EFFECT OF ENVIRONMENTAL NOISE AND ALCOHOL CONSUMPTION ON MEMORY RECALL AMONG UNDERGRADUATES

BY

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BEING A PROJECT SUBMITTED TO THE DEPARTMENT OF PSYCHOLOGY, FACULTY OF THE SOCIAL SCIENCES, FEDERAL UNIVERSITY OYE EKITI IN PARTIAL FULFILLMENT OF THE REQUIREMENT FOR THE AWARD OF BACHELOR OF SCIENCE (BSc) DEGREE IN PSYCHOLOGY.

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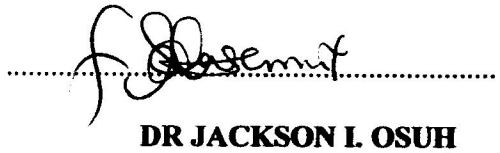
CERTIFICATION

I certify that this study was carried out by AYILARA HASSAN TAIWO PSY/14/2028 of the Department of Psychology, Faculty of Social Sciences, Federal University, Oye Ekiti.



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DEDICATION

This research project is dedicated to the almighty Allah the Benefactor for the successful completion of the research project. Glory belongs to Him for His mercies endure forever.

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The almighty Allah deserve all the praise for seeing me through the experiment and ensuring it success. Am highly grateful to my experiment supervisor, Dr Jackson for his assistance through the course of the experiment as well as corrections and discipline towards the success of this project work, May Almighty Allah increase you in wealth, health and knowledge. Also, appreciation goes to my parents and peers for their financial and moral contributions towards the completion of the research.

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ABSTRACT

The impact of alcohol and noise on memory formation even as a dose-related continuum could cause impairments deficit in the ability to transfer new information from short-term to long-term storage. These are constant factors in our daily lives. The researcher made use of independent group randomised experimental design. Participants are undergraduate student of federal university Oye Ekiti. Through the use of simple random sampling, ninety (90) participants were selected and assigned into nine experimental units for the course of the research. The independent variables alcohol and noise had three levels each to form nine experimental units. Statistical technique as t-test and one way anova were used to analyse data. The results indicate that alcohol has a significant influence on memory recall of undergraduates. (f=-.5.394; df =89; p= <.05), noise has a significant influence on memory recall of undergraduates. (f=13.865; df =89; p= <.05) and alcohol and noise have an interactive influence on memory recall of undergraduates. (f=833.387; df =89; p= <.05). It was therefore concluded that alcohol and noise influenced the memory recall of individuals. The recommendation of this study is that the various educational institutions should put on control measures to curb the consumption of alcohol among students.

Keywords; *Experiment, Alcohol, Noise, Memory Recall*

CHAPTER ONE

INTRODUCTION

1.1 Background to the Study

Memory is the ability to retains, retrieves and uses information that is no longer physically present (Goldstein, 2011). There have been many researchers (Atkinson & Shiffrin, 1968; Baddeley, 1986; Cowan, 1988; Ericsson & Kintsch, 1995) that have proposed models and theories in an attempt to explain what memory is and what it does. It is proposed that memory has multiple structures including sensory memory, short-term memory, long-term memory and more recently, working memory. Each of these structures provides different stages in the memory process and has different time-spans for different information. Immediate recall of stimuli occurs in the working memory (WM), as proposed by many researchers. Much of the research in WM appears to contradict other studies of the same subject with researchers including Baddeley (1986), Cowan (1988) and Ericsson and Kintsch (1995) proposing relatively diverse models and theories. For some time previous to the investigation of the WM many researchers focused on short-term memory (STM) as being responsible for immediate recall as it holds information for a short period of time (Baddeley, Eysenck & Anderson, 2009). The majority of information that is stored in STM is eventually forgotten with a minority managing to access long-term memory (LTM). There is a 15 -20 seconds duration of STM provided, there is no rehearsal of information presented (Goldstein, 2011). A popular measure of STM is digit span which attempts to explain how many digits a person is able to recall. All this form parts of an individual cognitive processes.

Baddeley, Tulving explained in 1983 how the episodic memory stem is responsible for the explicit recollection of incidents that occurred at a particular time and place in one's

personal past. Damage to the inner parts of the temporal lobes, including the hippocampal formation, greatly impairs the acquisition of new episodic memories. Individuals with amnesic syndromes produced by damage to the medial temporal region invariably have serious impairments of episodic memory. They are unable to remember ongoing events in their day-to-day lives and perform poorly on laboratory tests that require episodic memory. Regions within the prefrontal cortex play a key role in episodic memory. Although individuals with selective damage to prefrontal regions do not develop a profound amnesia for recent events, they have great difficulty remembering when and where recent events occurred. Damage to the frontal lobes can also yield distortions of episodic memory, in which patients claim to remember events that never occurred (Cabeza, & Nyberg, 1997). Recent neuro-imaging studies of memory, measuring regional cerebral blood flow using positron emission tomography (PET) and functional magnetic resonance imaging (MRI) have consistently revealed frontal lobe activation during episodic memory tasks. Right frontal regions have tended to show greater activation than right frontal regions during episodic encoding. Hippocampal activations have also been observed during encoding of information into episodic memory and also during retrieval of episodic memories. Somewhat surprisingly, however, quite a few neuroimaging studies have failed to report activation of the hippocampal formation, and researchers are still attempting to understand precisely why hippocampal activation is not always observed. Recent evidence suggests that the hippocampal formation tends to be most active during the actual recollection of that information, whereas prefrontal regions show maximal activation when volunteers make extensive efforts to recall recently presented information.

Alcohol consumption, both at acute levels and during post intoxication when blood alcohol concentration (BAC) has reached 0, is known to produce effects on cognitive performance. There is a long history of research examining the acute effects of alcohol on

mood and performance (Finigan and Hammersley, 1992; Tzambazis & Stough, 2000; Sullivan & Pfefferbaum, 2005). In contrast, it is only recently that the next-day effects of alcohol have attracted.

The cognitive and performance impairments due to acute alcohol consumption have been extensively investigated by using experimental studies especially laboratory-based experiments. For example, laboratory studies have revealed that acute alcohol consumption results in poorer memory performance (Curran & Weingartner, 2002; White, 2003), impairment in tasks of divided attention (Maylor et al., 1990) and impaired executive functions such as planning and decision making (Weissenborn & Duka, 2003; Geroge et al., 2005). Most research on the residual alcohol effects on cognitive performance has followed an experimental design (Prat, et al., 2008; Stephens et al., 2008; Ling et al., 2010; Verster et al., 2010).

Experimental studies induce hangover in a laboratory setting and measure cognitive performance the morning after, when Blood alcohol content (BAC) is zero. Laboratory studies have revealed decreased performance in attention (Myrstein et al., 1980; Roehrs & Roth, 2001; Howland et al., 2010; Rohsenow et al., 2010) and skills related to driving and fying (Seppala et al. 1976; Laurell & Törnos, 1983; Tornros and Laurell, 1991; Verster, 2007). However, many other laboratory-based studies have not observed any next-day effects of alcohol on performance (Collins & Chiles, 1980; Lemon et al., 1993; Chait and Perry, 1994; Finigan et al., 1998; Rohsenow et al., 2006; Kruisselbrink et al., 2006). The absence of impairment in these studies often can be explained by a combination of easy tests of short duration and various methodological shortcomings (Verster et al., 2003; Verster, 2008).

More recently, attention has been directed towards investigating alcohol in a naturalistic setting. It is important to note that there are various differences between controlled and naturalistic study designs and that these differences may have an impact on

study outcome (Verster et al., 2010). Within experimental investigations of the effects of alcohol, it is usual that a fxed dose of alcohol is administered, which may be adapted for gender and weight to realize the same BAC level for each participant. Also, the type of beverage and pace of drinking are usually controlled by the investigator. The participants are not aware of the specific quantity, and it could be argued that this loss of personal control over quantity and beverage type could obscure the subjective experience of alcohol consumption.

However, Myrsten (1971) revealed that the self-reported ratings of subjective intoxication closely resembled the measured BAC curve. Thus, subjective awareness closely mirrors the changes resulting from increasing BAC. Numerous other studies, which assessed the subjective state of intoxication, have revealed that participants can differentiate between alcohol and placebo or between different doses of alcohol (Hamilton et al., 1984; Miller, 1984). Successful deception is consistently reported with doses up to 0.5 mL/kg. Because of the known physiological changes after alcohol consumption, it is difficult to deceive participants that alcohol has been consumed when in fact they have consumed a placebo. This raises the issue of the expectancy effects of alcohol being as strong as the effect of actual alcohol consumption. Lyvers and Maltzman (1991) concluded that a balanced placebo design investigating the effects of alcohol cannot independently evaluate effects of both alcohol and beverage instructions, when behaviourally significant doses of alcohol are administered.

A second major difference is that in naturalistic studies various factors that may have an impact on hangover severity are not controlled by the investigator. For example, participants are allowed to smoke, dance, engage in other activities during drinking (e.g. playing darts) and consume different types of alcoholic beverages (with different congener contents) at their own drinking rate. These factors have been shown to infuence the presence and severity of

alcohol hangover symptoms (Piasecki et al., 2010; Rohsenow et al., 2010; Verster et al., 2010).

There are numerous studies about the effects of music with patients who have learning disabilities or brain diseases, with valid and steady results, however studies about the effects of music on people without any learning disabilities or brain diseases have been inconsistent. A study on background noise affecting memory recall could prove useful among college students whom are trying to find the most effective way to study. Studies have shown that music playing for Alzheimer's patients helped face-name recognition greatly improve (Carruth, 1997). Studies have also shown listening to music rather than background noise or silence gave dementia patients better memory recall (Larkin, 2001). Although the experiment is studying those without diseases such as Alzheimer's or Dimentia, this useful information helps in aiding the hypothesis that listening to music while studying or trying to memorize something could increase the chances of being able to recall that information at a later time. Music is one of the three conditions of the experiment. Another condition is daily noise you might hear while trying to study in a school campus cafeteria or at home. The noises or sounds may include chatter, cars driving by, doors opening and closing, someone opening a bag of chips, etc. Studies have shown that if the noise is not overly distracting and at a low enough decibel level that noise can affect memory positively if it is a consistent part of the background. (Baker & Holding, 1993).

Though, there are also studies that show memory recall being negatively affected by background noise when the information is brand new (Smith & Broadbent, 1981). This experiment was derived to see if background noise had any effects on memory recall, especially among young college students who are trying to study in areas around school, work, library, or home, where the background noises may differ. Due to the differing background noises, three conditions were chosen from a classical song with no speech

playing, silence, or noise recorded from the school cafeteria. The hypothesis is that the participants that studied while listening to the classical song with no speech would have a higher memory recall than those who had to sit in silence or listen to the recording of the Evergreen Valley College cafeteria. The ending results of this experiment could change the way students study or may even change their learning environments.

1.2 STATEMENT OF PROBLEM

Although the researches on the human memory system is still emerging in the field of cognitive psychology and neuroscience, focus must be on high rate of alcohol consumption among youths and unbearable environmental noise. There are quite a number of problems associated with memory system such as alcohol consumption and environmental noise. Researches have associated alcoholism or alcohol dependence or abuse on deteriorating cognitive function and motor functions. Although this findings is consistent over the century, then toxic effect of alcohol on the cognitive process of an individual cannot be over-emphasized. Although it has been assumed that these varied effects stem from alcohol's impairment of cognitive functioning, research findings have been unclear with respect to whether these effects result from a global impairment of cognition or rather some specific impairment of certain brain systems. Atkinson and Shiffrin (1968), posits that memory formation takes place in various stages, proceeding from the sensory memory to the short term memory and then the long term memory. Ryback (1971) characterized the impact of alcohol on memory formation as a dose-related continuum, with minor impairments at one end and large impairments at the other, all impairments representing the same fundamental deficit in the ability to transfer new information from short-term to long-term storage. When doses of alcohol are small to moderate (producing blood alcohol concentrations [BACs] below 0.15 percent), memory impairments tend to be small to moderate as well. At these

levels, alcohol produces what Ryback (1971) referred to as cocktail party memory deficits, lapses in memory that people might experience after having a few drinks at a cocktail party, often manifested as problems remembering what another person said or where they were in conversation. Several studies have revealed that alcohol at such levels causes difficulty forming memories for items on word lists or learning to recognize new faces (Westrick et al. 1988; Mintzer and Griffiths 2002). As the dose increases, the resulting memory impairments can become much more profound, sometimes culminating in blackouts which are periods for which a person is unable to remember critical elements of events, or even entire events, that occurred while he or she was intoxicated.

Noise is another negating factor to the memory recall ability of an individual as such it should be perceived as an all but constant factor in our daily lives. There are quite a number of sources of noise in the environment. Car traffic and construction sites are just two examples of sources for noise pollution that can have negative effects. The effects of noise are important to study and regulate if modern man wants to live healthily (World Health Organization, 2011). According to a Swedish survey made by Bluhm, Nilsson and Rosenlund (2006), noise on many important things, such as hearing, concentration, sleep and learning. When asking eight- and twelve years old schoolchildren in Stockholm, 30 percent felt disturbed by sound levels in their school, and 18 percent felt disturbed by sound their home environment. Based on these observations, the current study would like to answer the following research questions.

RESEARCH QUESTIONS

- How will alcohol influence memory recall of undergraduate students in federal university Oye Ekiti?
- To what extent will Background noise influence memory recall of undergraduate students in federal university Oye Ekiti?

1.3 RESEARCH OBJECTIVES

MAIN OBJECTIVE

The main objective is to examine the main and interactive effect of alcohol consumption and background noise on the memory recall of undergraduate students in federal university Oye Ekiti.

SPECIFIC OBJECTIVES

- To examine the influence of alcohol consumption on the memory recall of undergraduate students in federal university Oye Ekiti.
- To examine the influence of background noise on the memory recall of undergraduate of federal university Oye Ekiti.
- To examine the interactive effect if alcohol consumption and background noise on the memory recall of undergraduate of federal university Oye Ekiti.

1.4 RELEVANCE OF STUDY

This study is very relevant to the field of cognitive psychology as it provides information about the adverse effect of alcohol consumption and the negative impact of noise in the academic environment. The current study continues from previous studies that focused on the problems attached to the effective performance of the human memory. This study therefore belongs to the basic form of research as data from the research will continue to improve the effectiveness of the human memory.

More so, the current study lays more emphasis on the areas of academic performance decline by linking the increased use of alcohol among students and adverse effect of noisy

environment on the academic performance of students. The academic environment has been known for the vulnerability to usage of alcohol and inconducive environment due to noise. Therefore, linking these issues with academic performance will aid the improvement of students' academic performances.

CHAPTER TWO

2.1 THEORETICAL FRAME WORK

2.1.1 THEORY OF ENCODING SPECIFICITY

In the 1980s, Endel Tulving proposed an alternative to the two-stage theory. This theory states that memory utilizes information both from the specific memory trace as well as from the environment in which it is retrieved. Because of its focus on the retrieval environment or state, encoding specificity takes into account context cues, and it also has some advantages over the two-stage theory as it accounts for the fact that, in practice, recognition is not actually always superior to recall. Typically, recall is better when the environments are similar in both the learning (encoding) and recall phases, suggesting that context cues are important. In the same way, emotional material is remembered more reliably in moods that match the emotional content of these memories (e.g. happy people will remember more happy than sad information, whereas sad people will better remember sad than happy information).

Relations between the effects of the past and present inputs and the interaction of the memory trace with the retrieval environment constitute the domain of theories of retrieval. Although the important issues are not yet entirely clear, many questions do seem to be central to the understanding of retrieval processes and are likely to come more directly under experimental and theoretical scrutiny. What, for instance, determines the high degree of selectivity of retrieval, the fact that at any given moment a person can only remember one discrete event? Is the output mode of the memory system different from the input mode? Can information be retrieved at the same time that some other information is stored, or does storage always involve retrieval, and retrieval storage? How do we conceptualize the nature of the effect of a retrieval cue on stored information? Does it activate the trace, does it elicit it directly or indirectly, does it provide access to it, does it restrict the size of the search set,

does it somehow complement the information contained in the trace, or what? Is there a fundamental difference between recall and recognition, or do these two retrieval operations differ only in terms of the nature of retrieval cues present at output? What controls retrieval in a situation in which no specific cues seem to be present, such as in free recall? What makes some stimuli effective cues for retrieval of a given event and others not?

Some theorists are not interested in subjects' memories for particular events but rather in changes in probabilities of particular responses. One might say they are not interested in memory but in learning. In their pre-theoretical scheme of things, Word A is identical with Word A, regardless of the situations in which they occur. For instance, "chair" as a response indicating memory for a particular word event in an experimental task and "chair" as a response to the word table in the free-association test are lumped together into the same response class. The changes in the probability of emission of responses of this class then constitute behavioural happenings of experimental and theoretical interest. Given this type of orienting framework, the following simple explanation of extralist cuing effects can be and has been advocated. A semantic association exists between table and CHAIR prior to the experiment. Another association is created between CHAIR, or the corresponding response, and the general contextual stimuli present in the experiment. In the noncued recall test, only the contextual association is reactivated, while in the cued test both the contextual association derived from the experimental input and the specific association with table originating outside the experiment converge upon the response CHAIR, producing a higher probability of the correct response in the cued situation. Such a theory of convergence of experimental and extra experimentally acquired associations has been proposed by Bilodeau and his associates (Bilodeau, 1967; Bilodeau & Blick, 1965) to account for their own observations in extralist cuing experiments. It tacitly assumes that the activation of the extra experimental

association between the cue and the target word at the time of recall is independent of what happened at the time of presentation of the target word for study.

2.1.2 Levels of processing effect theory

This is another alternative theory of memory suggested by Fergus Craik and Robert Lockhart, memory recall of stimuli is also a function of the depth of mental processing, which is in turn determined by connections with pre-existing memory, time spent processing the stimulus, cognitive effort and sensory input mode. Thus, shallow processing (such as, typically, that based on sound or writing) leads to a relatively fragile memory trace that is susceptible to rapid decay, whereas deep processing (such as that based on semantics and meanings) results in a more durable memory trace. This theory suggests, then, that memory strength is continuously variable, as opposed to the earlier Atkinson-Shiffrin, or multi-store, memory model, which just involves a sequence of three discrete stages, from sensory to short-term to long-term memory. The evidence suggests that memory retrieval is a more or less automatic process. Thus, although distraction or divided attention at the time of recall tends to slow down the retrieval process to some extent, it typically has little to no effect on the accuracy of retrieved memories. Distraction at the time of encoding, on the other hand, can severely impair subsequent retrieval success. The efficiency of memory recall can be increased to some extent by making inferences from our personal stockpile of world knowledge, and by our use of schema (plural: schemata). A schema is an organized mental structure or framework of pre-conceived ideas about the world and how it works, which we can use to make realistic inferences and assumptions about how to interpret and process information. Thus, our everyday communication consists not just of words and their meanings, but also of what is left out and mutually understood (e.g. if someone says "it is 3 o'clock", our knowledge of the world usually allows us to know automatically whether it is 3am or 3pm). Such schemata are also applied to recalled memories, so that we can often flesh

out details of a memory from just a skeleton memory of a central event or object. However, the use of schemata may also lead to memory errors as assumed or expected associated events are added that did not actually occur.

When man is viewed as a processor of information (Miller, 1956; Broadbent, 1958), it seems necessary to postulate holding mechanisms or memory stores at various points in the system. For example, on the basis of his dichotic listening studies, Broadbent (1958) proposed that information must be held transiently before entering the limited-capacity processing channel. Items could be held over the short term by recycling them, after perception, through the same transient storage system. From there, information could be transferred into and retained in a more permanent long-term store. Broadbent's ideas have been developed and extended by Waugh and Norman (1965), Peterson (1966), and Atkinson and Shiffrin (1968). According to the modal model (Murdock, 1967), it is now widely accepted that memory can be classified into three levels of storage: sensory stores, short-term memory (STM) and long-term memory (LTM). Since there has been some ambiguity in the usage of terms in this area, we shall follow the convention of using STM and LTM to refer to experimental situations, and the terms "short-term store" (STS) and "long-term store" (LTS) to refer to the two relevant storage systems. Stimuli can be entered into the sensory stores regardless of whether or not the subject is paying attention to that source; that is, sensory stores are "pre-attentive" (Neisser, 1967). The input is represented in a rather literal form and can be overwritten by further inputs in the same modality (Neisser, 1967; Crowder & Morton, 1969). Further features which distinguish the sensory registers from later stores are the modality-specific nature and moderately large capacity of sensory stores and the transience of their contents. Attention to the material in a sensory register is equivalent to reading it out and transferring it to STS. Here, verbal items are coded in some phonemic fashion (Shulman, 1971) or in auditory-verbal-linguistic terms (Atkinson & Shiffrin, 1968).

The short term storage is further distinguished from sensory memories by virtue of its limited capacity (Miller, 1956; Broadbent, 1958), by the finding that information is lost principally by a process of displacement (Waugh & Norman, 1965), and by the slower rate of forgetting from short term storage: 5-20 seconds as opposed to the 1-2-second estimates for sensory storage. While most research has concentrated on verbal short term storage, there is evidence that more literal "representational" information may also be held over the short term (Posner, 1967), although the relationship between such modality-specific stores and the verbal STS short term storage has not been made clear. The distinctions between short term storage and LTS are well-documented. Whereas short term storage has a limited capacity, LTS has no known limit; verbal items are usually coded phonemically in STS but largely in terms of their semantic features in LTS (Baddeley, 1966); forgetting from short term storage is complete within 30 seconds or less while forgetting from LTS is either very slow or the material is not forgotten at all (Shiffrin & Atkinson, 1969). In the free-recall paradigm, it is generally believed that the last few items are retrieved from STS and prior items are retrieved from LTS; it is now known that several variables affect one of these retrieval components without affecting the other (Glanzer, 1972). Further persuasive evidence for the short term storage /LTS dichotomy comes from clinical studies (Milner, 1970; Warrington, 1971). The distinguishing features of the three storage levels are summarized in Table I. The attractiveness of the "box" approach is not difficult to understand.

Such multistore models are apparently specific and concrete; information flows in well-regulated paths between stores whose characteristics have intuitive appeal; their properties may be elicited by experiment and described either behaviourally or mathematically. All that remains, it seems, is to specify the properties of each component more precisely and to work out the transfer functions more accurately. Despite all these points in their favour, when the evidence for multistore models is examined in greater detail,

the stores become less tangible. One warning sign is the progressively greater part played by "control processes" in more recent formulations (for example, Atkinson & Shiffrin, 1971). In the next section we consider the adequacy of multistore notions more critically.

Working with verbal material, Conrad (1964) and Baddeley (1966) provided one plausible basis for distinguishing STS and LTS. They concluded that information in STS was coded acoustically and that coding was predominantly semantic in LTS. Further research has blurred this distinction, however. First, it has been shown that STS coding can be either acoustic or articulatory (Levy, 1971; Peterson & Johnson, 1971). Second, recent papers by Kroll and his colleagues (Kroll et al., 1970) have demonstrated that even with verbal material, STS can sometimes be visual. Apparently STS can accept a variety of physical codes. Can STS also hold semantic information? The persistence of contradictory evidence suggests either that the question has been inappropriately formulated or that the answer depends on the paradigm used. When traditional STM paradigms are considered, the answer seems to be "no" (Kintsch & Buschke, 1969; Craik & Levy, 1970), although Shulman (1970, 1972) has recently presented persuasive evidence in favour of a semantic STS. While type of coding may originally have seemed a good basis for the distinction between short-term and long-term memory, the distinction no longer appears satisfactory. A defender of the multistore notion might argue that STS coding is flexible, but this position removes an important characteristic by which one store is distinguished from another. If memory stores are to be distinguished in terms of their forgetting characteristics, a minimal requirement would seem to be that the retention function should be invariant across different paradigms and experimental conditions. While this invariance has not been rigorously tested, there are cases where it clearly breaks down. We will give two examples. First, in the finite-state models of paired-associate learning, the state commonly identified as STS shows forgetting characteristics which are different from those established for STS in other paradigms

(Kintsch, 1970). In the former case, STS retention extends over as many as 20 intervening items while in the free-recall and probe paradigms (Waugh & Norman, 1965), STS information is lost much more rapidly. As a second example, the durability of the memory trace for visual stimuli appears to depend on the material and the paradigm. According to Neisser (1967), the icon lasts 1 second or less, Posner (1969) and his colleagues have found evidence for visual persistence of up to 1.5 seconds, while other recent studies by Murdock (1971), Phillips and Baddeley (1971) and by Kroll et al. (1970) have yielded estimates of 6, 10, and 25 seconds, respectively. Estimates are even longer in recognition memory for pictures (Shepard, 1967; Haber, 1970). Given that we recognize pictures, faces, tunes, and voices after long periods of time, it is clear that we have long-term memory for relatively literal nonverbal information.

2.1.3 Richard Semon's theory of memory

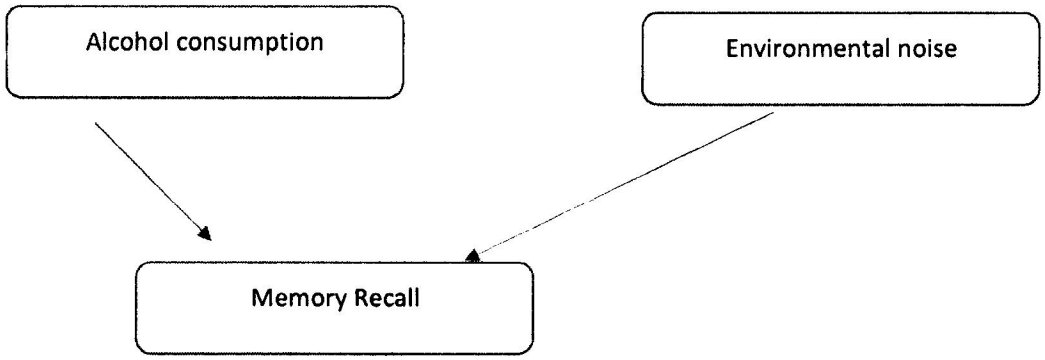
Semon's theory of memory was based upon two fundamental postulates, which the author termed the "Law of Engraphy" and the "Law of Ecphory." The first law was Semon's characterization of memory storage: "All simultaneous excitations...within our organisms form a connected simultaneous complex of excitations which, as such, acts engraphically, that is to say leaves behind it a connected and, to that extent, unified engram-complex" (1923, pp. 159-160). There are several points contained in this law that subsequently emerge as critical features of Semon's theory. First there is Semon's emphasis on the unitary, holistic nature of engram complexes that he later applies to the analysis of various mnemonic phenomena. Second there is the notion that each event, or corresponding "simultaneous excitation-complex" leaves behind a separate engram-complex; this idea is elaborated upon and utilized in Semon's analyses of repetition effects and recognition.

The law of engraphy also sets the stage for Semon's law of ecphory, which represents his view of memory retrieval: "The partial return of an energetic situation which has fixed

itself engraphically acts in an ecphoric sense upon a simultaneous engram-complex" (1923). Thus Semon's view of retrieval is red integrative. Only part of the total situation at the time of storage need be present at the time of recall in order for retrieval of the original event in its entirety to occur. This view of retrieval (one of the very few such views that had been explicitly formulated in Semon's time) was further developed and utilized by Semon in analyses of problems such as association by contiguity vs. association by similarity and the temporal organization of memory, and led Semon to formulate novel positions concerning matters such as the active role of ecphory in establishing new engram-complexes and the role that ecphory plays in the storage of new engram-complexes. Also, by allowing for the representation of internal or "energetic" stimuli in engram complexes, Semon was able to offer surprisingly modern statements concerning phenomena such as state-dependent retrieval. We will explore these points in greater detail shortly. A third notion that is part of the kernel of Semon's theory (although it was not granted the status of a "law" by Semon) is the concept of homophony. Homophony may be most simply viewed as a resonance metaphor; Semon used it to describe the mechanism by which information from different sources is combined, defining it as "...the concordant action of closely allied mnemic and original excitations, a consonance which I have found it convenient to call Homophony" (1921, p. 13). Homophony can exist between two "original sensations," between "original and mnemic sensations," or between two "mnemic sensations." This resonance principle was invoked by Semon in constructing what we might want to call "retrieval explanations" of repetition effects and problems of recognition; he also applied it to various problems of perception that will not concern us here. The major point that we wish to extract from this highly condensed overview of Semon's position, and which we will document more fully later in the paper, is that the analysis of retrieval was one of Semon's principal theoretical concerns. More specifically, we will argue that Semon's focus upon the conditions, functions,

and processes of retrieval was one of the few systematic attempts to elucidate the role of retrieval in memory during the period under consideration, that his ideas about retrieval anticipated much modern research, and that his emphasis on retrieval phenomena at a time when few were interested in this problem may well have contributed to his subsequent obscurity.

2.2 Conceptual Framework



The diagram above illustrates the research conceptual framework. It shows here that alcohol consumption and environmental noise will influence memory recall of individuals.

2.3 Related Empirical Studies

2.3.1 Primacy effect and memory recall

It is well known that events that are different from the prevailing context are better recalled in free recall tests than events that are congruent with the context (Schmidt, 1991). That is, isolated items, or items that are incongruent with the surrounding context, are better recalled than non-isolated items consistent with the current context, a phenomenon known as the isolation effect. For example, a letter that is presented in a list that otherwise consists of numbers is better recalled than the numbers. Traditional accounts of the isolation effect have emphasized cognitive concepts such as distinctiveness and salience (Green, 1956; Jenkins & Postman, 1948). The isolation effect is a nontrivial phenomenon. As argued later, it cannot easily be accounted for by mechanisms such as salience, distinctiveness, or interference.

The primacy effect is the finding that the free recall performance is improved for the first few items (Murdock, 1962). Primacy cannot easily, as reviewed later, be accounted for purely by rehearsal from short-term memory. The recency effect is the finding that the last few items are better recalled on immediate testing (Murdock, 1962). The isolation, primacy, and recency effects share the property that they occur when there is a change in a given context; however, these phenomena are seldom theoretically or experimentally related. A goal of this article is to establish a common theoretical framework.

The isolation is the robust and strong effect where an isolated item is better remembered in a free recall test than an item that is consistent with the surrounding context. The isolated item can be made different from the surrounding context in a variety of ways (Schmidt, 1991): by a physical difference, for example, one word printed in red and the other words printed in black (Wallace, 1965); by a conceptual difference, for example, the word car embedded in a list of various flower names (Hunt & Mitchell, 1982); by showing nude pictures in a series of more typical magazine pictures (Ellis, Detterman, Runcie, McCarver, & Craig, 1971); by consistency or inconsistency with the subjects' schema, for example, whether an ashtray is seen either in a preschool classroom or in an office (Pezdek, Whetstone, Reynolds, Askari, & Dougherty, 1989); by predictability, for example, a single word that was either predictable or not predicable from the a preceding text (O'Brian & Myers, 1985); by words rated as more distinctive than words rated as not distinctive (Hunt & Elliot, 1980); by bizarre versus non-bizarre imagery (Einstein, McDaniel, & Lackey, 1989); and so on, where the isolated, deviating, or different condition is better recalled or remembered than the corresponding non-isolated condition.

A traditional view of the isolation effect is to emphasize salience, distinctiveness, or interference; however, as argued here, the isolation effect cannot easily be explained by these concepts. For example, Jenkins and Postman (1948) were first to propose that differential

attention is the mechanism mediating the effects of distinctiveness. Green (1956) argued that the isolation effect results from a surprise induced by the change from preceding items. Murdock (1960) defined distinctiveness as the extent to which a given stimulus "stands out" from other stimuli and noted that the concept of distinctiveness refers to the relation between a given stimulus and one or more other stimuli to compare with. That is, if there are no comparison stimuli, the concept of distinctiveness is simply not applicable. Although salience and distinctiveness are intuitively appealing as theoretical constructs for the isolation effect, there are problems with this view. Already in the original article introducing the isolation effect, von Restorff (1933) argued against the necessity of salience at encoding for superior memory performance. Unlike the standard practice of placing the isolated item in the middle of the list, von Restorff placed this item at the second position. At the presentation of this item, no context has been established and participants should therefore not conceive of this item as being salient. Yet, an isolation effect was observed. Later research has also found the isolation effect when the isolated item is placed at the first serial position (Kelley & Nairne, 2001; McConnell, Sherman, & Hamilton, 1994; Pillsbury & Rausch, 1943). Von Restorff (1933) suggested that the isolation effect occurs due to impoverished memory of the non-isolated items rather than the salience of the isolated item. That is, it was argued that the isolation effect occurs because of interference among the similarity of the non-isolated items, making them less easily retrievable than the isolated item. This interference account makes different predictions depending on whether the comparison of the isolated item is made to an item at the same serial position in control lists of homogenous or heterogeneous items. It suggests that the isolated item should be better retrieved than a corresponding item in a homogenous control list consisting of items from the same category, where the interference is large; this has been found experimentally (von Restorff, 1933).

The primacy effect in free recall is the phenomenon that the first few items on a list are better recalled than items in the middle of a list. The dominating account of the primacy effect in free recall is repetition in short-term memory (Atkinson & Shiffrin, 1968; Phillips, Shiffrin, & Atkinson, 1967). That is, items at the beginning of the list are rehearsed more because there are fewer other items that interfere with the repetition compared to items later in the list. However, this account seems unsatisfactory as a complete account for all aspects of the primacy effect. Attempts made to eliminate rehearsal, for example as reviewed later by a short presentation time, do not eliminate the primacy effect. However, it is frequently claimed that although the primacy effect is not eliminated, the conditions where rehearsal is eliminated have a lower primacy effect than conditions where rehearsal is possible. However, this conclusion is confounded by the fact that elimination of rehearsal, for example, by using a fast presentation rate, not only attenuates the performance of the first items in the list but also attenuates the overall performance level. To avoid this confound it would be useful to have a quantitative measurement of the primacy effect that takes this confounding into account. To the author's knowledge no quantitative measurement of the size of the primacy effect has been introduced in the literature. Therefore the primacy ratio (PR) measurement of the primacy effect is introduced here. This measurement does not depend on the overall performance level. It is defined as one minus the ratio of the probability of correct recall of the last serial position in the primacy effect and the probability of correct recall of the first serial position. The last serial position in the primacy effect is defined as the first serial position followed by a serial position with a higher performance. The larger the value of the PR, the stronger the primacy effect is. A zero value indicates no primacy effect, whereas a positive value indicates a primacy effect. The maximum possible PR is 1. Notice that the PR may provide a different perception of what constitutes a primacy effect. For example, if the probability of recall at immediate testing for serial position 1 to 5 is 1, 0.5, 0.3, 0.1, and 1,

then most research would conclude that there is a primacy effect due to the large slope at the early positions. However, assume that after a considerable delay the performance has declined with a factor 1/100 to 0.010, 0.005, 0.003, 0.001, and 0.010, then many researchers would conclude that there is no primacy effect because the slope is approximately flat. This indicates that measuring the primacy by the slope is problematic, given that one is interested in inferring conclusions of what is happening during encoding. That is because this measurement is very dependent on other strength factors, for example, the retention interval. However, the PR measurement is less sensitive to similar strength factors, and in this example the PRs for the two conditions are actually identical $1 - 0.1/1 = 1 - 0.001/0.010 = 0.9$. Using the PR measure, available data show a strong PR for a large number of manipulations aimed to eliminate rehearsal. The number in parentheses shows the PR. Primacy effects are found in the following conditions: fast study time; a positive PR is found if items are presented so fast that rehearsal is impossible or unlikely. For example, the PR in Wixted and McDowell (1989) was larger (PR = 0.50) under fast conditions (0.50 sec per item) than under slow conditions (PR = 0.41; 2.5 sec per item). All participants in the fast condition reported that they did not rehearse, suggesting either that the primacy effect is independent of rehearsal, or that rehearsal occurs without awareness (Glanzer & Cunitz, 1966). A primacy effect was found following incidental instructions when participants have no reason whatsoever to rehearse because they are simply not expected to be tested (PR = 0.23 in Darley & Glass, 1975; PR = 0.67 in Gershberg & Shimamura, 1994) and for stimuli materials that are difficult to rehearse, for example, pictures (PR = 0.52 in Watkins & Peynircioglu, 1983). Primacy is found during rehearsal suppression, or fixed rehearsal, where participants are instructed to only rehearse the presently encoded item (PR = 0.43 in Fischler, Rundus, & (PR = 0.56 in Fischler et al., 1970). A pronounced primacy effect also occurs under continuous distractor tasks. For example, concurrent counting backward (PR = 0.60;

Modigliani & Hedges, 1987); it also occurs when rehearsal is encouraged (PR = 0.39 Modigliani & Hedges, 1987). The primacy effect is found in other species besides humans, where elaborated strategies such as rehearsal are less likely to occur. For example, in primates and pigeons (PR = 0.20 in Wright, Santiago, Sands, Kendrick, & Cook, 1985). Due to the arguments and data presented previously, it is reasonable to conclude that factors other than rehearsal contribute to the primacy effect. The recency effect in free recall is the phenomenon that the most recently encoded items are, on immediate retrieval, better recalled than items in the middle of the list (Murdock, 1962; Tan & Ward, 2000). The original explanation of the recency effect was that items first reside in a capacity-limited short-term buffer from which the items are immediately retrieved. Subsequent retrieval of earlier items are recalled from a more permanent long-term memory store (Atkinson et al., 1968). This dual-store model was later challenged by empirical data showing a "recency" effect also for retrieval from long-term memory. In particular, recency was found in a continuous distractor task, where each encoded item is followed by a distractor task of different lengths. A recency was found when the length of the distractor for the last item was not longer than the length of the earlier distracters (Bjork & Whitten, 1974; Glenberg, Bradley, Kraus, & Renzaglia, 1983). However, several lines of evidence have suggested that long-term recency (LTR) is different from short-term recency (STR). For example, a negative recency effect is found in STR but not in LTR. This effect occurs when participants first make an immediate recall from the lists. Following a delay, a final free recall test is given where the performance on the last few items are lower than items in the middle of the list (Craik, 1970). STR is sensitive to output order, whereas LTR is not (Dalezman, 1976). STR is insensitive to damage to the medial temporal lobe (Carlesimo, Marfia, Loasses, & Caltagirone, 1996). Kahana (1996) showed that items that appear nearby during encoding are more likely to be recalled together than items that are far apart during encoding. This effect is asymmetrical so that forward

transitions are more likely than backward transitions. However, this effect is much more pronounced during recency items compared to items from the middle of the list. Several variables affect pre-recency items but not recency items for example, list length, word frequency, semantic similarity, and proactive interference in free recall (Craik & Birtwistle, 1971; Glanzer, 1972).

Finally, several variables that influence short-term memory or the recency effect, for example, visual or auditory modality do not influence the primacy effect (Craik, 1970). Later theories have emphasized the role of a continuously changing context, and they account for the recency effect by residual overlap between the retrieval context and the encoding context (Davelaar, Goshen-Gottstein, Ashkenazi, Haarmann, & Usher, 2005; Howard & Kahana, 2002). Here it is shown how primacy, recency, and isolation effects are predicted by an adaptive LTP–LTD threshold and bounded synaptic strength.

2.3.2 Paradigms and Recognition Tasks

If memory stores are to be distinguished in terms of their forgetting characteristics, a minimal requirement would seem to be that the retention function should be invariant across different paradigms and experimental conditions. While this invariance has not been rigorously tested, there are cases where it clearly breaks down. Two examples explains this process. First, in the finite-state models of paired-associate learning, the state commonly identified as STS shows forgetting characteristics which are different from those established for STS in other paradigms (Kintsch, 1970). In the former case, STS retention extends over as many as 20 intervening items while in the free-recall and probe paradigms (Waugh & Norman, 1965), STS information is lost much more rapidly. As a second example, the durability of the memory trace for visual stimuli appears to depend on the material and the paradigm. According to Neisser (1967), the icon lasts 1 second or less, Posner (1969) and his colleagues have found evidence for visual persistence of up to 1.5 seconds, while other recent

studies by Murdock (1971), Phillips and Baddeley (1971) and by Kroll et al. (1970) have yielded estimates of 6, 10, and 25 seconds, respectively. Estimates are even longer in recognition memory for pictures (Shepard, 1967; Haber, 1970). Given that we recognize pictures, faces, tunes, and voices after long periods of time, it is clear that we have long-term memory for relatively literal nonverbal information. If memory stores are to be distinguished in terms of their forgetting characteristics, a minimal requirement would seem to be that the retention function should be invariant across different paradigms and experimental conditions. While this invariance has not been rigorously tested, there are cases where it clearly breaks down.

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2.3.3 Theory of Alcohol Effects

Theoretical models of alcohol's effects in the past two decades, researchers have begun to examine specific cognitive mechanisms that may underlie the effects of alcohol. Steele and his colleagues (Steele & Josephs, 1988, 1990; Steele & Southwick, 1985) proposed a model of alcohol effects that focuses on alcohol's influence on attentional processes, rather than its direct pharmacological effects on motivational systems. According to this attention-allocation model, intoxication restricts one's focus of attention to only the most salient cues in the environment, such that available cues are not fully processed (Sayette, 1999). This model has been used to account for a diverse range of social behaviours including aggression (Graham et al., 1998; Bushman, 1997), helping behaviour (Steele et al., 1985), and sexual risk-taking among adolescents (Cooper & Orcutt, 1997).

Additional evidence in favour of this theory comes from studies examining alcohol's effects on experimental tasks requiring participants to divide their attention across multiple tasks or spatial locations. For example, although alcohol generally seems to impair performance on divided-attention tasks (Lex et al., 1994; Maylor et al., 1990), performance is relatively unaffected on those tasks considered to be most important to participants (i.e. their primary task) while performance on secondary tasks is greatly impaired (Fisk and Scerbo, 1987). Also, studies in which participants are told to attend to stimuli in one modality while ignoring stimuli in a different modality (distracters) show that intoxicated participants perform somewhat better than sober participants (Erblich and Earleywine, 1995; Patel, 1988), indicating that alcohol actually may improve one's ability to screen out irrelevant information. In addition, alcohol reduces stress associated with threat cues primarily under conditions of divided attention (Curtin et al., 1998, 2001). All of these findings are consistent with the view that alcohol leads to a narrower focus of attention (or attention span).

A related model proposed by Vogel-Sprott and colleagues posits that, rather than restricting attentional focus, alcohol impairs a form of response inhibition (Fillmore and Vogel-Sprott, 1999, 2000; Vogel-Sprott, 1992; Vogel-Sprott et al., 2001). This model is based on a theory of cognitive control (Logan & Cowan, 1984) positing that behavioural activation and behavioural inhibition stem from two independent cognitive processes. According to the theory, certain stimuli or events prompt people to activate a given behaviour whereas others prompt people to inhibit that behaviour. For example, hearing one's favourite music at a party might prompt a person to begin dancing, whereas other cues (e.g. that no one else is dancing) should inhibit that response. Following alcohol consumption, however, this inhibition mechanism may be impaired. Direct support for this model has been provided in studies utilizing a 'go–stop' paradigm, in which participants are engaged in responding to 'go' signals while 'stop' signals occasionally inform them to inhibit the response (Fillmore & Vogel-Sprott, 1999, 2000; Mulvihill et al., 1997).

2.3.4 Memory recall and recognition memory

One major focus of research has concerned the relationship between recall and recognition memory (Anderson & Bower, 1973; Kintsch, 1970; Mandler, 1980; Tulving, 1976). Two early views were represented by strength theory and genemte-recognize theory. Strength theory used a threshold notion to explain the typical finding that recognition is usually superior to recall. That is, recalling an item from memory requires more information in storage (i.e., memory strength) than recognizing an item (McDougall, 1904; Postman, 1963).

The generate-recognize view proposed that recall depends on a two-stage process in which retrieval of candidate items from memory is followe

d by a familiarity decision, whereas recognition memory requires only a familiarity decision (Hollingworth, 1913; James, 1890). More formal versions of this view were later

developed (Anderson & Bower, 1973: Bahrick, 1970; Kintsch, 1970). Strength models and generate-recognize models of memory have been largely replaced by accounts that attribute important retrieval functions to both recall and recognition.

According to the encoding specificity principle (Tulving, 1983), successful retrieval depends on achieving a match between the information encoded at the time of learning and the information that is available at the time of retrieval. Recollection is successful to the extent that the information available at retrieval can reinstate features of the learning event (Horowitz & Prytulak, 1969). Recall is typically more difficult than recognition because, compared with recognition, recall requires more extensive reinstatement of the learning event (Anderson & Bower, 1972, 1974; Gillund & Shiffrin, 1984; Kintsch, 1974; Lockhart, Craik, & Jacoby, 1976; Ratcliff, 1978; Roediger, Weldon, & Challis, 1989).

Studies of memory have distinguished between declarative, explicit, or conscious memory on the one hand and non-declarative, implicit, or non-conscious memory on the other (see Hintzman, 1990; Richardson-Klavehn & Bjork, 1988;Schacter, 1987; Shimamura, 1989; Squire, 1987; Tulving. 1985; Weiskrantz, 1987). This distinction receives strong support from findings with amnesic patients, who are severely impaired on conventional tests of learning and memory (e.g., recall, recognition, and paired-associate learning), but who can nevertheless perform entirely normally on indirect or implicit tests of memory (e.g., priming, skill learning, and conditioning). On the basis of these findings, as well as other findings from normal subjects, it has been appreciated that memory is not a single faculty but is composed of multiple processes or systems. The memory system impaired in amnesic patients (i.e., declarative memory) is dependent on the integrity of the hippocampus and related structures (Squire & Zola-Morgan, 1991). Both recall and recognition memory' are generally considered to depend on declarative memory. By one view, recognition memory performance is closely linked to recall. Subjects explicitly evaluate their memory and can either retrieve items

(recall) or make judgments as to whether or not items are familiar (recognition). By this view, recall and recognition depend equivalently on declarative memory. Alternatively, recognition memory has been proposed to depend importantly on the facility with which a subject processes the recognition cue. This notion is based on perceptual priming. A non-conscious process whereby the facility for detecting and identifying words and other perceptual objects is improved by recent encounters with the same words or objects (Shimamura, 1986; Tulving & Schacter, 1990). The view is that recognition memory performance benefits not only from the ability to judge consciously whether a previous event has occurred but also from increased perceptual fluency, that is, from priming (Gardiner, 1988;Jacoby, 1983; Johnston, Dark, & Jacoby, 1985: Mandler, 1980). That is, subjects can detect the facility or fluency with which they process a test item and can then attribute this increased fluency to a recent occurrence of the item. Thus, by this view recall depends on declarative memory, and recognition depends on declarative memory as well as on non-declarative memory.

Evidence relevant to the nature of recognition memory could potentially come from the study of human amnesia, because amnesia selectively impairs declarative (explicit) memory. If recognition performance depends importantly on non-declarative memory (specifically, on perceptual fluency), then the relationship between recognition and recall performance should be different in amnesic patients than in normal subjects. In both subject groups, recognition should be superior to recall because it is typically easier to recognize items that were encountered recently than to recall them. However, in amnesic patients recognition memory should be disproportionately better than would be expected from the level of recall, because recognition is presumed to depend importantly on non-declarative (implicit) memory, which is spared in amnesia. Furthermore, to the extent that recognition performance depends on non-declarative (i.e., non-conscious) memory, it could be supposed that amnesic patients would perform well on a recognition test but be unable to reflect their

correct performance in confidence ratings, that is, they would report that they were simply guessing (Weiskrantz, 1988). By this view, recognition memory should be disproportionately spared in amnesia, relative to both recall and the confidence ratings given for recognition items. Alternatively, if recall and recognition memory depend primarily on declarative memory (and on the integrity of the brain system damaged in amnesia), then recall and recognition should be proportionately impaired in amnesia and the confidence ratings given for recognition items should be commensurate with the level of recognition memory performance that is achieved.

The small amount of data available from amnesic patients on this issue have been equivocal. In one report amnesic patients appeared to exhibit proportionate impairment on free recall and recognition tests (Squire & Shimamura, 1986). Similar findings were reported by Shimamura and Squire (1988) in comparisons of cued recall and recognition memory. Moreover, confidence ratings given for recognition judgments were commensurate with recognition performance.

However, two studies also have reported that amnesic patients exhibited disproportionate sparing of recognition in comparison to recall (Hirst et al., 1986; Hirst, Johnson, Phelps, & Volpe, 1988). The difficulty in interpreting all these findings is that comparisons between normal and impaired performance on two different tasks are beset by formidable methodological problems (Chapman & Chapman, 1973; Meudell & Mayes, 1982). One important concern is that the scales used to measure recall and recognition cannot be assumed to be linear across the entire range of normal and abnormal scores (Loftus, 1978; Loftus, 1985; Loftus, Shimamura, & Johnson, 1985; Shimamura, 1990). Accordingly, direct comparisons between amnesic patients and control subjects on tests of recall and recognition memory (e.g., an analysis of non-ordinal interactions) cannot be used to infer disproportionate impairment in patient groups.

2.4 Hypothesis

The following hypotheses were postulated to test the variables

- Undergraduates with low level of alcohol consumption will report higher memory recall than those with high level of alcohol consumption.
- Undergraduates exposed to low level of environmental noise will report higher memory recall than those exposed to high level of environmental noise
- Alcohol consumption and environmental noise will have main or interactive effect on the memory recall of undergraduates.

2.5 Operational Definition of Terms

Alcohol Consumption

This is a controlled and conscious intake of any alcoholic substance. In the current study, participants will be presented most popular bottles of alcoholic substance like Trophy lager. High level of alcohol is presentation of 3 or more bottles of this particular liquor while low level of alcohol consumption is denoted with just a bottle of the presented liquor.

Environmental Noise

Environmental noise is the presentation of obnoxious and disturbing sound and other form of sound that can distract an individual's level of cognitive coordination. the use of screams, yells and car horns would be sued to create a noisy atmosphere serving as background noise, There would be two levels for this variables as such participants would be placed on no background noise and background noise experimental treatments.

Memory Recall

In this study, memory recall is the ability of an individual to recall events or objects that was presented to him or her after which the object or event has been taken away. Here participants with list of words. Their ability to recall any of these words indicate their level of memory

recall. High level of memory recall is indicated when the research participant can recall at least 70% of the object or events presented.

CHAPTER THREE

METHODOLOGY

3.1 Research Design

The research design is an independent group randomised design adopting a 3 × 3 factorial matrix. The two factors are alcohol occurring at three levels of low dose, high dose and no alcohol and environmental noise occurring at three levels of low noise, high noise and no noise. Here, the response to the experimental treatment was tested immediately after the presentation of the experimental treatment. After which the experimenter examine difference in the response of research participants by comparing those that received the research treatment and those that did not receive research treatment. The independent variables include alcohol and background noise while the dependent variable is memory recall. The extraneous variables in this study includes participants' alcohol history and prior knowledge of what should be recalled by research participants. The extraneous variables was however controlled by elimination and randomisation as such participants were randomly selected for the purpose of the research while those that are chronic alcohol drinkers were eliminated prior to the research.

		alcohol intake	
Env. noise	low dose	high dose	no alc
low noise	low alc/low noise	high alc./ low N	Low N/ no alc
high noise	High N/low alc	high N/high alc	high n/No alc
No noise	low n/no noise	no noise/high alc	no Noise/No alc

There are nine experimental units as shown in this diagram as such the first unit would be given the no alcohol neither background noise.

3.2 Setting

The setting for this research an enclosed lecture theatre in the federal university Oye Ekiti. The setting served as the experimental treatments for the various experimental units. There are nine experimental cells units in this research and each of the cell received the experimental units at varying intervals. This was done to ensure that diffusion of experimental treatments was eliminated.

3.3 Research Participants

The research participants are ninety (90) undergraduate student of the federal university Oye Ekiti. The research participants are spread across nine experimental units. Prior to the research the research participants were asked whether they drink alcohol or not. This was done to avoid the issue of practice effect from the research participants. Some potential research participants are chronic alcohol abusers which could defeat the purpose of the research. In a nutshell, the research participants are undergraduates who are either occasional users of alcohol or do not drink alcohol.

3.4 Sampling Technique

Simple random sampling technique was used in the selection of participants from various departments in the faculty of social science, federal university Oye Ekiti. The participants were asked to pick a piece of paper from the bowl which indicated whether they would participate in the experiment or nor. This was exactly after the researcher had showed interest to participate in the experiment. Simple random sampling was also used in the process of administering experimental treatment which is the distribution of participants into the various experimental groups as well as the control group. P

3.5 Research Instruments

3.5.1 Participants Personal Data

After indicating and showing interest to participate in the research, the participants were required to fill a form sourcing for their personal data such as age, department, religious affiliation and their ethnic background.

3.5.2 Alcoholic Substances

The experimenter presented varieties of alcohol drinks to the experimental units as such the content of alcohol in a particular drink determined the experimental unit a participant belongs to. The alcoholic drinks include Smirnoff ice which has 4% alcoholic content and Budweiser which has 5% alcoholic content. Alcohol is presented with white disposable cups to hide the exact nature of the alcoholic content. In summary, alcohol is presented in Low dose, 4% alcohol, High dose, 5% alcohol and no alcohol.

3.5.3 Background noise

The presentation of background noise is in three categories. The first category of noise is the control group which is no noise experimental treatment such that the participant is placed in the research setting absent from any form background noise. The other category of noise in the research was presented in the same setting to include the low noise and the high noise experimental treatments. Here horn was used to present noise to the background of the research environment. The sound was not presented in direct proximity to the research setting rather from a distance that could be heard in the research setting.

3.5.4 Word List

To measure memory recall among research participants, participants were given a list of words to memorize. These words include

Articulate	surrender	Realism	Justify
Virtual	magnificent	Secular	multitude

Covenant sordid Queue procedure

3.6 Procedure

Prior to the commencement of the research, the experimener sourced permission to carry out the experiment from the department of psychology, federal university Oye Ekiti. Permission was provided on the basis of conducting the experiment as a requirement for the award of first degree. The experimenter then commenced the research by approaching the potential research participants. First the researcher introduced himself and the purpose of the research. Once they agreed to participate, they were required to pick from a box a paper. The paper indicated whether they would participate in the research or nor. Participants were also asked whether they took alcohol or not. Those that said they are frequent consumers of alcohol were not picked for the research. Those selected for the research were informed of the date, venue and time for the research as their phone numbers were collected to ensure prompt attendance to the venue of the experiment.

On the day of the experiment, the researcher randomly assigned the participants into the eight different experimental units of which they were presented experimental treatments accordingly. As they were presented with list of word to memorize, the research participants were presented experimental treatments of noise and alcohol. After this, data were collected pertaining to the number of words the research participant was able to recall.

3.7 Ethical Consideration

The current research is line with the standards for the conduct of experimental researches in the psychology as such ensured that issues pertaining to the ethical issues that must be in place for the proper conduct of the research. Ethical issues like informed consent and confidentiality was attended to in the research. After the research proposal was accepted, the research participants were approached for the research. Those that accepted the terms and

condition of the research participated in the research. Also, the research participants were assured that the information derived from the research was mainly for academic purpose.

3.8 Statistical Technique

Data was coded and analysed using the statistical package for social sciences version 20. Socio demographics was statistical analysed using descriptive such as mean and simple percentage. The first and second hypothesis is tested using t-test for independent groups. Since the research utilizes the factorial experimental research design, hypotheses is tested using the two way analysis of variance to examine the main and interactive effect of alcohol and noise on the memory recall of undergraduate.

CHAPTER FOUR

RESULTS

This chapter includes tabular summary of the results and findings from the research. It shows the inferences made on the hypothesis based on the research result.

Hypothesis one states that alcohol will have a significant influence on the memory recall of undergraduates. Hypothesis is tested using the one-way analysis of variance. The result is presented in table 4.1

Table 4.1:- The summary of analysis of variance of the influence of alcohol on the memory recall of undergraduates.

	SS	Df	Mean Square	F	P
Between Groups	56.27	2	28.13	5.394	<.05
Within Groups	453.733	87	5.215		
Total	510.00	89			

Table 4.1 shows that there is a significant difference in the memory recall of undergraduate student after the presentation of alcohol. This means that alcohol does have a significant influence on memory recall of undergraduates. (f=-.5.394; df =89; p= <.05). Therefore hypothesis one is accepted.

Hypothesis two states that noise will have a significant influence on the memory recall of undergraduates. Hypothesis is tested using the one-way analysis of variance. The result is presented in table 4.2

Table 4.2:- The summary of analysis of variance of the influence of noise on the memory recall of undergraduates.

	SS	Df	Mean Square	F	P
Between Groups	123.267	2	61.633	13.865	<.05
Within Groups	386.733	87	4.445		
Total	510.00	89			

Table 4.2 shows that there is a significant difference in the memory recall of undergraduate student after the presentation of noise. This means that noise does have a significant influence on memory recall of undergraduates. (f=13.865; df =89; p= <.05). Therefore hypothesis two is accepted.

Hypothesis three states that alcohol and noise will have an interactive effect on the memory recall of undergraduates. Hypothesis is tested using the univariate analysis of variance. The result is presented in table 4.3

Table 4.3:- The summary of univariate analysis of variance of the influence of alcohol and noise on the memory recall of undergraduates.

Source	Sum of Squares	Df	Mean Square	F	Sig.
Corrected Model	179.533[a]	4	44.883	11.545	.000
Intercept	3240.000	1	3240.000	833.367	.000
Noise Treatment	56.267	2	28.133	7.236	.001
Alcohol Treatment	123.267	2	61.633	15.853	.000
Error	330.467	85	3.888		
Total	3750.000	90			
Corrected Total	510.000	89			

Table 4.3 shows that alcohol and noise have an interactive influence on memory recall of undergraduates. (f=833.387; df =89; p= <.05). Therefore hypothesis three is accepted.

CHAPTER FIVE

5.1 Discussion

Results from the study indicates that there is a significant influence of alcohol on the memory recall of undergraduates. This means that there is a significant difference in the presentation of alcohol treatment as such influence the ability of research participants to recall words presented to them. Many researchers have worked on the effect of using alcohol which supports the findings of the current study. For example, Steele and his colleagues (Steele and Josephs, 1988, 1990; Steele and Southwick, 1985) proposed a model of alcohol effects that focuses on alcohol's influence on attentional processes, rather than its direct pharmacological effects on motivational systems. According to this attention-allocation model, intoxication restricts one's focus of attention to only the most salient cues in the environment, such that available cues are not fully processed (Sayette, 1999). The cognitive and performance impairments due to acute alcohol consumption have been extensively investigated by using experimental studies especially laboratory-based experiments. For example, Laboratory studies have revealed that acute alcohol consumption results in poorer memory performance (Curran and Weingartner, 2002; White, 2003), impairment in tasks of divided attention (Maylor et al., 1990) and impaired executive functions such as planning and decision making (Weissenborn and Duka, 2003; Geroge et al., 2005). Most research on the residual alcohol effects on cognitive performance has followed an experimental design (Prat, et al., 2008; Stephens et al., 2008; Ling et al., 2010; Verster et al., 2010). Experimental studies induce hangover in a laboratory setting and measure cognitive performance the morning after, when Blood alcohol content (BAC) is zero. Laboratory studies have revealed decreased performance in attention (Myrstein et al., 1980; Roehrs and Roth, 2001; Howland et al., 2010; Rohsenow et al., 2010) and skills related to driving and fying (Seppala et al.

1976; Laurell and Törnos, 1983; Tornros and Laurell, 1991; Verster, 2007). However, many other laboratory-based studies have not observed any next-day effects of alcohol on performance (Collins and Chiles, 1980; Lemon et al., 1993; Chait and Perry, 1994; Finigan et al., 1998; Rohsenow et al., 2006; Kruisselbrink et al., 2006). The absence of impairment in these studies often can be explained by a combination of easy tests of short duration and various methodological shortcomings (Verster et al., 2003; Verster, 2008).

Another finding from the current study is that there is a significant influence of background noise on the memory recall of research participants. This is also supported by researches on this field. A study on background noise affecting memory recall proves useful to the findings of the current study. A study conducted among college students trying to find the most effective way to study shows that music playing influenced memory recall. Also, for Alzheimer's patients helped face-name recognition greatly improves (Carruth, 1997). Studies have also shown listening to music rather than background noise or silence gave dementia patients better memory recall (Larkin, 2001). Although the experiment is studying those without diseases such as Alzheimer's or Dementia, this useful information helps in aiding the hypothesis that listening to music while studying or trying to memorize something could increase the chances of being able to recall that information at a later time. Music is one of the three conditions of the experiment. Another condition is daily noise you might hear while trying to study in a school campus cafeteria or at home. The noises or sounds may include chatter, cars driving by, doors opening and closing, someone opening a bag of chips, etc. Studies have shown that if the noise is not overly distracting and at a low enough decibel level that noise can affect memory positively if it is a consistent part of the background. (Baker & Holding, 1993).

Though, there are also studies that show memory recall being negatively affected by background noise when the information is brand new (Smith & Broadbent, 1981). This

experiment was derived to see if background noise had any effects on memory recall, especially among young college students who are trying to study in areas around school, work, library, or home, where the background noises may differ. Due to the differing background noises, three conditions were chosen from a classical song with no speech playing, silence, or noise recorded from the school cafeteria. The hypothesis is that the participants that studied while listening to the classical song with no speech would have a higher memory recall than those who had to sit in silence or listen to the recording of the Evergreen Valley College cafeteria.

5.2 Conclusion

The study makes the following inferences based on the findings from the current study. One of such inference is that no matter how little the amount of alcohol is, it affects memory recall among students. This means that students who consume alcohol regularly will have poor memory recall process. Also, the current study also infers that the introduction of noise while processing an information leading poor recollection of presented information. This means that in learning situations, students taught or studying in a noisy environment will have poor ability to recollect what they have learnt. In conclusion the consumption of alcohol and presentation of noisy stimulus in the environment will influence the recall ability of students if present at different intervals and at the simultaneously.

5.3 Recommendations and Suggestions

The research findings from the current study will be baseless if several suggestions are not provided by the researcher. Firstly, students should be warned against the negatives of consuming alcohol as regards to their academic performance. Control measures should then be carried out to reduce the high level of alcohol consumption among students such that there should be punishment standards awarded to students violating rules against alcohol consumption. Also, the researcher recommends that there should be a constant background

check of the alcohol level of students before entering the school premises. In this regard, the blood alcohol content of students should be examined prior to admission into the institutions' premises. Those found guilty of taking alcohol even at a high proportion should not be allowed entrance into the school premises. In terms of reducing the influx of noise in the school environments, Nigerian educational institutions should make use of facilities that reduces noise to the barest minimum especially in lecture theatres. In this regards, background noise will only be heard outside. For educational institutions that cannot afford the luxury of sound-proof facilities, there should be physical control of the influx of noise through the use of post signs like "Lecture is Going on No noise" or the pursuance of those who are involved in noise making in educational institutions. Students should also be wary of their reading environments especially those with minute or large presentation of noise treatments. This means that it is not advisable to read in such environment like the cafeteria or perhaps at recreational centres which is open to noise at varying intervals.

5.4 Limitation of Study

Findings from the current study should be considered based on several unavoidable limitations and restrictions. One of such is the location or setting of the experiment. The experiment was not conducted in a psychological lab and so the experimental did not have full control over the proceedings of the experiment as such inference made may still be influenced by couple of extraneous variables in the study. The experiment did not also make use of a placebo to investigate whether the alcohol not influenced by the feeling of consuming alcohol influenced the participants' memory recall.

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