The Role of Attributional Complexity in Person Memory

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Table of Contents

List of Tables and Figures

List of Appendices

Abstract

This study examined the relation between Attributional Complexity and how perceivers' organise and retrieve personality impressions from memory. One hundred and two subjects were asked to either: (a) form an impression of a target person described by twenty behaviourial sentences; (b) form an impression, and subsequently write a personality description of the target, and justify it with another subject, or (c) simply memorise as many sentences as they could. As predicted, subjects given impression formation instructions recalled significantly more behaviours than did subjects in the memory condition. In addition, attributionally complex subjects recalled significantly more items than attributionally simple subjects, but only in the two impression formation conditions when in-depth processing was encouraged; when in-depth processing was restricted in the memory condition there was no difference in recall between the attributionally complex and simple subjects. Also as expected, the attributionally complex subjects tended to write more complex personality descriptions of the target person. These results were discussed in relation to various accounts of person memory and it was concluded that individuals' who operate with more complex cognitive schemata have more ability than individuals' with simple schemata to understand, encode and subsequently recall a welter of trait related person information. However, this ability tends to be emphasised when there is sufficient motivation and challenge to do so. General implications are drawn for the relation between attributional complexity and intelligence as well as theoretical implications for person perception research.

Introduction

A vital part of the process of knowing an individual is the impression one develops and maintains of that person. Impressions are formed fairly quickly on the basis of evidence of what that individual is like including direct observation of behaviour, physical appearance, heresay, one's evaluative reactions together with continued inferences made about that person. This impression then serves to guide our interpretation of further information. However, what is an impression? How is it structured and stored? And how is it maintained and amended? These questions have bemused social psychologists for over 40 years.

The study of impression formation has been a fertile and dynamic area of research. From a historical perspective there have been three overlapping eras in the study of impression formation research including Asch's (1946) seminal qualitative approach, Anderson's (1974) algebraic models of information integration, and most recently the information-processing paradigm developed by Hamilton and others (Hamilton, 1981; Srull, 1981).

From his classic early work on the processes of impression formation, Asch (1946, 1952) is generally considered the pioneer of research in this field. Asch was the first to propose that forming an impression is an active on-going process which begins immediately on encountering information about a person. According to Asch, a dynamic interaction between new and current information is the process by which the perceiver systematically organises the person's personality into a unified coherent gestalt.

Towards the end of the 1950s, Asch's research orientation was criticised as being too subjective and imprecise (see Devine & Ostrom, 1989). In order to

find a more quantifiable and precise way to study impressions, researchers revolutionised the empirical paradigm. The definition of impression formation was changed to a rating of one's liking for the stimulus person. This second period of study into the impression formation process was characterised by Anderson's (1962, 1968, 1972, 1974, 1981) research on algebraic models of information integration. This research focused on investigating how perceivers' integrate incoming stimulus information about target persons to arrive at single judgements.

However, since the early 1980s, researchers have approached the study of impression formation from an information-processing perspective in an attempt to understand how information about a person is encoded, organised, and recalled from memory. An integral part of this approach has been the study of inference processes in which the perceiver uses an existing impression as a basis for elaborative processing.

This interest in inference processes has lead to to a revolutionary conceptual approach which interprets attribution theory in an information processing framework; "An attribution is an inference - specifically an inference about the cause for a particular behaviour" (Hamilton *et al.* 1990, p. 891). In sum, this new orientation considers the attribution process as a type of inference that might occur in the impression formation sequence. Acknowledging that the attribution process has an important role to play in forming an impression from an information-processing perspective, it was my general aim in this research to investigate individual differences in peoples' ability to engage in this attributional inference process. Specifically, it was the goal of this thesis to assess how differences in attributional complexity effect how person impressions are organised and retrieved from memory.

The following introduction will consist of eight main sections. First, I will discuss the recently adopted information-processing orientation. Second, I will discuss a series of studies by Hamilton and his colleagues which will characterise the experimental paradigm of my study. In the third and fourth sections I will discuss two research issues that have come out of Hamilton *et al's* findings, and propose some hypotheses derived from a model concerning how various encoding instructions affect the retrieval of information from memory. In the fifth section I discuss the integration of attribution theory with an information processing approach to impression formation. Sixth, I introduce the issue of individual differences in perceivers' abilities to engage in the impression formation process and discuss the scant research in this area. In the seventh section I further discuss the role of the attributional inference process in relation to impression formation, but from an individual differences perspective. More specifically I derive several predictions from the hypothesis concerning how individuals differ in the complexity of the attributional schemata they use in explaining human behaviour. Finally, I will briefly review the basic aims and hypotheses of this study.

An Information-Processing Approach to Impression Formation

In the 1960s and 1970s, the focus of research on impression formation processes was on how a perceiver integrates and combines pieces of information about a target person into a single judgement of that person. Despite the impressive levels of precision achieved by these integration models, it was apparent towards the end of the 1970s that this approach to the study of impression formation was severely limited. Hamilton, Katz and Leirer (1980a, 1980b) were some of the first researchers to question the

adequacy of information integration models to capture the entire impression formation process.

The first reason suggested for the incompleteness of this approach was that although these models provided a good description of the relationship between target stimuli and subjects' judgements, they provided minimal insight into the processes underlying these judgements.

A second reason given for the incompleteness of the information integration approach concerned the exclusive focus on a single dependent variable, usually a judgement of one's liking for the stimulus target person. This single response measure was then used to evaluate the utility of the algebraic model being tested, and as such, capture one's impression of the stimulus person. Hamilton *et al.* argued that although one's liking of a person is an important part of the formative process (Zajonc, 1980), there is more to an impression than a single evaluative judgement.

From these criticisms and subsequent dissatisfaction with the information integration models evolved a social cognitive perspective in the form of an information-processing framework. Rather than a single evaluative judgement of one's "liking" for the stimulus person, researchers became interested in examining the encoding, organisation, and retrieval activities involved in the process of forming an impression.

Redefining the term "Impression"

Hamilton and his colleagues (Hamilton *et al.*, 1980a; 1980b; Hamilton, 1981) were the pioneers of this perspective, re-defining the term impression as "*the perceiver's organised cognitive representation of another person*" (Hamilton *et al.*, 1980b, p. 123). These researchers hypothesised a number of processes and structures that contribute to the formation of the perceiver's

cognitive representation, including attentional and encoding processes, organisation of information by employing one's implicit personality theory[1] (cf. Rosenberg & Sedlak, 1972; Schneider, 1973), and the elaborative processes of inference and evaluation.

The formation and maintenance of the perceiver's cognitive representation is an ongoing process. Incoming bits of information are continually integrated into the dynamic impression. The result of this process is a network of associations between the items of information, termed a propositional network. A propositional network consists of a set of nodes and links, where each node is an item (for example, a trait or behaviour), and each link is a relation between items. According to Fiske and Taylor (1984), these networks are: (a) *associative* in which nodes are linked together; (b) *directional,* where it might be easier to remember the facts by working from the top down, and (c) *strengthened* each time they are activated.

According to the third criterion, the strengthening of the network of interitem associations through repeated activation is hypothesised to facilitate subsequent recall of information acquired about the stimulus person. This idea was the central premise of a series of studies by Hamilton and his colleagues examining how perceivers organise incoming items of information in their cognitive representations. Because Hamilton's

[1]There is a large body of research which has demonstrated that perceivers have cognitive structures or set patterns for storing and processing trait related information. This structure is widely assumed to be a two dimensional representation with a positive and negative end to separate social and intellectual meta-structures. The perceiver's implicit personality theory, underlined by these basic dimensions then serves as a set of cognitive strategies that the perceiver uses in selecting and encoding information about a target person. Thus, the perceiver's structure then influences what information about the target is processed (see Schneider, Hastorf and Ellsworth, 1979, for a discussion of this literature).

experimental paradigm was used in the current study, I will describe this research in some detail.

The Hamilton Studies on Impression Formation

As discussed above, Hamilton *et al's* (Hamilton & Lim, 1979; Hamilton *et al.*, 1980a, 1980b) experiments are based on several assumptions:

> "....that impressions tend to be highly organised, that achieving this organisation the perceiver develops a network of associations among items of information about the person, and that this characteristic of the resulting cognitive representation would facilitate recall of the descriptive information" (Hamilton *et al.*, 1980b, p. 141).

Hamilton and his colleagues constructed an empirical paradigm to test these assumptions. Assuming that a perceiver's organisational network of interitem associations (cognitive representation) facilitates recall, they predicted that subjects instructed to form an impression of a target person described by 16 behaviour predicates would organise the information in memory according to the personality categories conveyed by the descriptions, and that this organisational process would facilitate superior recall of the behaviours as compared to memory task subjects.

Results from numerous experiments provided strong support for Hamilton *et al's* hypotheses. First, their results showed over seven different experiments that subjects given impression formation instructions remembered significantly more behaviours than subjects in the memory condition (Hamilton, 1981, p.142). A second finding concerned the organisation of the participants' recall protocols in terms of the four personality themes. Specifically, impression formation subjects organised the stimulus items in terms of the personality categories to a greater extent than memory task subjects. Taken together, these findings are consistent

with the prediction that forming an impression requires the perceiver to organise information into a coherent structure and that this organisation facilitates subsequent recall of particular information. These findings have subsequently been replicated on numerous occasions by other researchers (Srull, 1981, 1983; Srull, Lichtenstein & Rothbart, 1985; Wyer, Bodenhausen and Srull, 1984; Wyer & Gordon, 1982).

These findings and the accompanying experimental paradigm have been the catalyst for numerous researchers seeking to understand how information available about a person is acquired, organised, and retrieved in developing an impression about that individual. Although there have been a variety of topics investigated, the two foci of this research has been on: (a) the differential processing, organisation, and retrieval of behaviours that are either consistent or inconsistent with an initial trait impression of a stimulus character, and (b) the effects of various processing contexts and their influence on the way the information is encoded, organised, and retrieved from memory.

Representation and Retrieval of Information Consistent and Inconsistent with an Impression

In the studies reported by Hamilton and his colleagues, the stimulus materials described only socially desirable behaviours. Yet throughout the process of knowing someone, we usually encounter behaviours that are inconsistent with our existing impression of the person. The study of how the perceiver recalls and organises this inconsistent information has been the focus of a great deal of investigation from researchers adopting an information-processing orientation.

In a landmark article, Hastie and Kumar (1979) found that behaviours inconsistent with an initial trait based impression were more likely to be

recalled than congruent behaviours. This has proved to be a remarkably robust finding and has been replicated in many subsequent studies (for reviews see Hamilton, Grubb, Acorn, Trolier & Carpenter, 1990; Bargh & Thein, 1984).

These results have generally been interpreted in terms of network models which posit that inconsistent behaviours are more likely to be recalled because perceivers create a greater number of associative linkages in memory as the behaviours are reconciled with consistent information and integrated into a unitary impression. Numerous network models have been developed by researchers to explain this finding. These include the associative network model (Hastie, 1980; Srull, 1981), the complete association model (Hamilton *et al.*, 1980a; Srull; 1983), and the dual coding model (Wyer & Gordon, 1982, 1984; Srull & Wyer, 1989).

The Influence of Various Encoding Tasks on the Organisation of Impressions in Memory

There are a number of studies in which the processing context is varied by manipulating the instructions given to the participants. Fiske and Taylor (1984) sort to integrate a typology of encoding tasks and provide an explanation for variations in person memory as a function of task instruction by developing the *Depth of Processing Model.*

A Depth of Processing Model.

Based on Craik and Lockhart's (1972) depth of processing theory, Fiske and Taylor (1984) argued that deeper more elaborate processing improves memory organisation and hence enhances recall:

> "One's memory for information about other people appears to improve the more psychologically engaging and less superficial the purpose which one approaches learning about them....." (Fiske & Taylor, 1984, p.225).

From their review of person memory research they classified five levels of processing that depend on the perceiver's degree of psychological engagement (see Table 1).

Table 1

Effects of Various Task Purposes on Person Memory

Task	Effect
1. Memorising	Variable memory, organised by whatever is available including psychologically irrelevant categories
2. Forming Impressions	Good memory, organised by traits
3. Empathising	Excellent memory, organised by goals
4. Self Reference	Excellent memory, organised by psychological categories (traits or goals)
5. Future Interaction	Better memory than memorising, effect on organisation not yet clear

Source: Fiske and Taylor (1984, p.229).

In moving down the continuum from memorising to future interaction, the level of processing determines the effectiveness of the organisational memory strategy which in turn determines greater recall of information. The foregoing set of studies by Hamilton *et al.* (1980a, 1980b) indicated that forming impressions of a target requires more elaborative processing than does simply memorising specific behaviours; consequently impression-task subjects have superior recall. Empathising, by focussing on the target person's goals, requires an even deeper level of processing because the

person's imagined goals provide easily retrievable links among items in memory (Bower, Gilligan & Monteiro, 1974). Self-referent encoding, where interpersonal information is processed in terms of the person's cognitive schema, has sometimes produced superior memory to other-referent encoding (Rogers, Kuiper & Kirker, 1977). Future Interaction may be the most psychologically engaging of all task purposes. Srull and Brand (1983) found that compared to standard memory instructions, subjects who expected to interact with the target person in the future were more likely to organise the information around the individual in memory and this processing facilitated retrieval.

In the present study I aimed to assess the validity of the depth of processing approach by utilising an information processing paradigm similar to that used by Hamilton *et al.* Based on the premise that deeper more elaborate psychological processing facilitates recall from memory, I hypothesised that one's memory of a target person, described by 20 conflicting behaviourial predicates would significantly improve across three processing tasks: (a) subjects attempting to remember as many of the behaviours as possible; (b) subjects instructed to form an impression of the target, and (c) subjects instructed to form an impression of the target and describe their account with another.

The Attribution Process and Impression Formation

In an attempt to extend our understanding of the impression formation process, it appears that research into person memory has entered a fourth era. Specifically, a conceptual framework which views attribution theory in the context of an information-processing system is proving a fruitful avenue for impression formation research in the 1990s.

Attribution refers to the linking of an event to its causes (Ross & Fletcher, 1985). When developing an impression, liberal use of attributions perhaps implies a relatively in-depth level of information processing. Moreover, attributions may influence how the information is represented in memory, and consequently effect the extent to which attribution-relevant information is recalled.

Hamilton and his colleagues (Hamilton, 1988; Hamilton, Drisoll & Worth, 1989; Hamilton, Grubb, Acorn, Trolier & Carpenter, 1990; Hamilton, Grubb, Trolier & Carpenter, 1987) have applied attribution theory to the impression formation process. When confronted with person information, the processing circumstances will partly determine the degree of difficulty in arriving at an attributional inference. For example, suppose you learned that a waitress named Sarah had complained that the restaurant manager had unfairly dismissed her. As a perceiver, your task is to decide whether Sarah's dismissal is of her own making - a person attribution - or was due to something about the manager or restaurant - a situation attribution. You learn that Sarah has been dismissed from three previous waitressing jobs, was late on occasions for work, and that other staff consider the manager to be reasonably fair. This information would most likely lead you to think that Sarah's complaints are unjustified and thus lead to a person attribution. However, you may also learn that the manager sets unusually high standards, dismissed Sarah without legal warning, and had been looking to lay off staff because of poor business. This additional context information makes attributional analysis more difficult and thus you would face greater difficulty attributing causality to either the person or the situation.

This example illustrates that when context information consistently implies a particular cause, making an attribution may be relatively simple and require minimal cognitive processing. On the other hand, when context information is ambiguous, more consideration of the information and its implications is required. Difficult attribution tasks require the perceiver to engage in extended processing which in turn appears to generate a more elaborate pattern of interitem associations among the items as they are represented in memory (Fiske & Taylor, 1984). In this case behaviourial information associated with more difficult attribution tasks should be better organised, develop more associative connections with other items, and hence be more easily recalled at a later date from memory (Hamilton *et al.*, 1990). This analysis lead Hamilton and his colleagues to predict and confirm that difficult attribution tasks result in higher recall of attribution-relevant information than easier attribution tasks (Hamilton *et al.*, 1987, 1990).

These researchers also extended the attribution paradigm to investigate the robust finding by Hastie and others (Srull, 1981; Srull *et al.*, 1985) where behaviours inconsistent with an initial impression were recalled with higher probability than impression-congruent behaviours. They found that a behaviour was more likely to be recalled if its attributional implications were incongruent with the causal implications of the other behaviours. The contradictory items were presumably more difficult to integrate into the evolving impression, spent more time in working memory, and hence developed stronger links with other items. These associative linkages provided more retrieval routes for recall of inconsistent items at a later time.

In addition, past research supports the contention that expectancy incongruent person information triggers attributional analysis (Asch &

Zukier, 1986; Clary & Tesser, 1983; Crocker, Hannah & Weber, 1983; Hastie, 1984; Weiner, 1985). For example, Clary and Tesser provided subjects with information about a target person that established a particular impression (for example, selfishness), and followed it with behaviourial sentences that were either congruent or incongruent with the existing impression. When they were instructed to retell their information, subjects were more likely to use explanatory accounts (engage in attributional analysis) when the behaviour description was incongruent with the existing impression than when it was congruent. Moreover, Crocker *et al.* (1983) found that the type of attribution elicited by behaviours incongruent with an existing impression has a critical impact on the extent to which that information is processed and retained in memory. Incongruent information was only more likely to be recalled than congruent information if it was attributed to dispositional causes rather than situation causes.

Asch and Zukier (1984) identified and described several ways individuals engage in causal reasoning to resolve inconsistent information to form a unified impression of a target person. They identified seven modes of resolution in which perceivers explained how two seemingly inconsistent attributes could be descriptive of the same individual. For example, perceivers resolved the dispositions by segregating each attribute to a different domain of the individual. An excellent illustration of this mode of attributional analysis is the way a seemingly discordant pair *brilliant-foolish* was resolved: "A person may be *brilliant* intellectually but *foolish* in practical, common-sense matters; probably very bright about abstract matters, but silly about day-to-day practical tasks" (p. 1233). This exemplifies how we as naive perceivers engage in causal analysis to resolve conflicting person information.

Taken together, these findings critically suggest that attributional processing contributes both to the extent to which person information is encoded and subsequently to the way it is represented and retrieved from memory. Moreover, this research supports the idea that attributional processes are intimately involved with the process of developing impressions. Specifically, it follows that when the impression formation task is complex and the perceiver is faced with discordant behaviours, he or she should be likely to invoke attributional processes as an aid to understanding person information. However, the critical question addressed in this study concerns the issue of whether some perceivers' with more well developed attributional schemata are more skilled at engaging in this inference process than others when developing impressions.

Individual Differences in Impression Formation

One type of analysis that has rarely been considered in impression formation research is the study of individual differences in the ability of naive perceivers to encode, organise, and retrieve information from their person memory. In one of the few studies, Srull, Lichtenstein and Rothbart (1985) investigated the effects on person memory of individual differences in perceivers' need for cognition.

Need for cognition generally refers to the tendency to engage in and enjoy thinking (Cohen, Scotland & Wolfe, 1955). Using an empirically based scale developed to measure an individual's need for cognition (Caccioppo & Petty, 1982), Srull and his colleagues found that following an impression formation task, high need for cognition subjects recalled more behaviours descriptive of a stimulus person than low need for cognition subjects. This result was explained by arguing that high need for cognition subjects compared to low need for cognition subjects, were more likely to think

about the items in relationship to one another and presumably developed more associative links. Consequently, this more elaborate associative activity by high need for cognition subjects facilitated subsequent retrieval of the behaviours.

In the present research I further investigated the role of individual differences in the ability to utilise causal attribution processes in developing person impressions.

In a study of peoples' causal structures (or schemas) for inferring causes for behaviours, Wimer and Kelly (1982) noted the presence of individual differences in attributional complexity; certain individuals tended to make simple attributions involving only one cause, while other individuals tended to make complex attributions involving several causes. The presence of differences in individuals' attributional schema complexity has also been supported by subsequent research (Fiske, Kinder & Larter, 1983; Fletcher, Danilovics, Fernandez, Peterson & Reeder, 1986).

There were two related reasons why I believed measuring individual differences in attributional complexity would expand our understanding of the impression formation process. First, previous research has shown that some people do indeed possess more complex attributional schemata than others. Second, as previously argued, recent research has confirmed that causal attribution processes are integrally involved in the way person information is encoded and represented in memory. (Hamilton *et al.*, 1990).

Individual Differences in Attributional Complexity

Within an impression formation context, I intended to measure the complexity of attributional schemata using a recently developed scale, termed the Attributional Complexity Scale developed by Fletcher,

Danilovics, Fernandez, Peterson and Reeder (1986) The underlying premise of this scale is that some people possess more complex attributional schemata for explaining peoples behaviour than others. Specifically, the Attributional Complexity Scale is a 28 item questionnaire that has seven attributional sub-constructs which vary along a simple-complex cognitive dimension. They include: (a) level of interest or motivation in processing information; (b) preference for complex rather than simple attributions; (c) presence of meta-cognitions concerning explanations; (d) awareness of the extent to which peoples' behaviour is a function of interaction with others; (e) tendency to infer abstract or causally complex internal attributions; (f) tendency to infer abstract, contemporary, external causal attributions, and (g) the tendency to infer causes operating from the past.

Recent work with this scale has provided support for its reliability and validity (Brookings & Brown, 1988; Marsh & Weary, 1989; Fletcher, Grigg & Bull, 1988; Flett, Pliner & Blankstein, 1989). It has been found that the scale possesses good internal reliability, with all seven dimensions contributing to the single underlying construct of attributional complexity. Moreover, psychometric evidence has been garnered for the scale's convergent and discriminant validity, concurrent validity and predictive validity.

The Attributional Complexity Scale has been applied to several research settings where it has been useful to identify individuals with complex and abstract causal schemata. For example, consider the moderating effect of attributional complexity on the *fundamental attribution error*: the tendency to prefer dispositional explanations for others' behaviour and be relatively insensitive to situational constraints (Ross, 1977). Several researchers have found that attributionally complex subjects produce more accurate trait and attitude judgements than do those with simple schemata, but only under conditions that encourage in-depth processing of person information.

(Devine, 1989; Fletcher, Reeder & Bull, 1990; Fletcher, Rhodes, Rosanowski & Lange, 1990). In a study assessing reaction time, Fletcher, Rhodes, Rosanowski and Lange (1990) found that attributionally complex subjects tended to control the amount of processing time according to the difficulty levels of causal problems, whereas attributionally simple folk did not control their processing according to the difficulty level of the problems.

Further, Fletcher *et al.* (1988) reported that attributionally complex persons produced more accurate personality impressions than did attributionally simple subjects, on the basis of a fifteen minute interaction with a stranger. However, this difference was present only in the condition where subjects were motivated to develop a personality appraisal of their partner as opposed to the simple aim of having a conversation.

This research investigating individual differences in causal attributions has important implications for how we form person impressions. It appears that the causal inferences generated when we process person information are all important to how effectively we organise and represent our impressions in person memory. Assuming this theorising is correct, then persons with more complex attributional schemata should be capable of organising and retrieving personality impressions more efficiently than persons with simple schemata; but also if prior findings are correct, this difference will be more likely to occur under conditions that provide sufficient motivation for in-depth processing.

Attributional Complexity and Impression Formation

A common tenet of the previous research exploring individual differences in attributional schemata was that differences between low and high complexity persons were only evident when people had the motivation and time to engage in attributional processing. Not all situations are endowed

with the inherent motivation to produce spontaneous attributional processing:

> "The critical theoretical point here is that attributionally complex people are capable of using either complex or simple schemata in generating causal attributions; conversely attributionally simple folk are permanently restricted to the more primitive forms of causal schemata" (Fletcher *et al.*, 1986, p. 883).

Thus, in a processing situation where a person with complex attributional schemata is not particularly interested in finding complex causes for behaviour, he or she may be just as likely to use a quick or automatic heuristic (Anderson, 1985) just as a simple person would. There are however several processing conditions that are likely to encourage persons to use their complex strategies.

Bassili and Smith (1986) identified five situations which should trigger spontaneous attributional processing: (a) the presence of questions inquiring about the causes of behaviour; (b) the occurrence of unexpected events; (c) the participant's dependence on the target for desired outcomes; (d) the participant's failure at a task, and (e) perceived loss of control.

Several of these conditions are present in the typical impression formation experimental paradigm. For example, in the process of forming an impression the perceiver will tend to consider why the target behaved in various ways. The perceiver may also be called upon to incorporate surprising behaviourial occurrences into the emerging impression. Further, previous research has suggested that information that is incongruent or inconsistent with the evolving impression triggers or activates the attribution process (Hamilton, 1988, p. 373).

Thus, on the basis of this rationale I would expect an impression formation task consisting of 20 inconsistent behaviours to provide the motivation

necessary to activate the attribution process. Moreover, these processing conditions should provide attributionally complex persons with enough motivation to engage their complex attributional schemata, and consequently organise and reconcile conflicting incoming information more effectively. This advanced processing should lead to better recall at a later date.

In this study, subjects were supplied with a list of 20 conflicting behaviours, either as an impression formation task or under memory instruction conditions. Because the memory instructions involve learning individual behaviours, there should be little activation of the attribution process and hence no need to engage causal schemata. Thus, in the condition where subjects were instructed to memorise the behaviours, I expected no difference in recall of items between attributionally complex and simple persons. This latter hypothesis is critical because any differences between complex and simple subjects in the impression conditions could then be simply explained by the hypothesis that complex subjects have better memory for person information per. se. than simple subjects.

Based on the rationale that in-depth processing of contradictory behaviours in an impression formation task would trigger attributional analysis of information in an attempt to resolve the inconsistencies, I derived several predictions. First, I hypothesised that under instructions to either form an impression of a target person, or form an impression and justify a subsequent written personality account, attributionally complex people would recall more behaviourial sentences than attributionally simple people. However, under instructions to memorise the behaviourial sentences, complex and simple people should not differ in the number of behaviours recalled.

Summary

This study was designed to explore the effect of individual differences in attributional complexity on subjects' ability to form an impression of a target person described by 20 conflicting behaviourial predicates. Further, this research tested a depth of processing model which proposes that deeper, more elaborate, psychological processing improves memory.

The major hypotheses of this study were as follows:

a) Subjects instructed to form an impression of a target person described by a series of behaviours would be able to recall more of those items than subjects who were instructed to remember as many of the items as possible.

b) Attributionally complex and attributionally simple people would not differ in the number of behaviours recalled, under instructions to simply memorise the behaviourial sentences.

c) Subjects instructed to form an impression and write a description of the target person, and subsequently discuss and justify their account would recall more items compared to subjects either instructed to form an impression, or simply remember as many of the behaviours as possible.

d) Under instructions to either form an impression of the target person or form an impression, and justify and discuss a subsequent written personality account, attributionally complex people would recall more behaviourial sentences descriptive of that person than attributionally simple people.

Method

Overview

Subjects designated as either attributionally complex or attributionally simple were exposed to a sequence of 20 behaviourial descriptions under instructions to either: (a) memorise as many of the behaviours as they could; (b) form an impression of a person described by these various actions, or (c) form an impression, and subsequently write a personality description of the person and justify it with another subject.

Following a 5 minute distraction task, two dependent measures were administered. Subjects in all three conditions were asked to recall as many of the behaviours as they could. Second, subjects in the impression formation and impression formation/justification conditions were instructed to write a personality description of the target person.

This experiment was therefore a 2 (attributionally complex x simple) X 3 (memory x impression formation x impression formation/justification) design. Both independent variables were between-group factors.

Subjects

The Attributional Complexity Scale (Appendix A) was administered to 388 female[2] students at the University of Canterbury. Attributional complexity scores were derived (possible range from -84 to 84) and subjects who scored

[2] Several researchers have found that women generally perform better on the Attributional Complexity Scale than men (e.g., Fletcher *et al.*, 1986). This leads to problems in setting cut off scores for men and women. Hence, balancing the cell sizes for the simple and complex groups is also confounded. To avoid these problems the sample was confined to women only.

in the upper and lower quartiles of the scale were designated as attributionally complex and simple respectively. The final sample consisted of 51 attributionally complex and 51 attributionally simple subjects. Mean scores for the attributionally simple and complex subjects are shown in Table 2.

Table 2
Mean Attributional Complexity Scores for Attributionally Simple and Complex Subjects in the Memory, Impression Formation and Impression Formation/Justification Processing Conditions.

	Attributional Complexity	
Processing Condition	Simple	Complex
Memory	2.6 (8.3)	57.7 (10.1)
Impression	1.8 (12.3)	57.6 (7.2)
Impression/Justification	2.9 (10.2)	57.2 (11.3)

Note. The SD's for each cell are shown in brackets.

Development of Stimulus Materials

A set of 20 behaviourial descriptions characteristic of the stimulus person was constructed from 10 pairs of incongruent traits. These items were adapted from pairs of inharmonious dispositions developed by Asch and Zukier (1984) and Rosenberg and Sedlak (1972). A pilot study was conducted to develop a list of behaviours that were individually prototypical of the selected traits. Various combinations of the behaviours were presented to 78 students from three second year General Psychology classes with

instructions to write down the trait that best described each behaviour. The responses were analysed and then edited to yield a single behaviourial description for each of the 20 traits. These behaviours were chosen so as to be moderately inconsistent with one another rather than homogeneous. The full list of behaviours can be found in Appendix B. The sentences were randomly ordered and the same list of behaviours was used for each experimental condition.

Procedure

Subjects were run in small groups ranging in size from 2 to 8, with each session randomly assigned to one experimental condition. Subjects were told the experiment was concerned with person perception processes and would involve viewing a series of slides and answering several questions about them. The instructions were adapted from those used by Hamilton, Katz and Leirer (1980a).

The *impression formation* instructions:

> This experiment is concerned with the way we ***form an impression of a person*** on the basis of his or her actions. To do this, we have selected information about a person who is unfamiliar to you. In a few moments you will be shown a series of slides, each slide containing a single description of this person's behaviour. Please read these sentences carefully, studying each one until the next appears on the screen. Do not be concerned with memorisation - there are far too many individual items to remember. Try instead to ***form an overall impression*** of what the person who performed these various actions is like. At the end of the session we will ask you a series of questions concerning the impression that you have formed of the person described in these sentences.

The *impression formation/justification* instructions:

> This experiment is concerned with the way we ***form an impression of a person*** on the basis of his or her actions. To do this, we have selected information about a person who is unfamiliar to you. In a few moments you will be shown a series of slides, each slide containing a single description of this person's behaviour. Please read these sentences carefully, studying each one until the next appears on the screen. Do not be concerned with memorisation - there are far too many individual items to remember. Try instead to ***form an overall impression*** of what the person who performed these various actions is like. At the end of the session you will write a personality description, giving an account of the impression that you have formed of the person described in these sentences. Following this, you will get together with another member of the group to discuss and justify your personality description and impression.

The instructions for people in the *memory* condition read as follows:

> This experiment is concerned with the way in which we ***memorise verbal descriptions of action.*** In a few moments you will be shown a series of slides, each slide containing a description of ***a different person's behaviour.*** Please read these sentences carefully, ***studying each one*** until the next slide appears on the screen. Try to remember the exact wording of each single description as accurately as you can. At the end of the session, we will ask you a series of questions pertaining to the information contained in these sentences.

Each slide was shown for a period of 10 seconds, controlled automatically by an electrical timer. The order in which the 20 slides was presented was randomly decided and was the same for all subjects.

After the slides had been presented, each subject was seated at a table and given a sheet of paper. A five minute distraction task was carried out to reduce short term memory for the behaviours. They were told to write down the names of as many New Zealand city and town names as they could think of.

The dependent measures were administered at the conclusion of the 5 minute distraction task. Following completion of the dependent measures, subjects were fully debriefed as to the nature and purpose of the study.

Dependent Measures

Free Recall of Behaviours

Immediately following the distraction task, all subjects were given a sheet of paper headed up with the following instructions:

> We would like you to recall and write down as many behaviours you read about as you can. Try to remember them in as close to the exact wording as possible. However, if you cannot remember the exact wording but can remember the idea, write that down as well.

Four minutes was permitted for subjects to write down as many behaviours as they could recall. This time period was sufficient for all subjects.

The free recall protocols were scored on the basis of "gist." That is, responses were scored as correct if they conveyed the basic idea of the behaviourial item, even if the wording was different. However, responses that simply characterised the behaviour of the person in abstract terms (for example, "he did something rude," or "he was friendly") were not counted. The author scored each recall protocol, blind to the condition or complexity level of the subject. To check the reliability of the coding, a second coder coded 50% of

the protocols selected randomly from each condition. An agreement rate of 96% was reached.

Written Personality Description

Subjects in the impression formation and impression formation/justification conditions were instructed to write a personality description based on their impression of the stimulus person. Although no time limit was placed on this activity, most subjects had completed the task within five minutes.

The complexity level of the personality descriptions were assessed using two criteria adapted from scale developed by Fletcher, Grigg and Bull (1988): (a) the number of personality dispositions listed, and (b) the number of causal connections mentioned. The first measure, concerning the number of personality dispositions, referred to internal stable traits, beliefs, and abilities. Stimulus behaviours repeated from the free recall task were not included. As for the free recall protocols, the author coded each description, blind to the condition or complexity level of the subject. The second rater again coded 50% of the protocols selected randomly from each condition. An agreement rate of 86% was achieved.

The second measure of complexity was assessed by scoring the number of causal connections mentioned in the personality descriptions. The presence of each of the following linkages was counted as a causal connection: (a) explaining a behaviour by relating it to an internal disposition (for example, he demanded service first in the queue because he was selfish); (b) relating a disposition to a past causal factor (for example, he visited his sick aunty because he had a nurturant upbringing); (c) explaining how one disposition is causally linked to another (for example, he was often rude to achieve his selfish aims). The author coded all the personality descriptions for causal

connections blind to the participants' complexity level or experimental condition. After a short training period, the second rater coded 50% of the protocols. The inter-rater reliability achieved was 85%.

The mean number of causal connections produced was 3.0 (SD = 2.8) and the mean number of dispositions was 7.4 (SD = 3.1). As the two measures of complexity were significantly positively correlated ($r = .27$, $p < .05$), an overall complexity score was derived. This was achieved by standardising each complexity measure (converting to z scores) and summing the two variables.

Results

The findings of this study will be presented in three main sections. First, the results from the free recall task will be reported. Second, the personality description complexity scores for subjects in the impression formation and impression formation/justification conditions will be analysed. Finally, the hypothesis that complexity of causal processing mediates the link between attributional complexity and memory for the behaviours will be investigated.

Free Recall of Behaviours

The first analysis examined the behaviour-recall performance of subjects. A 2 (attributionally complex vs. simple) X 3 (memory vs. impression formation vs. impression formation/justification) analysis of variance was conducted on participants' recall score. Cell means from this analysis are shown in Table 3 and illustrated in Figure 1.

This analysis yielded a significant main effect for processing condition, $F(2,96) = 39.7$, $p < .0001$. As predicted, subjects recalled most behaviours when they were instructed to write a personality description ($M = 11.8$) or form an impression ($M = 10.9$) of the target person and fewer behaviours when they had been told to remember as many of the behaviours as possible ($M = 7.1$). These results replicate the common findings in this area of research.

Overall, there was also a main effect for attributional complexity, $F(1,96) = 9.6$, $p < .005$. Across all three processing conditions, attributionally complex subjects recalled more behaviours ($M = 10.6$) than attributionally simple

people (M = 9.2). This relationship is illustrated in Figure 1. However, the interaction between processing set and attributional complexity was not significant, $F(2,96) = 1.0$, *n.s.*

Table 3
Mean Number of Behaviours Recalled by Attributionally Simple and Complex Subjects in the Memory, Impression Formation and Impression Formation/Justification Processing Conditions.

	Attributional Complexity	
Processing Condition	Simple	Complex
Memory	6.8 (1.8)	7.3 (2.9)
n's	*18*	*18*
Impression	9.9 (2.8)	11.8 (1.6)
n's	*18*	*18*
Impression/Justification	10.9 (2.6)	12.8 (1.8)
n's	*15*	*15*

Note. The SD's for each cell are shown in brackets.

Planned Comparisons

A series of planned comparisons was calculated across the three processing conditions and the two attributional complexity levels.

First, it was hypothesised that subjects in the impression formation and impression formation/justification conditions would recall more behaviourial items than would persons in the memory condition. These

predictions were strongly supported, t (71) = 48.1, p < .001; t (65) = 24.92, p < .001). However, the prediction that impression formation/justification condition subjects would recall significantly more behaviours than those only instructed to form an impression was only weakly supported, t (65) = 2.90, p < .10.

It was also hypothesised that attributionally complex subjects would recall significantly more behaviours than attributionally simple persons in both the impression formation and impression formation/justification processing conditions. However, in the memory condition, it was predicted that complex and simple folk would not differ in the number of behaviours recalled.

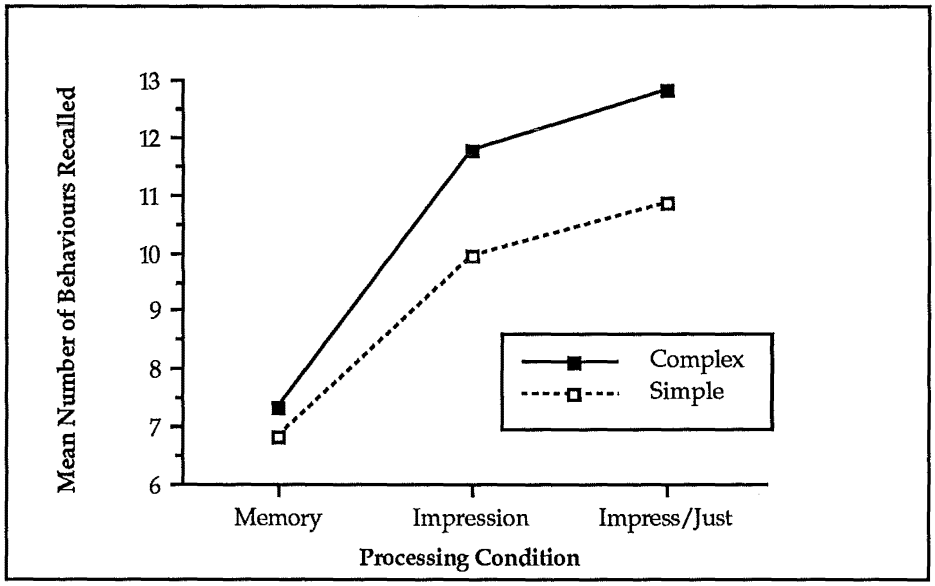

Figure 1. *Recall Scores for Attributionally Complex and Simple Subjects in the Three Processing Conditions.*

These predictions were confirmed using planned comparisons. Complex people recalled significantly more behaviours than simple subjects, both under instructions to form an impression of the target person, t (35) = 5.67, p < .025, and under impression formation/justification instructions, t (29) =

5.25, $p < .025$. However, in the memory condition, attributionally simple and complex subjects recalled very similar numbers of behaviours, $t < 1$.

Table 4
Mean Causal Complexity Scores of Personality Descriptions as a Function of Processing Condition and Attributional Complexity Level.

	Attributional Complexity	
Processing Condition	Simple	Complex
Impression	-.38 (1.5)	.29 (1.8)
n's	*18*	*17*
Impression/Justification	-.34 (1.5)	.345 (1.3)
n's	*15*	*15*

Note. Higher causal complexity scores represent more complex personality descriptions. The SD's for each cell are shown in brackets. One case was not included because of missing data.

Personality Description Complexity Scores

A 2 (Attributionally complex vs. simple) X 2 (impression formation vs. impression formation/justification) analysis of variance was carried out on the personality description complexity scores. Cell means from this analysis are shown in Table 4.

The main effect for attributional complexity was close to achieving significance, $F(1,61) = 2.9$, $p < .09$. Although not significant, as predicted, attributionally complex subjects (M = 0.32) wrote more complex personality

descriptions than attributionally simple people (M = -0.36). No other main effects or interactions were significant.[3]

The Mediating Effect of Causal Processing on Free Recall Scores

Why did attributionally complex subjects recall significantly more behaviours on the free recall task than simple persons in the two impression formation conditions? One possibility is that the complexity of causal processing while encoding the behaviours mediated the link between attributional complexity and performance on the free recall task. This possibility was tested using a mediational model.

According to Baron and Kenny (1986) the following conditions must apply for a variable to function as a mediator (see Figure 2): (a) variations in levels of the independent variable significantly account for variations in the hypothesised mediator (Path *a*); (b) variations in the mediator significantly account for variations in the dependent variable (path *b*), and (c) when paths *a* and *b* are controlled, a previously significant relation between the independent and dependent variables is no longer significant. The strongest incidence of mediation occurs when Path *c* drops to zero. However, because social phenomena have multiple causes it may be more realistic to identify mediators that significantly decrease Path *c* rather than expecting a reduction to zero.

[3] Analyses were also carried out on the two measures of causal complexity independently, for both (a) the number of personality dispositions listed, and (b) the number of causal connections. Again there were no significant main or interaction effects.

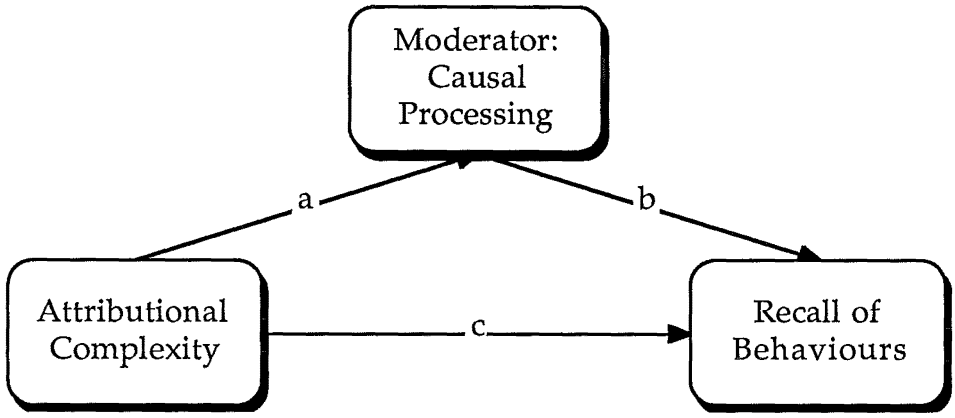

Figure 2: *Hypothesised Mediational Model for Impression Formation and Impression Formation/Justification Processing Conditions.*
Source: Baron and Kenny (1986, p.1176).

Three regression equations were calculated to test the linkages of the hypothesised mediational model in both the impression formation and impression formation/justification conditions. First, the hypothesised mediator (measured by the causal complexity of the personality descriptions) was regressed on the independent variable (attributional complexity) (path *a*). Second, the dependent variable (recall score) was regressed on the independent variable (attributional complexity), and third, the dependent variable (recall score) was regressed on both the independent variable (attributional complexity) and the mediator variable (causal processing) to obtain paths *b* and *c*.

The mediation hypothesis for the impression formation condition was not supported. None of the regression coefficients for paths *a* and *b* were significant. Moreover, the effect of the independent variable on the dependent variable was not significantly less when the mediating variable was controlled for (β = 0.36) than when it was not controlled for (β = 0.38).

This pattern of results was similar for the impression formation/justification condition. The independent variable (attributional

complexity) did affect the dependent variable (recall score) in the second equation, $\beta = 0.41$, $p < .025$, and the mediator (causal processing) weakly affected the dependent variable (recall score) in the third equation ($\beta = 0.32$, $p < .10$). However, the effect of the independent variable on the dependent variable was not significantly less when the mediating variable was controlled for ($\beta = 0.34$) than when it was not controlled for ($\beta = 0.41$).

In summary, the regression analysis offered little support for the hypothesised mediational model[4] (Figure 2). Specifically, there was no evidence that the complexity of causal processing (at least as measured in the personality description) was mediating the link between attributional complexity and performance on the free recall task.

4 Regression equations were also calculated on the two measures of causal complexity independently, for both (a) the number of personality dispositions listed, and (b) the number of causal connections mentioned. The mediational hypothesis was not supported in either case.

Discussion

The major aim of this study was to investigate the effects of individual differences in schemata complexity in the ability to store and recall personality impressions. The study also examined three levels of a model which predicted that more in-depth processing instructions would enhance retrieval of information from person memory.

The results demonstrated that memory for person impressions is the product of an interacting and complex set of processes. The following discussion will be presented in four main sections. First, I will review the results of the study with respect to the hypotheses derived from the Depth of Processing model. Second, I will propose that these findings can be also explained according to the role of the causal attribution process in impression formation. In the third section I will review the results regarding individual differences in subjects' recall of stimulus items, the complexity of their personality descriptions, and the mediating effect of causal processing on behaviourial recall. Finally, I will draw some conclusions and implications from these results for the challenging study of impression formation.

Depth of Processing Model: Recall of Behaviours

It was hypothesised that memory for person information would significantly improve across the three processing tasks. The main effect for this processing set manipulation was significant and supported the hypotheses. As expected, subjects provided with instructions to either: (a) form an impression, or (b) form an impression and write a personality account of the target person recalled significantly more behaviour

descriptions than subjects given the memory instructions. This finding of superior recall of impression formation conditions over memory instructions replicates results reported by other investigators (e.g., Hamilton, Katz & Leirer, 1980a, 1980b; Srull, 1981, 1983; Srull, Lichtenstein & Rothbart, 1985; Wyer & Gordon, 1982).

This finding has traditionally been accounted for by the high degree of information organisation inherent in the impression formation process, compared to the memory condition (Hamilton, 1981). This organisation, in the form of a network of inter-item associations is then assumed to enhance recall of the information at a later time. Memory condition subjects, on the other hand, were presumably restricted to less advanced organisational strategies for representing the information in memory, and hence, recalled fewer behaviours.

A further explanation of these findings stems from work (Gordon, 1982; Hamilton, Leirer & Katz, 1979; Hoffman, Mischel & Mazze, 1981; Jeffrey & Mischel, 1979) which has found that impression and memory subjects engage in qualitatively different organisational strategies when encoding the stimulus information. Specifically, impression formation subjects organise the behaviours in terms of relevant personality schemata (or traits) to a greater extent than memory instruction subjects. This implies in the present study, for example, that perceivers would have been likely to store the behaviour "He greeted everyone with a smile," under the trait "friendly" and this organisational strategy would have enhanced later retrieval of this information.

The second hypothesis that subjects instructed to form an impression, write a description, and subsequently discuss and justify their account would recall more items than subjects instructed solely to form an impression was

not supported. However, the results ($p < .10$) were consistent with the hypothesised pattern.

Overall, the results from the first two hypotheses provide strong support for the interpretation that impression formation instructions trigger the activation of relevant personality schemas for storing and organising person information in memory. The cognitive representation of this information then serves as an effective strategy for retrieving these behaviours when required.

Furthermore, these results are consistent with Fiske and Taylor's (1984) depth of processing account of person memory which proposes that deeper, more elaborate processing of stimulus information enhances one's memory for that material. These findings clearly demonstrate therefore, the important link between the experimenter's instructions and subjects hypothesised cognitive processes[5] as well as highlighting that schematic organisation is a crucial part of the impression formation process.

The Role of Causal Attributions in the Impression Formation Process

The results also support Hamilton's (1988) contention that attributional analysis plays an important role in person information processing systems. As previously argued, the attribution process is an inferential activity in which the perceiver goes beyond the available information to develop the cognitive representation of the stimulus person. This development involves processing the behaviours in terms of the existing information and/or pre-existing schematic structures to provide a causal explanation of the stimulus material. To the extent that this inferential activity occurs, the

[5] See Hastie, Park and Weber (1984) for an excellent discussion of the influence of various encoding tasks on the way in which information is encoded, organised and retrieved from person memory.

more effectively this information should be represented in memory, and hence more easily retrieved at a later time (Hamilton *et al.*, 1990).

Several features in the design of this study may have particularly encouraged attributional processing, including unexpected person information (Clary & Tesser, 1983), pairs of contradictory behaviours (Asch & Zukier, 1984), and the presence of questions inquiring about the causes of behaviour (Bassili & Smith, 1986). In this study, these enabling conditions were present in (a) the construction of the stimulus behaviours, and (b) the structure of the impression formation instructions.

Thus, I believe that the target person described by the set of stimulus items encouraged perceivers to indulge in attributional processing, but only in the two impression formation task instruction sets. These conditions required perceivers to engage in in-depth and conscious dispositional processing of the stimulus material, whereas the memory instructions were presumably invoking strategies that were less likely to explore the causal implications of interrelating the items.

Consequently, the behaviours processed by subjects in the two impression formation conditions received extended causal processing and were represented in and retrieved from memory more efficiently than subjects in the memory instruction condition (Hamilton *et al.*, 1990). How then did individual differences in subjects' pre-existing schema structures effect attributional processing during the impression formation process?

Individual Differences in Impression Formation

Free Recall of Behaviours

The central question I wanted to explore in this study concerned whether differences in schema complexity influenced the encoding and

representation of person information in memory. As predicted, subjects with more complex attributional schemata recalled more behaviours in the two impression formation tasks than the attributionally simple subjects. Crucially, however, the difference in behaviour recall between attributionally complex and simple people was not significant under instructions to simply memorise the person information. This finding therefore, precludes the most obvious explanation for differences between attributionally complex and simple folk in the two impression conditions; namely that complex subjects have better memory for person information per. se.

These results support Fletcher *et al's* (1988) contention that persons with more complex attributional schemata are capable of representing and recalling person information from memory more efficiently than those with simple attributional schemata, but only under conditions that encourage in-depth processing of the stimulus information. Under instructions to simply memorise the behaviours, there was presumably minimal motivation or opportunity to engage attributional schemata; thus both attributionally complex and simple subjects most likely utilised relatively unsophisticated memory strategies to represent the information in memory.

A further explanation of these results was outlined by Fletcher, Grigg and Bull (1988). They interpreted the superior performance of attributionally complex subjects to be due to their ability to integrate a variety of trait related person information, providing that the material was processed in an in-depth manner. However, identical in-depth processing conditions produced a drop off in the ability of simple subjects to engage in trait attributions. These and other results by Fletcher and his colleagues (Fletcher, Reeder & Bull, 1990) support the contention that it is when the

processing conditions encourage conscious, in-depth, attributional analysis that individuals' personality schemata have their strongest impact.

These results also contribute to the paucity of research investigating individual differences in person memory processes. Specifically, they are consistent with an individual differences study by Srull, Lichtenstein and Rothbart (1985) which found that high need for cognition subjects recalled more behaviours in an impression formation task than low need for cognition subjects. Consistent with the attributional complexity findings found here, higher recall by the high need for cognition subjects was attributed by Srull *et al.* to their greater motivation to think about the behaviours in relation to one another, which developed more associative links between the items, and hence facilitated recall of the behaviours compared to low need for cognition subjects.

Both studies demonstrate that stable individual differences can be important moderators of person memory. Indeed, future research could look toward investigating other relevant individual difference variables. Two possibilities include individual differences in locus of control (Rotter, 1966), and in the intolerance of ambiguity (MacDonald, 1970). For example, Ellis and Franklin (1983) discovered that individual differences in locus of control were related to significant individual differences in how information was recalled from person memory.

Personality Description Complexity Scores

It was predicted that attributionally complex subjects would write more complex personality descriptions than attributionally simple subjects in the two impression formation conditions. This hypothesis was only weakly upheld. This finding provides some support for a similar study by Fletcher, Grigg and Bull (1988), who found that following a brief 15 minute

conversation, attributionally complex subjects produced more complex and accurate personality impressions than simple folk when conscious dispositional and in-depth attributional processing was encouraged. Interestingly however, this difference between the two groups was not evident when the conversation task was more casual and not aimed at personality appraisal.

One explanation for the null finding in this research may lie in the nature of this study's processing task compared to that of Fletcher *et al's* (1988). It is clear from this earlier research, that the 15 minute conversation provided considerably more material and time to base a written personality account on, as compared to the processing task in the current study. It is possible that 20 behaviourial descriptions of a target person may not have provided enough person material for the attributionally complex subjects to fully exert their higher order cognitive schemata. Another possibility is that the 10 seconds to process each behaviour may also have provided little time for extensive higher order processing.

The Mediating Effect of Causal Processing on Free Recall

The prediction that the complexity of causal processing while encoding the stimulus items mediated the link between attributional complexity and subsequent behaviourial recall was not supported by the mediational analysis. One possible explanation for this null result may have been that the processing measure was not a true gauge of causal complexity because it was administered *after* the free recall task. Second, the processing measure may have been an insensitive measure of spontaneous causal attributions, as subjects were asked for a personality description and not causal explanations per. se. Thus, future research could develop a more sensitive measure to more accurately assess the mediating role of causal processing in

the relationship between attributional complexity and how impressions are represented and retrieved from person memory.

Conclusions and Implications

Taken together, the free recall and personality account results support the three aims of this research: (a) that deeper, more psychologically task instructions improve memory for social information; (b) that causal attribution processes play an important role in how personality impressions are organised and retrieved from memory, and (c) that there are differences in ability to engage in this attributional analysis that effect the nature of the person impressions. However, these differences in ability are only exhibited under conditions that encourage in-depth processing of social information.

Attribution is one process, in which the perceiver goes beyond the behaviourial information to draw inferences about the person's underlying personality characteristics. There are of course many other elements to forming an impression, including, for example, the evaluative reactions, observers opinions, or indeed the person's physical appearance. However, the integration of attributional research and theory with the study of person memory processes within an information processing paradigm, should be fruitful in expanding our knowledge of social cognition.

The results from this study also have implications for other important areas within attribution theory and social cognition. I shall briefly mention two: (a) the relationship between attributional complexity and social intelligence, and (b) the implications for a re-worked naive scientist model of social psychology.

Attributional Complexity and Social Intelligence

One important issue relevant to these results is the relationship between intelligence and attributional complexity. An alternative explanation of the superior recall of the attributionally complex subjects in the two impression formation conditions might be that attributional complexity is merely a re-packaged intelligence test. However, two separate sets of evidence dismiss such a claim.

First, the results demonstrated that attributionally complex subjects recalled more stimulus items than attributionally simple subjects only in the two in-depth processing conditions and not in the memory condition.

Second, Fletcher and his colleagues (Fletcher, *et al.*, 1986; Fletcher, *et al.*, 1988) found that attributional complexity was not correlated with standard IQ tests, or with general academic ability. However, the present results and those of other researchers (Fletcher *et al.*, 1990; Funder & Harris, 1986; Sternberg and Smith, 1985) suggest that attributional complexity can best be understood as a form of social intelligence.

Implications for a Re-worked Naive Scientist Model of Social Psychology

On a more conceptual level, individual differences in perceivers ability to represent and recall person information from memory has implications for contemporary social psychological theory. Traditionally, there has been two competing theoretical paradigms in social cognition: (a) The naive scientist model, and (b) The cognitive miser model.

The central premise of the naive scientist model is that human cognition is rational and scientific. It assumes that the layperson's causal explanations for human behaviour are similar to that of a scientist: explanation,

prediction, and control (Heider, 1958; Jones & Davis, 1965). This approach views the causal attribution process as rational and that the layperson does a fairly good job of extracting useful stable impressions from their analyses of people.

In contrast, the cognitive miser model which claims that the layperson's cognitive processes are severely hampered by inferential biases has been the dominant theoretical focus of the 1980s. This more disparaging view of the naive perceiver proposes that cognitive processes are governed by simple rules or heuristics that often lead to error. (Hamilton & Rose, 1980). According to this approach, laypeople are lazy thinkers, looking to navigate the social world with a minimum of effort.

However, the 1990s is signalling a reaction against the cognitive miser model. Specifically, a reworking of the naive scientist model (Fletcher, in press) suggests a compromise between the two views. Fletcher argues that under favourable processing conditions, laypeople will be quite accurate in their personality inferences, but that under unfavourable processing conditions they will fall back on heuristics or rules of thumb consistent with the cognitive miser model.

Results from the current study add further support to one class of conditions that appear to influence social inference biases: individual differences. Specifically, these results lend weight to the claim that some people are indeed more proficient naive (social) scientists than others, under favourable information processing conditions.

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Appendix 1

University of Canterbury, Department of Psychology

Cognitive Processing Scale

Please indicate your name, age and sex below:

Name: ..... Sex: male/female

Instructions

This questionnaire has been designed to investigate the different ways that people think about themselves. The questionnaire will be kept completely confidential. There are no *right* or *wrong* answers. We are interested in your own *perceptions*.

Please answer each question as *honestly* and *accurately* as you can, but don't spend too much time thinking about each answer.

Scoring Procedure

The numbers on each scale represent the following degrees of agreement.

-3 = very untrue/inaccurate
-2 = moderately untrue/inaccurate
-1 = slightly untrue/inaccurate
0 = neither true nor untrue, accurate or inaccurate
1 = slightly true/accurate
2 = moderately true/accurate
3 = very true/accurate

Read each statement carefully and show your agreement or disagreement by circling *one number* on each scale. If what you believe or think about yourself is in agreement with the statement, circle one of the numbers from 1 to 3. If what you believe or think about yourself conflicts with the statement, circle one of the negative numbers. If you neither agree nor disagree circle the zero.

Example 1): If the statement said "I am very tall" you would circle the 2 if you were moderately tall, the zero if you were average height, and the -3 if you were very short.

Example 2): If the statement said "I believe in the death penalty for murder", you would circle the 3 if you very strongly believed that, the 1 if you slightly believed it, and the -3 if you strongly believed the opposite, that is, murder should not carry the death penalty.

1) I have thought a lot about the family background and personal history of people who are close to me, in order to understand why they are the sort of people they are.

very untrue or inaccurate	-3	-2	-1	0	1	2	3	very true or accurate

2) I believe it is important to analyse and understand our own thinking processes.

very untrue or inaccurate	-3	-2	-1	0	1	2	3	very true or accurate

3) I think a lot about the influence that I have on other people's behaviour.

very untrue or inaccurate	-3	-2	-1	0	1	2	3	very true or accurate

4) I have found that relationships between a person's attitudes, beliefs, habits and character traits are usually simple and straight-forward.

very untrue or inaccurate	-3	-2	-1	0	1	2	3	very true or accurate

5) If I see people behaving in a really strange or peculiar manner I usually put it down to the fact that they are strange people and don't bother to explain it any further.

very untrue or inaccurate	-3	-2	-1	0	1	2	3	very true or accurate

6) Once I have figured out a single cause for a person's behaviour I don't usually go any further.

very untrue or inaccurate	-3	-2	-1	0	1	2	3	very true or accurate

7) I don't usually bother trying to analyse and explain people's behaviour.

very untrue or inaccurate	-3	-2	-1	0	1	2	3	very true or accurate

8) I have often found that the basic cause for a person's behaviour is located far back in time.

very untrue or inaccurate	-3	-2	-1	0	1	2	3	very true or accurate

9) I am very interested in understanding how my own thinking works when I make judgements about people or attach causes to their behaviour.

very untrue or inaccurate	-3	-2	-1	0	1	2	3	very true or accurate

10) I think very little about the different ways that people influence each other.

very untrue or inaccurate	-3	-2	-1	0	1	2	3	very true or accurate

11) To understand a person's personality/behaviour I have found that it is important to know how that person's attitudes, beliefs, and character traits fit together.

very untrue or inaccurate	-3	-2	-1	0	1	2	3	very true or accurate

12) When I try to explain other people's behaviour I concentrate on the person and don't worry too much about all the existing external factors that might be affecting them.

very untrue or inaccurate	-3	-2	-1	0	1	2	3	very true or accurate

13) I have found that the causes for people's behaviour are usually complex rather than simple.

very untrue or inaccurate	-3	-2	-1	0	1	2	3	very true or accurate

14) I don't enjoy getting into discussions where the causes for people's behaviour are being talked over.

very untrue or inaccurate	-3	-2	-1	0	1	2	3	very true or accurate

15) When I analyse a person's behaviour I often find that the causes form a chain that go back in time, sometimes for years.

very untrue or inaccurate	-3	-2	-1	0	1	2	3	very true or accurate

16) I give little thought to how my own thinking works in the process of understanding or explaining people's behaviour.

very untrue or inaccurate	-3	-2	-1	0	1	2	3	very true or accurate

17) I think very little about the influence that other people have on my behaviour.

very untrue or inaccurate	-3	-2	-1	0	1	2	3	very true or accurate

18) I have thought a lot about the way that different parts of my personality influence other parts, e.g., beliefs affecting attitudes or attitudes affecting character traits.

very untrue or inaccurate	-3	-2	-1	0	1	2	3	very true or accurate

19) I think a lot about the influence that society has on other people.

very untrue or inaccurate	-3	-2	-1	0	1	2	3	very true or accurate

20) I usually find that complicated explanations for people's behaviour are confusing rather than helpful.

very untrue or inaccurate	-3	-2	-1	0	1	2	3	very true or accurate

21) I really enjoy analysing the reasons or causes for people's behaviour.

very untrue or inaccurate	-3	-2	-1	0	1	2	3	very true or accurate

22) I have thought very little about my own family background and personal history in order to understand why I am the sort of person I am.

very untrue or inaccurate	-3	-2	-1	0	1	2	3	very true or accurate

23) When the reasons I give for my own behaviour are different from someone else's, this often makes me think about the thinking processes that lead to my explanations.

very untrue or inaccurate	-3	-2	-1	0	1	2	3	very true or accurate

24) I believe that to understand a person you need to know and understand the people who that person has close contact with.

very untrue or inaccurate	-3	-2	-1	0	1	2	3	very true or accurate

25) I tend to take people's behaviour at face value and not worry about the inner causes for their behaviour, e.g., attitudes, beliefs, etc.

very untrue or inaccurate	-3	-2	-1	0	1	2	3	very true or accurate

26) I think a lot about the influence that society has on my behaviour and personality.

very untrue or inaccurate	-3	-2	-1	0	1	2	3	very true or accurate

27) I prefer simple rather than complex explanations for people's behaviour.

very untrue or inaccurate	-3	-2	-1	0	1	2	3	very true or accurate

28) I am not really curious about human behaviour.

very untrue or inaccurate	-3	-2	-1	0	1	2	3	very true or accurate

Appendix 2

List of Stimulus Behaviours

He moped around home all day

He risked his life to save the drowning man

He went to the movies alone on Saturday night

He never did his rostered duties in the flat

He conversed freely with many people at the party

He demanded service first in the busy queue

He pledged $100 to charity

He provoked a fist fight.

He greeted everyone with a smile

He cancelled his annual holiday to attend a work seminar

He consistently found fault with those around him

He invited friends to a potluck dinner at his house

He felt awkward when meeting new people

He visited his sick Aunty every weekend

He told a lot of funny stories at the party

He failed his driving license three times

He returned a wallet containing money to the police

He loudly made a comment about the woman's shoes

He scored highly in all his exams

He sold a scratched album to a record dealer after telling him it was new

Appendix 3

Pilot Study to Develop Stimulus Behaviours

Consider the following behaviours and write down the trait that **you think** best describes each one.

Example 1: He was dux of the school **Trait:** Intelligent

Example 2: He always told the truth **Trait:** Honest

Note: If more than one trait comes to mind, please write it down as well.

BEHAVIOURS

1. He felt low and moped around home
   Trait:

2. He risked his life to save the drowning man
   Trait:

3. He had no-one to go with, so he went to the movies alone
   Trait:

4. He never did his rostered duties in the flat
   Trait:

5. He mixed freely with many people at the party
   Trait:

6. He demanded service first in the busy queue
   Trait:

7. He pledged $100 to charity
   Trait:

8. He provoked a fist fight
   Trait:

9. He felt awkward when meeting new people
   Trait:

10. He cancelled his annual holiday to attend a work seminar
    Trait:

11. He consistently found fault with those around him
    Trait:

12. He invited his new neighbours to dinner
    Trait:

13. He greeted everyone with a smile
    Trait:

14. He visited his sick Aunty every weekend
    Trait:

15. He told a lot of funny stories at the party
    Trait:

16. He failed his driving license three times
    Trait:

17. He was in good spirits
    Trait:

18. He was easily upset by others' comments about him
    Trait:

19. His goal was to become head of the corporation
    Trait:

20. He sold a scratched album to a record dealer after telling him it was new **Trait:**

21. He mixed well with various social groups
Trait:

Please generate three-to-ten word behaviour descriptions for each of the following traits

Example:
Consider a person who is very ***intelligent*** ; you would expect to see her (him) ..... win the chess tournament

1. Consider a person who is very ***cheerful*** ; you would expect to see her (him)
.....

2. Consider a person who is very ***gloomy*** ; you would expect to see her (him)
.....

3. Consider a person who is very ***ambitious*** ; you would expect to see her (him)
.....

4. Consider a person who is very ***critical*** ; you would expect to see her (him)
.....

5. Consider a person who is very ***sensitive*** ; you would expect to see her (him)
.....

6. Consider a person who is very ***un-intelligent*** ; you would expect to see her
(him).....

Thanks