about the penny and the characteristics of how the penny actually is (Baker, 1986). That is, according to Anderson (1927/1962), the appearance is a relation (viz. that of being known or apprehended). In short, what is perceived in the end

is never "simple and indubitably known – [it] is not a 'whole nature' we 'know all about' … [instead, what confronts us] is … a complex situation or state of affairs, about which we can make new discoveries and also make mistakes" (Baker, 1986, p. 15; see also McMullen, 1996).

Indistinguishability principle

The indistinguishability principle, otherwise known as the common core/element, is less a principle and more an intuitive claim regarding the debate about the characteristic of one's visual conscious experiences. The claim is that we cannot tell apart the difference between genuine awareness and mere appearance because there is a state that is common to the two experiences (Dancy, 1995). Both veridical and erroneous perceptual experiences are subjectively indistinguishable, so it is claimed, because there must be a common element that exists in both states. The common element between the veridical and erroneous states occurs because the "existence and nature of the external object *are not intrinsic* to the nature of the perceptual state of the perceiver" (Dancy, 1995, p. 422, emphasis in original). That is, the ontological independence of what is sensed does not prevent a subject from distinguishing when a state involves an external object or not (Dancy, 1995). This example is a weaker version of the argument from illusion but it highlights that any alternative theory of perception must explain indistinguishability without positing a common core element between veridical and erroneous perceptual experiences (Fish, 2009). Furthermore, as a general rule, intuitively, the more similar two things are, the more difficult it will be to tell them apart.

On the flipside, some disjunctivists like Martin (1997, 2004, 2006) deny that there is a common element between the states of veridical and erroneous perceptual experience. Disjunctivism is a theory of perception that states that mental states are involved when a subject experiences a visual perceptual experience (Fish, 2009, 2013). Varieties of disjunctivism are divided on whether or not there is a common mental element between states

of minds in veridical (V), illusory (I) and hallucinatory (H) perceptual experiences (Byrne & Logue, 2009). In brief, *VI* v *H* disjunctivism views the veridical and illusory cases (also known as the 'good' case of error) as sharing a common element, while the hallucinatory (also known as the 'bad' case) does not. On the other hand, *V* v *I/H* disjunctivism that Martin (1997, 2006) defends does not propose that veridical cases share a common core with the illusory and hallucinatory cases.

Unlike the subjectivist tradition of sense-datum theories whose experiences are constituted by an awareness of entities, Martin defends a version of naïve realism that states:

> For any conscious state of mind there is something that it is like for the subject to be in that state; each such state of mind contributes to the character of one's stream of consciousness. What it contributes, the "what-it-is-like" properties of that state and in the case of perceptual experiences, I shall use interchangeable the term "phenomenal character." According to naïve realism, the actual objects of perception, the external things such as trees, tables and rainbows, which one can perceive, and the properties which they can manifest to one when perceived, partly constitutes one's conscious experience, and hence determine the phenomenal character of one's experience. (Martin, 1997/2009, p. 93)

That is, perceptual experience, from a naïve realist point of view maintains that states of mind are partly constituted by external objects and so, their phenomenal characters are determined by said objects and their qualities (Martin, 1997/2009; cf. Fish, 2013; Logue, 2012). For example, when a subject perceives a lemon, the lemon is an essential constituent of the subject's experience. Namely, the subject's experience of the lemon cannot have occurred if there is no lemon to be perceived (Bryne & Logue, 2009). Naïve realism denies there is a comment element on the basis of a negative disjunctivism where:

> … the essence of hallucination—what distinguishes hallucination as a class from other mental states—lies in their being indistinguishable from veridical perceptions, not in some antecedently identifiable feature of the state. This is why, "when it comes to a mental characterization of the hallucinatory experience, nothing more can be said than the relational and epistemological claim that it is indiscriminable from the perception" (Martin, 2004, p. 72)

It is necessary to note, however, that indistinguishability is separate from indiscrimination, the former related to the phenomenal character and the latter to a cognitive ability to discern differences between the characteristics of the cognitive relations. Martin defines indiscriminability in terms of judgement where "[t]o discriminate two things … is to judge them [as] non-identical" (2004, p. 62. cf. Genome, 2016). The basis of Martin's thesis is that what makes veridical perception indiscriminable from hallucination is the same proximate causal antecedents as shared by both veridical and hallucination (Siegal, 2008). Therefore, rather than there being a mental core, what makes the two experiences indiscriminable is that the hallucination causally matches the normal veridical perception (Siegal, 2008). For example, when I hallucinate seeing a tennis ball, this arises because my hallucinatory experience is causally matching a veridical experience of seeing a tennis ball.

One problem with an epistemological disjunctivist account, such as Martin's (1997, 2004, 2006), is that a hallucination "is such that it is not possible to know through reflection that it is not one of the veridical perceptions" (2006, p. 364), and so a problem lies with Martin's definition of discrimination. More specifically, the problem lies with the issue of the restriction of relevant knowledge as acquired through reflection (Fish, 2013). It is suggested that one manner that one can come to know whether an experience is veridical is via testimony. The difficulty though lies in being able to, through reflection, know what information should be disqualified, since the 'through reflection' restriction must be stringent enough for the hallucinating subjects to figure out that they are hallucinating and know how

to decide which "information involved in background beliefs cannot be generally available to reflection … Otherwise the possibility of everyday knowledge of will slip through the net count as knowledge obtainable by reflection" (Sturgeon, 2006, p. 209). Moreover, Sturgeon observes that Martin's account would require that a vast amount of background knowledge or beliefs be made available. Another issue with Martin's (1997, 2004, 2006) account has to do with the discussion of simpler and less sophisticated knowers such as animals where such beliefs are presumably not available (see Siegal, 2008 for futher discussion).

From the situational realist perspective, the account of naïve realism in disjunctivist theories, whilst similar, does not go far enough to say whether there is a mind-independent world or not: things are only mind-independent in so far as that states of mind are constituted by external objects and their phenomenal characters are determined by said objects and their qualities (Martin, 2004). Moreover, from a relational perspective, veridical perception cannot be constituted by either the terms in the relation because this commits the problem known as the fallacy of constitutive relations. As discussed in Chapter Two, the fallacy of constitutive relations is a form of reification that occurs when relations are treated as "if they were terms, entities possessing independent natures of their own" (McMullen, 1996, p. 61). For example, in the situation where the fox jumps the dog, there are only two terms – the fox and the dog. The fox and dog are independent entities, and neither is constituted by the relation between them. On the other hand, the 'jump' only denotes the particular spatial relation that shows how the fox and dog are standing with respect to each other, and this relation is not a separate entity (McMullen, 1996; see also Medlow, 2008). From this perspective then, notions of 'perceptions' and 'concepts' alike denote only the sort of cognitive relation that the organism is standing in with respect to the object (situation). Therefore, when the disjunctivist treats states of minds as constituted by their external objects, this indicates a form of reification. Direct realism's response to the issue of indistinguishability is that because veridical and hallucinatory experience may be erroneous due to the fact that they are more akin to the parallel relation of true and false beliefs. And though the two may be phenomenally

indistinguishable, it does not change the fact that what is phenomenally indistinguishable is not ontologically indistinguishable (Le Morvan, 2004; cf. Gibson, 1970). That is, all situations are external and exist mind-independently of the subject and so, while it is possible that we may not ever know we are in error, the discovery of whether or not we are in error is thus not an improbable task.

Summary of the arguments from illusion and hallucination

In summary, while the arguments from illusion and hallucination have been employed to demonstrate that direct realism is false, there are reasons why these arguments are not convincing (Robinson, 1994). This is because there are formative weaknesses in the arguments that are difficult to salvage. First, the arguments from illusion and hallucination rely on negative conclusions and do not deter support for direct realism. If anything, all the arguments from illusion and hallucination are able to conclude positively is that errors occur, but this is not a cause for concern for direct realism since direct realism has never denied the existence of errors. That is, errors are part and parcel of cognition and for any cognitive act there is always the risk of error (Laird, 1932).

Secondly, with regards to the immediate object of cognition, both representationalism and positions appealing to phenomenology maintain that because there is a disjunct between what is perceived and what is experienced, therefore what is directly apprehended must be something mental and cognitive. However, direct realism only needs to respond to the fact that there is no assumption that the immediate object of perception must be the one in front of the subject (Le Morvan, 2004). For example, while direct realism is the thesis what the subject perceives is the actual world itself, the important distinction here is that the object term is complex, and situational realism specifically highlights this by noting that the object term is a situation (and thus a complex states of affairs). Accordingly, when I perceive a cat on the table, this is a true situation in the case of veridical perception, but if I perceive a cat on

the table where there is no actual cat, what is still perceived is a situation, albeit a false or inaccurate one.

Thirdly, between the argument from illusion and hallucination, the argument from hallucination is the more challenging one for direct realism. However, direct realists can respond to proponents of the argument by stating that what is phenomenally indistinguishable is not necessarily ontologically indistinguishable (Le Morvan, 2004. cf. Armstrong, 1955, 1968; Mackie, 1969/1971). That is, from the direct realist point of view, while two objects can be similar in terms of their phenomenal character, the point is that the two objects are ontologically distinguishable because they are two separate objects that exist independently of each other.

Solutions from Situational Realism

Concerning the problem of error, the direct realist is faced with the problem that, as cognition is a relation between an organism and a situation, in the case of error where there is no situation to cognise, then what the realist is left is either the impossibility of a single-term relation or that misperception needs to be understood as a different process from perception altogether (Mackay & Petocz, 2011a). In order to establish the grounds of how a direct realist position can account for memory errors, this section aims to show how errors of omission and commission can be accounted for.

Errors as asymmetrical relations

Anderson's (1934/1962) proposal is that the occurrence of errors of commission is the result of a false proposition, which is explained by the subject-predicate distinction as someone's mistaking *X* for *Y*. That is, when *S* mistakes *X* for *Y*, *S* is related to situation of *X's* being *Y*. Thus, in the case of error, the subject is in a relation to a *false proposition*. For example, when Mike mistakes the cat for the dog, rather than it being the case where Mike in

a direct relation to the cat, which is the object of the false proposition, Mike is instead, in a direct relation to the false proposition of the cat's being the dog.

For Anderson, error occurs as a result of striving (see also Baker, 1986). Based on Alexander's (1911) theory of striving and influenced by Freud's ideas about wishes, Anderson proposes that:

> …knowing is a matter of learning or finding out, that we may be seeking or demanding the occurrence of the predicate Y in the subject X, wishing to introduce or simply desiring that there should be, this character in a place we other identify—in particular, by other predicates. (Anderson, 1962, p, 170)

That is, knowing is motivated and so the organism, in wanting a certain situation to occur, might strive for other alternative situations to occur instead. When *S* mistakes *X* for *Y*, the subject's relation to the false situation is the result of a complex process stemming from a motivation or striving for a different outcome or situation to have occurred instead of the actual situation perceived.

There are a number of issues with Anderson's (1962) account of error, however. First of all, when *S* mistakes *X* for *Y*, the three terms are not united in a subject-predicate form within a single proposition but yet the object of cognition is the false belief that *X* is *Y* (Maze, 1983; Michell, 1988/2011). For example, if true belief (i.e., veridical cognition) is held to be propositional in form (i.e., subject-predicate), then false belief must also be propositional in form as well (Michell, 1988/2011; cf. Birchall, 1982). Armstrong (1973) criticises Anderson here for introducing an asymmetry between true and false beliefs where in true belief, the organism is held to be directly related to the situation while in false belief (error), the organism is held to be "related to the "scattered 'constituents' of the thing believed" (Armstrong, 1973, p. 44) when *S* mistakes *X* for *Y*, *S* is related to situation of *X's* being *Y*, and Armstrong believes the essence of what distinguishes true and false beliefs must lie outside

the beliefs. However, Baker emphasises that Anderson's treatment of error requires acknowledging complexity of both the situation and the terms involved, and that most importantly, discovery, knowledge and error go hand in hand (see also Laird, 1920, 1932). That is, when a subject believes a true proposition *X* is *Y*, and when a subject believes a false proposition *X* is *Y*, he or she takes *X* to be *Y* (Baker, 1986). The difference of course is that in error, *X* is not *Y*.

Secondly, the other problem with Anderson's account has to do with the notion of striving. The problem here is that when a subject mistakes *X* for *Y*, where *S* holds a false belief of *X's* being *Y*, the onus of the responsibility for holding the false belief is entirely on the subject. For example, Birchall (1981) suggests that when a subject mistakes *X* for *Y*, it is a matter of *S* taking *X* to be *Y*. However, the problem here is that the subject is now only in relation to the terms and not to the situations and relations in propositional form. Therefore, the "*experienced* unity of subject and predicate within the proposition" (Michell, 1988/2011, p. 310, emphasis in original) depends on the subject and the actual real unity of the terms in subject-predicate form in an actual situation, which will never be realised and be out of the reach of the cogniser (Michell, 1988/2011). Thus, on this account, the knower will never know situations directly but only constructions of situations, making it not a theory of knowledge from a direct realist epistemology but rather, a constructivist one instead (Michell, 1988/2011; Rantzen, 1993/2011).

Errors in the Absence of Cognition

Michell sets out his thesis to the problem of error by pointing out direct realism holds that only *veridical cognition* is a direct relation between the organism and object of cognition (Michell, 1988/2011). And so, error does not have to be a direct relation between the organism and the false situation. Michell (1988/2011) believes that the problem with the solution offered by Anderson is in trying to accommodate accounting for false belief as a relation to a *false proposition*. That is, while Anderson is able to account for the relation of

the knower to particulars that exist in true propositions, the solution is not able to account for how a knower is able to enter into a relation where these particulars from different situations come together in a single proposition that does not exist.

Similarly, Maze (1983) offers only a partial solution to the problem of error in suggesting that:

> …the material composing the false belief must have originally have come from our perception of actual existents. The concept of centaur starts with the perception of actual men and actual horses. Or, for a real-life example, if I as a foreigner believe mistakenly that President Bush is a Democrat, the components of that false belief derive from my direct perception of print and TV media assurances of his existence, and their similar assurances that there is a political party called the Democrats. The relation 'being a member of' something is also directly perceived by me in various contexts. Erroneous beliefs state falsely that two or more things or properties or situations stand in a certain relation. Yet things, properties and relations of the relevant kind all exist and have been directly perceived by me. I do not need a mental picture to represent the non-existing situation. I simply know from experience what it would be like if it were the case. The error arises when I leap to a conclusion on the basis of insufficient data. (Maze, 2001/2009, p. 174)

For example, when a subject hallucinates about a unicorn, the subject is said to be aware of a belief about horse-like creatures and the belief about mammal-like creatures with single horns. That is, in cases of errors, the ingredients are at least real (cf. Tonneau, 2004, 2011, 2013), but how these come to be united is not addressed.

Michell instead, proposes a different approach: if true belief is cognition of a true state of affairs (i.e., the fact that *p*) then false belief is *erring* (i.e., not-*p*.) That is, "[f]alse belief, like true belief, must be related to propositions" (Michell, 1988/2011, p. 312) but error is the

knower entering into a relation with not-*p*, which may be a result of the knower *ignoring* the fact that they are in a relation with not-*p*. In other words, the relation of error is no longer to the false proposition but to a relation where the subject does not realise that *p* is not the case. This idea of ignoring or neglecting is one that is similar to Gibson's where even if the organism is capable of picking up information, the organism may neglect or ignore the information (Rantzen, 1992/2011). This situation may arise when there is too much information for the organism to manage and so:

> [a]t this stage only the information required to identify an object need to be picked up and all the other information in the array, whatever makes it unique and special can be neglected … There is a great danger of error, we may note, in this kind of economical perception. (Gibson, 1966b, p. 309)

Gibson later writes that the selective attention may be due to "[t]he malfunctioning of the perceptual systems which leads to true hallucinations … is probably due to some kind of inhibition of perceptual exploration with a shutting off or rejection of the current input of perceptual information" (Gibson, 1966, p. 317). While Gibson does not develop this idea of inhibition further, from the situational realist point of view, inhibitory processes may be the key to a direct realist account of error.

According to Michell (1988/2011), if *S* believes *X* is *Y* and *S* is being prevented (inhibited) from cognising the fact that s/he does not know that *X* is not *Y*, then this is a second order inhibition, which arises due to ignorance (i.e., *S* is *ignoring* the fact that not-*p*):

> When subject to a first-order error (which we have been describing as errors of omission) *A* is *inhibited from cognizing that X is not Y*, a process referred to as *A*'s *ignoring* that fact. Inhibition as a mechanism for blocking cognition … underlies *all* forms of errors. This first-order error is *not* a false belief, for *A* might quite correctly

> recognize his ignorance. However, when it seems additionally to *A* that he *knows* that *X* is *Y*, then this is what is traditionally conceived of as a false belief. It is explained, non-traditionally, by *A*'s being inhibited from cognizing the fact that he does not know that *X* is not *Y* (second-order error) … We might say that *A*'s error comes about because he's inhibited from cognizing his lack of knowledge (Rantzen, 1993/2011, p. 409, emphasis in original).

That is, in the first place, first order inhibition do not necessarily result in false beliefs but rather, the errors of commission occur when second order inhibition is involved (i.e., *S* does not know *X* is not *Y*). Thus, errors of cognition occur due to the *absence of cognition* since it is not a variety cognition gone wrong but instead a form of non-perception or non-cognition (Rantzen, 1993/2011).

If cognition involves sensitivity to spatio-temporal location and features of the situation, then "the obvious candidate for a process underlying error is one in which some component of this sensitivity is prevented" (Michell, 2004, p. 8). Michell (1988/2011) speculates that such process of inhibition might lie with the instinctual drives (see Chapter 2). If instinctual drives are able to selectively guide cognition, then there is no difficulty in claiming that the same instinctual drives can be the cause of the inhibition of cognition (Michell, 1988/2011). While Michell does not elaborate further about the specific mechanisms involved, Michell does suggest that one relatively obvious candidate could be neural inhibition. It is undeniable that cognitive sensitivity is dependent on neural activity in the brain so the "required sensitivity will typically involve specific sets of neural processes" (Michell, 2004, p. 8). Therefore, if something was to interfere with the neurological processes in the brain, it follows that the interference might in turn prevent the organism from not only realising that it is in error but also preventing it from recognising that it is in error. In this sense, *S* falsely believes that *X* is *Y*, which could have come about due to very specific and motivated inhibition of certain activities at a neurological level, resulting in the subject

ignoring the fact that *X* is not *Y* (Michell, 1988; 2004). Accordingly, errors occur because we are:

> … prevented from *recognising our ignorance* ... Normally, if we are preventing from cognising some matter of fact that we are otherwise capable of cognising, we are able to recognise our ignorance. When we recognise our ignorance, we can take steps to overcome it. However, if we are not only ignorant, but also ignorant of our ignorance, then we are in danger of error. Ignorance itself is no cause for alarm. *Meta-ignorance* is. (p. 8, emphasis in original)

As Freud (1915) notes, all mental processes are in the first instance unconscious and require a second mental act to become known (cf. Maze, 1983; Boag, 2008b, 2012). That is, when *S* knows *p* the relation of knowing (*S*R*p*) is not itself known and requires a further act of reflection such that *S* knows *S*R*p* (see Boag, 2008b, 2012). For instance, we all believe that the earth is round and this belief is generally unconscious (not presently the object of attention) until attention is turned to it (such that a person knows that s/he knows that the world is round) (Armstrong, 1973; Boag, 2008b). When the fact is not presently known it can be described as an unconscious belief and at any given moment the majority of our beliefs etc., are unconscious (see Boag, 2008b, 2012; cf. Maze, 1983). Consequently, there is no logical difficulty with the claim that we can know but yet not know that we know and given situation (Boag, 2008, 2012). For example, in instances where injury is sustained such as brain damage to particular regions in the brain (i.e., Alzheimer's disease, or those arising from other medical conditions such as Korsakoff's syndrome, hemispatio-neglect, etc.), such conditions can prevent us from being able to reflect upon what we know (Boag, 2008, 2012). Nevertheless, there are a few issues with Michell's solution. Rantzen (1993/2011) notes that Michell's (1988/2011) account of inhibition of cognition does not take into account a number of instances reflecting people's actual experiences. For example, Rantzen says that if the fins

of the Müller-Lyer illusion are removed, or if the previously naïve subject had the opportunity to learn about the illusion, what should happen is that the error of commission becomes corrected and the subject accepts that now the lines are of equal length. If said subject is subjected to the second-order inhibition of the fact that not-*p*, then an exposure of the fact that the lines are equal should reassert the second-order inhibition. However, the problem is that if, according to Michell, the subject is inhibited from cognising the fact that the lines are equal, an exposure to the same fact under different circumstances tends to counteracts the subject's inhibition of the fact not-*p* (Rantzen, 1993/2011). Even if one tries to argue that the fins are the reasons for causing the second-order inhibition (i.e., they are responsible for causing both the first and second-order inhibition) and so removal of the fins will eliminate the error (Rantzen, 1993/2011). The problem is accounting for why when the fins are reinstated, only the first-order inhibition and not the second-order inhibition, is affected. That is, when the fins are put back on the figure, the subject that is aware of the illusion is more likely to report that the lines are equal despite being subjected to the effects of the illusion of not seeing the lines as equal.

In contrast, subjects suffering from delusions are likely to persist in denying the fact not-*p* regardless of the situational context and the denial would assert itself whenever not-*p* is cognised (Rantzen, 1993/2011). Instead, delusional subjects would persist in denying the fact that not-*p* regardless of whether they are presented with evidence that says otherwise. Therefore, what Rantzen (1993/2011) wishes to argue is that in such cases, subjects cannot be said to be subjected to an inhibition that prevents them from recognising the true states of affairs since in the first place, subject are already experiencing a perceptual error (Galloway, 2000; see section on errors of omission for examples of organism-environmental situations). The difference lies in that what Rantzen proposes is the case is that the second-order is not one of inhibition but one of error of a different sort.

Secondly, Michell's (1988/2011) account does not take into consideration that inhibition that might be motivated in an active sense where subjects play an active role in

preventing themselves from knowing the situation and, inhibition from other sources outside the subjects' control that are more passive. For example, compare two people in the room that are watching a horror movie. When a gory scene is played, one person here might actively inhibit knowledge by shutting his or her eyes and covering his or her ears, while the other may suddenly feel the urge to go to the bathroom because a stomach ache has come on, and thus needing to leave the room and not viewing the gory scene. The point is that subjects are not always conscious or aware that inhibitory processes are taking place.

In short, errors of omission are instances in which the organism is not standing in the appropriate cognitive relation, such that the organism is unable to perceive part(s) or whole situations. In terms of how error can come about, it can be due to environmental factors such as fog or lack of good lighting that prevents the subject from standing in the appropriate relation to view the situations accurately. On the other hand, there are other factors where there are situations where errors arise because the organism did not have the opportunity to perceive the situation and so lacks the opportunity to cognise the situation accurately. The organism may also not cognise the situations accurately in the first place due to the inability to cognise caused by the organism lacking the biological structures to do so, and lastly, the organism may not be able to cognise the situation accurately due to motivation that can prevent the subject from perceiving and recognising that they are in error.

Errors of Omission

As established earlier, errors of omission are the instances where "the organism fails to stand in the requisite cognitive relation" (Rantzen, 1993/2011) and as a result the organism does not perceive part(s) or even whole situations (cf., Holt, 1914). The charge of errors of omission is that because the direct realist is committed to the view that direct perception of the world is possible, then how do errors arise even if the subject has direct access to the world?

Rantzen (1992/2011) argues that error, rather than being the case of perception or cognition gone wrong, is actually the case of non-perception or non-cognition. Therefore, error is the result of mechanisms different from perception and therefore, misperception (or error) and cognition are asymmetrical. Rantzen (1993/2011) proposes that there are at least three categories of organism-environment situations in which errors of omission can arise: (i) the lack of opportunity to cognise; (ii) the organismic inability to cognise, and; (iii) the inhibition of cognition.

First, (i) a lack of opportunity to cognise is where relevant information is not available to the subject require to perceive the situation correctly (Galloway, 2000; Rantzen, 1993/2011). For example, consider the Müller-Lyer illusion. Individuals from western societies who live in rectilinear environments are more susceptible to the Müller-Lyer illusion because individual from western societies tend to learn from a very young age that the fins provide valuable cues for depth perception (cf. Rivers, 1905). Thus, when a naïve western subject is exposed to the line drawings of the Müller-Lyer illusion, s/he believes that one line is longer than the other when in reality both lines are exactly the same length. This stands in contrast to populations that tend to perceive more circular shapes in their culture and society. For instance, both individuals from more rural African tribes and Inuit societies (Berry, 1968; Segall, Campbell & Herskovits, 1966) do not perceive the lines of the Müller-Lyer figure as being unequal in length. Therefore, the reason why some individuals are particularly susceptible or immune to visual illusion like the Müller-Lyer illusion is due to a lack of opportunity to cognise.

Second, (ii) organismic inability to cognise situations is found in any case where an individual does not have the requisite skills or tools to cognise situations accurately. For instance, an underlying biological condition, such as colour-blindness might mean that the subject is unable to discern certain colours, such as red and green. In such cases, the organism is able to cognise other features of the situation but due to missing cones and rods in the retina of the eye, fails to pick up information about certain spectrums of colours. This failure to

cognise is generally due more to a lack of biological structures to support learning and remembering (see Galloway, 2000 for other examples relating to other perceptual illusions).

Third, (iii) What Rantzen (1993/2011) refers to as the category of inhibition of cognition refers to the situation where a subject is prevented from recognising the fact that s/he are in error and this can occur either as an active mode where the subject is an active participant in the inhibitory process or as a passive mode where the subject is not necessarily aware that s/he is engaging in inhibitory processes. For example, a subject that has a spider phobia may mistake a toy spider on the table for a real. Due to a fear of spiders, the subject may not want to take an active stance to go investigate and confirm whether or not the spider on the table is a real spider or not and thus, is inhibited from recognising that s/he is in error. In short, errors of omission are instances where the organism is not standing in the appropriate cognitive relation, such that the organism is unable to perceive part(s) or whole situations. In terms of how error can come about, it can be due to environmental factors such as fog or lack of good lighting that prevents the subject from standing in the appropriate relation to view the situations accurately. On the other hand, there are other factors where there are situations where errors arise because the organism did not have the opportunity to perceive the situation and so lack the opportunity to cognise the situation accurately. The organism may also not cognise the situations accurately in the first place due to the inability to cognise caused by the organism lacking the biological structures to do so, and lastly, the organism may not be able to cognise the situation accurately due to motivation that can prevent the subject from perceiving and recognising that they are in error.

Errors of Commission – The Illusory Case

With respect to errors of commission, Rantzen (1993/2011) proposes that errors of commission arise due to a hierarchy of errors of omission, termed as a hierarchical omission theory of error (cf. Armstrong, 1955). As described in errors of omission, errors arise due to the organism not standing in an appropriate cognitive relation where the organism fails to

perceive some part(s) or whole situations. Three different situations were outlined, where a lack of opportunity to cognise, inability to cognise, or the inhibition of cognition, can result in an organism's having an error of omission. Errors of commission are viewed as *second-order errors of omission* involving a two-stage process of a failure of cognition, which may occur through inhibition (i.e., preventing recognising that one is in error) but not necessarily so. Rantzen (1993/2011) writes, "[a]ny one of the three categories of errors of omission, when compounded by a second error of omission regarding the first, will cause an error of commission" (pp. 413-414). That is, if *S* believes *X* is *Y* and *S* is prevented (inhibited) from cognising the fact that s/he does not know that *X* is not *Y*, then this constitutes a second order error, which arises due to ignorance (i.e., *S* is *ignoring* the fact that not-*p*). For example, in terms of analogy, the multiplication of two negatives will yield a positive and similarly so in linguistics, where the use of double negatives in a sentence can be used to convey a positive (e.g. "I don't know nothing") (Mackay & Petocz, 2011).

In the case of errors of illusion, *S* falsely believes that *P* is *Q* where both *P* and *Q* may exist. In this case *S mistakes P* for *Q*:

S knows *P*.
S knows *Q*.
S mistakes *P* for *Q*, where *P* and *Q* are both situations that exist.

Errors of commission here are considered to be acts of mis-perceiving, and so, Rantzen proposes that errors of commission occur when any of the two errors of omission (either (i) a lack of opportunity; (ii) the organismic inability to cognise, or; (iii) the inhibition of cognition) would bring about an error of illusion. In the case of when a subject perceives a yellow ovoid-shaped object as it whizzes by them (due to someone throwing the object) and mistakes it for a tennis ball instead of a lemon, the first-order of error may be due to the subject's having not perceived lemons before (a lack of opportunity). The second-order error

follows from the first-order error where the person has not seen lemons before and so when a lemon whizzes by, the person did not have the opportunity to perceive and check that it is a lemon that whizzed by (another lack of opportunity). The second-order error is sustained when the subject mistakes the lemon for a tennis ball.

The hierarchical theory omission theory of error can also be applied to the case of the Müller-Lyer illusion (Rantzen, 1993/2011). When a naïve subject is presented with the Müller-Lyer illusion, the first-order error arises because the fins in the figure will operate to inhibit the perception that one line is not longer than the other (i.e., the person is prevented from recognising that the two lines are the same), which creates the illusion. The second-order error arises, not because of the inhibition caused by the first-order omission, but instead due to a lack of an opportunity to cognise the fact that one is in error because the organism has not encountered the illusion before. The second-order omission in this case proceeds from the first-order omission and the error of commission is maintained. According to Rantzen (1993/2011), subjects would be able to correct the second-order error by exposing them to the true state of affairs (e.g. by getting the subject to measure the two lines themselves with a ruler) and so subjects now are only inhibited at the first stage since they would not be able to overcome easily the perceptual neurology to perceive the lines as equal. However, as a result of the correction, the error of commission does not hold now since the organism no longer holds a false belief about the lines being unequal even though the organism will still perceive the lines otherwise.

Errors of Commission – The Hallucinatory Case

The solution to the case of errors of commission follows the same steps as for the case for illusory errors. In the case of errors of hallucination, *S* falsely perceives *P* is *Q*, where *P* and *Q* exist but the relationship *PRQ* does not:

S knows *P*.

S knows *Q*.

S mistakenly believes *PRQ*, where *PRQ* involves *P* being the property of *Q*.

To apply Rantzen's (1993/2011) hierarchical omission theory of error, where errors of commission are *second-order errors of omission* involving a two-stage process of a failure of cognition, which involve inhibition. For example, Rantzen (1993/2011) applies the hierarchical omission theory of error to the case of Dr. P (Sacks, 1985), who mistook his wife for his hat. First-order error arises because Dr. P is unable to cognise due to the neurological damage that his wife's head was not a hat and the second-order error follows from the first-order omission when Dr. P is unable to recognise that he is mistaking his wife's head for his hat. The error of commission is maintained at the second-order because he lacks the ability to correct the mistake.

Rantzen's (1992/2011) hierarchical theory of omission of errors has advantages over previous situational realist solution to the problem of error since it supposedly avoids the problem of accounting for the ontological status of the believed-in object in false situations. The theory is also able to account for cases where error arises due to environmental or organismic factors. It does, however, have its limitations.

Limitations

There are two main issues with Rantzen's (1993/2011) hierarchical omission theory of error. The first lies with the claim that any two errors of omission are adequate enough to bring about an error of commission and that the "hallmark of an error of commission will, however, always be present, and that is the compounding of one error of omission by another" (Rantzen, 1993/2011, p. 413). This set-up presents errors of commission are being parasitic on errors of omission. This is a problem because this solution appear too simple. Rantzen further concedes that the question of which omissions are in operation is not knowable *a priori* because it depends on the organism's history, circumstances and the condition of the

organism's existing biological structures. However, there is no problem with knowing errors after they have been made because for the most part, we are only aware of being in error *after* we either realise we are in error or that we are told that we are in error (Anderson, 1962).

The second issue with Rantzen's (1993/2011) account is that it cannot avoid the question regarding the ontological status of the false situation. For example, in the cases of hallucination where the object in question appears to be something that does not exist in reality, such as a unicorn, Rantzen is unable to avoid the question regarding the ontological status of the object in the false situation. While Rantzen is able to perhaps account for how, and to some extent why, the error of commission is sustained, the problem lies in accounting for the ontological status of the object in the hallucinatory case (e.g., the unicorn).
There is no straightforward easy solution to the problem of accounting for the ontological status of the object of error in the hallucinatory case. However, a possible solution from a situational realist position might lie in the idea of potential situations.

A Partial Solution to the Problem of Hallucination

Situational realism proposes that the way to account for the ontological status of the false situation is best accommodated by the idea that "when mistakes do occur they involve the mind's *misplacing* of real ingredients of situations" (Baker, 1986, p. 15). That is, all acts of cognition involve a subject and an object. Therefore, even in case of errors, the cognitive relations must involve a subject and an object, even in the cases such as hallucinations where the object does not exist in the world (Maze, 2001/2009). As Michell writes:

> [c]ognition and error are always cognition of some *fact* and error with respect to some fact; it always involves an organism in some state (defined physiologically and including its motivational state) and already standing in various *relationships* to its environment (including veridical and non-veridical *cognitive* relationships); and it

> always involves an environment composed of *spatio-temporal situations* of various kinds. (Michell, 1988/2011, p. 316, emphasis in original)

That is, in both cognition and error, the organism is always cognising some fact with respect to another situation, in some state and in various relationships to its environment such that the cognitive relation always involves spatio-temporal relations of various kinds. Therefore, in the case of error, what might be the case is that the subject may be in a situation where they are not aware that they are misplacing one object from one situation for another. For example, Jaime may misremember leaving yesterday's episode of brewing a cup of tea for one that occurred today when she went looking for said cup of tea in the living room.

In order to accommodate the idea that error is the case of the subject mistaking one situation for another, Baker (1986) suggests that there is a meaningful distinction to be made between the class of true propositions, and the class of situations. As Baker (1986) writes:

> …while all true propositions are situations, it is only the case that all situations are *potentially* true propositions; not all of them have in fact yet come to be believed or 'proposed' by somebody, and in view of what Anderson calls 'the infinite complexity of things', not all of them ever will be. (p. 15, emphasis in original)

That is, while true propositions are situations, all situations are only potentially true propositions that are not believed or realised by a subject (i.e., potential situations). This provides the opportunity to propose that perhaps, when errors arise in cognition, these are instances of errors regarding the *nature* of the situation where a potential situation is being mistaken for a true proposition. That is, in the case of error, where a subject believes a false proposition of *X*'s being *Y*, *X*'s being *Y* is not a false situation per se since this involves real terms and relations where a potential situation is being mistaken for an actual true proposition (i.e., true situation).

The idea of potential situations aligns well with the idea of infinite complexity and the nesting of situations. For example, Edna who lives in Australia knows of black swans and has never come across white swans. However, she knows of white ibises and white herons amongst other varieties of birds that have white feathers, so there is potentially, the proposition that there are white swans in the world. In other words, the potential propositions are 'neutral' in this sense because they present as situations that might come to be or may present as situations that will never be known (i.e., true or false beliefs).

Whilst similar to Armstrong's (1986, 1989, 1997) combinatorial theory of possibility, what is proposed here it not the idea of possible worlds or even possible states of affairs. This is an important distinction because while propositions may possibly be true situations yet to be realised, potential situations are by themselves only potentially true propositions (i.e., states of affairs). Additionally, unlike the case of possible worlds, potential situations are based on previously known true situations to the subject. That is, potential propositions are determined by true situations that the subject has previous knowledge or experience of. This is regardless of whether the subject is aware that they know that they have apprehended the situations before (i.e., knowing that they know; see Boag, 2012) and this may explain why in some cases of hallucinatory error, the object appears to be unfamiliar to the subject.

The question then is how does the particular form of potential situations come about? The tentative answer is that the form of the potential situation is explained by reference to the distinction of subject and predicate as someone mistaking *X* for *Y* (Anderson, 1927/1962; Baker, 1986). In knowing a situation, a subject knows the situations in space and time and so, in a complex world where previous known situations of universals and particulars are being mistaken for actual true situations. That is, in the cases of hallucination, a subject may mistake a potential proposition for an actual situation and falsely believe that the potential proposition is the true situation. For example, when Eddy hallucinates seeing a unicorn, the unicorn is the result of Eddy mistaking the situations of 'horse-ness' and 'mammals with single horns-ness' for a potential proposition where unicorns actually exist. As previously

said, whether Eddy is aware that he has encountered situations of 'horse-ness' and 'mammals with single horns-ness' is a separate matter. The point is that the situations of 'horse-ness' and 'mammals with single horns-ness' are known to Eddy.

A limitation of this solution concerns the ontological status of potential situations and until direct realists are able to account for the ontological status of potential situations, this remains a partial solution. However, this presents a step for direct realists to work towards future research to account for other varieties of errors like hallucination. In the next chapter, it will be shown that by it is by taking into consideration both memory and error together that the direct realist can begin to address the problem of memory error.

Summary

The problem of error is one that is an issue to any theory of cognition. For defenders of a relational direct realist account of cognition, the problem is accounting for error when there is a *direct* relation between a knower and the situation known. Furthermore, in the case of errors, there appears to be a direct relation to a false situation (i.e., non-existent situation) whereas direct realism is the thesis that cognition is only to real situations. Therefore, critics argue, direct realism must be false. However, the conclusion does not hold because direct realism holds that only *veridical cognition* is a direct relation between the organism and an object of cognition. That is, while veridical cognition is a direct epistemic relation between a subject and a known true situation, error is not a direct relation to a false situation. The relation of error and cognition are different and that the relation of error to cognition is in fact asymmetrical in nature.

Situational realism maintains that the ingredients involved in error must be propositions or states of affairs already known to the subject. While true situations are propositional, false propositions are not. Therefore, Anderson proposes that the occurrence of error is the result of someone's mistaking *X* for *Y*, where both *X* and *Y* are true situations. While Anderson's account encounters problems relating to the how the ternary relations is

held between *S*, *X*, and *Y*, Michell proposes that the asymmetry of relations can be rescued if true belief is cognition of a true state of affairs (i.e., the fact that *p*) then false belief is *erring* (i.e., not-*p*.) and so the subject enters into the relation with not-*p,* which may be a result of the knower *ignoring* the fact that s/he are in a relation with not-*p*. Error is thus proposed to be the result of an absence of cognition that may be due to neural inhibition.

Taking direction from Michell (1988/2011), Rantzen (1993/2011) proposes a hierarchical theory of omission where three categories of errors of omission can arises: (i) the lack of opportunity to cognise; (ii) the organismic inability to cognise, and; (iii) the inhibition of cognition. Errors of commission are conceptualised as second-order errors where any two errors of omission compounded will lead to an error of commission.

While Rantzen (1993/2011) is able to show how errors of commission arise from a situational realist perspective, in cases where the cognised object does not exist, the ontological status of the object of error comes into question. A partial solution is offered here whereby in the case of hallucination, what is proposed is that the organism (whether they are aware or not) mistakes the universal and particulars of previously known situations (that they not know that they know) for a potential situation. However, this is only a partial solution and what requires consideration is the role of memory and time.

Chapter Five: A Contribution to the Realist Understanding of Memory Errors

Introduction

While most individuals are able to recollect accurately on most occasions, both everyday experiences and laboratory findings show that memory is not only fallible but also malleable (Roediger & McDermott, 2000a, 2000b; Schacter, 1995, 2001; see also Loftus, 1975, 2003; Loftus & Palmer, 1974). Memory errors have been at the heart of both theoretical and empirical studies going back to the ancient Greeks. The topic of memory error presents a unique challenge for direct realism because it requires the thesis to tackle related challenges concerning memory and errors in general. Taken in consideration, the challenge of memory errors for direct realism is twofold: not only is the act of remembering apparently taking place separately from the time that the remembered initial event occurred, but the direct realist needs also to account for how the subject, who has a direct, independent relation to the event, can be mistaken about the past event s/he is remembering. This chapter will examine the types of memory errors studied in psychology before proceeding with showing how the situational realist can account for such memory errors.

Types of Memory Errors

As discussed in the previous chapter, there are two main kinds of errors: errors of omission and commission. With regard to memory, errors of omission generally refer to instances where the subject is unable to recall previously recalled information (Roediger & McDermott, 2000, p. 149; cf. Kimball & Bjork, 2002). For example, an error of omission occurs when a person is unable to recall the name of a person he or she has just met. According to this definition, forgetting is an error of omission. However, as will be shown later in the next section, forgetting is not necessarily an error of omission. Therefore, similar to the definition of errors of omission in perception in Chapter 4, errors of omission in memory are instances when the organism fails to stand in the appropriate cognitive relation

with the cognised situation, thereby resulting in the organism not being able to recall part(s) or whole situations.

Errors of commission in memory, on the other hand, are instances when people recall events quite differently from the way that they happened, or when they recollect an event that has never happened at all (Roediger & McDermott, 2000; see also Koriat, Goldsmith & Pansky, 2000, 2006; cf. Kimball & Bjork, 2002). For example, remembering the car involved in a motor vehicle accident as being blue instead of red would be an error of commission. As with the definition of errors of omission in memory, the definition will be modified to reflect the definition of errors of commission in Chapter 4. Therefore, errors of commission in memory are the instances when the subject recalls events differently from the way that they happened, or recalls events that have never occurred in the first place, resulting in the subject holding a false belief.

With the definitions established, the next section will examine some of the types of errors of omission and commission in memory within the psychological literature.

Errors of Omission in Memory

Errors of omission are the instances when the organism fails to stand in the appropriate cognitive relation, thereby resulting in the organism not being able to recall part(s) or whole situations. With errors of omission in memory, *S* perceives *P* but fails to stand in an appropriate relation where *S* is able to know that *S* had perceived *P* correctly, therefore leading *S* not to recall part(s) of *P* or even *P*. For example, Tom drives to the university and parks his car on level one. However, as he was in a rush, he did not take note exactly where he had parked his car, and so when he returned later, he realised that he could not recall where he parked his car.

In the psychological literature, instances of forgetting are often classified under errors of omission (e.g., Kimball & Bjork, 2002; Roediger & McDermott, 2000a, 2000b). However, as mentioned previously, not all instances of forgetting are actually memory errors per se.

Forgetting

While seemingly obvious, defining forgetting is actually not a simple task. First, forgetting is not a unitary phenomenon (Neisser, 1978; Wessel & Moulds, 2008) in that forgetting is not simply the act of failing to recall and can be conceived in a number of ways (for a review of theories of forgetting, see Wixted, 2005; see also Connorton, 2008; Roediger, Weinstein, & Argarwal, 2010).

Second, some argue that forgetting is actually not the opposite of remembering since forgetting does not occur in the absence of remembering (e.g., Wixted, 2007). That is, successful remembering occurs in the absence of forgetting. However, postulating forgetting and remembering as mutually exclusive processes creates circular explanation, which does not reflect the case since there is evidence to show that retrieval of information can affect forgetting (e.g., Anderson, Bjork, & Bjork, 1994, 2000; Anderson & Hanslmayr, 2014; Huddleston, 2012; Barnier, Hung & Conway, 2004).

Third, the idea that forgetting is a 'cognitive vice' (Michaelian, 2011b), 'cognitive malfunction' (Schacter, 2001), or more commonly, as a failing of the memory system, requires revision. Recent studies have turned their focus on the adaptive functions of forgetting (e.g., Anderson, 2003; Bjork, 1989; Nørby, 2015; Schacter, 1999; Storm, 2011). For example, psychologists such as Bjork and Bjork (1988) argue that forgetting is critical for preventing out-dated information from interfering with current recall of necessary information. Forgetting is thus adaptive in the sense that items in memory that are accessible would be those that we have been retrieving recently. The items that we are retrieving more often and more recently would tend to be ones that are most relevant to our interests and thus, would statistically be more likely to be relevant to future situations.

The advantage of forgetting is also illustrated when one is not able to forget. Take for example, the case of a woman, AJ, who reports the inability to forget about autobiographical events in her life and who is bound by her recollections of her past, whether they are good or

bad (Parker, Cahill, & McGaugh, 2006). The authors propose that AJ's condition be named as hyperthymestic syndrome and is characterised by the superior autobiographical memory. However, unlike previous literature that emphasised the ability to perform memory feat such as learning strings of random numbers and repeating them back, AJ reports elements of being disturbed by her autobiographical memory and not having control over her superior autobiographical ability. For instance, AJ reports having memories of being a toddler in the crib and take any date and be able to recall what day it falls on and what she was doing on that date and any significant event associated with the date such as the Challenger explosion. This form of memory condition differentiates from other eidetic memory cases as it only applies to autobiographical information and does not extend to performances in other memory systems such as working memory. For example, AJ reports having difficulties with rote learning in school. The case study of AJ calls into question whether seemingly "superior" remembering is necessarily a virtue and so, lends support to the notion of a form of "virtuous" forgetting, where there is a balance between forgetting information that one no longer needs but is able to retain access to information that one continues to need (Michaelian, 2011b).

In short, the psychology of forgetting indicates that in understanding how errors of omission are defined and conceptualised, one needs to take in account that even a so-called simple act of forgetting is complex and not necessarily considered as 'error'.

Errors of Commission in Memory

Errors of commission in memory are defined as the instances when the subject recalls events differently from the way they happened, or, recall, events that have never occurred in the first place, resulting in the subject holding a false belief. Similar to the case of perceptual errors, we can identify two general types of errors of commission: illusory and hallucinatory.

Errors of Commission in Memory – The Illusory Case

With errors of illusion in memory, *S* remembers *P* instead of Q, and this is a case where *S* falsely believes that *P* is *Q* where both *P* and *Q* may exist. In this case *S misremembers P* for *Q*:

S knows *P*.
S knows *Q*.
S misremembers *P* for *Q*, where *P* and *Q* are both situations that exist.

For example, Tom drives to the university and parks his car on level one. When Tom returns to his car later, Tom finds himself on level 2 thinking that this was where his car was. However, upon arriving at level 2, Tom realises that he had misremembered the fact that he parked his car on level two (he had parked there on the previous day) instead of level one. He had mistaken the memory of the car's location for the day before with today's location.

Memory distortions

In psychology, the types of memory errors that are included under errors of commission in the illusory case include the varieties of memory errors known as memory distortion, memory illusion, and the more widely recognised term, false memory (Roediger, 1996; Schacter, 1995; see Bernstein & Loftus, 2009a; see Deprince, Allard, Oh, & Freyd, 2004; Pezdek & Lam, 2007; see also Wade et al., 2007 on debates on the use of the term false memory). For example, false memory includes a wide range of memory errors ranging from (but not limited to):

> … changes in the context of a memory (e.g., believing you saw something that was imagined or believing you heard about an event on the television news rather than from a friend) to changes in the content of the memory itself (e.g., believing a criminal carried a gun rather than a knife). (Okado & Stark, 2005)

That is, false memory encompasses a number of memory errors ranging from partial memory distortion in the context of the memory, to changes in the content of the memory in both experimental and natural recollections (i.e., with or without experimental manipulation to influence and elicit errors) (Wade et al., 2007). Examples of errors of commission in the illusory case are the errors arising from the misinformation effect and misattribution errors. The misinformation effect demonstrates how post-event information could affect the accuracy of recall (e.g., Bekerian & Bowers, 1983; Loftus, 1980; Loftus & Hoffman, 1989; Loftus, Hoffman & Wengenaar, 1992; Loftus, Miller, & Burns, 1978; Loftus & Palmer, 1974; see also Loftus, 2005). In one of the studies, Loftus and Palmer (1974) had participants watch a film depicting a car crash and asked various questions about what they saw. Loftus and Palmer found that when the word "hit" was replaced with "contacted", "bumped", "collided", or "smashed", the participants' estimated speed of the car varied. The word "smashed" elicited in the highest average speed, while the word "contacted" produced the lowest speed estimate. A week later, the participants were asked about the presence of broken glass and it was found that those who were asked the question with "smashed" were also more likely to report the presence of broken glass.

The experimental set up to investigate memory distortion is termed the misinformation effect paradigm and has been applied widely to demonstrate the pervasiveness of the malleability of memory but also more importantly, how the interviewer's style of questioning can affect the way the memory event is perceived and recalled. Unlike previous tests that utilised word lists, the misinformation effect shows how memory contamination can occur in everyday settings and in particular, in the case of eyewitness testimonies (see Loftus, 1975; 1979; see also Ceci & Bruck, 1993 for the history of eyewitness testimony studies in children).

Misattribution errors refer to instances where a subject misattributes the information to the wrong source (Schacter, 1999, 2001). Johnson, Hastroudi, and Lindsay (1993) introduced

the source-monitoring framework that highlights the development of factors that affect accuracy and inaccuracy of remembering in the area of memory distortion. Source memory, also known as source monitoring, is the term used to describe the process by which people remember when and where a memory was acquired. Any failures to distinguish where and when the memory is acquired are known as source monitoring errors (Johnson, Hastroudi, & Lindsay, 1993).

While both the misinformation effect and misattribution errors are listed as examples of errors of commission in the illusory case, the experimental paradigms are often also applied to investigate cases in the hallucinatory case as well (see the next paragraph). For example, the initial interest of Johnson and colleagues (Johnson, Taylor, & Raye, 1977; Johnson & Raye, 1981) was to investigate how individuals distinguish between information derived from external sources (i.e., events that actually occurred) and those that were generated from sources that are internal to the person (e.g., events that were imagined). What these researchers found was that the more times subjects imagined an event, the greater the impact it had on their judgements concerning the frequency that the event actually occurred. Moreover, Johnson and Raye (1981) noted that subjects would confuse the imagined events for those that actually occurred. This form of error was what Johnson and Raye termed as failure of reality monitoring, where reality monitoring refers to the process by which a person attributes a memory to an external or internal source (Johnson & Raye, 1981. cf. Johnson, 1977).

Errors of Commission in Memory – The Hallucinatory Case

With errors of hallucination, *S* remembers *PRQ* instead of either *P* or *Q*, and this is a case where *S* falsely believes *PRQ*, where *P* and *Q* may exist but the relationship *PRQ* does not:

S knows *P*.

S knows *Q*.

S misremembers and falsely believes *PRQ*, where *PRQ* involves *P* being the property of *Q*.

For example, an error of hallucination in memory would be if Brad remembers having a goldfish for a pet as a child when in actual fact, he has never owned a pet and so did not have a pet goldfish.

Implanting memory events

One example of errors of commission of the hallucinatory case can be seen in the studies investigating the implantation of memory events. Within the memory distortion research, it is one thing to manipulate and change a memory (e.g., remember that the driver in the accident is a woman instead of a man), it is a separate thing altogether to implant a 'whole' memory event (e.g., remembering having eggs for breakfast when actually, the person had skipped breakfast) (Loftus, 1999). Experiments that investigate the possibility of implanting fictitious events have suggested various events ranging from getting lost in the mall (Loftus & Pickrell, 1995), being hospitalised when they were younger (Hyman, Husband, & Billings, 1995), having false memories concerning food (Bernstein, Laney, Morris, & Loftus, 2005; Bernstein & Loftus, 2009a), and even using doctored photographs to create false childhood memories (Wade, Garry, Read, & Lindsay, 2002). What these results from the experiments show are that it is possible to implant a fictitious memory event in participants ranging from children to adults (see also de Lavilléon, Lacroix, Rondi-Reig, & Benchenane, 2015; Ramirez et al., 2013; Xu, Ramirez & Tonegawa, 2014 for examples in animal studies manipulating false memory at the neuro-cellular level). An implication of the results from experiments investigating implantation of whole memory events is that the results showed how unreliable and how malleable memories can be and thus lending support that undermined the credibility of claims and allegation from individuals whose memories have been de-repressed during therapeutic and forensic settings (see Loftus, 1993, 1994;

Loftus & Davis, 2006; Loftus & Ketcham, 1994; see also Campbell, 2006b; Crews, 1990; Patihis, Ho, Tingen, Lilienfield, & Loftus, 2014 on the Memory Wars that was the controversy between clinicians and memory research scientists on the reliability (or rather, unreliability) of repressed memory. What the memory implantation research shows is that there are very important implications regarding not just how techniques can be applied to elicit false memories in individuals but also, the ontological status of the fictitious memory event can have very real and dire implications and consequences in the study of hallucinatory cases of memory errors.

Another example of errors of commission in the hallucination case is confabulation errors. The phenomenon of confabulation has various definitions (see Metcalf, Langdon, & Coltheart, 2007; Nedjam, Devouche, & Dalla Barba, 2004). The definition of confabulation has evolved from the initial description by Berlyne (1972) that views confabulation as a "falsification of memory occurring with clear consciousness in association with an organically derived amnesia" (p. 38) to one that suggests there is a motivational component. One example is the definition by Fotopoulou, Conway, and Solms (2007) who write that confabulation is the "production of fabricated, distorted or misinterpreted memories about one's self or the world without conscious intention to deceive" (Fotopoulou, Conway & Solms, 2007, p. 2180). The evolving conception of confabulation as reflected in the definitions shows a change in the view that confabulation occurs incidentally without conscious intention (e.g. Dalla Barba et al., 1997; Dalla Barba, & Decaix 2009; Kopelman, 1987; Talland, 1965) to one where the confabulation serves to reflect self-enhancing biases, suggesting that motivational forces may have a greater role than previously thought (Conway & Taachi, 1996; Fotopoulo, Solms, & Turnbull, 2004; Fotopoulo et al. 2007; Fotopoulo, Conway, Griffths, Birchall, Tyrer, 2007).

Situational Realist Approach to Errors of Omission and Commission of Memory Errors

The strategy for approaching memory errors from a situational realist approach is to employ Rantzen's (1993/2011) categories of omission and the hierarchical omission theory of error where any two errors of omission will result in an error of commission (see Chapter 4). Since perceiving is involved in remembering, the categories of omission and the hierarchical omission theory of error should extend themselves to account for memory errors as well.

Errors of Omission in Memory

As stated before, errors of omission are the instances when the organism fails to stand in the appropriate cognitive relation, thereby resulting in the organism not being able to recall part(s) or whole situations. In other words, *S* perceives *P* but fails to stand in an appropriate relation where *S* is able to know that *S* had perceived *P* correctly, therefore leading *S* is not recall part(s) of *P* or even *P*. With some modification, the aim is to apply Rantzen's (1993/2011) three categories of organism-environment situations as described in Chapter 4 to show how errors of omission in memory are accounted for from a situational realist account.

In the first instance, errors of omission in memory arising from a lack of opportunity to cognise is where relevant information is not available to the organism, and so the organism is not able to recall the situational correctly. In the case of memory error, this may present as the situation where the subject, in the initial act of perception, did not stand in the appropriate cognitive relation such that the relevant information was not available to the organism, resulting in the organism being unable to recall the information. For example, if the subject was distracted or standing in a way where s/he has only partial view of some object, then the organism may not be able to perceive the situation accurately.

In the case of Tom discussed previously, after Tom had driven to the university, Tom had failed to stand in the appropriate cognitive relation where he had perceived that he had parked his car on level one. At this first instance, Tom would have perceived certain information that was relevant (e.g., he had parked in the car park) but missed specific aspects that would cue him on where he really parked his car (e.g., he did not check the signs that

indicated what level he had parked), therefore resulting in Tom not being able to recall where he had parked his car.

When errors of omission in memory errors arise from the organismic inability to cognise, an individual does not have the requisite skills or tools to perceive and/or remember situations accurately (Rantzen, 1993/2011). For example, persons with neurological damage to the hippocampus, such as Clive Wearing (Wilson & Wearing, 1995) and Henry Molaisson (or H. M. as he was more famously known, who underwent a bilateral medial temporal lobectomy (see Corkin, 1984, 2002; see also Corkin, Amaral, Gonzalez, Johnson & Hyman, 1997), might be able to perceive but not necessarily be able to remember situations accurately. Similarly, the phenomenon of childhood amnesia or infantile amnesia (Freud, 1905/1953), involving the absence or scarcity of autobiographical memories in adults for events that occurred in their earlier years, until the ages of around 4-5 years (Fivush & Hudson, 1990; see also Bauer & Fivush, 2013), also indicates an organismic inability to remember.

When errors of omission in memory arise due to the inhibition of cognition, this is the situation where the subject is prevented from recognising the fact that he or she is in error (Rantzen, 1993/2011). Motivation is one possible factor that can prevent subjects from recognising they are in error. For example, in a case study of himself, Freud (1901) found that he had difficulty recalling the name of the artist whose work in the dome of Orvieto he admired. As Freud (1901) writes:

> The name I tried without success to recall in the example I chose for analysis in 1898 was that of the artist who painted the magnificent frescoes of the 'Four Last Things' in Orvieto cathedral. Instead of the name I was looking for – *Signorelli* – the names of other painters – *Botticeli* and *Boltraffio* – thrust themselves on me, though they were immediately and decisively rejected by my judgement as incorrect. When I learnt the

> correct name from someone else, I recognized it at once and without hesitation. (p. 2, emphasis in original)

In this example, Freud demonstrates that motivation can interfere with remembering. What had happened was that whilst travelling to a station to Herzegovina, Freud and his travelling companion were engaged in chats about travelling in Italy. Prior to the talk about Italy, they were discussing the customs of Turks in Bosnia and Herzegovina where Freud had related an anecdote about Turks who show full confidence in their physician and submission to fate. When one is informed that no further help is possible for the patient, the patients would reply, "*Sir* (Herr), what can I say? I know that if he could be saved you would save him" (Freud, 1901/1914, p. 6). From here, an association formed between Bosnia, Herzegovina, and Herr (sir) and the names Signorelli, Botticelli and Boltraffio and *Herr* (Sir) and Signorelli, Botticelli and Boltraffio.

What Freud realised later was that the talk about the Turks in Bosnia brought on a "*disturbance of the newly emerging theme preceding it*" (Freud, 1901, p. 6, emphasis in original). The second anecdote that Freud had wanted to recount about Turks was how they valued sexual pleasure above all else, to point that losing sexual pleasure would bring them into despair, with one saying that, "[f]or you know, sir (Herr), if that ceases, life no long has any charm" (1901, p. 6). Freud at this point refrained from retelling this anecdote because the train of thought would have led to him remembering news about a patient in Trafoi who had just ended his life after a prolonged period of sexual disturbances. Freud writes, "[a]ll we have done in certain cases, to add a *motive* to the factors that have been recognized all along as being able to bring about the forgetting of a name" (Freud, 1901, p. 6, emphasis in original) and despite not being aware of the associations at first, Freud found that "[he had] *forgot the* [the name he was searching for] *against my will*, while I *intentionally* wished to forget the other" (Freud, 1901, p. 8, emphasis in original).

The categories of omission by Rantzen (1993/2011) do extend relatively well to accounting to errors of commission on the basis that perceiving is involved in remembering. The question now is whether Rantzen's hierarchical omission theory of error will extend to errors of commission in memory.

Errors of Commission in Memory – The Illusory Case

Errors of commission in the illusory case of memory errors are the instances when the subject recalls events differently from the way that they first happened. In this case *S misremembers P* for *Q* where both *P* and *Q* exist:

S knows *P*.
S knows *Q*.
S misremembers *P* for *Q*, where *P* and *Q* are both situations that exist.

For example, Tom drives to the university and parks his car on level one. When Tom returns to his car later, Tom finds himself on level two believing that he had left his car there. However, upon arriving at level two, Tom realises that he had misremembered the fact that he parked his car on level two (where he had parked yesterday) instead of level one. In other words, he had mistaken yesterday's car location for today's location.

As previously discussed in Chapter 4, errors of commission are *second-order errors of omission* involving a two-stage process of a failure of cognition, which may occur through inhibition (i.e., preventing recognising that one is in error) but not necessarily so. According to Rantzen (1993/2011): "[a]ny one of the three categories of errors of omission, when compounded by a second error of omission regarding the first, will cause an error of commission" (pp. 413-414). That is, in memory errors, if *S* remembers *X* is *Y* and *S* is prevented (inhibited) from cognising the fact that s/he does not know that *X* is not *Y*, this

constitutes a second order error, which arises due to ignorance (i.e., *S* is *ignoring* the fact that not-*p*).

Consider again the case of Tom who had driven to the university and subsequently misremembers that he parked on level two instead of level one. According to Rantzen's (1993/2011) hierarchical omission theory of error, a first-order error may arise when Tom failed to note where he parked his car in the first place because he was rushing to get to a meeting (i.e., a lack of opportunity to cognise). A second-order error could follow from the first-order error, preventing him from realising the mistake, in terms of a vandalised sign in the carpark, misinforming him of his location. It is only when he reaches level two of the car park that he realises his error and the second-order error is corrected. The first-order error is maintained until he is able to locate his car because he had failed to cognise the situation of where he really parked his car. While this appears to account for this example of illusory errors, the question is whether this can be applied to a psychological case study.

To address this, consider the example of source monitoring errors known as time-slice errors. Time-slice errors (sometimes referred also to the wrong time slice hypothesis, or "mislocations") arise when a person recalls a thought or action that seemed to be the correct event but the subject appears to recall a segment that is offset in time from the actual time the event had taken place (Brewer, 1988; Hyman, 1998; Neisser & Harsch, 1992). Despite the errors, it does not mean that the event is not an actual true experience (Hyman, 1998). According to Hyman, what may be happening is the case of a person recalling a true event but just not the one in question (i.e., the wrong slice of time) (see Brewer, 1998). Time-slice errors are suggested as a possible source of some erroneous information in flashbulb studies (Hyman, 1998; Neisser & Harsch, 1992; Winningham, Hyman & Dimmel, 2000; see also Kheriaty, Kleinknecht, & Hyman, 1999). Flashbulb studies examine the type of vivid and detailed memories of the circumstances surrounding a public event that the subject learns about, and often the subjects report remembering more about the circumstances than the actual event (Larsen, 1988; cf. Brown & Kulik, 1977). For example, one of the prototypical

studies of a flashbulb memory is the study of people's memories when they learn about the news of President Kennedy's assassination in 1963 (Brown & Kulik, 1977). For example, Neisser and Harsch studied flashbulb memories by utilising a highly publicised event, the 1986 explosion of the space shuttle Challenger. Students were distributed questionnaires the morning after the event asking them to describe details regarding what time it was when they heard the news, what they were doing, who else was there with them, etc. The questionnaires were then put away till two and half years later when the students were contacted and asked to fill in a similar questionnaire concerning the event with an additional item asking them to rate their confidence in their recall regarding the memories associated with the Challenger incident. Neisser and Harsch found that there were large discrepancies between what they had initially reported and what they wrote two and half years later. The students were subsequently interviewed and the errors persisted despite being provided cognitive cues and hints. When the students were shown their original questionnaire, the students were surprised by their own answers but were confident that the way they had remembered the event was correct. The errors persisted and seem permanent despite the investigators' efforts to elicit and assist with their recall. One of the possible source of the errors observed was the idea that the subjects actually remembers a real event but not on the occasion that when s/he had first heard about the Challenger explosion. Neisser and Harsch reports that one of the students RT had initially heard the news from two people who had walked into her religion class but this fact was forgotten while she remembered watching the news about the event on the television. Therefore, while the memory was vivid and her confidence rating was high, the accuracy score is actually zero because she had initially heard the news elsewhere.

To account for time-slice errors, according to the hierarchical omission theory of error (Rantzen, 1993/2011), a first-order error occurs when the subject may be prevented from recognising that the portions of the memory event is not in the right structure, as for example, first-order error might arise in the case of RT (Neisser & Harsch, 1992) because she may be unable to recall the memory of when she first learnt about the Challenger explosion because

too much time has lapsed between the initial time when she filled out the questionnaire on the morning after and the interview two and half years later. The second-order error follows from the first-order error because RT might be inhibited from realising her mistake due to a bias towards television. Neisser and Harsch (1992) reported that many of the subjects that reported discrepancies of their memories were often found to have watched television, despite that television was not the source of where they learned about the Challenger. The reasons for biasness towards television stem from a number of factors including the fact that many of the subjects did watch a lot of television that night when the Challenger news was reported and that the event were replayed repeated. Therefore, biasness toward television may inhibit RT from realising that that was not the first instance when she learned about the news, resulting in the persisting of the error.

Errors of Commission in Memory – The Hallucinatory Case

Errors of commission in the hallucinatory case of memory errors are instances when the subject recalls events that have never occurred in the first place, resulting in the subject holding a false belief. With errors of commission in the hallucinatory case, *S* remembers *PRQ* instead of either *P* or *Q* alone, where *P* and *Q* may exist but the relationship *PRQ* does not:

S knows *P*.

S knows *Q*.

S misremembers and falsely believes *PRQ*, where *PRQ* involves *P* being the property of *Q*.

For example, if Dave misremembers that Linda had a cat when Linda has never actually had a pet, let alone a cat. What is presented here is the instance where Dave misremembers previously known true situations of somebody else like Diana who does have a cat for a pet and mistakes some aspects of that previously known situation for one where Linda, who has never had a pet or a cat, is misremembered as having a cat as a pet.

Similar to accounting for errors of commission in the illusory case, according to the hierarchical omission theory of error (Rantzen, 1993/2011), a first-order error occurs when Dave is prevented from remembering that Linda did not have a cat for a pet because he might not be paying adequate attention to the source of the error (the fact that it was Diana who has a cat for a pet). The second-order error occurs when Dave is prevented from realising that he had actually mistaken the fact that Diana has a cat for a pet for the idea of Linda having a cat for a pet. The second-order error is maintained because he may be motivated to believe she had a cat for a pet because he knows Linda likes cats.

To apply this account to a psychology case study, consider the experiment by Loftus and Pickrell (1995; see also Loftus, Coan, & Pickrell, 1996) that utilised the misinformation paradigm and applied it to everyday autobiographical memory events. The authors devised the "lost in the mall" technique where subjects were presented with a booklet of four stories that were said to be true events that occurred in their childhood, as told by their relatives. However, unbeknown to the participants, one of the events was actually false (i.e., the one where they were reportedly lost). The false events were crafted from information given by the participants' family member about where the family would have shopped when the participant was five years old, which members would have gone on the shopping trip and what sort of stores might have attracted the participants' interests. The false event then always included the participants being lost for an extended period of time, that they cried, were lost in either a mall or large department store at aged five, were found and helped by an elderly woman, and lastly were reunited with their family. The subjects were then told to spend the next five days reading the scenarios and writing about what they remembered about each event. The subjects were further encouraged to 'remember' more details. It was observed that the subjects would not only 'remember' more details, but that the details evolved to become more vivid and richer. A few weeks later, the subjects were then interviewed and were asked to guess which was the false memory and 19 out of 24 chose the lost in the mall scenario correctly, although the remaining five were misled, indicating that it is possible to 'implant' false memories.

To apply the hierarchical omission theory of error to such cases (Rantzen, 1993/2011), a first-order error arises when the subject is presented with the false scenario and was told that the memory is a true one as corroborated by his family members. The subject in this instance lacked the opportunity to cognise that the scenario was false because he or she was being deceived about the accuracy of the event. The second-order error thus follows from the first when the subject is asked to recall and "remember" more information about the scenario. Given that the subject has previous experiences of visiting malls, and knows what it is to 'be lost', the second-order error is maintained because "[b]y this mechanism, the memory errors occur because grains of experienced events or imagined events are integrated with inferences and other elaborations that go beyond direct experience" (Loftus & Pickrell, 1995, p. 724). There is no difficulty with the idea that a person can mistake a previously suggested situation formed based on actual situations for an actual situation that does not exist.

Concerning the observation that when the participants are told that one of the four scenarios presented at the first session was false, 19 out of the 24 participants were able to pick out which memory is false. From the situational realist perspective, this would not be surprising because unless individuals reflect and realise the error, most would not realise that they are in error. In this study, the subjects were given a chance to reflect and so those who are able to are able to detect which scenario is the false one. What this indicates is that while individuals can be mistaken about their memory, it is important to show that people can be accurate and correct about their memories as well. For the five that did not correctly choose the false memory, this is an instance where the second-order error is maintained where they were not able to or inhibited from realising the error committed because they are likely to be unable to differentiate between aspects from previously known situations that formed the false situation. The situational realist maintains that memory errors are complex and there are a variety of reasons why some second-order error persist in some individuals over others. Loftus and Pickrell showed that while partial to full implantation of false memory is possible, there are differences in the way the memory persisted and the degree that the false memory

was recalled. While the participants remembered between 49 of the 72 true events, the rate of remembering for the false event was lower with only seven out of the 24 participants who 'remembered' the false event (either partially or fully) in the initial booklet and only six who remembered in the second interview follow-up (Loftus, Coan, Pickrell, 1996). What the results suggest is that it is possible to use explicit suggestions to implant a false memory but to maintain a false memory as a long term memory appears to be more complicated. Perhaps it might be due to plausibility (e.g., Bernstein, Godfrey, & Loftus, 2009; Mazzoni, Loftus, & Kirsch, 2001; cf. Hyman, Gilstrap, Decker, & Wilkinson, 1998; Hyman & Kleinknecht, 1999; Lindsay & Read, 1994: Pezdek, Finger, & Hodge, 1997; see also Strange, Sutherland, & Garry, 2006) but it could also be due to susceptibility where in general, young children (see Ceci & Bruck, 1993 for the history of children as eyewitnesses) and elderly adults are more likely to be affected by the misinformation effect (Karpel, Hoyer, & Toglia, 2001; see also Davis & Loftus, 2005). In any case, the boundaries and variables involved that sustains memory error are complex and remains to be empirically investigated.

Some Notes and Limitations

The aim of the thesis, rather than to provide accounts of all possible types of memorial errors, is to take steps to show how direct realists might address the problems of memory error. The account here is also not attempting to show what specific mechanisms underlie error. Instead, the present account demonstrates that solutions from situational realism need not conflict with empirical findings and may instead offer alternative solutions into exploring contributing factors that can account for memory errors. For example, the hierarchical omission theory of error (Rantzen, 1993/2011) does fit in with the widely accepted notion that memory can be constructive and reconstructive (Michaelian, 2011a, 2013; see also Neisser, 1967; cf. Bartlett, 1932). Particularly in the case where the object of error is often distorted or does not exist, there is no problem with the idea that aspects from previously known situations are falsely mistaken for the actual situations.

To some extent, the account here does share the same problem of accounting for the ontological status of the false situation as in the case of hallucinatory errors in perception. However, as discussed in Chapter 4, there is a way to accommodate the direct relation to object of the false situation where a potential proposition may be mistaken for an actual situation. That is, some aspects from previous known past situations are being mistaken for the actual past situation that is being remembered. Situational realism maintains that errors are always secondary to cognition and so to some extent, the object of error is at least in part related to true situations (Anderson, 1962; Maze, 1983; Michell, 1988/2011; cf. Tonneau, 2011). For example, if Barry misremembers that he used to live in a house on Daphne Street when he has never lived on Daphne Street, or lived in a house, what the situational realism proposes is that the idea of living in a house and the idea of Daphne Street are at least real situations that have been mistaken for aspects of a previous past situation.

On a final note, with regards to the direct realist understanding of error in general, I had suggested in Chapter 4 was that while memory and error are difficult challenges for situational realism, when memory and error are considered together, a direct realist understanding of error in general is possible. As shown above, memory errors show that when the infinite complexity of things is taken into account and we understand that in knowing, we know things as situated in space and time, it is not surprising that memory errors can be accounted for. The implication for account for error in general from a direct realist perspective is that when an organism is mis-cognising, the past and present situations are often involved and in some cases, past and present situations can be misplaced.

Summary

With regard to memory errors, the challenge involves accounting for both how a subject misremembers despite having a direct epistemic relation to past events and how the subject can be related to a false situation (i.e., a situation that does not exist). In general, there are two types of memory errors: errors of omission and errors of commission. Errors of

omission in memory are the instances when the organism fails to stand in the appropriate cognitive relation, thereby resulting in the organism not being able to recall part(s) or whole situations. On the other hand, errors of commission in memory are the instances when the subject recalls event differently from the way that they happened, or recalls events that have never occurred in the first place, resulting in the subject holding a false belief. Of the two, errors of commission present a greater challenge for defendants of realism. The chapter further identifies two types of errors of commission in memory: in the case of errors of illusion in memory, *S* remembers *P* instead of Q, where *S* falsely believes that *P* is *Q* where both *P* and *Q* may exist. In this case *S misremembers P* for *Q*. In the case of hallucinatory errors, *S* remembers *PRQ* instead of either *P* or *Q*, where *P* and *Q* may exist but the relationship *PRQ* does not. Applying Rantzen's (1993/2011) categories of omission and the hierarchical omission theory of error, it can be shown that memory errors can be accounted from a direct realist perspective. It is acknowledged that while errors of omission and errors of commission in the illusory case can be accounted for, there are limitations to this account of error and the ontological status of the object of error in the hallucinatory case remains a challenge for proponents of direct realism. However, since the question is whether it is logically possible to account for memory errors, the chapter is able to achieve some success in showing that yes, it is possible to account for memory error from a direct realist perspective.

Conclusion

The aim of the thesis is to show that it is logically possible to account for memory errors from a direct realist perspective. Memory errors present a unique challenge for direct realism because in the first place, in order to account for memory errors, the direct realist must first address the challenges associated with memory and error respectively. On the one hand, the direct realist must address how a subject in a present act of remembering can directly perceive an object in the past that no longer exists. On the other hand, the direct realist must address how a subject that is able to directly perceive an object can be mistaken. Taking into consideration the challenges for memory and errors, for many, memory errors appear to be an insurmountable challenge for direct realism. However, as this thesis demonstrates, it is in considering the problems of memory and errors in tandem that the direct realist is actually able to tackle the challenge presented by memory errors.

Making the case for direct realism

The reason for revisiting direct realism is partially motivated by the rise of anti-representationalism that signals a changing landscape for psychology and cognitive science. Chapter 1 examines the rise of anti-representationalism examines the case for the reasons why anti-representational accounts are reluctant to engage with realism. That is, while direct realist accounts are anti-representationalist, anti-representational accounts such as Varela, Thompson and Rosch's enactivist cognition are not necessarily realist (Zahidi, 2014). Realism here referring to thesis that there is a mind-independent world (Genome, in press; Mackay & Petocz, 2011a), and while not all non-representationalist positions are against realism, enactive cognition, that has autopoiesis as a core component, views realism and enactivism as incompatible theses. This is because autopoietic enactivism views direct realism as firstly, not being able to accommodate subjective experience because the organism's tight structural coupling to environment, while the history of mutual determination of the organism-environmental interaction limits the possibility of objective knowledge of the world.

According to this position, realism does not serve any useful purposes (Varela, Thompson, & Rosch, 1991). This notwithstanding, non-representational positions, such as radical embodied cognitive science, propose that some form of realism is acceptable though the modified form of entity realism (Chemero, 2009; Zahidi, 2014) proposed does not go far enough for entities that are not manipulated or perceived.

A major reason that discourages non-representational theories from embracing direct realism could be due to some of the logical difficulties associated with some basic cognitive phenomena such as memory and errors. A reason to consider direct realism lies in the premise that logic is to be found in the fabric and structures of reality, and because logic is necessary to understand to world. Realism, with its commitment to logic for the purposes of discourse means that the only way an organism can know the world is directly through observation and discovery (Michell, 2013). To do so otherwise would result in solipsism or scepticism. Therefore, if it can be shown that realism is able to overcome some of these logical issues, direct realism can be considered as a logically coherent alternative to current cognitive approaches. It is in the light of the changing landscape that motivated the revisiting of a school of direct realism known as situational realism.

Situational Realism

As developed in Chapter 2, situational realism defends a form of direct realism that views the subject in an organism-environmental system that exists in one spatio-temporal universe. Situation realism defines psychology as the study of organism-environmental relations as embodied in the interactions involving cognition, emotion, and motivation (Petocz & Mackary, 2013). Like other realisms, situational realism maintains that there is a mind-independent world. What stands situational realism apart is its commitment to ontological egalitarianism that claims everything exists in the same spatio-temporal universe. Other characteristics of situational realism includes the commitment to the logic of relations that states that a relation by definition involves two or more terms of the relation, each

logically distinct from the other. Situational realism is also committed to a logic of motivation – the idea that cognition is motivated. The implication of which is that any study of cognition has to take into account that the subject term is complex and the organism is an active participant in the cognitive relation.

The Problem of Memory

Chapter 3 examines the problem of memory is how the subject who is engaged in the present remembering act is able to recall a past event that no longer exists in the present moment. Specific challenges from memory are the problem of co-temporality, the temporal gap and action at a distance. These challenges are aimed at showing how direct awareness of past events is not possible.

The problem of co-temporality is when *S* knows *P,* where *P* is some past event, both *S* and *P* are said to co-exist temporally such that the past must come to be be in the present (Hamilton, 2003; Van Cleve, 2015; see also Malcolm, 1977; see also Alexander, 1920; Bergson, 1999). The problem of co-temporality hinges on the assumption that we can only cognise things if they exist in the present. There are two parts to addressing the problem of co-temporality: firstly, there is an assumption that once the event passed, the object of cognition ceases to exist. Secondly, that cognition can only occur in the present.

As shown in Chapter 3, the idea that an object once passed must ceased to exist is no a valid one. This is a problem of not distinguishing between an object that has ceased to persist and when an object has ceased to exist. That is, while the World Trade Towers in New York has ceased to persist in 2016, the World Trade Towers continues to exist, albeit existing in a further distance in space and time. All things exist in space and time. However, one only needs to examine the position of presentism to realise that if all that exists only does so in the present, then without truth-makers for the past, presentists would have to analyse statements about the past via statements of the present. If new evidence emerges, the presentist would not

be able to maintain their statements (Bernecker, 2008). While presentism is the extreme version of the view, it shows that the position is untenable.

What is argued that there is no real 'present' to be perceived and that all acts of perceiving involving viewing time as being temporally continuous and extended. The "specious" present means that we never experience an instance of time in isolation, since there is never a completely unextended 'now'. Instead, experience always involves duration across the past and future (Gibson, 1979; James, 1890; McMullen, 2000; Pockett, 2003). Therefore, from an epistemological point of view, the cognitive relation involving the subject and object are all extended in time as well as in space. Therefore, the second assumption that acts of cognition such as perceiving only occurs in the present is not logically feasible and is not a fatal problem for the direct realist account.

To the challenge of the temporal gap and action at a distance, situational realism neither denies that there is a temporal gap between a past event and one that has perceived immediately before, nor that remembering as an action at a distance appears difficult to account without appealing to memory traces. The situational realist's response is that remembering does not require appealing to representations because of relations, since remembering and perceiving are sustained by causal processes (McMullen, 2000). In remembering causal processes from a past event, A could cause neural changes in the brain B such that under the certain circumstances would result in neural sensitivity to the past event and bring about remembering C. This appeal to neural changes as the mediating process does not necessarily mean an appeal to the traditional account of memory traces (see also Maze, 1983; cf. Tonneau, 2011, 2013; see also Deutscher, 1989) because what the organism is aware of is not the mediating causal processes but rather the sensitivity to the propositional structure and content of the past event itself. For example, returning to the example of the girl with the photograph of her grandfather, the remembering process occurs across time where the memory of the grandfather and her perceiving the photograph are all extended in space and time.

The Problem of Error

Chapter 4 examines the problem from error. Arguments from illusion and hallucination have been employed to show how direct realism is false and that what we inevitably are cognising are not actual material objects and situations in the world but rather, something mental like sense-data (Austin, 1964; Dancy, 1995/2009; Reynolds, 2000; Robinson, 2003; Smith, 2002). Furthermore, similar to the arguments from illusion and hallucination, the problem of error is that according to direct realism, in cognition, there is a *direct* relation between a knower and the situation known. In the case of errors, there must be a direct relation to a false situation (i.e., non-existent situation) that is not possible. That is, if *S* falsely believes that *X* is *Y* then *S* cannot be related to the false situation of *X*'s being *Y*, for then there is no such situation. Therefore, direct realism is taken by critics to be false (see Michell, 1988/2011).

Situational realist response to the problem of error is that first, situational realism state that only veridical cognition is a direct relation between a subject and object, it does not mean that error has to be direct relation. Secondly, the ingredients involved in error must be propositions or states of affairs already known to the subject. While true situations are propositions, false propositions are not. Therefore, Anderson proposes that the occurrence of error is the result of someone's mistaking *X* for *Y*, where both *X* and *Y* are true situations. While Anderson's account encounters problems relating to the how the ternary relations is held between *S*, *X*, and *Y*, Michell proposes that the asymmetry of relations can be rescued if true belief is cognition of a true state of affairs (i.e., the fact that *p*) then false belief is *erring* (i.e., not-*p*.) and so the subject enters into the relation with not-*p,* which may be a result of the knower *ignoring* the fact that they are in a relation with not-*p*. Error is thus proposed to be the result of an absence of cognition that is instantiated by neural inhibition.

Errors of omission can be accounted for by one (or more) of three categories of errors of omission: (i) the lack of opportunity to cognise where relevant information is not available

to the subject in order to perceive the situation correctly; (ii) the organismic inability to cognise is found in any case where an individual does not have the requisite skills or tools to cognise situations accurately, and; (iii) the inhibition of cognition refers to the situation where a subject is prevented from recognising the fact that they are in error (Rantzen, 1993/2011). Based on the categories of errors, the hierarchical omission theory of error views errors of commission as second-order errors where any two errors of omission compounded will lead to an error of commission.

In the illusory case of errors of commission, when a naïve subject encounters the Müller-Lyer illusion, the first-order error arises because the fins in the figure will operate to inhibit the perception that one line is not longer than the other (i.e., the person is prevented from recognising that the two lines are the same), which creates the illusion. The second-order error arises, not because of the inhibition caused by the first-order omission, but instead due to a lack of an opportunity to cognise the fact that one is in error because the organism has not encountered the illusion before. The second-order omission in this case proceeds from the first-order omission and the error of commission is maintained. The organism would be able to correct the second-order error with an exposure to the true state of affairs by measuring the two lines themselves and so the organism now is only inhibited at the first stage since the subject would not be able to overcome easily the perceptual neurology to perceive the lines as equal. However, as a result of the correction, the error of commission does not hold now since the organism no longer holds a false belief about the lines being unequal even though the organism will still perceive the lines otherwise.

In the hallucinatory case of errors of commission, Rantzen (1993/2011) shows that in the case of Dr. P (Sacks, 1985), who mistook his wife for his hat. First-order error arises because Dr. P is unable to cognise due to the neurological damage that his wife's head was not a hat and the second-order error follows from the first-order omission when Dr. P is unable to recognise that he is mistaking his wife's head for his hat. The error of commission is maintained at the second-order because he lacks the ability to correct the mistake.

While Rantzen (1993/2011) is able to show how errors of commission arise from a situational realist perspective, in cases where the cognised object does not exist, the ontological status of the object of error comes into question. A partial solution is offered here whereby in the case of hallucination, what is proposed is that the organism mistakes a potential situation for an actual situation. A potential situation is based on previous known situations where the universals and particulars are misplaced and mistaken for the actual situation. It should be noted that the notion of potential propositions is not a theory of possible worlds (cf. Armstrong, 1986, 1989, 1997). The distinction is important because potential propositions present as possible true situations that may or may not come to be. In addition, potential propositions are based on previously known true propositions and situations to the subject. That is, potential propositions are determined by true situations that the subject has previous knowledge or experience of but whether the subject is aware that they know that they have apprehended the situations before is another thing and this may explain why in some cases of hallucinatory error, the object appears to unfamiliar to the subject.

In knowing a situation, a subject knows the situations in space and time and so, in a complex world where previous known situations of universals and particulars are being misplaced and mistaken for potential situations, or in the case of error, being mistaken for actual situations. That is, in the cases of hallucination, a subject may mistake to be a potential proposition for an actual situation and falsely believes that the potential proposition is the true situation. For example, when Eddy hallucinates seeing a unicorn, the unicorn is the result of Eddy mistaking the situations of ‘horse-ness’ and ‘mammals with single horns-ness’ for a potential proposition where unicorns exists. As previously said, whether Eddy is aware that he has encountered situations of ‘horse-ness’ and ‘mammals with single horns-ness’ is a separate matter. The point is that the situations of ‘horse-ness’ and ‘mammals with single horns-ness’ are known situations to Eddy.

A limitation of this solutions is that the ontological status of potential situations, and so this is still only a partial solution.

A Situational Realism Account of Memory Errors

As noted in Chapter 5, there are two main kinds of errors – errors of omission and commission. With regard to memory, errors of omission generally refer to instances where the subject is unable to recall previously acquired information, such as not being able to recall the mobile number seen a moment earlier (Roediger & McDermott, 2000). Errors of commission in memory, on the other hand, refer to instances when people recall events quite differently from the way they had happened, or that they recollect an event that has never happened at all, such as mistaking the name of friend as being Peter instead of Ron (Roediger & McDermott, 2000. see also Koriat, Goldsmith & Pansky, 2000). With errors of commission, we can further break down the distinction to two subtypes: the first type of error of commission, referred to as the illusory case, is where *S* mistakes *P* for *Q*, where *P* and *Q* are both situations that exist. For example, misremembering that one's childhood home was on Elm street instead of Fern street. The second type that is referred to as the hallucinatory case, where *S* mistakes *P* is *Q,* where *P* and *Q* exist but the relationship *PRQ* does not. Instances of errors of hallucination in memory include misremembering that a person having a cat when the person never had a cat before.

The challenge for situational realism is to show that it is logically possible to account for memory error from direct realist perspective. As was discussed in Chapter 4, case of errors of omission in memory are generally easily accounted for. Applying Rantzen's (1993/2011) categories of omission: *S* may be unable to retrieve *X* due to an illness that has brought about temporal memory problems. Thus, *S* is prevented from knowing that s/he knows that s/he had previously perceived *X* before. For example, as the subliminal perception literature demonstrates, a person can unconsciously perceive something yet be unable to know that s/he knows that perception has occurred, and yet his or her behaviour is influenced nonetheless (Boag, 2008).

In the illusory case of memory errors, the memory errors involve the mistaking of an event, or an aspect of a memory event such that the recalled memory event has deviated from the actual memory event as it had occurred (Bernstein & Loftus, 2009; Roediger, 1996; Roediger, & McDermott, 2000). Applying the hierarchical omission theory of errors (Rantzen, 1993/2011), the first order error arises where *S* misremembers *X* for *Y* when *Y* is the original/targeted memory event that is being recalled due to an inability to recall the situation. The second-order error follows from the first-order error, when the subject is prevented from realising the error. In the illusory case, the ontological status of the object of error is not in question since this is a case is where "*a remembered situation* that really is as things appear to be to the person making an error is confused with the current state of affairs" (Galloway, 2000, p. 607, emphasis in original).

In the hallucinatory case of memory errors where the subject recalls a past event *X* that does not exist (or did not occur). In the experiment by Loftus and Pickrell (1995) that utilised the "lost in the mall" technique where subjects were presented four scenarios that are said to be true events that occurred in their childhood as told by their relatives, except one of the events was actually false (i.e., the one where they were reportedly lost in the mall). The subjects were then told to spend the next five days reading the scenarios and writing about what they remembered about each event. The subjects were encouraged to 'remember' more details. It was observed that the subjects would not only 'remember' more details, the details evolved to become more vivid and richer. A few weeks later, the subjects were interviewed and were asked to guess which was the false memory and 19 out of 24 did chose the lost in the mall scenario correctly but the remaining five were misled. While the "lost in the mall" experiment is not necessarily a classic example of hallucinatory error, we can treat it as a hallucinatory case because the lost in the mall memory was a false one that they attempted to plant into the subjects.

To apply the hierarchical omission theory of error (Rantzen, 1993/2011), a first-order error arises when the subject is presented the false scenario and was told that the memory is a

true one as corroborated by his family members. The subject in this instance lacked the opportunity to cognise that the scenario was false because he was given enough incentives to be convinced that the memory might be true. The second-order error thus follows from the first when the subject is asked to recall and "remember" more information about the scenario and given that the subject has previous experiences of having gone to the mall and having been lost, the subject constructs the memory event and comes to believe that the memory event is real. The imagined memory event becomes a real one. The error of commission holds until the subject is presented with the choice that one of the four scenarios that was presented at the first session was false and the subject is able to pick out which memory is false. In the case where the subject believes the memory is real may be due to the reinforcement brought on by the trust in their family members and/or because the memory event fits well into the overall memory of what may have occurred in their childhood.

The proposed account is compatible with the idea that memory is reconstructive (see Bartlett, 1932; see also Neisser, 1967). While situational realism states that in remembering, there is a direct epistemic relation to past events, there are no difficulties with reconstructive memory because direct epistemic relations do not imply that memory is reproductive. Remembering is not reproductive because the subject cannot re-enter into the precise same relation as when s/he perceives *X* initially. Depending on what aspect the subject is paying attention to, the subject can remember *X* (e.g., semantic memory) but can also remember that *S* perceived *X* (e.g., episodic or factual memory). The remembering relation is a separate act, and therefore, unlike most non-representationalist accounts, situational realism is able to demonstrate how different types of memory can be accommodated.

Is it possible to logically account for memory error from a direct realism perspective?

In short, situational realism is able to account for at least some kinds of memory errors. Errors of omission can be accounted for when categories of omission show how in some situations the subject may not be standing in an appropriate cognitive relation to the

actual situation, thus preventing the subject from perceiving the situation correctly that will subsequently affect the veridicality of the memory recalled. With errors of commission, the categories of omission do show that they can be applied to the case of memory errors with some modification to accommodate the complexity involved to account for memory, perception and error. Errors of commission in memory errors arises because two categories of omission compounded will result in the second-order error that will maintain the false belief and in some cases involving neural injury or illness, the false belief may or may not be correctable. However, while situational realism is able to account for how errors of omission in memory and memory errors in the illusory case can be account for, the problem of accounting for the ontological status of the false situation remains a problem for situational realism.

While a partial solution is offered where the organism in the case of hallucination misplaces universals and particulars from other situations in a manner where the universal and particular are united in a situation that the organism takes and believes is true. However, this remains a partial solution because the ontological status of potential situations is not account for.

Nonetheless, this thesis has demonstrated that challenges for direct realism can be addressed and therefore there is no reason why direct realism cannot be considered as a logically coherent theory of cognition.

References

Alexander, S. (1911). Foundations and sketch-plan of a conational psychology. *British Journal of Psychology, 4*, 239–267.

Alexander, S. (1920). *Space, Time, and Deity*. New York: The Humanities Press.

Anderson, J. (1927/1962). The knower and the Known. In *Studies in Empirical Philosophy* (pp. 27–40). Sydney, NSW: Angus and Robertson.

Anderson, J. (1934/1962). Mind as feeling. In *Studies in Empirical Philosophy* (pp. 68–87). Sydney, NSW: Angus and Robertson.

Anderson, J. (1935/1962). Marxist philosophy, *Studies in empirical philosophy* (pp. 292-313). Sydney, NSW: Angus and Robertson.

Anderson, J. (1962). *Studies in empirical philosophy*. Sydney, NSW: Angus and Robertson.

Anderson, M. C. (2003). Rethinking interference theory: Executive control and the mechanisms of forgetting. *Journal of Memory and Language*, *49*, 415-445. doi:10.1016/j.jml.2003.08.006

Anderson, M. C., Bjork, R. A., & Bjork, E. L. (1994). Remembering can cause forgetting: retrieval dynamics in long-term memory. *Journal of Experimental Psychology. Learning, Memory, and Cognition*, *20*, 1063–1087. doi:10.1037/0278-7393.20.5.1063

Anderson, M. C., Bjork, E. L., & Bjork, R. A. (2000). Retrieval-induced forgetting: Evidence for a recall-specific mechanism. *Psychonomic Rulletin & Review*, *7*, 522–530.

Anderson, M. C., & Hanslmayr, S. (2014). Neural mechanisms of motivated forgetting. *Trends in Cognitive Sciences*, *18*, 279–92. doi:10.1016/j.tics.2014.03.002

Anderson, M. C., & Huddleston, E. (2012). Towards a cognitive and neurobiological model of motivated forgetting. In R. F. Belli (Ed.), *True and false recovered memories: toward a reconciliation of the debate* (Vol. 58, pp. 53–120). New York, NY: Springer New York. doi:10.1007/978-1-4614-1195-6

Anderson, M. L. (2003). Embodied Cognition: A field guide. *Artificial Intelligence*, *149*, 91–130. doi:10.1016/S0004-3702(03)00054-7

Armstrong, D. M. (1968). *A Materialist Theory of the Mind*. London, UK: Routledge & K. Paul.

Armstrong, D. M. (1955). Illusions of sense. *Australasian Journal of Philosophy*, *33*, 88–106. doi:10.1080/00048405585200101

Armstrong, D. M. (1986). The nature of possibility. *Canadian Journal of Philosophy*, *16*, 575–594. doi:10.2307/2087802

Armstrong, D. M. (1989). *A combinatorial theory of possibility*. Cambridge, UK: Cambridge University Press.

Armstrong, D. M. (1997). *A World of States of Affairs*. Cambridge, UK: Cambridge University Press.

Armstrong, D. M. (2010). *Sketch for a Systematic Metaphysics*. Oxford, UK: Oxford University Press.

Armstrong, D. M. (2005). John Anderson remembered. In *John Anderson Conference*. Retrieved from http://sydney.edu.au/news/84.html?newsstoryid=597

Austin, J. L. (1964). Sense and sensibilia. Oxford, UK: Oxford University Press.

Baker, A. J. (1986). *Australian realism: The systematic philosophy of John Anderson*. Cambridge, UK: Cambridge University Press.

Barnier, A., Hung, L., & Conway, M. (2004). Retrieval-induced forgetting of emotional and unemotional autobiographical memories. *Cognition & Emotion*, *18*, 457–477. doi:10.1080/0269993034000392

Bartlett, F. C. (1932). *Remembering: a study in experimental and social psychology*. Cambridge, UK: The University Press.

Barwise, J. & Perry, J. (1980). The situation underground. In J. Barwise & I. A. Sag (Eds.), *Stanford working papers in semantics*. (Vol. 1., Section D, pp. 1-55). Stanford Cognitive Science Group. Redwood City, CA: Stanford University Press.

Barwise, J., & Perry, J. (1981). Situations and attitudes. *The Journal of Philosophy*, *78*, 668–691.

Bauer, P. J. and Fivush, R. (2013) The Development of Memory: Multiple Levels and Perspectives. In P. J. Bauer and R. Fivush (Eds.). *The Wiley Handbook on the Development of Children's Memory, Volume I/II*, Chichester, UK: John Wiley & Sons Ltd. doi: 10.1002/9781118597705.ch1

Bechtel, W. (2009). Explanation: Mechanism, modularity, and situated cognition. In P. Robbins & M. Aydede (Eds.). *The Cambridge Handbook of Situated Cognition* (pp. 155-170). Cambridge Handbooks in Psychology. Cambridge, MA: Cambridge University Press.

Beer, R. D. (1995). A dynamical systems perspective on agent-environment interaction. *Artificial Intelligence*, *72*, 173–215.

Bekerian, D. A., & Bowers, J. M. (1983). Eyewitness testimony: Were we misled? *Journal of Experimental Psychology: Learning, Memory, and Cognition, 9*, 139-145. doi:10.1037/0278-7393.9.1.139

Ben-zeev, A. (1986). Two Approaches to Memory. *Philosophical Investigations*, *9*, 288–301.

Berlyne, N. (1972). Confabulation. *British Journal of Psychiatry*, *120*, 31–39.

Bernecker, S. (2008). *The metaphysics of memory*. Springer Science + Business Media, B. V.

Bernecker, S. (2010). *Memory: A Philosophical Study*. Oxford, UK: Oxford University Press.

Bernstein, D. M., Laney, C., Morris, E. K., & Loftus, E. F. (2007). False memories about food can lead to food avoidance. *Social Cognition*, *23*, 11–34. doi:10.1521/soco.23.1.11.59195

Bernstein, D. M., & Loftus, E. F. (2009a). The Consequences of False Memories for Food Preferences and Choices. *Perspectives on Psychological Science*, *4*, 135–139. doi:10.1111/j.1745-6924.2009.01113.x

Bernstein, D. M., & Loftus, E. F. (2009b). Memory Distortion. In *Encyclopedia of Neuroscience*. Springer Berlin Heidelberg. doi:10.1007/978-3-540-29678-2_3415

Berry, J. W. (1968). Ecology, perceptual development and the Muller-Lyer illusion. *British Journal of Psychology*, *59*, 205-210. doi: 10.1111/j.2044-8295.1968.tb01134.x

Bhaskar, R. (1975). A realist theory of science. Oxford, UK: Routledge.

Bhaskar, R. (1978). The possibility of naturalism: A philosophical critique of the contemporary human sciences. Brighton, Sussex: Harvester Press Ltd.

Birchall, B. C. (1981). The intentional project. *Philosophy and Phenomenological Research*, *42*, 147–159.

Bjork, E. L., & Bjork, R. a. (1988). On the adaptive aspects of retrieval failure in autobiographical memory. In M. M. Gruneberg, P. E. Morris, & R. N. Sykes (Eds.), *Practical Aspects of Memory: Current Research and Issues, Vol. 1: Memory in Everyday Life* (pp. 283-288). New York, NY: Wiley.

Bjork, E. L., Bjork, R. A., & Anderson, M. C. (1998). Varieties of goal-directed forgetting. In J. M. Golding & C. M. MacLeod (Eds.). *Intentional forgetting: Interdisciplinary approaches*. Mahwah, NJ: Psychology Press.

Bjork, R. A. (1989). Retrieval inhibition as an adaptive mechanism in human memory. In H. L. Roediger, III & F. I. M. Craik (Eds.), *Varieties of Memory and Consciousness: Essays in honor of Endel Tulving* (pp. 309–330). Hillside, NJ: Erlbaum.

Boag, S. (2005). Addressing Mental Plurality: Justification, Objections and Logical Requirements of Strongly Partitive Accounts of Mind. *Theory & Psychology*, *15*, 747–767. doi:10.1177/0959354305059022

Boag, S. (2008a). `Mind as Feeling' or Affective Relations?: A Contribution to the School of Andersonian Realism. *Theory & Psychology*, *18*, 505–525. doi:10.1177/0959354308091841

Boag, S. (2008b). Making sense of subliminal perception. In A. M. Columbus (Ed.), *Advances in Psychology Research* (pp. 117–139). New York, NY: Nova Science Publishers.

Boag, S. (2011). Explanation in personality psychology: "Verbal magic" and the five-factor model. *Philosophical Psychology*, *24*, 223–243. doi:10.1080/09515089.2010.548319

Boag, S. (2012). *Freudian repression, the unconscious, and the dynamics of inhibition*. London, UK: Karnac.

Bonjour, L. (2004). In Search of Direct Realism. *Philosophy and Phenomenological Research*, *69*, 349–367. doi:10.1111/j.1933-1592.2004.tb00398.x

Brainerd, C. J., & Reyna, V. F. (2005). *The science of false memory*. *The Science of False Memory*. doi:10.1093/acprof:oso/9780195154054.001.0001

Braude, S. E. (2006). Memory Without a Trace. *European Journal of Parapsychology*, *21*, 182–202.

Brooks, R. A. (2003). Intelligence without representation. *Philosophical Transactions. Series A, Mathematical, Physical, and Engineering Sciences*, *361*, 2381–95. doi:10.1098/rsta.2003.1257

Brewer, W. F. (1988). Memory for randomly sampled autobiographical events. In (U. Neisser & E. Winograd (Eds.). *Remembering reconsidered: Ecological and traditional approaches to the study of memory. Emory Symposia in Cognition 2* (pp. 21–90). New York, NY: Cambridge University Press.

Brown, R., & Kulik, J. (1977). Flashbulb memories. *Cognition*, *5*, 73–99. doi:10.1016/0010-0277(77)90018-X

Byrne, A., & Logue, H. (Eds.). (2009). *Disjunctivism: Contemporay readings*. Cambridge, MA: MIT Press. doi:10.1002/car.1158

Campbell, J. (1997). The realism of memory. In R. G. J. Heck (Ed.), *Language, thought and logic: Essays in honour of Michael Dummett* (pp. 157–181). Oxford, UK.

Campbell, J. (2002). *Reference and consciousness*. Oxford, UK: Clarendon Press.

Campbell, S. (2006a). Our Faithfulness to the Past: Reconstructing Memory Value. *Philosophical Psychology*, *19*, 361–380. doi:10.1080/09515080600690573

Campbell, S. (2006b). *Relational remembering: Rethinking the Memory Wars*. Lanham: Maryland: Rowman & Littlefield Publishers, Inc.

Charles, E. P. (Ed.). (2011). *A new look at new realism: the psychology and philosophy of E.B. Holt*. New Brunswich, NJ: Transaction Publishers.

Ceci, S. J. & Bruck, M. (1993). Suggestibility of the child witness: A historical review and synthesis. *Psychological Bulletin, 11*, 403-439.

Chemero, A. (2000). Anti-representationism and the dynamical stance. *Philosophy of Science*, *67*, 625–647.

Chemero, A. (2009). *Radical Embodied Cognitive Science*. Cambridge, MA: MIT Press.

Chemero, A. (2013). Radical embodied cognitive science. *Review of General Psychology*, *17*, 145–150. doi:10.1037/a0032923

Chemero, A., Klein, C., & Cordeiro, W. (2003). Events as Changes in the Layout of Affordances. *Ecological Psychology*, *15*, 19–28. doi:10.1207/S15326969ECO1501_02

Chiel, H. & Beer, R. (1997). The brain has a body: Adaptive behavior emerges from interactions of nervous system, body and environment. *Trends in Neurosciences, 20*, 553-557. doi:10.1016/s0166-2236(97)01149-1

Claparède, É. (1951). Recognition and "me-ness." In D. Rapaport (Ed.), *Organization and pathology of thought: Selected essays* (pp. 58–75). New York, NY: Columbia University Press.

Clark, A. (1997). The Dynamical Challenge. *Cognitive Science*, *21*, 461–481. doi:10.1207/s15516709cog2104_3

Clark, A. (1998). Being There: Putting Brain, Body, and World Together Again. Cambridge, MA: MIT Press. doi:10.2307/2998391

Clark, A. (2008). *Supersizing the Mind: Embodiment, Action, and Cognitive Extension*. Oxford, UK: Oxford University Press. doi:10.1080/09515080903432798

Clark, A. & Chalmers, D. (1998). The extended mind. *Analysis*, *58*, 7-19.

Clark, A., & Toribio, J. (1994). Doing without representing? *Synthese*, *101*, 401–431. doi:10.1007/BF01063896

Connerton, P. (2008). Seven types of forgetting. *Memory Studies*, *1*, 59–71. doi:10.1177/1750698007083889

Conway, M. A., & Tacchi, P. C. (1996). Motivated confabulation. *Neurocase*, *2*, 325–339. doi:10.1080/13554799608402406

Copenhaver, R. (2004). A realism for Reid: Mediated but direct. *British Journal for the History of Philosophy*, *12*, 61–74. doi:10.1080/0960878042000188856

Corkin, S. (1984). Lasting Consequences of Bilateral Medial Temporal Lobectomy: Clinical Course and Experimental Findings in H.M. *Seminars in Neurology*. doi:10.1055/s-2008-1041556

Corkin, S. (2002). What's new with the amnesic patient H.M.? *Nature Reviews Neuroscience, 3*, 153–160. doi:10.1038/nrn726

Corkin, S., Amaral, D. G., Gonza, R. G., Johnson, K. A., & Hyman, B. T. (1997). H. M.'s Medial Temporal Lobe Lesion : Findings from Magnetic Resonance Imaging, *17*, 3964–3979.

Crews, F. C. (1990). *The memory wars: Freud's legacy in dispute*. New York, NY: Review of Books.

Dalla Barba, G., & Decaix, C. (2009). "Do you remember what you did on March 13, 1985?" A case study of confabulatory hypermnesia. *Cortex*, *45*, 566–574. doi:10.1016/j.cortex.2008.03.009

Dalla Barba, G. (2001). Beyond the Memory-Trace Paradox and the Fallacy of the Homunculus. *Journal of Consciousness Studies*, *8*, 51–78.

Dalla Barba, G. (2002). *Memory, Consciousness and Temporality*. New York, NY: Springer Science + Business Media. doi:10.1007/978-1-4615-1741-2

Dancy, J. (1995). Arguments from illusion. *The Philosophical Quarterly*, *45*, 421–438.

Dawson, M. (2014). Embedded and situated cognition. In L. Shapiro (Ed.). *The routledge handbook of embodied cognition*. (pp. 59-67). Abingdon, Oxon: Routledge.

Deebus, D. (2010). Accounting for epistemic relevance: A new problem for the causal theory of memory. *American Philosophical Quarterly*, *47*, 17–29.

Deprince, A. P., Allard, C. B., Oh, H., & Freyd, J. J. (2004). What's in a Name for Memory Errors? Implications and Ethical Issues Arising From the Use of the Term "False Memory" for Errors in Memory for Details. *Ethics & Behavior*, *14*, 201–233. doi:10.1207/s15327019eb1403

Dewey, J. (1884). The new psychology, *Andover Review, 2*, 278-289.

Dretske, F. (2006). Perception without awareness. In T. S. Gendler & J. Hawthorne (Eds.), *Perceptual experience* (pp. 148–180). Oxford, UK: Oxford University Press. doi:10.1097/00005053-199306000-00011

Dudai, Y., Moscovitch, M., Schacter, D. L., & Morris, R. G. M. (2009). Memory. In H. L. Roediger, Y. Dudai, & S. M. Fitzpatrick (Eds.), *Science of memory concepts* (pp. 1–17). doi:10.1093/acprof

Earle, W. (1956). Memory. *The Review of Metaphysics*, *10*, 3–27.

Ebbinghaus, H. (1885). Memory. A Contribution to Experimental Psychology (translated to English in 1913). New York: Teachers College, Columbia University.

Fenici, M. (2012). Embodied Social Cognition and Embedded Theory of Mind. *Biolinguistics*, *6*, 276–307.

Fernández, J. (2015). What are the benefits of memory distortion? *Consciousness and Cognition*, *33*, 536–547. doi:10.1016/j.concog.2014.09.019

Fish, W. (2009). *Perception, hallucination, and illusion*. New York: Oxford University Press.

Fish, W. (2013). *Philosophy of perception: A contemporary*. New York. doi:10.4324/9780203880586

Fodor, J. A. (1975). *The language of thought*. New York: Thomas Y. Crowell Company Inc.

Fodor, J. A. (1980). Methodological solipsism considered as a research strategy in cognitive science, *Behavioral and Brain Sciences, 3*, 63-73.

Fodor, J. A., & Pylyshyn, Z. W. (1981). How direct is visual perception?: Some reflections on Gibson 's " Ecological Approach." *Cognition*, *9*, 139–196.

Fodor, J. A., & Pylyshyn, Z. W. (2015). *Minds without Meanings*. *Book*. Cambridge, MA: MIT Press.

Fotopoulou, A., Conway, M. A., Griffiths, P., Birchall, D., & Tyrer, S. (2007). Self-enhancing confabulation: revisiting the motivational hypothesis. *Neurocase*, *13*, 6–15. doi:10.1080/13554790601160566

Fotopoulou, A., Conway, M. A., & Solms, M. (2007). Confabulation: motivated reality monitoring. *Neuropsychologia*, *45*(10), 2180–90. doi:10.1016/j.neuropsychologia.2007.03.003

Fotopoulou, A., Solms, M., & Turnbull, O. (2004). Wishful reality distortions in confabulation: a case report. *Neuropsychologia*, *42*, 727–44. doi:10.1016/j.neuropsychologia.2003.11.008

Freud, S. (1901). Forgetting of Proper names, *Psychonomic bulletin & review*, 3–13.

Freud, S. (1905/1953). Childhood and concealing memories. In A. A. Brill (Ed. & Trans.), *The basic writings of Sigmund Freud*. New York, NY: The Modern Library.

Fivush, R., & Hudson, J. (1990). (Eds.). *Knowing and remembering in young children*. New York, NY: Cambridge University Press.

Gallagher, S. (2008). Are Minimal Representations Still Representations? *International Journal of Philosophical Studies*, *16*, 351–369. doi:10.1080/09672550802113243

Gallagher, S. (2009). Philosophical Antecedents of Situated Cognition. In P. Robbins & M. Aydede. (Eds.). *The Cambridge Handbook of Situated Cognition*. (pp. 35–52). Cambridge, UK: Cambridge University Press. doi:10.1017/cbo9780511816826.003

Gallagher, S. (2011). Interpretations of embodied: Cognition and Communication. In W. Tschacher & C. Bergomi (Eds.), *The Implications of Embodiment and Communication* (pp. 59–74). Exeter, UK: Imprint-Academic.

Gallagher, S. & Varela, F. (2003). Redrawing the map and resettling the time: Phenomenology and the cognitive sciences. *Canadian Journal of Philosophy, 33,* 93-132.

Gallo, D. A. (2010). False memories and fantastic beliefs: 15 years of the DRM illusion. *Memory & Cognition*, *38*, 833–848. doi:10.3758/MC.38.7.833

Galloway, G. (2000). Direct Realism and the Analysis of Perceptual Error. *Theory & Psychology*, *10*, 605–613. doi:10.1177/0959354300105002

Genone, J. (2016). Recent work on naive realism. *American Philosophical Quarterly, 53*, 1-26.

Gibson, J. J. (1970). On the relation between hallucination and perception. *Leonardo*, *3*, 425–427.

Gibson, J. J. (1967). New Reasons for Realism. *Synthese*, *17*, 162–172. doi:10.1007/bf00485025

Gibson, J. J. (1966a). The problem of temporal order in stimulation and perception. *Journal of Psychology: Interdisciplinary and Applied*, *62*, 141–149. doi:10.1080/00223980.1966.10543777

Gibson, J.J. (1966b). *The Senses Considered as Perceptual Systems*. Boston and New York: Houghton Mifflin.

Gibson, J. J. (1970). The relation between perception and hallucination. *Leonardo*, *3*, 425-427.

Gibson, J. J. (1979). The ecological approach to visual perception. of Experimental Psychology Human Perception and (Vol. 39).

Goldman, A., & de Vignemont, F. (2009). Is social cognition embodied? *Trends in Cognitive Sciences*, *13*, 154–159. doi:10.1016/j.tics.2009.01.007

Goldman, A. I. (2012). A Moderate Approach to Embodied Cognitive Science. *Review of Philosophy and Psychology*, *3*, 71–88. doi:10.1007/s13164-012-0089-0

Goldman, A. I. (2014). The Bodily Formats Approach to Embodied Cognition. In *Current Controversies in Philosophy of Mind* (pp. 91–108). Routledge.

Golonka, S., & Wilson, A. D. (2012). Gibson's ecological approach – a model for the benefits of a theory driven psychology. *Avant*, 40–53.

Greenwood, J. D. (2007). Review: Strange bedfellows. *Theory & Psychology, 17*, 605-607.

Hacking, I. (1982). Experimentation and scientific realism. *Philosophical Topics, 13*, 81-87.

Hacking, I. (1983). *Representing and intervening: Introductory topics in the philosophy of natural science.* Cambridge, MA: Cambridge University Press.

Haddock, A., & Macpherson, F. (Eds.). (2008). *Disjunctivism: Perception, Action, Knowledge*. Oxford, UK: Oxford University Press.

Hamilton, W. (1785). Footnote. In T. Reid, *Essays on the intellectual powers of man*. Dublin.

Hamilton, A. (2003). "Scottish Commonsense" about memory. A defence of Thomas Reid's direct knowledge account. *Australasian Journal of Philosophy*, *81*(2), 229–245.

Harré, R. (1986). *Varieties of realism: A rationale for the natural scien*ces. Oxford, UK: Blackwell.

Hartwig, M. (Ed.). (2007). *Dictionary of critical realism.* London, UK: Routledge.

Heft, H. (2001). *Ecological psychology in context: James Gibson, Roger Barker, and the legacy of William James' Radical Empricism*. Mahwah, NJ: Lawrence Erlbaum Associates, Inc. doi:10.1007/s13398-014-0173-7.2

Henry, R. (2009). *Psychologies of mind: The collected papers of John Maze*. London, UK: Continuum.

Henry, R. (2009a). Introduction. In R. Henry (Ed), *Psychologies of mind: The collected papers of John Maze*. London, UK: Continuum.

Heil, J. (1978). Traces of Things Past. *Philosophy of Science*, *45*, 60–72.

Heil, J. (1981). Does cognitive psychology rest on a mistake? *Mind*, *90*, 321–342.

Heil, J. (1983). *Perception and cognition*. Berkley, CA: University of California Press

Heil, J. (Ed.). (1989). *Cause, mind, and reality: Essays honoring C.B. Martin*. Springer Science + Business Media Dordrecht.

Heil, J. (2003a). Levels of reality. *Ratio*, *16*, 205–318.

Hibberd, F. J. (2009/2011). John Anderson's development of (situational) realism and its bearing on psychology today. In N. Mackay & A. Petocz (Eds.). *Realism and psychology: Collected essays* (pp. 119–158). Brill Academic Publishers.

Hibberd, F. J. (2014). The metaphysical basis of a process psychology. *Journal of Theoretical and Philosophical Psychology*, *34*, 161–186. doi:10.1037/a0036242

Hinton, J. M. (1973). *Experiences: An inquiry into some ambiguities*. Oxford, UK: Clarendon Press.

Hinton, J. M. (1967). Visual experiences. *Mind*, *76*, 217–227. doi:10.1093/mind/LI.202.200

Hoerl, C. (2013). Causal Theories of Memory. In: H. Pashler, T. Crane, M. Kinsbourne, F. Ferreira, & R. Zemel (eds.): *The Encyclopedia of the Mind*. SAGE Publications.

Holt, E. B. (1914). *The concept of consciousness*. London, UK: George Allen & Co.

Holt, E. B. (1915). *The Freudian wish and its place in ethics*. New York, NY: H. Holt and Company.

Holt, E. B., Marvin, W. T., Montague, W. P., Perry, R. B., & Walter, B. (1910). The program and first platform of six realists. *The Journal of Philosophy, Psychology and Scientific Methods*, *7*, 393–401.

Houts, R. W. (1980). Some implications of the time-lag argument. *Philosophy and Phenomenological Research*, *41*, 150-157.

Huneman, P. & Wolfe, C. T. (2010). The concept of organism: Historical, philosophical, scientific perspectives. *History and Philosophy of the Life Sciences, 32*, 147-154.

Hutto, D. D. (2011). Representation Reconsidered. *Philosophical Psychology*, *24*, 135–139. doi:10.1080/09515089.2010.529

Hutto, D. D., & Myin, E. (2013). Neural representations not needed - no more please. *Phenomenology and the Cognitive Sciences*, 1–16. doi:10.1007/s11097-013-9331-1261

Hutto, D. (2013). Exorcising action oriented representations: ridding cognitive science of its Nazgul. *Adaptive Behavior*, *21*, 142–150. doi:10.1177/1059712313482684

Hutto, D. D., & Myin, E. (2013). *Radicalizing enactivism: basic minds without content*. Cambridge, Mass: MIT Press.

Hutto, D. D. (2013). Psychology unified: From folk psychology to radical enactivism. *Review of General Psychology*, *17*, 174–178. doi:10.1037/a0032930

Hutto, D. D., Kirchhoff, M. D., & Myin, E. (2014). Extensive enactivism: why keep it all in? *Frontiers in Human Neuroscience*, *8*, 706. doi:10.3389/fnhum.2014.00706

Hutto, D. D., & McGivern, P. (2015). How Embodied Is Cognition? *Philosopher's Magazine*, 77–83.

Hume, D. (1739). A treatise of human nature: Being an attempt to introduce the experimental method of reasoning into moral subjects. London, UK.

Hyman, I. E., Husband, T. H. and Billings, F. J. (1995), False memories of childhood experiences. *Appl. Cognit. Psychol*., *9*, 181–197. doi: 10.1002/acp.2350090302

Hyman, I. E. (1998). Creating false autobiographical memories: Why people believe their memory errors. In E. Winograd, R. Fivush, & W. Hirst (Eds.), *Ecological approaches to Cognitions: Essays in Honor of Ulric Neisser* (pp. 229–252). Hillsdale, NJ: Erlbaum.

James, W. (1890). *The principles of psychology. Volume I.* New York, NY: Henry Holt and company.

James, W. (1905). The things and its relations. *Journal of Philosophy, Psychology and Scientific Methods*, *2*, 29–41.

Jarvilehto, T. (1998). The theory of the Organism-Environment System: I. Description of the Theory. *Integrative Physiological and Behavioural Science*, *33*, 321–334.

Järvilehto, T. (2009). The Theory of the Organism-Environment System as a Basis of Experimental Work in Psychology. *Ecological Psychology*, *21*, 112–120. doi:10.1080/10407410902877066

Johnson, M.K. (1997). Source monitoring and memory distortion. *Philosophical Transactions of the Royal Society of London B, 352,* 1733-1745.

Johnson, M. K. (2006). Memory and reality. *The American Psychologist*, *61*, 760–71. doi:10.1037/0003-066X.61.8.760

Johnson, M. K., Hashtroudi, S., & Lindsay, D. (1993). Source Monitoring. *Psychological Bulletin*, *114*, 3–28.

Johnson, M. K., O'Connor, M., & Cantor, J. (1997). Confabulation, memory deficits, and frontal dysfunction. *Brain and Cognition*, *34*, 189–206. doi:10.1006/brcg.1997.0873

Johnson, M. K., & Raye, C. L. (1981). Reality Monitoring, *Psychological Review, 88*, 67–85.

Johnson, M. K., & Raye, C. L. (1998). False memories and confabulation. *Trends in Cognitive Sciences*, *2*(4), 137–145. doi:10.1016/S1364-6613(98)01152-8

Johnson, M. K., Taylor, T.B., & Raye, C. L. (1977). Fact and fantasy: The effects of internally generated events on the apparent frequency of externally generated events. *Memory & Cognition, 5,* 116-122

Johnston, M. (2004). The obscure object of hallucination. *Philosophical Studies*, *120*, 113–183.

Karpel, M. E., Hoyer, W. J., & Toglia, M. P. (2001). Accuracy and qualities of real and suggested memories: Non-specific age differences. *Journals of Gerontology Series B – Psychological Sciences and Social Sciences*, *56*, 103-110.

Khemka, A., Frossard, L., Lord, S. J., Bosley, B., & Muderis, M. A. (2015). Osseointegrated total knee replacement connected to a lower limb prosthesis: 4 cases, *Acta Orthopaedica, 86*, 740-744, doi:10.3109/17453674.2015.1068635

Kimball, D. R., & Bjork, R. A. (2002). Influences of intentional and unintentional forgetting on false memories. *Journal of Experimental Psychology: General*, *131*, 116–130. doi:10.1037//0096-3445.131.1.116

Kirchhoff, M. D. (2011). Anti-representationalism: Not a Well-founded Theory of Cognition. *Res. Cogitans*, *2*, 1–34.

Kopelman, M. D. (1987). Two types of confabulation. *Journal of Neurology, Neurosurgery, and Psychiatry*, *50*, 1482–1487.

Koriat, A., & Goldsmith, M. (1996). Memory metaphors and the real-life / laboratory controversy : Correspondence versus storehouse conceptions of memory. *Behavioral and Brain Sciences*, *19*, 167–228.

Koriat, A., Goldsmith, M., & Pansky, A. (2000). Towards a psychology of memory accuracy. *Annual Review of Psychology*, *51*, 481–537.

Koriat, A., Goldsmith, M., & Pansky, A. (2006). Memory Distortions and Forgetting. In *Encyclopedia of Cognitive Science*. John Wiley & Sons, Ltd. doi:10.1002/0470018860.s00570

Laird, J. (1920). *A Study in Realism*. Freeport, NY: Books for Library Press.

Laird, J. (1932). The Obsequies of Realism. *Philosophy*, *7*, 201–214.

Larsen, S. F. (*1988*). *Remembering* without experiencing: Memory for reported events. In U. Neisser & E. Winograd (Eds.). *Remembering reconsidered: Ecological approaches to the study of memory* (pp.326-355). New York, NY: Cambridge University Press.

Latimer, C. R. & Michell, J. (Eds.). (1996). *At once scientific and philosophic: A festschrift for John Philip Sutcliffe*. Brisbane, QLD: Boombana Publications.

Le Morvan, P. (2004). Arguments against direct realism and how to counter them. *American Philosophical Quarterly*, *41*, 221–234.

Lechner, H. A., Squire, L. R., & Byrne, J. H. (1999). 100 years of consolidation—remembering Müller and Pilzecker. *Learning & Memory*, *6*, 77–87. doi:10.1101/lm.6.2.77

Leitan, N. D., & Chaffey, L. (2014). Embodied cognition and its applications: A brief review. *Sensoria: A Journal of Mind, Brain and Culture*, *10*, 3-10. doi:10.7790/sa.v10i1.384

Loftus, E. F. (1975). Leading questions and the eyewitness report. *Cognitive Psychology*, *7*, 560–572.

Loftus, E. F. (1979). *Eyewitness testimony*. Cambridge, MA: Harvard University Press.

Loftus, E. F. (1998). Illusions of Memory. *Proceedings of the American Philosophical Society*, *142*, 60–73.

Loftus, E. F. (1999). Lost in the mall: misrepresentations and misunderstandings. *Ethics & Behavior*, *9*, 51–60. doi:10.1207/s15327019eb0901_4

Loftus, E. F. (2003). Make-Believe Memories. *American Psychologist*, *November*, 867–973.

Loftus, E. F. (2005). Planting misinformation in the human mind: a 30-year investigation of the malleability of memory. *Learning & Memory*, *12*, 361–6. doi:10.1101/lm.94705

Loftus, E. F., & Calvin, W. (2001, March). Memory's future. *Psychology Today*.

Loftus, E. F., Coan, J. A., & Pickrell, J. E. (1996). Manufacturing false memories using bits of reality. In L. M. Reder (Ed.), *Implicit Memory and Metacognition* (pp. 195–220). New York, NY: Lawrence Erlbaum Associates, Inc.

Loftus, E. F., & Davis, D. (2006). Recovered memories. *Annual Review of Clinical Psychology*, *2*, 469–498. doi:10.1146/annurev.clinpsy.2.022305.095315

Loftus, E. F., & Hoffman, H. G. (1989). Misinformation and memory: the creation of new memories. *Journal of Experimental Psychology. General*, *118*, 100–4.

Loftus, E. F., Hoffman, H. G., & Wagenaar, W. A. (1992). The misinformation effect: Transformations in memory induced by postevent information. In M. L. Howe, C. J. Brainerd,

& V. F. Reyna (Eds.) *Development of Long-Term Retention* (pp. 159–183). New York, NY: Springer New York. doi:10.1007/978-1-4612-2868-4_5

Loftus, E. F., & Ketcham, K. (1994). *The myth of repressed memories: False memories and the allegations of sexual abuse*. New York, NY: St Martin's Press.

Loftus, E. F., Miller, D. G., & Burns, H. J. (1978). Semantic integration of verbal information into a visual memory. *Journal of Experimental Psychology. Human Learning and Memory*, *4*, 19–31. doi:10.1037/0278-7393.4.1.19

Loftus, E. F., & Palmer, J. (1974). Reconstruction of automobile destruction: An example of the Interaction Between Language and Memory. *Journal of Verbal Learning and Verbal Behavior*, *13*, 585–589.

Loftus, E. F., & Pickrell, J. E. (1995). The formation of false memories. *Psychiatric Annals*, *25*, 720–725. doi:10.3928/0048-5713-19951201-07

MacDougall, W. (1908). *An introduction to social psychology*. London, UK: Methuen & Co.

Mackay, N. (1996). The place of motivation in psychoanalysis. *Modern Psychoanalysis*, *21*, 3–17.

Mackay, N., & Petocz, A. (Eds.). (2011). *Realism and Psychology: Collected Essays*. Leiden, NL: Brill Academic Publishers.

Mackay, N., & Petocz, A. (2011a). Introduction. In N. Mackay & A. Petocz (Eds.), *Realism and Psychology: Collected Essays*. Brill Academic Publishers.

Mackay, N., & Petocz, A. (2011b). Realism and the state of theory in psychology. In N. Mackay & A. Petocz (Eds.), *Realism and psychology: Collected essays* (pp. 17–51). Leiden, NL: Brill Academic Publishers.

Mackey, J. (1974). *The Cement of the Universe: A Study of Causation*. Oxford, UK: Oxford University Press.

Mackie, J. L. (1962). John Anderson. *Australasian Journal of Philosophy*, *40*, 124–126. doi:10.1080/00048406212341091

Mackie, J. L. (1962). The philosophy of John Anderson. *Australasian Journal of Philosophy*, *40*, 264–282. doi:10.1080/00048406212341221

Mackie, J. L. (1965). Causes and Conditions. *American Philosophical Quarterly*, *2*, 245–264.

Mackie J. L. (1969/1971). What's really wrong with phenomenalism? *Proceedings of the British Academy*, *55*, 113-127.

Macpherson, F., & Platchias, D. (Eds.). (2013). *Hallucination: Philosophy and Psychology*. Cambridge, MA: MIT Press.

Madden, E. (1986). Was Reid a natural realist? *Philosophy and Phenomenological Research*, *47*, 255–276.

Malcolm, N. (1970). Memory and representation. *Noûs*, *4*, 59–70.

Malcolm, N. (1975). Memory as Direct Awareness of the Past. *Royal Institute of Philosophy Lectures*, *9*, 1–22. doi:10.1017/S0080443600000960

Malcolm, N. (1977). *Memory and mind*. Ithaca, NY: Cornell University Press.

Mandik, P., & Clark, A. (2002). Selective Representing and World-Making. *Minds and Machines*, *12*, 383–395. doi.org:10.1023/A:1016159621665

Martin, C. B., & Deutscher, M. (1966). Remembering. *Philosophical Review*, *75*, 161–196. doi:10.2307/2183082

Martin, M. (1997). The Reality of Appearances, In M. Sainsbury (Ed), *Thought and ontology*, (pp. 143-164). Milano, IL: FrancoAngeli.

Martin, M. G. F. (2002). The transparency of experience. *Mind & Language*, *17*, 376–425. doi:10.1111/1468-0017.00205

Martin, M. G. F. (1992). Perception, concepts, and memory. *Philosophical Review*, *101*, 745–763.

Martin, M. (2001). Out of the past: Episodic recall as retained acquaintance. In C. Hoerl & T. McCormack (Eds.), *Time and memory: Issues in philosophy and psychology,* (pp. 257–284). Oxford, UK: Clarendon Press.

Martin, M. (2004). The Limits of Self-awareness, *Philosophical Studies*, *120*, 37–89. doi: 10.1023/b:phil.0000033751.66949.97

Matthen, M. (2010). Is memory preservation? *Philosophical Studies*, *148*, 3–14. doi:10.1007/s11098-010-9501-8

Matthews, Robert, J. (1984). Troubles with representationalism. *Social Research*, *51*, 1065–1097.

Maturana, H. & Varela, F. (1992). The tree of knowledge. Boston, MA: Shambhala.

Maze, J. R. (1983). *Meaning of Behaviour*. London, UK: George Allen & Unwin.

Mazzoni, G. A., Loftus, E. F., & Kirsch, I. (2001). Changing beliefs about implausible autobiographical events: a little plausibility goes a long way. *J. Exp. Psychol. Appl.*, *7*, 51–59. doi:10.1037/1076-898X.7.1.51

McClelland, J. L., & Rumelhart, D. E. (1985). Distributed memory and the representation of general and specific information. *Journal of Experimental Psychology. General*, *114*, 159–97.

McClelland, J. L. (1995). Constructive memory and memory distortions: a parallel-distributed processing approach. In D. L. Schacter (Ed.), *Memory distortion: How minds, brains, and …*. Cambridge, MA: Harvard University Press.

McClelland, J. L., & Rumelhart, D. E. (1985). Distributed memory and the representation of general and specific information. *Journal of Experimental Psychology: General*, *114*, 159–188. doi:10.1037//0096-3445.114.2.159

McClelland, J., Rumelhart, D., & Hinton, G. (1986). The appeal of parallel distributed processing. In J. McClelland, & D. Rumelhart, and the PDP Research Group (eds.), *Parallel Distributed Processing: Explorations in the Microstructure of Cognition, Vol II* (pp. 1-44). Cambridge, MA: MIT Press/Bradford.

McIlwain, D., & Sutton, J. (2014). Yoga from the mat up: How words alight on bodies. *Educational Philosophy and Theory*, *46*, 655–673. doi:10.1080/00131857.2013.779216

McKay, R. T., & Dennett, D. C. (2009). Adaptive misbeliefs and false memories. *The Behavioral and Brain Sciences*, *32*, 535–536. doi:10.1017/S0140525X09991488

McMullen, T. (1996). Psychology and realism. In C. R. Latimer & J. Michell (Eds.), *At once scientific and philosophic: A festschrift for John Philip Sutcliffe* (pp. 59–66). Brisbane, QLD: Boombana Publications.

McMullen, T. (2000). The "specious present": Realism and memory. In *XXVII International Congress of Psychology*. Stockhlom, Sweden.

McMullen, T. (2011). Concepts are "out there", not "in here". In N. Mackay & A. Petocz (Eds.). *Realism and psychology: Collected essays* (pp. 322–353). Brill Academic Publishers.

Medlow, S. (2008). *The "paradox" of Mental Causation*. VDM Publishing.

Menary, R. (2006). Attacking the Bounds of Cognition. *Philosophical Psychology*, *19*, 329–344. doi:10.1080/09515080600690557

Menary, R. (2007). *Cognitive Integration*. Basingstoke, UK: Palgrave Macmillan.

Menary, R. (2010). *The Extended Mind*. Cambridge, MA: MIT Press.

Merleau-Ponty, M. (1945). *Phenomenology of Perception*. London and New York: Taylor & Francis Group.

Merricks, T. (1999). Persistence, Parts, and Presentism. *Noûs*, *33*, 421–438. doi:10.1111/0029-4624.00162

Metcalf, K., Langdon, R., & Coltheart, M. (2007). Models of confabulation: A critical review and a new framework. *Cogn Neuropsychol., 24,* 23-47.

Michaelian, K. (2011a). Generative memory. *Philosophical Psychology*, *24*, 323–342. doi:10.1080/09515089.2011.559623

Michaelian, K. (2011b). The epistemology of forgetting. *Erkenntnis*, *74*, 1–26.

Michealian, K. (2013). The information effect: Constructive memory, testimony, and epistemic luck. *Synthese, 190*, 2429-2456.

Michaels, C. F., & Carello, C. (1981). *Direct Perception*. Englewood Cliffs, New Jersey: Prentice-Hall, INC.

Michell, J. (1988/2011). Maze's direct realism and the character of cognition. In N. Mackay & A. Petocz (Eds.). *Realism and psychology: Collected essays* (pp. 278-321). Leiden: BRILL.

Michell, J. (2011). Observing mental processes. In E. P. Charles (Ed). *New look at New Realism: The psychology and philosophy of E. B. Holt*. New Brunswick, NJ: Transaction Publishers.

Milkowski, M. (2013). Explaining the computational mind. The effects of brief mindfulness intervention on acute pain experience: An examination of individual difference (Vol. 1). Cambridge, MA: MIT Press.

Myin, E., & Hutto, D. D. (2013). REC: Just Radical Enough, *41*, 61–71. doi.org:10.1515/slgr-2015-0020

Nedjam, Z., Devouche, E., & Dalla Barba, G. (2004). Confabulation, but no executive dysfunction discriminate AD from frontotemporal dementia. *European Journal of Neurology*, *11*, 728-733.

Neisser, U. (1978). Memory: What are the important questions. In M. Gruneberg, M, P. E. Morris, & R. N. Sykes (Eds.), Proceedings of the International Conference on Practical Aspects of Memory, held under the auspices of the Welsh branch of the British Psychological Society, in Cardiff from September 4-8, 1978 (pp. 3–24). London, UK: Academic Press.

Neisser, U. (1997). The ecological study of memory. *Philosophical Transactions of the Royal Society of London. Series B, Biological Sciences*, *352*(1362), 1697–701. doi:10.1098/rstb.1997.0151

Neisser, U., & Harsch, N. (1992). Phantom flashbulbs: False recollections of hearing the news about Challenger. In U. Neisser & E. Winograd (Eds.). Remembering reconsidered: Ecological and Traditional Approaches to the Study of Memory. *Emory Symposia in Cognition 2* (pp. 9-31). New York, NY: Cambridge University Press.

Neisser, U., & Winograd, E. (Eds.). (1988). Remembering reconsidered: Ecological and Traditional Approaches to the Study of Memory. *Emory Symposia in Cognition 2*. New York, NY: Cambridge University Press.

Nöe, A. (2004). *Action in Perception*. Cambridge, MA: MIT Press. doi:10.1068/p5878

Nørby, S. (2015). Why Forget? On the Adaptive Value of Memory Loss. *Perspectives on Psychological Science*, *10*, 551–578. doi:10.1177/1745691615596787

O'Neil, W. M. (1934). Mind as feeling? *Australasian Journal of Psychology and Philosophy*, *12*(4), 280–288. doi:10.1080/00048403408541352

O'Neil, W. M. (1949). The relation of inner experience and overt behaviour. *Australasian Journal of Philosophy*, *27*, 27–45. doi:10.1080/00048404908541251

O'Neil, W. M. (1958). Basic issues in perceptual theory. *Psychological Review*, *65*(6), 348–361. doi:10.1037/h0043562

O'Neil, W. M. (1979). Anderson, John (1893-1962). In *Australian Dictionary of Biography*. National Centre of Biography, Australia National University. Retrieved from http://adb.anu.edu.au/biography/anderson-john-5017

Okado, Y., & Stark, C. E. L. (2005). Neural activity during encoding predicts false memories created by misinformation. *Learning & Memory*, *12*, 3–11. doi:10.1101/lm.87605

Oppy, G. & Trakakis, N. N. (2010). *A companion to philosophy in Australia and New Zealand*. Clayton, VIC: Monash University Publishing.

Parker, E. S., Cahill, L., & McGaugh, J. L. (2006). A case of unusual autobiographical remembering. *Neurocase*, *12*, 35–49. doi:10.1080/13554790500473680

Passmore, J. A. (1935). The nature of intelligence. *Australasian Journal of Psychology and Philosophy*, *13*, 279–289. doi:10.1080/00048403508541060

Passmore, J. A. (1962). John Anderson and twentieth-century philosophy. In *Studies in Empirical Philosophy* (pp. ix–xxiv). Sydney, NSW: Angus and Robertson.

Passmore, J. A. (1997). *Memoirs of a semi-detached Australian*. Carlton South, VIC: Melbourne University Press.

Patihis, L., Ho, L. Y., Tingen, I. W., Lilienfeld, S. O., & Loftus, E. F. (2014). Are the "memory wars" over? A scientist-practitioner gap in beliefs about repressed memory. *Psychological Science*, *25*, 519–30. doi:10.1177/0956797613510718

Petocz, A. (1999). *Freud, Psychoanalisis and Symbolism*. Cambridge, UK: Cambridge University Press.

Petocz, A. (2006). Commentary on "Freudian Dream Theory, Dream Bizarreness, and the Disguise-Censor Controversy." *Neuropsychoanalysis*, *8*, 48–53. doi:10.1080/15294145.2006.10773511

Petocz, A. (2011). Why psychology has neglected symbolism and what a realist approach can offer. In N. Mackay & A. Petocz (Eds.). *Realism and psychology: Collected essays* (pp. 598–653). Brill Academic Publishers.

Petocz, A., & Mackay, N. (2013). Unifying psychology through situational realism. *Review of General Psychology*, *17*, 216–223. doi:10.1037/a0032937

Pezdek, K. (1994). The illusion of illusory memory. *Applied Cognitive Psychology*, *8*, 339–350.

Pezdek, K. (2007). It's just not good science. *Consciousness and Cognition*, *16*, 29–30. doi:10.1016/j.concog.2006.05.006

Pezdek, K., Finger, K. & Hodge, D. (1997). Planting false childhood memories: The role of event plausibility. *Psychological Science*, *8*, 437-441.

Pezdek, K., & Lam, S. (2007). What research paradigms have cognitive psychologists used to study "False memory," and what are the implications of these choices? *Consciousness and Cognition*, *16*, 2–17. doi:10.1016/j.concog.2005.06.006

Piaget, J. (1951). The biological problem of intelligence. In D. Rapaport (ed.). *Organization and pathology of thought: Selected sources* (pp. 176-192). New York, NY: Columbia University Press.

Piaget, J. (1963). *The origins of intelligence in children*. New York, NY: Norton.

Pockett, S. (2003). How long is "now"? Phenomenology and the specious present. *Phenomenology and the Cognitive Sciences*, *2*, 55–68.

Port, R. & van Gelder, T. (Eds.). (1995). *Mind as motion: Explorations in the dynamics of cognition*. Cambridge, MA: MIT Press.

Power, S. E. (2012). The Metaphysics of the "Specious" Present. *Erkenn*, *77*, 121–132. doi:10.1007/s10670-011-9287-x

Price, H. H. (1932). *Perception.* London, UK: Methuen and Co.

Putnam, H. (2008). Wittgenstein and Realism. *International Journal of Philosophical Studies*, *16*(1), 3–16. doi:10.1080/09672550701809370

Putnam, H. (1993). Realism without absolutes. *International Journal of Philosophical Studies*, *1*(2), 179–192. doi:10.1080/09672559308570769

Ramirez, S., Tonegawa, S., & Liu, X. (2013). Identification and optogenetic manipulation of memory engrams in the hippocampus. *Frontiers in Behavioral Neuroscience*, *7*, 226. doi:10.3389/fnbeh.2013.00226

Ramirez, S., Liu, X., Lin, P-A., Suh, J., Pignatelli, M., Redondo, R. L., Ryan, T. J., Tonegawa, S. (2013). Creating a false memory in the hippocampus. *Science*, *341*, 387–391. http://doi.org/10.1126/science.1239073

Ramsey, W. (2007). *Representation reconsidered / William Ramsey.* Cambridge: Cambridge University Press.

Rantzen, A. J. (1993). Constructivism, Direct Realism and the Nature of Error. In *Realism and psychology: Collected essays* (Vol. 3, pp. 147–171). Brill Academic Publishers. doi:10.1177/0959354393032001

Reid, T. (1764). *An inquiry into the human mind*. London.

Reid, T. (1785). *Essays on the intellectual powers of man*. Dublin.

Reyna, V. F., & Brainerd, C. J. (1998). Fuzzy-trace theory and false memory: new frontiers. *Journal of Experimental Child Psychology*, *71*, 194–209. doi:10.1111/1467-8721.00192

Reyna, V. F., Holliday, R., & Marche, T. (2002). Explaining the development of false memories. *Developmental Review*, *22*(3), 436–489. doi:10.1016/S0273-2297(02)00003-5

Reynolds, S. L. (2000). The argument from illusion. *Noûs*, *34*, 604–621. doi:10.1111/0029-4624.00280

Rivers, W. H. R. (1905). Observations on the senses of the Todas. *British Journal of Psychology*, *1*, 321-396.

Robbins, P. & Aydede, M. (2009). In P. Robbins & M. Aydede. (Eds.). A short primer on situated cognition. *The Cambridge Handbook of Situated Cognition*. (pp. 3–10). Cambridge, UK: Cambridge University Press. doi:10.1017/cbo9780511816826.001

Robinson, H. (1994/2003). *Perception*. London, UK: Routledge.

Roediger, H. L. (1980). Memory metaphors in cognitive psychology. *Memory & Cognition*, *8*, 231–46.

Roediger, H. L. (1996). Memory Illusions. *Journal of Memory and Language*, *35*, 76–100.

Roediger, H. L., & Mcdermott, K. B. (1995). Creating False Memories: Remembering Words Not Presented in Lists. *Journal of Experimental Psychology, 21*, 803–814.

Roediger, H. L., Dudai, Y., & Fitzpatrick, S. M. (Eds.). (2007). *Science of memory: Concepts*. New York: Oxford University Press.

Roediger, H. L., & McDermott, K. B. (2000a). Distortion of Memory. In E. Tulving & F. I. M. Craik (Eds.), *The Oxford Handbook of Memory* (pp. 149–162). New York: Oxford University Press.

Roediger, H. L., & McDermott, K. B. (2000). Tricks of memory. *Current Directions in Psychological Science, 9*, 123-127

Roediger, H. L., Weinstein, Y., & Agarwal, P. K. (2010). Forgetting: Preliminary considerations. In S. Della Sala (Ed.), *Forgetting* (pp. 1-22). Hove, UK: Psychology Press.

Rowlands, M. (2006). *Body language: Representing in action*. Cambridge, MA: MIT Press.

Rowlands, M. (2010). New science of the mind: From extended mind to embodied phenomenology. Cambridge, MA: MIT Press.

Rowlands, M. (2015). Arguing about representation. *Synthese*, January 2014. doi.org/10.1007/s11229-014-0646-4

Russell, B. (1912). *The problems of philosophy*. London, UK: Williams and Norgate.

Sacks, O. (1985). *The man who mistook his wife for a hat, and other clinical tales*. New York, NY: Summit Books.

Schacter, D. L. (1995). Memory distortions: History and current status. In D. L. Schacter (Ed.), *Memory Distortion: How minds, brains and societies reconstruct the past* (pp. 1–43). Cambridge, MA: Harvard University Press.

Schacter, D. L., & Coyle, J. T. (Eds.). (1995). *Memory distortion : how minds, brains, and societies reconstruct the past*. Cambridge, MA: Harvard University Press.

Schacter, D. L., Eich, J. E., & Tulvlng, E. (1978). Richard Semon's theory of memory. *Journal of Verbal Learning and Verbal Behavior*, *17*, 721–743.

Schacter, D. L. (1999). The seven sins of memory. *American Psychologist*, *54*, 182–203.

Schacter, D. L. (2001). *The seven sins of memory: How the mind forgets and remembers*. Boston, MA: Houghton Mifflin Company.

Schacter, D. L., & Addis, D. R. (2007). The cognitive neuroscience of constructive memory: remembering the past and imagining the future. *Philosophical Transactions of the Royal Society of London. Series B, Biological Sciences*, *362*, 773–86. doi:10.1098/rstb.2007.2087

Schacter, D. L., Addis, D. R., & Buckner, R. L. (2007). Remembering the past to imagine the future: the prospective brain. *Nature Reviews. Neuroscience*, *8*, 657–61. doi:10.1038/nrn2213

Schacter, D. L., Guerin, S. A., & St Jacques, P. L. (2011). Memory distortion: an adaptive perspective. *Trends in Cognitive Sciences*, *15*, 467–74. doi:10.1016/j.tics.2011.08.004

Schacter, D. L. (2012). Adaptive constructive processes and the future of memory. *American Psychologist*, *67*. doi:10.1037/a0029869.Adaptive

Schellenberg, S. (2008). The situation-dependency of perception. *The Journal of Philosophy*, *CV*, 55–84.

Segall, M. H., Campbell, D. T., & Herskovits, M. J. (1966). *The influence of culture on visual perception* (p. 184). Indianapolis: Bobbs-Merrill.

Shenefelt, M., & White, H. (2015). *If A, then B: How the world discovered logic* (Vol. 1). New York, NY: Columbia University Press. doi:10.1017/CBO9781107415324.004

Shapiro, L. A. (2004). *The mind incarnate*. Cambridge, MA: MIT Press.

Shapiro, L. A. (2011). *Embodied Cognition*. Abingdon, Oxon: Routledge.

Shapiro, L. A. (2014). *The Routledge Handbook of Embodied Cognition*. (L. A. Shapiro, Ed.). Abingdon, Oxon: Routledge. doi:10.1016/j.tourman.2012.03.001

Sheard, E. D., & MacLeod, C. M. (2005). List method directed forgetting: Return of the selective rehearsal account. *Dynamic Cognitive Processes*, 219–248. doi:10.1007/4-431-27431-6_10

Shoemaker, S. (1998). Two cheers for representationalism. *Philosophical and Phenomenological Research*, *58*, 671–678.

Siegel, S. (2008). The Epistemic Conception of Hallucination. *Disjunctivism: Perception, Action, Knowledge*, 203–224.

Siegel, S. (2006). Direct Realism and Perceptual Consciousness, *LXXIII*, 378–410.

Smith, A. D. (2006). In Defence of Direct Realism. *Philosophy and Phenomenological Research*, *LXXIII*, 411–424.

Smith, A. D. (2010). Disjunctivism and Illusion. *Philosophy and Phenomenological Research*, *80*, 384–410. doi:10.1111/j.1933-1592.2010.00330.x

Smith, L. B. (2005). Cognition as a dynamic system: Principles from embodiment. *Developmental Review*, *25*, 278–298. doi:10.1016/j.dr.2005.11.001

Smith, L. B. & Thelen, E. (2003) Development as a dynamic system. *TRENDS in Cognitive Science, 7*, 343-348.

Squires, R. (1969). Memory unchained. *The Philosophical Review*, *78*, 178–196.

Steiner, P. (2014). Enacting anti-representationalism. The scope and the limits of enactive critiques of representationalism. *Avant*, *5*, 43–86. doi:10.12849/50202014.0109.0003

Storm, B. C., Bjork, E. L., Bjork, R. A, & Nestojko, J. F. (2006). Is retrieval success a necessary condition for retrieval-induced forgetting? *Psychonomic Bulletin & Review*, *13*, 1023–1027. doi:10.3758/BF03213919

Storm, B. C. (2011). The Benefit of Forgetting in Thinking and Remembering. *Current Directions in Psychological Science*, *20*, 291–295. doi:10.1177/0963721411418469

Strange, D., Sutherland, R., Garry, M. (2006). Event plausibility does not determine children's false memories. *Memory*, *14*, 937-951.

Sutton, J. (1998). Philosophy and Memory Traces: Descartes to Connectionism. Cambridge, UK: Cambridge University Press.

Sutton, J. (2003/2006). Memory. In (D. M. Borchert, Ed.) *Encyclopedia of Philosophy*. Detriot, MI: Thomson Gale.

Sutton, J. (2006). Introduction: Memory, Embodied Cognition, and the Extended Mind. *Philosophical Psychology*, *19*, 281–289. doi:10.1080/09515080600702550

Sutton, J. (2007). Batting, Habit and Memory: The Embodied Mind and the Nature of Skill. *Sport in Society*, *10*, 763–786. doi:10.1080/17430430701442462

Sutton, J., McIlwain, D., Christensen, W., & Geeves, A. (2011). Applying intelligence to the reflexes: embodied skills and habits between Dreyfus and Descartes. *Journal of the British Society for Phenomenology*, *42*, 78–103. doi:10.1080/00071773.2011.11006732

Sutton, J., & Windhorst, C. (2009). Extended and constructive remembering: Two notes on Martin and Deutscher. *Crossroads: An Interdisciplinary Journal for the History, Philosophy, Religion and Classics*, *IV*, 79–91.

Talland, G. A. (1956). *Deranged Memory*. New York, NY: Academic Press.

Taylor, D. (1938). Realism and memory. *Australasian Journal of Psychology and Philosophy*, *16*, 218–232. doi:10.1080/00048403808541115

Thau, M. (2004). What is disjunctivism? Philosophical Studies: An International Journal for Philosophy in the Analytic Tradition, 120, 193–253. doi:10.1007/sI

Thelen, E., Schöner, G., Scheier, C., & Smith, L. B. (2001). The dynamics of embodiment : A field theory of infant perseverative reaching, *Behavioral and Brain Sciences, 42*, 1–86.

Thelen, E. & Smith, L. B. (1994). *A dynamical systems approach to development and action.* Cambridge, MA: MIT Press.

Thompson, E., & Varela, F. J. (2001). Radical embodiment: Neural dynamics and consciousness. *Trends in Cognitive Sciences*, *5*, 418–425. doi:10.1016/S1364-6613(00)01750-2

Thompson, E. (2007). Sensorimotor subjectivity and the enactive approach to experience. *Phenomenology and the Cognitive sciences, 4*, 407-427.

Tonneau, F. (2004). Consciousness outside the Head. *Behavior and Philosophy*, *32*, 97–123.

Tonneau, F. (2011/2012). Metaphor and truth: A review of representation reconsidered by WM Ramsey. *Behavior and Philosophy*, *39/40*, 191–231.

Tonneau, F. (2013). Neorealism: Unifying cognition and environment. *Review of General Psychology*, *17*, 237–242. doi:10.1037/a0032939

Turtle, A. M. (1997). Institution, Ideology, Icon: Psychology at Sydney 1921-1996. *Australian Journal of Psychology*, *49*, 121–127.

Van Cleve, J. (2015). *Problems from Reid*. Oxford, UK: Oxford University Press.

Van Gelder, T. (1995). What might cognition be, if not computation? *Journal of Philosophy*, *92*, 345–381.

Varela, F. J. & Harré, R. Conflicting varieties of realism: Causal powers and the problem of social structure. *Journal for the Theory of Social Behaviour, 26*, 313–325. doi:10.1111/j.1468-5914.1996.tb00293.x

Varela, F. J., Thompson, E., & Rosch, E. (1993). *The Embodied Mind: Cognitive Science and Human Experience*. Cambridge, MA: MIT Press. doi:10.1111/j.1468-0149.1965.tb01386.x

Wade, K. A., Sharman, S. J., Garry, M., Memon, A., Mazzoni, G., Merckelbach, H., & Loftus, E. F. (2007). False claims about false memory research. *Consciousness and Cognition*, *16*, 18–28.

Wade, K. A., Garry, M., Read, J. D., & Lindsay, D. S. (2002). A picture is worth a thousand lies: using false photographs to create false childhood memories. *Psychonomic Bulletin & Review*, *9*(3), 597–603.

Wagner, A. D., & Davachi, L. (2001). Cognitive neuroscience: Forgetting of things past. *Current Biology*, *11*, 964–967. doi:10.1016/S0960-9822(01)00575-9

Wessel, I., & Moulds, M. L. (2008). How many types of forgetting? Comments on Connerton (2008). *Memory Studies*, *1*, 287–294. doi:10.1177/1750698008093794

Wheeler, M. (2005). *Reconstructing the Cognitive World: The Next Step*. Cambridge, MA: MIT Press. doi/10.1007/s11097-007-9062-2

Wilson, B. A, & Wearing, D. (1995). Prisoner of consciousness: A state of just awakening following herpes simplex encephalitis. In R. Campbell & M. A. Conway. (Eds.). Broken memories: Case studies in memory impairment (pp. 14-30). Malden, MA: Blackwell Publishing.

Wilcox, S., & Katz, S. (1981). A direct realistic alternative to the traditional conception of memory. *Behaviorism*, *9*, 227–239.

Wilson, A. D., & Golonka, S. (2013). Embodied cognition is not what you think it is. *Frontiers in Psychology*, *4*, 1-13. doi:10.3389/fpsyg.2013.00058

Wilson, B. A., & Wearing, D. (1995). Prisoner of consciousness: A state of just awakening following herpes simplex encephalitis. In R. Campbell & M. A. Conway (Eds.), *Broken memories: Case studies in memory impairment*. (pp. 14-30). Oxford, UK: Blackwell Publishing

Wilson, M. (2002). Six views of embodied cognition. *Psychonomic Bulletin & Review*, *9*, 625–36.

Wilson, R. A., Clark, A. (2009). How to situate cognition: Letting nature take its course. In P. Robbins & M. Aydede. (Eds.). *The Cambridge Handbook of Situated Cognition* (pp. 55–77). Cambridge, UK: Cambridge University Press. doi:10.1017/cbo9780511816826.004

Wilson, R. & Foglia, L. (2011/2016). Embodied Cognition. In *Stanford Encyclopedia of Philosophy*. Retrieved from http://plato.stanford.edu/entries/embodied-cognition/

Winograd, E., Fivush, R., & Hirst, W. (Eds.). *Ecological approaches to Cognitions: Essays in Honor of Ulric Neisser*. Hillsdale, NJ: Erlbaum.

Wixted, J. T. (2005). Current Directions in Psychological Science What We Once Knew. *Current Directions in Psychological Science*, *14*, 5–9. doi:10.1111/j.0963-7214.2005.00324.x

Woozley, A. D. (1949). *Theory of knowledge: An introduction*. London, UK: Hutchinson & Co Ltd.

Xu, L., Ramirez, S., & Tonegawa, S. (2014). Inception of a false memory by optogenetic manipulation of a hippocampal memory engram. *Philosophical Transactions of the Royal Society of London B: Biological Sciences*, *369*. doi:10.1098/rstb.2013.0142

Zahidi, K. (2014). Non-representationalist cognitive science and realism. *Phenomenology and the Cognitive Sciences*, *13*, 461–475. doi:10.1007/s11097-013-9310-6

Zemach, E. M. (1983). Memory: What is it, and what it cannot possibly be. *Philosophy and Phenomenological Research*, *44*, 31–44.

Zimmerman, D. (1996). Persistence and presentism. *Philosophical Papers*, *25*, 115-126.

Zimmerman, D. (2011). Presentism and the space-time manifold. *The Oxford Handbook of Philosophy of Time*.