MERE PRESENCE AND CONFORMITY EFFECTS IN SOCIAL FACILITATION

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SUMMARY

This thesis sets out to investigate the effects of the passive presence, or mere presence, of another person. After reviewing the history of social facilitation research, concentrating on mere presence effects, all the major theories and models are detailed. Relationships between the theories are suggested, especially the difference between causal and functional theories. A new model of mere presence effects is proposed. This is based on the notion that the function of being alert to even the passive presence of another person is one of defense. Other people are potential threats and need to be monitored for possible danger. Evidence for this view from many sources is given.

After outlining the theories a major review is made of all of the experimental literature on social facilitation. Criteria are proposed for what would be accepted as clear tests of social facilitation, clear tests of mere presence effects and tests of the effects of the presence of an experimenter. All the social facilitation studies are listed in tables which detail either the findings of the study or the reason for its exclusion.

From the review of studies and the review of theories it is suggested that there are at least two major classes of social facilitation effects. First, there is evidence for the existence of effects due to just the mere presence of another person, but only when there is some possible threat present. Second, there is evidence for a tendency to conform to public standards or norms when in the

presence of another person. This effect is stronger when the person is observing the subject or when the person present is the experimenter.

Experiments 1 to 4 tests these ideas. Some support is given for the threat interpretation of mere presence, but it is not strong. A possible explanation based on evaluation apprehension is also consistent with the results. Experiment 7 follows this up using an original procedure to reduce evaluation effects. A facilitation of performance in the mere presence of another person is still found. It is suggested that mere presence effects do exist but that little can be said about the mechanisms involved at present.

An unexpected finding of Experiment 3 is that subjects decrease their body and hand movements and vocalizations in the presence of others. This is interpreted as subjects conforming more to a social norm in the presence of others. Experiment 5 replicates this phenomenon in another laboratory experiment and Experiment 6 makes another replication in a field setting.

The overall conclusion reached is that social facilitation effects can be parsimoniously explained as either due to an increase in alertness or arousal from the possible physical threat of another person, or as due to greater conformity to public norms in the presence of others. Indirect evidence is available to show that both these explanations are needed. Two different phenomena are involved.

This thesis contains no material which has been accepted for the award of any other degree or diploma in any other university and, to the best of my knowledge and belief, contains no material previously published or written by another person, except when due reference is made in the text.

Bernard Guerin

August, 1984

NOTE

Portions of this thesis have been published elsewhere, although the versions here are the work of the present author. Specifically:

1) Parts of Chapter 3 were published in an earlier form as Guerin & Innes (1982).
2) Portions of Chapter 3 are to appear as Guerin & Innes (1984, in press).
3) An earlier, less detailed version of Chapter 4 was also contained in Guerin & Innes (1982).
4) The first part of Chapter 6 appeared as Guerin (1983), with some modifications to the Introduction and Discussion sections and only minor changes elsewhere.

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To the Inter-Library Loan Service of the Barr Smith Library of the University of Adelaide I give thanks for locating many experimental studies needed for the review of the literature in Chapter 4. No matter how obscure the journal they were able to find it somewhere.

Thanks are also due to the Psychology Department of the University of Adelaide not only for facilities and experimental rooms, but also for allowing me to borrow a NorthStar for unusually long periods of time on which to write this thesis. I wish to thank Judy Fallon for her intelligent and quick preparation of Tables, Figures and References.

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Final debts are to family and friends for support and for allowing me to ignore them for long periods, especially to my mother, my siblings and Amy. Special thanks to Amy for reading through the thesis and pointing out many errors.

CHAPTER I.

OVERVIEW

Social facilitation has meant different things since its appearance in the social psychological literature in 1898. Originally it referred to an increase in responding due to the presence of others. For Allport (1920), who coined the term, it meant the increase in responses from the sight and sound of another person making the same responses. For LaPiere & Farnsworth (1936) it was nothing more than a mild form of rivalry. With Zajonc (1965) it came to refer to an increase or decrease in responding from the mere presence of others. More recent authors have used the term to refer to the effects of evaluative audiences on behaviour.

The present study set out to investigate some aspects of social facilitation. In particular, the notion of the mere presence of another person was examined, as suggested by Zajonc (1965) and others before. What are the minimal effects of other persons on behaviour? Do others have an effect on behaviour even if they are passive, quiet, non-interactive and non-evaluative? What if they are present but cannot even watch what the subject is doing?

These questions stem from an influential review of social facilitation by Zajonc (1965) who suggested a drive or arousal basis to such 'mere presence' effects. Since then, like most areas of social psychology, the explanations have increasingly been based on cognitive mechanisms, and human specific mechanisms, rather than more general mechanisms based on 'lower functioning'. While certainly not

denying the role of cognitive functioning in humans the present work set out to re-emphasize the less cognitive aspects.

The reasons for this were both to redress an imbalance and to bring out one of Zajonc's points concerning the similarity between some animal and human social behaviours. The field of this study will, however, be limited to human social behaviour, although certain relevant findings in the animal literature will be mentioned. The large animal social facilitation literature will not be reviewed.

A further emphasis of the present study concerns the number of explanations for 'social facilitation' that exist. While it may seem useful to discuss the experimental results in terms of each available theory, the large number of them preclude this. More to the point, a review of all of these theories in Chapter 3 will show both that there are probably a number of social facilitation phenomena and that the theories can be reduced to a few conceptual types.

In particular, it will be suggested that there are effects from just the presence of others which are related to xenophobic reactions and the unpredictability of the behaviour of other persons, and that there are effects also from the social approval given to behaving in a socially approved manner. While the present study will concentrate on the former, aspects of the other processes will be raised, especially in interpreting experimental results.

This view of social facilitation as a group of phenomena has led to a few differences in reviewing the history of the subject and the experimental results, as compared to previous reviews. First, in reviewing the history (Chapter 2), emphasis will be placed on the earlier work, to show that the main ideas of all the different social facilitation effects and phenomena were present in the early

conceptual work, even though the early experiments were not well controlled.

Second, the complete experimental literature will not be reviewed until all the theories have been presented (Chapter 3). It will be seen that most experiments support a number of theories, and to use some to bolster one particular theory will give a narrow view of the overall picture. The experimental literature will be reviewed as a whole in Chapter 4. It will be seen that although there is evidence for each of the major types of explanations there is little clear evidence for any particular one.

Chapters 5 to 7 detail seven experiments carried out to investigate social facilitation. The first four directly test predictions made from the reviews of theory and experiments, while Experiments 5 and 6 follow up some interesting findings of Experiment 3. The final experiment attempted a clearer test of mere presence effects using some new experimental manipulations designed to reduce evaluation effects.

The last introductory point to make concerns the importance of this area. It is perhaps fair to say that although attempts have been made apply social facilitation in work situations, education and sport, the area remains one of primarily theoretical interest. The main reason for this concerns the exclusion of interactive processes. In considering and researching social facilitation the effects of competition, reinforcement and cooperation are excluded. In applying the results of such studies to a real situation these effects must be taken into account again. It may be that they swamp any social facilitation effects or that facilitation effects only appear under certain circumstances. The usually simplistic use of social

facilitation findings to applied settings fails to address this issue.

It was Allport (1920) who first put the area into a wider social context, to view it as showing the basic orientations of minimal social situations. When the major interactive processes have been eliminated from the situation, when someone is present but not interacting in any way, how social is the situation still? Is the other ignored as a chair might be, or is it still a social situation? Are there unspoken social interdependencies? What if the person present was a stranger? Does the anticipation of interactions have an effect?

Social facilitation research, and especially that of mere presence effects, may be viewed as a question of sociality. It is a fundamental theoretical question of social psychology. It is not perhaps an 'atom' of social psychology and the foundation upon which to construct all other social behaviours, as has sometimes been suggested, but rather concerns the question of the non-interactive effects of the presence of others. Mere presence effects, which are the main concern of this thesis, look directly at such minimal situations. The importance lies in showing the background orientations towards others and the unspoken interdependencies of social behaviour.

CHAPTER II

THE HISTORY OF SOCIAL FACILITATION RESEARCH

The present chapter contains a review of the history of research into social facilitation. A number of things will be emphasized. First, it will be stressed that the major conceptual discoveries of recent years had already been mentioned in the earlier literature, even if only in passing. Most of the ideas were not followed up with experimental work. Where they were tested, the manipulations were usually inadequate by present day standards.

A second point of emphasis is that the definition of social facilitation keeps changing. In the very early work the term was not used. The term was later applied to the early work to show effects of the presence of others. Allport (1920) coined the term to refer to effects of the 'sight and sound' of another person doing the same activity (co-working). Later still the term was used for audience situations, unlike Allport.

The final point of emphasis will be to point out the number of possible phenomena that may have been present in the early experimental work. This will show that almost none of the early work contains clearly interpretable results. Chapter III will show that the same actually applies to the more recent experimental work as well.

II. 1. THE EARLY WORK OF TRIPLETT

The tradition of social facilitation research extends back at least as far as Triplett (1898). His pioneering experiment has often

been called the first social psychological experiment, although this has recently been queried (Haines & Vaughan, 1979). In his paper Triplett discussed the observation by many cycling fans that paced cycling produced faster times than un-paced. He presented cycling records to support this statement, raised a number of explanations for its occurrence, and conducted a laboratory study with children to investigate further.

The first reasons he raised for faster racing times in pairs were physical ones: the rider in front provided shelter from the wind or provided a suction to pull the second rider and so help to conserve energy. It was also suggested that encouragement was a factor. The "brain-worry" theory argued that when the paced riders had their turn behind, they knew how they were doing, unlike the unpaced riders, and less mental fatigue led to less muscular fatigue. A further reason suggested was that riders behind had more energy, compared to an unpaced rider, because they were hypnotized by the wheels in front. This meant that they proceeded automatically, leaving more energy for a later controlled performance when they were in front.

The theory favoured by Triplett was the dynamogenic one. It had been suggested by Féré (1887) that "the energy of a movement is in proportion to the idea of that movement" (Triplett, 1898, p.531). Just the sight or sound of another rider is sufficient to increase the idea of riding movements and increase the energy of such movements. Without denying the possible importance of physical and competitional factors, Triplett was interested in the dynamogenic factor.

To test this experimentally, Triplett used an apparatus consisting of two fishing reels which turned silk bands around a drum. To complete one trial a flag sewn to the silk band had to travel four

times around around the wheel- the equivalent of 16 metres. The time taken to do this was measured. Results were presented for 40 children who had 6 trials each. The trials alternated between working alone and working two at a time in competition. The results were broken down into those who performed slower in competition, those who performed faster in competition, and those little affected. Of the 40, 20 were faster in competition, 10 were slower, and 10 were not affected.

While these results do not suggest an overall positive effect of competition, Triplett drew some conclusions from the data. He interpreted the faster 20 subjects as showing the effects of both "the arousal of their competitive instincts and the idea of a faster movement" (Triplett, 1898, p.526). For those who were slower in competitional trials, he presented observations that they were overstimulated, in "going to pieces" during the race and in "not being able to endure the nervous strain". Accompanying this was "labored breathing, flushed faces and a stiffening or contraction of the muscles in the arm" (p.523). Unfortunately, it was not recorded how often this also occurred in the other groups. Another feature of the results was that the 20 for whom the effects were strongest were also those who were initially slower. So the conditions may have affected these ones more or there may have been ceiling effects.

The mean results of Tripplett's experiment are graphed in Figure 1 for his two Groups A and B. Overall there was a tendency to do better on each trial, probably due to practice. When the differences between doing a trial alone followed by a trial together are compared to doing a trial together followed by a trial alone, then more of an effect can be seen. Looking only at Group B, as Group A

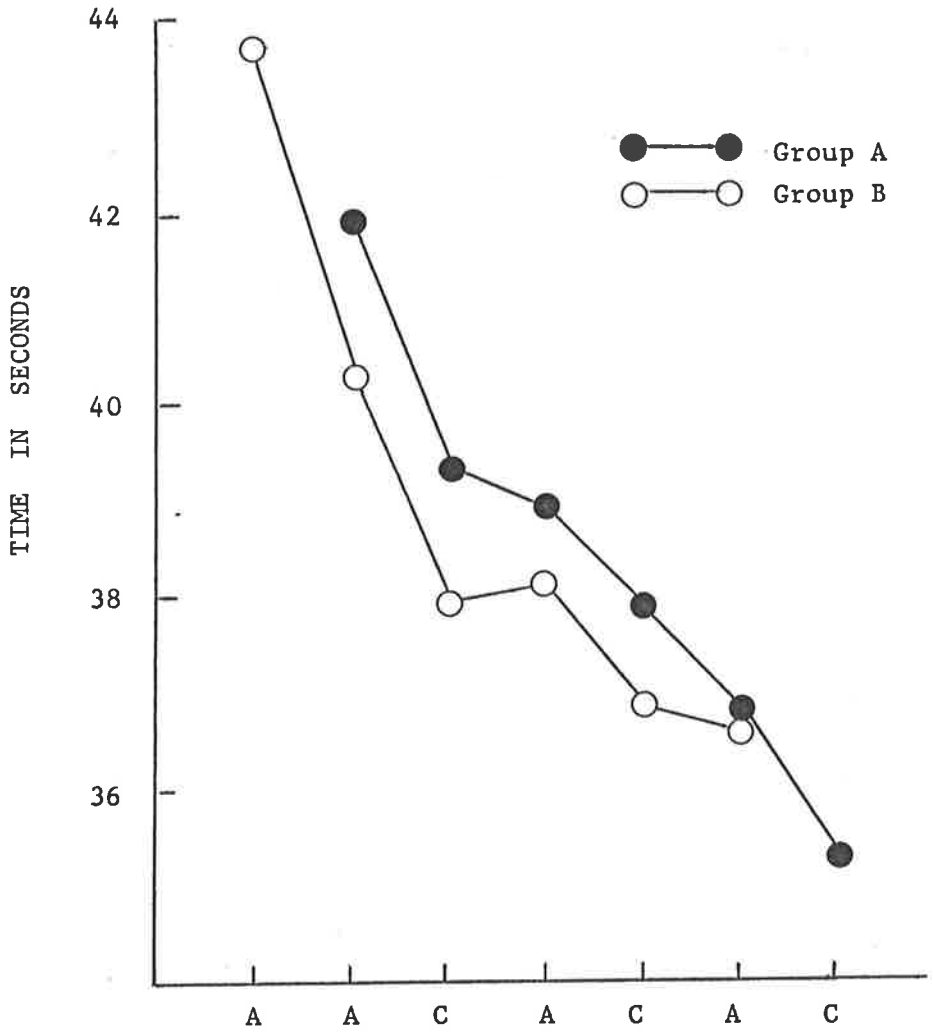

Figure 1. Time in seconds per trial for turning reels alone (A) or in competition (C) for groups A and B (data from Triplett, 1898, p.521).

had an extra Alone trial, the three mean differences between Alone (A) followed by Together (C) are 2.52, 1.14, and 1.51. The two mean differences between Together followed by Alone are 0.09 and 0.62. Clearly then, subjects did better going from an Alone condition to a Together condition. Given the emphasis on competing, it is likely that the results come more from competition than from the mere presence of a coworker.

While Triplett did not control for all factors his report was important for some distinctions he made in discussion. First, he distinguished between effects due to competition, rivalry and the desire to win, and effects due to just the sight and sound of another person performing the same behaviour. Second, he distinguished between co-acting situations and spectator situations (p.530), in which others are present as observers. He commented on some results of spectator studies by Manouvrier (see Haines & Vaughan, 1979, note 22) and proposed that the increase in movement found with spectators was due to "wishing to impress". With this he raised the possibility that someone passively watching subjects perform in Alone conditions may still stimulate them.

In 1910, Burnham reviewed "the effects on mental activity of the presence of a group of other persons" (Burnham, 1910, p.761), which included his own study (Burnham,1905). The work that had been done since Triplett was mostly from Germany and concerned the education of children: was it better for children to study in class groups or alone; at school or at home? Schmidt (1904) had found on a number of tests that work at school was superior to work at home. One exception was the writing of original essays in the mother tongue. Schmidt suggested that original thinking was better in solitude.

Although suggestive, these studies were not well controlled. There may have been a number of influences occuring in the homes when the children worked there which were not present at school.

Mayer (1904) studied children in classrooms, either alone or in a group. The superior work found in groups was explained as arising from ambition and competition. These results do not relate to social facilitation, however, as the teacher was present with all the children in all the conditions so they were never truly alone. Triplett (1898) had already pointed out that a spectator could affect performance. This might be especially so with a teacher present.

Meumann (1904) found that children did more work when alone, as measured by dynamometers and ergographs,than with others present. He concluded that distraction from working, due to the others present, had little detrimental effect. He even suggested that the distraction led the children to increase work to compensate.

Burnham's conclusions from the pre-1910 work were as follows. Generally, superior performance had been found when working in groups as compared to working alone except where original thought was required. Distraction by others had little effect except to further motivate concentration to overcome the distractions. The main explanation for the facilitation found with co-working was competition or rivalry. Subjects tried to do as well, or better, than the other person. The reason for doing better with observers present was to impress them. Methodologically, the experiments were poorly controlled and could support no firm conclusions about specific factors.

Burnham's review was also the first to use the term "mere presence" (p.766), in suggesting that there may be effects of just the

presence of a co-worker even apart from competition. One further development by Burnham (1910) was to present data from studies of non-human animals to show "emotional" influences of the presence of others.

II. 2. THE EXPERIMENTAL STUDIES OF THE 1920'S

It appears that between 1910 to 1920 no work on social facilitation was done. In 1920, Allport reported a series of experiments on co-working which attempted to improve previous methods. He studied "the mental process of the individual when alone with his reactions...and when a member of a 'co-working or co-feeling' group" (Allport, 1920, p.159). He attempted to stop subjects competing and tried to stop comparisons between subjects. In an effort to get rid of practice effects subjects were given frequent alterations of conditions.

Allport's first experiments dealt with word associations. He distinguished between the quality and quantity of performance. Social increments and social decrements referred to the quantity of work done, while social supervaluants and social subvaluants referred to the quality of work done. In the study with the clearest design, Experiment 2, 14 of the 15 subjects gave more associations in the group than when alone. The average difference was not large (63.6 Together and 60.3 Alone). The difference is a significant one however, although Allport did not analyse it statistically ($t = 3.85$, $d.f. = 14$, $p < 0.01$).

Allport also found that this effect was stronger in the first minute of producing associations and weakest in the third minute. This is shown graphically in Figure 2. Allport suggested that the

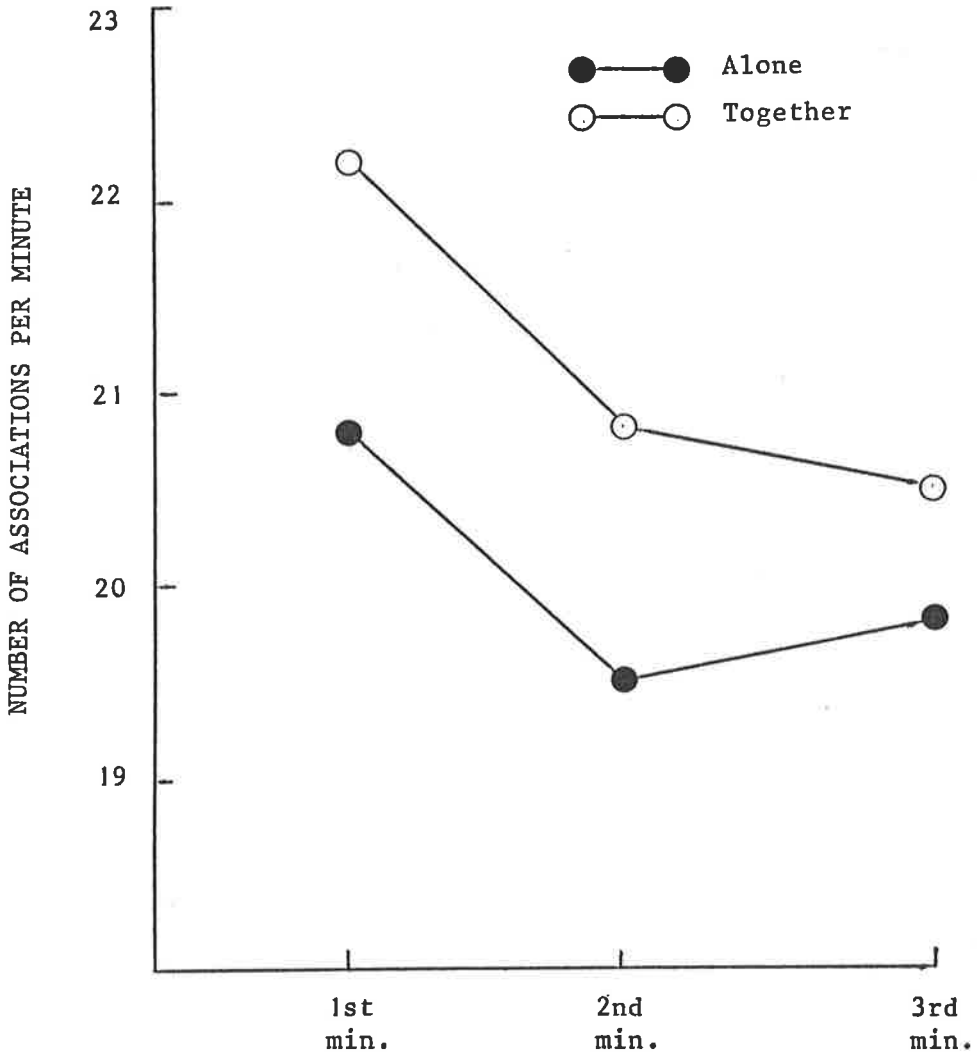

Figure 2. Average number of associations working alone or together for each of 3 minutes (data from Allport, 1920, p.165).

social influence was strongest when the associations came more easily, and that "under difficult conditions therefore being alone tends to favour concentration" (p.167). This was one suggestion that Zajonc (1965) took up in his major review.

For the quality of associations the clearest result was found with the number of personal associations. Twelve out of the 15 subjects gave more personal associations when alone. Allport proposed that an individual in a group is taken "out of himself" and that attention is directed to outside objects. Small differences were also found for words suggested by the environment, words suggested by the stimulus word, and free-rising ideas.

Allport interpreted the results of Experiment 2 as a reflection of 'speed of writing'. Subjects could produce more associations than they could write. For this reason the experiment was replicated but with subjects writing down every fourth association. With this change the results were similar but less pronounced. Only 8 out of 15 subjects showed more associations in groups than alone. This was also found in a further experiment which used less subjects but which doubled the number of tests.

These experiments are also noteworthy for finding higher self-reports of rivalry for those who did better in groups. For Allport's Experiment IV it can be calculated that there was a correlation of 0.89 between performance and self-reported rivalry. So despite Allport's instructions not to compete the results may be due to just this.

In a final experiment Allport tested group and solitary performance of "the more intellectual functions involved in reasoning" (p.175). Subjects were required to write as many refutations of an

argument as possible in five minutes. The quality of the ideas used in the refutations were judged from 1 to 3, a score of 3 for the more clear and forceful ideas. While the results showed no difference in the average number of ideas produced in the Alone and Co-working situations (8 and 8.8 respectively), all but one subject had a higher average in the group situation. Further, 6 of the 9 subjects had superior ideas alone, and 6 of the 9 had inferior ideas in the group situation.

In his conclusion, Allport claimed that the group situation is favourable to greater speed of free association but that this may be a reflection of motor requirements which were a limiting factor. This effect is greater in slower individuals and at the start of the task. There are more personal associations given when alone, offset by more environmentally stimulated associations in the group.

Allport listed the social factors thought to influence the association process. Facilitating factors were the perception or idea of movement in others and the intrinsic rivalry of the group. His experiments showed only the latter. Impeding factors were distraction, over-rivalry, and emotions.

Allport's work in 1920 was important for a number of reasons. First, he vastly improved the methods and experimental designs of previous work, although his work was not without problems. He re-emphasized the distinction between quantity and qualitity of performance and also examined social facilitation effects in the new context of word associations. He further improved the methodology by trying to control for the effects of practice and rivalry. Last, he took the study of co-working out of the educational context and viewed it as a wider social phenomenom.

The conceptual and experimental work of Allport was extended in his later book (Allport,1924a). In this he distinguished face-to-face groups from co-working groups (p.261). In the former there is direct social interaction, in the latter the individuals are co-working without interaction. He did not distinguish this, however, from the effects of passive observers. Allport recognized two social factors in co-working performance. The first he termed social facilitation: "which consists of an increase in response merely from the sight or sound of others making the same movement" (p.262). The second factor was rivalry.

After briefly reviewing the studies of Triplett, Schmidt and Meumann, Allport described further experiments conducted by himself. For these, subjects worked either in groups or alone. Instructions emphasized that rivalry be kept to a minimum. The tasks used were a Vowel Cancellation Task, a Reversible Perspective Test of attention and a multiplication test. In terms of quantity it was found that twice as many subjects did more work in groups than did subjects in the alone situation, although the differences were small. The quality was unaffected by the conditions. Allport suggested that social facilitation works to release or augment some form of movement. Subjects who had produced social subvaluants, less work in groups, also reported distraction in questioning afterwards.

A further experiment reported concerned with judgement of odours alone or in groups. It was found that the unpleasant odours were judged less unpleasant when in a group and that the pleasant odours were judged less pleasant when in a group. Allport generalized that there is a moderation of judgements in a group. The same was found for judgements of weights. In groups, the heavy weights were

judged as lighter and the light weights were judged as heavier. Again, the extremes were avoided in group judgements. Allport explained this as a conformity influence in groups. After presenting these results Allport again considered the effects of social facilitation without rivalry. He viewed them as either arising from the ideomotor response or from over-compensation for the greater distraction in groups as Meumann had suggested.

While Allport's experiments were an improvement on previous work, they were not without large problems. Williamson (1926) was the first to take this up. He suggested that Allport had not controlled rivalry enough when looking at social facilitation effects. As mentioned above, one of Allport's experiments (1920) had shown this. Even in the Alone condition the subjects could compete with standards set by themselves, the experimenter, or by the task itself. A second criticism was that Allport had assumed that the subjects' performances were only determined by his instructions whereas the situation or the subjects themselves could instruct or act otherwise. Williamson also pointed out that no details of Allport's subjects or their selection were given, limiting the generalization of the results.

In re-examining Allport's results, Williamson looked at the averages rather than the frequencies used by Allport. Only two of the four experiments showed a higher average frequency in the group situation and these both had large variances. He also pointed out that Allport's Table 2 presented results which did not control for the number of trials performed. When the average number of associations per trial were substituted, little real difference remained between the Alone and Group conditions. Similar re-analysis occurs for

Experiments 3, 4 and 6. If anything, the results favour more associations when alone. Williamson did not present criticisms of Allport (1924a) because no individual results had been given. Nor had many details of the procedures been given.

It seems that the data of Allport (1920) do not support his conclusions, although Williamson's paper has been ignored in later accounts of Allport's work (e.g. Cottrell,1972). Allport's conceptual distinctions are still important, however, despite lack of support. It had been shown that there was a phenomenon to be studied and that experimental methods could be applied. This generated an increase in studies during the 1920's as can be seen in Figure 3. Most of these took Allport as their impetus.

Gates (1924) took a slightly different turn. She compared the performance at a number of tasks of a person alone with the same person in front of either a small or a large audience. She was interested in "the reaction caused by the mere presence of the observers not of anything they might do in the way of friendly or unfriendly behaviour" (p.334). Despite this, and despite earlier warnings, Gates failed to have proper controls to test this hypothesis- the experimenter was present in all conditions. Thus performance was compared between audience sizes of one, 4 to 6, and large.

In an editorial comment on this study, Allport suggested that a number of factors might have been present and further commented that: "it might be worthwhile to repeat Dr. Gates' method using solitary individuals, in one set of trials working wholly unobserved, and in another set of trials working before an audience" (Allport, 1924b, p.344). Allport also commented on Gates' finding that those

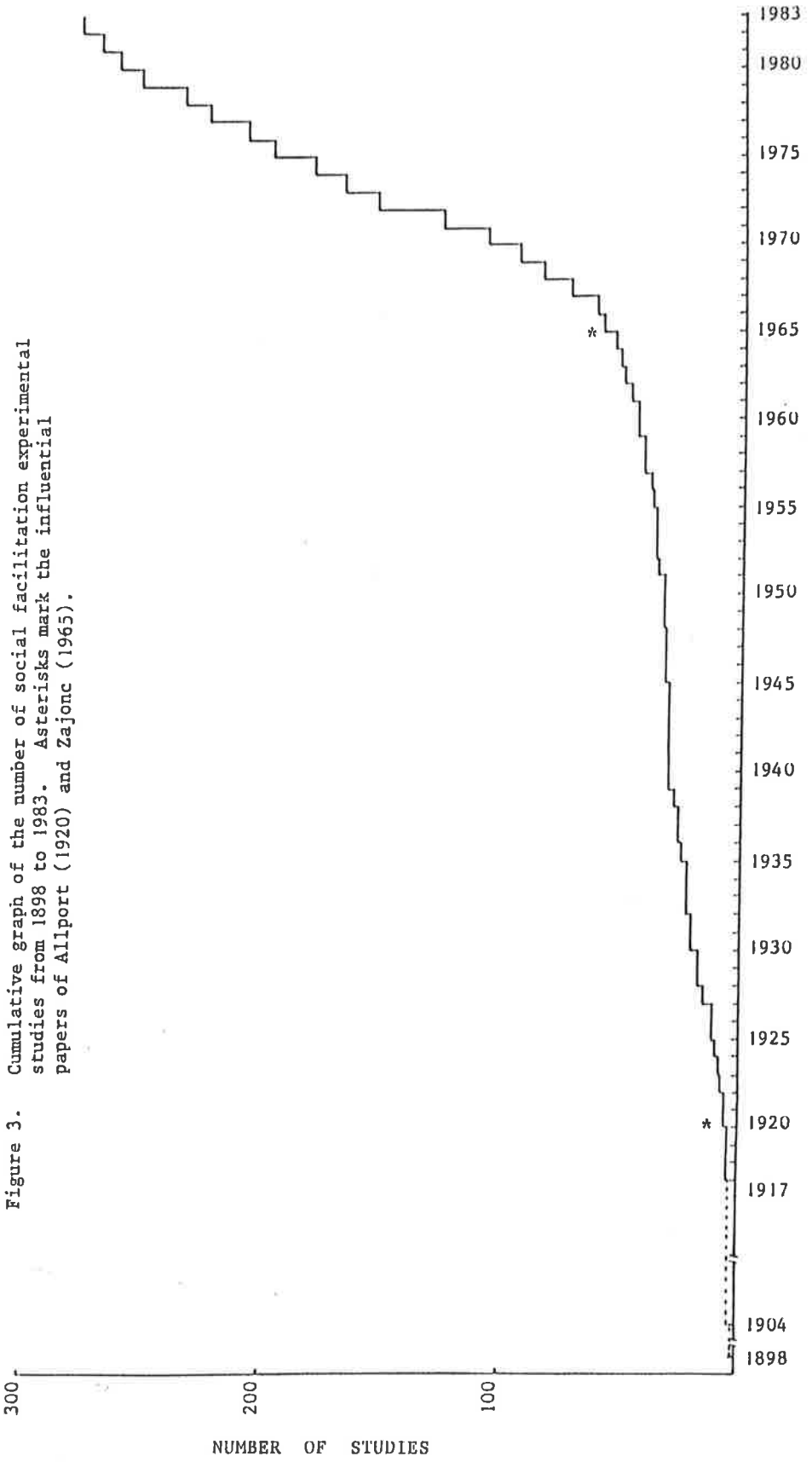

Figure 3. Cumulative graph of the number of social facilitation experimental studies from 1898 to 1983. Asterisks mark the influential papers of Allport (1920) and Zajonc (1965).

with poorest ability initially improved more with an audience. Those who were good alone were little better with an audience. This had been found previousely by Allport (1920, 1924a), Mayer (1904), and Moede (1914), although these last two studies were not concerned with social facilitation.

A further test of audience effects was made by Travis (1925). He had 22 young men practise a pursuit-rotor task with no audience until there were no further rises over two days. They then performed five trials again alone followed by ten trials with an audience of 4 to 8 people. It was found that 18 out of the 22 men performed better with the audience. Although Travis found the actual difference to be non-significant, it was later pointed out that a proper test of the results, using a related-samples test, did show a significant difference albeit a small one (Cottrell,1972). The conclusions from the experiment must be tempered, however, because the experimenter had been present during the alone trials.

Six more experiments in this area were published between 1926 and 1929. Sengupta & Sinha (1926) found an improvement with group presence on the vowel cancellation task used by Allport (1920). This was after subjects had practised until there was little variation from day to day. Weston & English (1926) gave subjects I.Q. tests either alone or in groups. They controlled for order effects, which Allport did not do, and also tried to control rivalry. The experimenter was excluded from the alone condition. With these changes an improvement was found for the group condition. It was admitted that a problem might have been a lack of control of test form; Form 1 was used by all those alone and Form 2 by those in the group situation. Farnsworth (1928) criticised them for this point and also for not controlling

I.Q. levels. When subjects were matched for I.Q. no difference was found between the Alone and Group conditions (Farnsworth, 1928).

Travis (1928) obtained the opposite result to Allport (1920) for word associations when using stutterers as subjects. Eighty percent of the stutterers gave more associations when alone than when with the group. Anderson (1929) looked further at I.Q. and found that while in the normal I.Q. range there was improvement in the group on a number of tasks, those of higher I.Q. showed some disturbance in the group situation. Anderson (1929) also found greater variability in the group situation, as had Allport (1920).

A different approach was taken by Ekdahl (1929) who was interested in the effects of an experimenter on word associations. He had subjects who were alone to speak their associations into an Ediphone. He found that subjects were quicker to give associations when alone but only when the experimenter had been present for the first half of the session. When the Experimenter Absent condition preceeded the Experimenter Present condition there was no difference. Only when learning to do the task were effects found.

Ekdahl also asked subjects for their introspections. With the experimenter present subjects reported being more distracted, less free, more hesitant to give associations, more embarrassed, more confused, more alert and more self-conscious. So a number of social and non-social factors appear with just the presence of the experimenter. Similar results were found with Ekdahl's second experiment using a mature group and again in a third experiment which also showed quicker associations when alone compared to having the experimenter present.

II. 3. CONCEPTUAL AND EXPERIMENTAL ADVANCES UP TO 1964

In 1930, Dashiell opened up the area further by making several important distinctions. First, he suggested that there are effects from just the presence of quiet spectators; second, there are effects from others who present "overt vocal attitudes" (p.190), making encouraging or discouraging comments; third, there are effects from co-working even without competition; and last, effects from explicit rivalry and competition. Dashiell set out to test these four factors within the same paradigm using three types of tasks. He set up conditions of subjects working alone, observed, co-working, and with rivalry.

It was found that the differences between the groups were small but there was a general tendency for greater speed in the Observed group and a lesser effect in the Rivalry condition. Speed was lowest in both the Alone and Co-working groups, with little difference between them. There was a slight tendency for accuracy to be higher in the Alone and Co-working conditions and lowest in the Observed condition. Dashiell pointed out that the lack of difference between the Alone and Co-working groups went against the earlier findings of Allport and others. He interpreted his finding as showing that the "competitive attitude" is all important in such circumstances.

Dashiell next set out to look at two types of Alone conditions. In one, the subjects were alone but in different rooms. Signals were controlled from a central room so that subjects were signalled simultaneously (AS). In the other situation, subjects were run independently (AD). A co-working (together) group was also run (T). Dashiell expected that the AS group would adopt a competitive

attitude. The result, although again with problems, suggested that the T condition was the fastest and least accurate, the AD was the slowest and most accurate, and that AS held a middle position. Thus AS was not a true Alone condition since mere synchrony was enough to induce competition. This explained why no difference had been found in Dashiell's first experiment between the Alone and Co-working groups. It also indicated the potency of competition effects, especially to swamp other effects. With just the knowledge that someone else is performing somewhere else simultaneously, speed is increased and accuracy suffers.

In 1931, Murphy & Murphy reviewed most of the extant literature and reached a similar conclusion to Dashiell: "Despite the dynamogenic factor, it would certainly appear that the main factor at work in such results is the same old desire to make a good showing" (1931, p.462). Five more studies were published in the following three years. Despite the plea of Dashiell for "more and more analytic research" (1930, p.198) these studies were not well controlled.

Burri (1931) tested the influence of an audience on recall with competition effects reduced. All subjects learnt a list of words in the presence of the experimenter. Two of three groups were told that they would be asked to recall the words the next day in front of an audience. One audience was attentive and evaluative while the other was unattentive. The third group recalled with only the experimenter present. The results showed that there was better recall with only the experimenter present and that there was no difference between the two types of audiences. This was despite the fact that subjects who had anticipated recalling in front of an audience had taken 30% more trials to learn the list of words on the first day.

This showed that expectancy of performing in front of an audience had a direct influence on the task.

It is hard to interpret these data clearly, however. The experimenter present in the "No Audience" condition must be considered an evaluating audience, as Dashiell (1930) and Ekdahl (1929) had found. It might have been that the experimenter's presence focussed the subjects on the accuracy of the performance, which was being measured, whereas in the audience conditions subjects may have concentrated on presentation features or else have been distracted. Little can be gleaned from the data.

Farnsworth & Behner (1931) looked more closely at Allport's notion of "the attitude of social conformity" (1924a, p.278). They repeated his experiment of judging weights alone and in groups, and found similar results. The heavier weights were judged lighter when in a group than when alone, and the lighter weights were judged heavier in the groups. When tested for statistical significance, which Allport had not done, only a few of the comparisons showed significant differences.

Pessin (1933) compared the effects of social and mechanical stimulation on learning and recall. Each subject learnt three lists of nonsense syllables, each list under a different condition. The order of conditions was varied. In the Control condition the subjects worked alone without extraneous stimulation. In the Mechanical condition the subjects had to contend with a buzzer and flashing lights. In the Social condition a passive observer was introduced. This consisted of Pessin himself watching through a small window.

Results showed that subjects needed more repetitions of the list and made more errors in the Social condition compared to the

Control condition. More errors still were made in the Mechanical condition. There was also some weaker evidence in a follow up that subjects in the Social and Mechanical conditions retained more afterwards. This was probably due to those subjects having greater exposure to the lists.

Pessin & Husband (1933) tested two social conditions against a control using a fingermaze task. Large variability in the data, however, precludes any sure interpretation. Another feature of this publication deserves mention. The authors pointed out that Allport's notion of social facilitation only dealt with an increase in the ongoing activity due to others co-working. There is no reason from Allport's conception to expect performance changes in the presence of a passive spectator. They suggested that distraction may play a role.

Perl (1933) reported evidence that visual or verbal jokes presented to a group were judged to be more funny than the same jokes presented privately. The evidence for this was not well controlled but suggests a further example of conformity influences.

In 1935, some of the social facilitation work was reviewed by Hollingworth (1935). After discussing early co-working studies, Hollingworth reached a similar conclusion to that of Pessin & Husband (1933) that the effects of Allport (1924a) do not apply to an audience situation. With an audience, claimed Hollingworth, there is no rivalry and no ideomotor stimulation from others working with the same movements. He did agree with Allport that "working in the presence of others...establishes certain fundamental attitudes" (Allport, 1924a, p.285). In particular, effects can come from the attitude of the audience, whether they register approval or disapproval. Hollingworth reviewed the extant audience studies and concluded that most had

design faults. What effects there were appeared to be small.

In his book Hollingworth drew attention to the work of Ruger (1910), who had suggested that one intefering effect of audiences was due to self-attention:

> "The self is felt to be on trial. 'what sort of self shall I and others consider myself to be?' is the question which occupies attention, and this is usually accompanied by a state of worry, of emotional attention, which still further distracts from the problem in hand" (Hollingworth, 1935, p.205).

This suggests that effects of an audience are not just limited to effects on the task in hand. The whole behaviour of the subject and the whole social situation should be investigated.

The same year saw a substantive review published by Dashiell (1935). He differentiated seven types of relationships between an individual and others. These were: a passive audience; co-workers with no competition; contestants; evaluators making comments on the work; co-operators; information controllers; and prestigious or large audiences.

Dashiell acknowledged that few significant results had been found using analyses of means and standard errors so he relied on trends in individual results. He argued that "a social influence... is as validly measured by the number of people affected as by the relative intensity with which they are affected" (p.1107). He also thought that this took account of individual differences in

susceptibility. Pessin & Husband (1933) were criticised for having the experimenter present in all three conditions although no comment was made on other studies which had done likewise. Dashiell's conclusion for the effects of a passive audience was that "the mere presence of others tends to speed up the individual's work but to make it less accurate" (1935, p.1106).

His conclusions were based, as has been seen, on frequency data which were not tested for possible chance effects by non-parametric analyses. Performing binomial tests on the figures of Allport (1924a), as presented by Dashiell (1935, p.1108) it is found that only two of the sixteen results differ from chance level. In fact, Dashiell strongly pressed his case against the analysis of means using Allport's data of the number of associations alone or together (p. 1107). He showed that mean values reveal no difference betweeen these two conditions but that 6 of the 8 subjects had produced more associations in the co-working situation. This, however, has a binomial probability of only 0.145. By present day standards even this frequency difference must be judged as due to chance.

So despite Dashiell's optimistic review the work up to 1935 had failed to show consistant results. Properly controlled experimentation had not been tried. It must be kept in mind, of course, that statistics and experimental design were still young (Fisher, 1925, 1935). Problems that had been commented upon in the literature at this stage were the experimenter's presence in Alone conditions; confounding and not controlling for other effects which had been shown to exert an influence, such as competition; insufficient data analysis; and little comparability between the conditions in different studies.

In their textbook discussion of social facilitation (wholly confined to a footnote), La Piere & Farnsworth (1936) raised a further problem with the early work. This was that it was doubtful that the controls for rivalry and competition used were effective. They suggested that it may be impossible ever to be rid of these effects: "In fact, it is possible that social facilitation is nothing more than mild rivalry" (p.377). With this doubt, and those expressed by Dashiell (1935), it is unlikely that any clear effects of just the passive presence of another person had been shown up to this time. Conceptually, the area had been refined, but efficient methods of testing these distinctions had not followed.

The next few years produced a number of reported studies, but only a few after the American involvement in the Second World War. Some of these claimed to be of concern to social facilitaion, but actually dealt with co-operation effects which Dashiell (1935) had excluded. For this reason they will not be reviewed in detail. Table 1 of Chapter 4 lists all of them. Only a few of the better ones will be mentioned here.

In the two conditions of their study relevant to social facilitation, Taylor, Thompson & Spasoff (1937) found less work done in groups (Condition A) than alone (Condition H). The number of subjects was used small, but performing a two-tail test on these groups shows it to be reliable at the 0.01 level, t= 2.95. Abel (1938) found better maze performance in pairs than alone using retarded subjects. Murkerji (1940) also found better performance in groups than alone of trained children. Despite having no controls for order effects the better results were found in the first test taken by the children (in groups). Hanawalt & Ruttiger (1944) had subjects

read the "Ghost story" of Bartlett (1932), and then repeat the story from memory to another experimenter or to an audience. There was more elaboration given to the audience, although there was no true Alone condition for comparison. This perhaps suggests that attention is given to presentation rather than just performance with an audience as was suggested earlier by the results of Burri (1931).

Wapner & Alper (1952) varied the type of audience in a test of choice times. In the Unseen Audience condition subjects thought that they were being watched from behind a one-way mirror; in the Seen Audience condition subjects could see an audience through a back-illuminated one-way mirror; and in the No Audience condition only the experimenter was present. Again, no true Alone condition was used. No difference was found between the No Audience and Seen Audience conditions but subjects were slowest with their choices in the Unseen Audience condition. It was not even suggested that the experimenter may have acted as an audience.

Seidman et al. (1957) found that subjects tolerated more self-administered shock when a partner shared the shock than when alone. This occurred even though the experimenter was present in both conditions. From the instructions given it is likely that some form of rivalry or face-saving produced the results. No true Alone condition was run to test whether the presence of the experimenter had an added effect.

Gurnee (1962) in his Experiment 2, tested subjects on maze performance either in co-working groups with no interaction or else alone. He found no difference between these two conditions. Few details of procedure were given in the report but it seems that the experimenter was present with the Alone subjects, after each six

trials at least, to collect the results. Thus there was probably no real Alone comparison.

Bergum and Lehr conducted three experiments looking at the effects of the presence of others on vigilance performance. In the first two experiments (1962), subjects worked alone or in pairs. A slight improvement in vigilance was found for pairs but the second experiment showed that this was proportional to the amount of conversation. As there was interaction between the subjects in pairs this tells us nothing about the effects of the passive presence of others. In the later study (Bergum & Lehr, 1963) subjects either worked alone or had periodic visits from an officer. The latter conditions improved vigilance. Again, this tells us little about effects of a passive other as the officers could converse with the subjects. In any case, the officers were hardly neutral stimuli for the soldiers taking part in the study.

Ader & Tatum (1963) found that more subjects who were alone learnt to escape from a free-operant shock avoidance situation than subjects in pairs. As no other measures were taken it is difficult to interpret this result. Colquhoun & Corcoran (1964) found a very weak improvement in vowel cancellation for subjects alone compared to subjects in pairs. The subjects alone, however, had the experimenter watching so a proper test of presence effects was not made.

II. 4. CONCLUSION

What does the first 66 years of social facilitation research reveal? Conceptually, the results can be divided into audience and co-worker effects though most of the tests suffer from methodological flaws which preclude a clear interpretation. What evidence there is

suggests that co-workers lead to a greater quantity of behaviour but with less accuracy. It had been suggested that this is due to over-compensation for the increased distraction (Meumann, 1904), to the effects of rivalry and competition, even if implicit (La Piere & Farnsworth, 1936), or to an ideomotor facilitation from just the sight and sound of the co-worker's activity (Triplett, 1898).

There are almost no clear results for the effects of a passive other person. Proposed effects include distraction (Meumann, 1904), trying to look good or trying to make a good impression (Ruger, 1910; Seidman et al., 1957), tension and arousal (Ekdahl, 1929), evaluation and authority (Bergum & Lehr, 1963), and the presence of the experimenter (Ekdahl, 1929). Although these effects of the passive presence of another person have come to be called social facilitation effects, this no longer corresponds to the meaning given by Allport (1924a). With a passive audience there can be no dynamogenic idea of movements in sight and sound. This was essential to Allport's definition.

II. 5. THE DRIVE MODEL OF ZAJONC (1965)

II. 5.1. An outline of Zajonc (1965)

In 1965, Zajonc produced an influential account of the social facilitation literature. In this he made at least 9 points, which, because of the importance of this article in renewing interest in the field, will be discussed in detail.

1) The first point of Zajonc's was a summary of the previous work in the area. Claiming that the area was "nearly completely abandoned" (p.269) he summarized six human studies for audience effects and eight

animal and three human studies for co-action effects.

2) From the audience studies Zajonc suggested "just one, rather subtle, consistency" (1965, p.270). This was that:

> "The emission of well-learned responses is facilitated by the presence of spectators, while the acquisition of new responses is impaired.... performance is facilitated and learning is impaired by the presence of spectators" (p.270).

3) It was argued by Zajonc that for a well-learned task the correct responses are the dominant or strong responses whereas for learning tasks the dominant or strong responses will be the incorrect ones. This meant that Zajonc's previous hypothesis could be restated as follows: "(an) audience enhances the emission of dominant responses" (p.270). That is, for complex or learning tasks, audiences will inhibit performance; for simple or well-learned tasks, audiences will facilitate performance.

4) To explain the increase in dominant responses Zajonc used the Hull-Spence drive model. This states that reaction potential (sEr), the potential for a particular response, is a multiplicative function of both habit strength, (sHr), and drive. In this case Zajonc was concerned with Hullian generalized drive, (D). So:

$$sEr = sHr \times D$$

This means that with an increase in generalized drive those responses with a high habit strength, the dominant ones, will become more likely to be emitted than less dominant ones. The response potential is not

predictable from habit strength or drive level alone. If it can be shown that the presence of another person increases drive level then this could explain the increased emission of dominant responses.

5) The next step in Zajonc's argument, an implicit step, was to equate the Hull-Spence notion of Drive with a general arousal level. It was assumed that the effect of increased arousal on performance is the same as an increase in the theoretical construct Drive (Spence, 1956).

6) Evidence was provided that the presence of others increases arousal level. This evidence rested almost exclusively on the increase of hydrocortisone levels in plasma under crowded or stressed conditions. Studies have found higher levels of hydrocortisone in animals caged together than in animals alone. This is linked to adrenocorticol functions which are linked to changes in arousal. Zajonc admitted, however, that this evidence was "indirect and scanty" (p.274).

7) Zajonc further argued for a separation of different effects of the presence of others. He distinguished those effects which are directed by the behaviour of others present from any non-directive effects. Directive influences included imitation, co-operation, competition, reinforcement and distraction. He claimed that there can be effects apart from these due to just the "sheer passive presence", or the "mere presence", of others. He also made a case that almost all the co-action studies have confounded the directive effects.

8) It was suggested that the mere presence of another person is sufficient to increase drive or arousal and so enhance the emission of

dominant responses. While not denying other directive effects non-directive influences are sufficient for social facilitation effects.

9) The final claim made was that although there were problems with the mere presence formulation, it was a parsimonious view of the literature. The effects are reduced to a single process: the increased emission of dominant responses through increased arousal in the presence of others. Much of the appeal for Zajonc's model has come from this simplicity of its total formulation.

No major changes were made to this argument in Zajonc's book which followed (1966), only some experimental work which had been published since the review article. In 1972 he added more both in a small publication on animal social behaviour (Zajonc, 1972) and in a conference address (Zajonc, Note 11).

In the small booklet he claimed that the generalized arousal was not like fear arousal, so an increase in arousal for most animals would lead to an increase in eating, a common dominant response. He likened arousal to alertness or preparedness to respond: "states commonly associated with a heightened arousal" (p.7). He further suggested that only for a normally isolated animal put in the presence of a conspecific should one strictly talk of heightened arousal. For normally social animals put in the presence of others one should talk of a lowering of arousal.

In both of the 1972 publications Zajonc also suggested a basis for the increase in arousal due to the presence of others. This was that conspecifics are inherently less predictable than physical objects and their behaviour less certain. A chair which is present

will stay where it is and need not be addressed nor engaged in any interaction. With a person present there is always the possibility that they will interact in some way, and require some response. So in the presence of conspecifics animals will be alert for the unexpected- in a state of response preparedness. This was the basis of arousal or drive increase.

II. 5.2. Critical discussion of Zajonc (1965)

II. 5.2.1. The drive construct and the dominance hierachy of responses

To examine the Zajonc (1965) paper each of the main points outlined above will be dealt with in turn. The first two points claimed that the social facilitation area had been nearly abandoned and that one consistency was the facilitation of dominant responses and the inhibition of non-dominant responses. While it is true that very few studies were done from about 1940 to 1964 it is also true that there was more to the results of the early studies than the one suggested consistency. A number of factors had been put forward as important such as impression giving, evaluation and authority, and compensation for distraction. There was little direct evidence for these, however. What evidence there was, including that used by Zajonc, was poorly controlled.

Zajonc's third point has been widely accepted, that for well-learned tasks the correct responses are dominant while for learning tasks the incorrect responses are dominant. Indeed it seems a straightforward step. Some doubts about its place in his whole argument will be raised.

The first problem is that this step changes the discussion

into one about correct and incorrect responses while some of the more subtle behaviour changes suggested in the earlier work are not easily characterised in this fashion. Trying to make a good impression on a person present cannot easily be classed as a correct or incorrect response. This has led to an emphasis on the performance of task measures which do allow measurements of correct and incorrect responses. So although this formulation may accurately describe a number of phenomena, a number of other phenomena are ignored in making this step. This is not a criticism of Zajonc's view, just of its scope and its consequences.

Even with the use of task performance, Blank (Note 5) comments that Zajonc's formulation blurs the early differences found between the quality and quantity of performance in the presence of others, especially within the same task (Kelley & Thibaut, 1954; Jones & Gerard, 1967). The blurring occurs at this same point in Zajonc's argument. Performance becomes reduced to either facilitation or inhibition. It does not allow for both the facilitation of quantity and the inhibition of quality at the same time.

Zajonc's use of the Hull-Spence model of generalized drive is a curious feature of his 1965 article. This is partly because the model was on the wane in most other areas in psychology, but also, as Zajonc himself later commented (1980, p.38), because of the uncritical acceptance this part of his theory received.

Generalized Drive was originally a theoretical construct defined so as to mediate between stimuli and responses (Hull, 1943). Its early success was due to its integration of an area previously fractured by instinct theorists (McDougall, 1923) and also due to its suggested possible physiological basis. Its later demise was due to

its inability to explain a number of findings, especially ones relevant to cognitive mediations of motivational states (Bolles, 1975; Hinde, 1970; Petri, 1981). The demise was also due to the vagueness of its conception, both as a theoretical device and as an indicator of physiological change (Dethier, 1966; Hinde, 1960). Even for Hull to explain the results found in his own time he needed further constructs of incentive motivation (K), stimulus intensity dynamism (V), and conditioned and reactive inhibition (sIr, Ir). Zajonc (1965) used only the most simple form of Hull's work for his social facilitation model.

A final problem with Zajonc's use of Drive Theory concerns the dominance hierarchies of responses. The point has been made by a number of writers that while correct and incorrect responses may be defined by laboratory tasks, it is not clear how to specify response hierarchies independently of the tasks without post-hoc determination (Carron, 1971; Duflos et al., 1969; Glaser, 1982; Landers, Daniel, 1980; Martens, 1974).

> "..predictions cannot clearly be derived from the Hull-Spence position without a complete specification of the habit-family hierarchies elicited by the stimuli... and without a model of conflict resolution which discloses the probability of each response, given a number of competing responses" (Weiner & Schneider, 1971, p.258).

So even in a two-response task, there may be responses irrelevant to the task responses which may be dominant. These may interfere with task performance in a regular way if enhanced by increased drive. For

example, if subjects were bored then body shifts and small scratching movements might be dominant responses. If these increased with increased drive then they could interfere with some tasks.

II. 5.2.2. The arousal construct

As a theoretical construct, Drive could only be useful if measured or manipulated. To this end generalized drive has been equated with general arousal or general anxiety. Zajonc (1965) used this to provide some support. Problems have arisen with this since, however.

First, the two ways of grounding drive theory in arousal and anxiety both had problems. One, physiological methods, will be discussed below. The other was the use of the Manifest Anxiety Scale (Taylor, 1953). This scale has come in for a lot of criticism,and hardly serves to ground a theory (Cofer & Appley, 1964; Hill, 1957; Jessor & Hammond, 1957; Martens, 1971; Weiner, 1966).

A second problem is that the term 'arousal' turns out to be as vague as 'drive', and could refer to a number of varying processes. In a discussion of arousal Andrew (1974) isolated six different usages of this term. Arousal can be thought of as responsiveness, the likelihood that a response will be given to a stimulus at a particular time. It can also mean the 'behavioural intensity' with which a repsonse is made. Both these usages derive from Hebb (1949, 1955). Arousal is also used as a continuum along which different responses are made, aggressive and defensive responses at higher levels and appetitive responses or sleep at lower arousal levels (Moruzzi, 1969).

Arousal has also been used as a common mediating mechanism underlying a group of related responses. For higher drive states

responses include cardiac acceleration, increased muscle tension and the orienting response (Lynn, 1966). Arousal is often related directly to the level of sensory seeking, high sensory input being a higher drive state. Last, arousal has been equated with the activity of specific brain structures, especially the ascending activation system of the mesencephalon and thalamus.

Each of these usages of arousal have problems but these will not be raised here (Andrew, 1974; Claridge, 1981; Martens, 1974). The point to be made is that until more is known about the exact nature of an arousal process it can neither be clearly measured nor used as a theoretical basis. The physiological evidence presented by Zajonc (1965) regarding hydrocortisone levels is based on the behavioural intensity usage of arousal. How this relates to the other usages and measures of arousal is unknown. More recent studies have used a wider range of physiological indicators (Moore & Baron, 1983). How these all fit together is also unknown.

The last problem with arousal to be discussed concerns the link between arousal and performance. Hull predicted a monotonic relation between drive and performance for a given habit strength and Zajonc (1965) assumed likewise when linking this to arousal. Previous work, however, suggested an inverted-U relation between arousal and performance (Broadhurst, 1957; Welford, 1976). This was most often a post-hoc explanation for experimental findings though.

Zajonc (1980, p.53) himself referred to this relation in explaining some contradictory results. On this point, one review has found that there is little real support for the inverted-U function despite its widespread use in post-hoc explanations (Martens, 1974). Problems with the original experimental support has also been noted

(Brown, 1965). As will be seen when reviewing theories in Chapter 3, a number of social facilitation theories are based upon this relation. Zajonc also related arousal to the ceiling effects of drive (Broen & Storms, 1961), although this paper refers only to complex tasks and not to the simple tasks that Zajonc was explaining (Glaser, 1982).

Given the problems of the Drive and arousal constructs and their measurement, what of the evidence that the presence of others induces an increase in general arousal level? The evidence produced by Zajonc (1965) was admitted to be doubtful for a number of reasons. All but one study concerned crowded conditions, where there was anything but just the presence of a passive other. In the one study cited by Zajonc as indicating the "mere presence of other animals in the same room" (p.273), the three monkeys had visual, auditory and tactile contacts (Mason & Brady, 1964). The elevated hydrocortisone levels found could be due to many sorts of social interaction effects. This was precisely the reason for which Zajonc had earlier denied that some other social facilitation studies had shown mere presence effects.

Since 1965, many more physiological measures have been used, such as EEG, palmar sweat, galvanomic skin responses, heart rate and the electromyograph. Without discussing individual studies, problems can be seen to exist. First, the evidence suggests that the arousal measures do not correlate well with one another (Lacey, 1967; Martens, 1974; Martin, 1961; Moore & Baron, 1983; Poulson, 1970). This could be for a number of reasons. There may not be a general arousal factor, it may have several parts, or only parts of the one factor may become manifest in certain conditions. The point being made here is that until more is known with certainty a solid theoretical foundation

for arousal has not been provided.

The criticism has also been raised a number of times that arousal measures are likely to be reactive (Gale & Baker, 1981). It is probably arousing to be brought to a room and hooked up with a number of physiological devices. So the baseline condition, in this case the Alone condition, is probably arousing even before any experimental manipulations. The problem then is one of interactive effects or ceiling effects.

A further reactive effect arises in the Alone conditions of social facilitation experiments. If the physiological measure is taken after the task is finished then it will not be measuring the same physiological reaction as occurred during the task. If the experimenter is present to take the measure during the task then this no longer constitutes an Alone condition. Last, if the subject is asked to make self-measures during the task, such as palmar sweat fingerprints, then novelty effects may both change arousal levels anyway and also lead to distractive effects.

In any event most physiological measures have been "rough indicators" (Martens, 1974, p.166). Mere presence effects may be too subtle to be registered. One can not even plot relative levels of induced arousal to make a test between the monotonic and inverted-U relationships of arousal and performance (Martens, 1974). It should be said, though, that the physiological technology appears to be improving and may someday be predictive (Cacioppo & Petty, 1983). At present, a recent review suggested that the role of physiological measures in social facilitation research should only be exploratory (Moore & Baron, 1983).

A final problem will be raised about Zajonc's conception of

arousal increases in the presence of others. This concerns his use of the term arousal in two later publications (Zajonc, 1972, 1980). In his 1965 publication Zajonc wrote of arousal in the ordinary conversational sense. In the presence of others we are alert to them so we can be prepared for contingencies. When we are alone we can relax this state of readiness.

In the later publications he wrote that he means "relative changes in arousal level brought about by moving from a state of isolation to compresence" (1972, p.8). He suggested that for animals which are typically with others and only occasionally alone:

> "..it would be more appropriate to speak of a lowering of arousal level that comes about when the individual is placed in isolation. For others that spend most of their time in isolation, we can speak of a heightened arousal that is associated with the presence of others" (p.8).

While this latter clause is the usual interpretation of Zajonc's model, the first clause suggests a different meaning of arousal. Highly social animals placed in isolation become more aroused, in the usual sense of the word, showing increased distress calls, readiness to respond and fear (Gaioni & Ross, 1982; Rajecki et al., 1975; Suarez & Gallup, 1981, 1982; Taylor, 1981). While less feeding (a dominant response) might be found in such a situation, this is compensated for by an increase in vigilance-related behaviours (Lazarus, 1979). These latter behaviours also seem consistant with Zajonc's notion of "alertness and preparedness" (1972, p.8). So from this point of view the animals can be said to be more aroused when

placed in isolation.

What seems to be the problem here is a play on two meanings of the term 'arousal'. Zajonc wants to say that there is an arousal increase in the presence of others or an arousal decrease when alone, depending upon resting state level. The distress caused by isolating a normally social animal, however, is also indicative of an arousal increase in another sense of the word. A similar distress can also been seen when putting a normally solitary animal with unfamiliar conspecifics.

It might be argued that these distress or fear effects are not mere presence effects and that because they are more powerful the lowering of arousal might never be found. It could also be suggested that mere presence effects are some form of fear or threat reaction. This would occur when alone for normally social animals and when others are present for normally solitary animals. A model of mere presence effects based on this notion will be developed in Chapter 3.

II. 5.2.3. The construct of mere presence

The seventh step in Zajonc (1965), as outlined above, was that non-directive effects of the presence of others can be separated from directive effects such as giving cues, imitation, social reinforcement and competition. This assumption is important because it is actually used to define mere presence effects: that which is left when the directive effects have been removed.

In practice, Zajonc himself admitted that mere presence effects can only be approximated (1980, p.43). Most of our behaviours can be evaluated by others and the presence of others is usually distracting in some way, so these effects at least are hard to remove.

Further, most co-action studies confound with any mere presence the effects of evaluation, competition and sometimes imitation. Zajonc suggested that such effects are additive. So although mere presence effects may be swamped, they are still present.

While it has been pointed out that the mere presence formulation leaves out a number of social facilitation phenomena found in the early work, what of the eighth claim that mere presence is a sufficient condition for social facilitation effects? While a review of the experimental literature will be left until Chapter 4, one comment will be made here. Markus (1981) considers that this question has been answered, that:

> "some aspects of the social nature of individuals may indeed be instinctual or hard-wired and that this social nature or attitude may be stimulated by the presence of another member of the species... We are no longer interested in demonstrating just that an organism's dominant response can be enhanced by the presence of a species mate. It can. We are now left with the question of how" (p. 261).

To the extent that doubt has been placed on the meaning and measurement of dominant responses and on the physiological measures that have been used, it cannot be said that the question is answered. As will also be shown in Chapter 4, there is very little good evidence for any of the theories of social facilitation.

II. 5.3. Conclusion

In the light of the above discussion, Zajonc's final claim for the simplicity and parsimony of his drive model is correct, but only in so far as a number of terms are left vague and a number of phenomena are not considered. As Blank (Note 5) remarks, since Zajonc included evaluation apprehension to explain all the social facilitation findings (Zajonc,1980) his explanation is no longer a simple one-process model. A large part of its appeal probably came from its simplicity and its "great elegance" (Weiss & Miller, 1971).

The problems that have been raised with Zajonc's model are mostly problems with the evidence that was available at the time and with the use of the Drive and arousal theories. As has been outlined, none of the evidence at the time was clearly interpretable. Similarly, the current arousal theory of the time had not been clearly examined and most of the problems were not raised until a later date. Even so, Zajonc's model provided a good account of what literature was available and it clearly led to a resurgence of work in the area (Figure 3). When some of the underpinnings of recent social facilitation theories are examined closely, they too have many weak points that are ignored.

Zajonc's model can perhaps be now seen as an elegant model of mere presence effects and not social facilitation effects in general. There may be a number of social facilitation phenomena (Desportes, 1969). While Zajonc's model retains its elegance, it does not deal with all the social facilitation phenomena. As a sufficient condition for social facilitation effects, it still has great importance.

CHAPTER III.

THEORIES OF SOCIAL FACILITATION

III. 1. INTRODUCTION

In the years following Zajonc (1965), there was a surge in experimental and theoretical papers, as Figure 3 shows. Up to 1982 there were at least 15 theories to explain social facilitation phenomena. Apart from a minor change in theorising (Bruning et al., 1968) which will be mentioned later, a new approach had to wait until Wicklund & Duval (1971). Following this, the next major theoretical proposal was not until Sanders, Baron & Moore (1978). Between 1978 and 1982 at least 8 other explanations for social facilitation effects were published.

Rather than review these theories chronologically they will be discussed in terms of their content. It will be suggested below that the theories can be usefully grouped into three types: arousal, social conformity and attention. They will be discussed in terms of these categories in this chapter.

Some of the similarities between the approaches can be traced back to the influence of Zajonc (1965). One side effect of Zajonc's formulation was that most of the opposing theories put forward were still based on the drive hypothesis and treated social facilitation as a single phenomenon. There was disagreement over the cause of the increase in drive in the presence of others but the drive mechanism usually went unchallanged. The first real non-drive explanation did not come until 1978 (Carver & Scheier, 1978).

A further side effect of the Zajonc (1965) paper was that the majority of experiments conducted used the same paradigm looking for the same type of behaviour change- the facilitation of simple responses and the inhibition of complex responses. The responses measured were almost exclusively those of laboratory tasks. The basic design consisted of subjects performing a simple or a complex task, in either an Alone condition or in a Presence condition. A significant interaction between these two variables counted for social facilitation effects. Thus, almost all the theories have been directed at explaining this interaction. Other types of behaviour changes in the presence of others have not been examined. It will be suggested, however, that different theories may refer to different phenomena.

As mentioned, the theories of social facilitation will be divided into three conceptual types, although there is some overlap between them. The first type involve the notions of drive and arousal. The second type of theory involve the production or reduction of socially learnt behaviours which conform to some social standard. The 'social conformity' may be towards increasing or decreasing the frequency of the behaviours and can be produced by the passive presence of others. As will be shown, there is little to decide between the particular social conformity theories put forward; they can each explain the same experimental studies. For this reson they have all been put together as 'social conformity' theories. The third group of explanations are all concerned with attentional processes in some way. These have the greatest overlap with the other theories but will be discussed separately.

The three types of explanations will be discussed in turn. Evidence for each view will not be given unless directly relevant to a

particular point. The experimental work will be detailed in Chapter 4. One reason for this is that many of the experiments have design faults which make their interpretation doubtful. Another is that many of the experiments support a number of different theories of social facilitation. Presenting them at this stage as supportive of only one view will be seen to be misleading when they are viewed as a whole in Chapter 4.

III. 2. DRIVE AND AROUSAL THEORIES

The main arousal theory of Zajonc (1965, 1980) has already been dealt with at length. The theories that followed still based themselves on drive and arousal. They disagreed over whether the mere presence of others was sufficient to increase arousal and proposed other conditions for this to occur. It was still assumed that however the arousal was increased from the presence of others, the increase acted to facilitate dominant responses and inhibit non-dominant responses.

III. 2.1. Evaluation apprehension

The first opposing theoretical formulation following Zajonc (1965), was that of Cottrell (1968, 1972) who suggested that the basis of the social facilitation interaction effect was an increase in learned drive. It was proposed that people learn through their lives that depending upon how they behave, others can mediate positive or negative outcomes. That is, they can praise a performance or they can give a negative evaluation. It was the anticipation of this, Cottrell suggested, that was arousing. The increase in learned drive led to the social facilitation effects rather than Zajonc's generalized

drive. Only when an audience can evaluate a performance and are "potential dispensers of praise or reproof" (Cottrell, 1968, p.105) will social facilitation effects be found.

In line with this Cottrell, Wack, Sekerak & Rittle (1968) found a difference between an Alone and a Presence condition, but no difference between the Alone condition and an audience who were blindfolded and could not therefore evaluate.

A similar idea was put forward at the same time by Henchy & Glass (1968). They emphasized the aversive drive effects of audiences (Brown & Farber, 1968) and argued that it was the subject's "evaluation apprehension" that increased drive level. They tested this by comparing an Alone condition with three Presence conditions, varying in the degree of evaluation. In one the subjects were told that the audience consisted of two students (Non- Expert); in another the audience consisted of two staff members (Expert); and in the third, subjects were told that they were being filmed for later evaluation. The results presented showed that the Recorded and Expert conditions were significantly different from the Alone condition, while the Non-Expert condition was not. However, as later pointed out by Zajonc (Note 11), there was still a reasonable difference between the Alone and Non-Expert conditions ($p < 0.07$).

These two studies led to a large number of new studies which tried to test between evaluative conditions and non-evaluative conditions, with little real success. One recurring problem was the difficulty of reducing the possible evaluation when performing in front of others, especially when doing laboratory tasks. These studies will be reviewed later.

A number of other arousal models of social facilitation were

put forward in the following years. As most of these involved constructs of attention, discussion of them will be left to that section. The rest of this section will develop a new account of mere presence.

III. 2.2. Mere presence effects, fear and alertness

The later extensions of Zajonc's arousal theory (Zajonc, 1980) have already been discussed in Chapter 2. A number of problems were also raised there. It was suggested that a fruitful approach to take would be to consider the arousal as arising from inherent threat or fear due to the presence of another person. It is obvious, however, that every encounter with every other person is not wrought with fear. This means that the conditions for there being fear may be the conditions for mere presence effects. It is not proposed that this account deals with all the social facilitation phenomena. Rather, it is mainly concerned with the possibly hard-wired mere presence effects and possible similarities between human and non-human animals. The non-human animal literature will not be reviewed.

III. 2.2.1. Alertness to social and non-social stimuli

The account to be given of mere presence effects suggests that in the presence of a social being, a being that is animate, unpredictable and which affords social interaction, this other being is monitored so far as is possible or necessary. Monitoring here refers to a broad process of orientation (Lynn, 1966) and attention to the other, to assess familiarity, possible threat, and impending interaction or encounter. Monitoring social stimuli allows for response preparation in advance of any encounter. This point is made

by Norman:

> "If potential danger is to be discovered quickly, there must be continual monitoring of possible sources of evidence. Moreover, when danger is detected, the organism must be alerted" (1980, p.10).

If, as suggested by Zajonc (Note 11), social stimuli are the most unpredictable then regular monitoring, in the background of other social behaviours, must centre on conspecifics. It is argued then, that the mere presence of a social being elicits monitoring. There will be conditions in which monitoring is not necessary and there will be consequences of not being able to monitor a person who is present.

Before dealing with these, two studies will be mentioned which show differential attention to social and non-social stimuli. The early eye-movement studies of Yarbus (1967) found that subjects would fixate most often on the persons present in a picture, particularly their faces, rather than non-social stimuli. Although these were only pictures of social stimuli, the results are suggestive.

Heylen (Note 8), in an unpublished study, had subjects perform a task in someone's office, supposedly due to lack of space. There was either no one present or else the occupant of the office worked at her desk paying no attention to the subject. Although subjects in both these groups subsequently remembered about the same amount of detail about the office environment, in the Presence condition attention away from the central task was given to the confederate rather than to the environment.

Further to this, analysis of two levels of task evaluation

suggested that the hypothesis of Easterbrook (1959) did not apply to the irrelevant social stimulus. There was no reduction in attention to the task-irrelevant social stimulus. Even in the condition stressing very high levels of performance, subjects still monitored the person present. This study, and that of Yarbus (1967), give some evidence that social beings are watched more than non-social objects.

It was also pointed out by Heylen that the only other test of the attenuation of attending to other persons under increased arousal had used pictures of persons (Cohen & Lezak, 1977), and had found an attenuation. When this was tried with an actual person the effect was not found (Heylen, Note 8).

These results must be treated with caution. Two studies have found attention to objects rather than persons (Argyle & Graham, 1976; Krupski & Boyle, 1978). In the first of these subjects were engaged in a task and it was found that only occasional glances at the other were made. There was though, "evidence of forces to avoid too much gaze at the other person" (Argyle & Graham, 1976, p.6). It is likely that monitoring in normal situations will not consist of staring, if there is a 'rule' against this. Rather, occasional glances will be made.

In the second study, children were found to look more at objects around them than at the experimenter. The experimenter, however, was sitting slightly behind the children and watching. So the children had to turn their heads to look and would have met the experimenter's gaze. Given the avoidance of mutual gaze and the head turning needed, it is not unexpected that the children did not gaze more often at the experimenter.

III. 2.2.2. Monitorability and alertness

How then does monitoring relate to arousal? It is suggested that monitoring, alertness and arousal are responses to varying degrees of physical threat, ranging from just the possibility of a threat to a direct attack. Factors affecting the communication and perception of threat have been discussed by Marler (1976) and Archer (1976) as conditions which provoke aggression. Social monitoring for possible or actual threat would seem to be an adaptation to aggressive, and other, behaviours.

That is, the first and most frequent response to the presence of another is monitoring rather than aggression. It is not that "every one of our fellow humans is a bearer of aggression-releasing signals" (Eibl-Eibesfeldt, 1978, p.42). Rather, the mere presence of a conspecific initiates monitoring and not aggression in the first instance (McBride, 1971). Monitoring, alertness, arousal and attack can be seen as gradations in responding from neutrality to aggression or fear (Leyhausen, 1979).

What conditions, then, suggest possible or actual threat? What conditions lead to increased monitoring and alertness? First, proximity of the other can indicate threat. With other things equal, there is a greater danger from someone close than from someone at a distance. Monitoring may concentrate on those close by. There is a large body of evidence to suggest that having others close is alerting or aversive (Altman, 1975; Hall, 1966; Hayduk, 1983; Knowles, 1980).

Second; vocal, facial, postural and gestural communications are a common source of social unease. Regardless of the disputed differences and similarities between species and between cultures, members of a group do consistently recognise displeasure and threat by

others in their group (Eibl-Eibesfeldt, 1974; Redican, 1975). While a red belly and head down position may be threatening to another stickleback, a raised clenched fist is commonly threatening among human cultures.

A more specific indicator of possible threat is the direction of eye-gaze of the other. It has been shown that humans and other social species have some ability to detect this information (Ellsworth & Langer, 1976; Gibson & Pick, 1963; Lord & Haith, 1974; Martin & Rovira, 1981). If another social being is attentive then there is a greater chance of an encounter. There is also evidence that eye-gaze precipitates alertness and arousal (Ellsworth et al., 1972; Gale et al., 1972; Kleinke & Pohlen, 1971; McBride et al., 1965; Nichols & Champness, 1971).

The last mediating factor to be discussed is one of the most important- novelty or unfamiliarity. Research from a number of different areas suggests that strange or unfamiliar stimuli provoke initial fear, monitoring, arousal and avoidance (Berlyne, 1960; Bronson, 1968b; Scruton & Herbert, 1972), and play a major role in aggression (Archer, 1976; Marler, 1976). This factor is especially important during development as evidenced in research on imprinting (Hess, 1973) and children's fears of strangers (Bronson, 1968a). As so few others are familiar to us, interaction rituals, such as hand shaking, and periodic monitoring are continued to assess changes in friendly behaviour (Goffman, 1963; Eibl-Eibesfeldt, 1974).

Adult monitoring of unfamiliarity has also been found to occur where there is 'stimulus novelty' (Langer et al., 1976; Taylor & Langer, 1977), such as handicaps and non-normal features, attire, or behaviour. It has been found that when given a socially acceptable

opportunity to look at such features, then they are watched.

Further evidence of adult monitoring of unfamiliars comes from Rutter & Stephenson (1979) who found that during an interaction subjects spent more time looking at the other if a stranger than if the other was a friend. Other studies also support this (Kissel, 1965; Scruton & Herbert, 1972; Swain et al., 1982). There is also evidence from eye-movement studies that attention is directed rapidly to novel features (Loftus & Mackworth, 1978).

There are a number of factors that can mediate monitoring. Those who are close, overtly threatening, unfamiliar or who have uncertain behaviour require more monitoring. The more predictable the behaviour of the other, the less attention is needed.

III. 2.2.3. Predictions of mere presence effects

Predictions can now be made as to when the presence of others will be alerting or arousing. First, if a familiar other is present and periodic monitoring is possible, then no arousal increase would be expected. This contradicts the model of Zajonc (1965) for which any mere presence will be arousing. Second, if another is present and monitoring is not possible, then it is predicted that arousal will increase because of the greater possible physical threat. Arousal will also increase in the presence of a familiar or an unfamiliar who is directly threatening, or when there is some uncertainty about the other's behaviour. We are alerted to, aroused by, or 'keep an eye on' those around us who are unfamiliar, novel, or threatening.

It should be noted here that this model points out a difference between audience and co-action social facilitation studies. In the former, the confederate's behaviour is usually unknown to the

subject and the confederate is usually able to change position or change behaviour. Thus they are unpredictable. In co-action studies, the confederates (co-actors) are doing what the subject is doing and so their behaviour is more predictable. It can be predicted from this that mere presence effects would be less likely in co-action settings. This point will be taken up when reviewing the empirical studies in Chapter 4.

Two more points about this model will be made here. First, it is concerned with possible physical threat and not evaluation threat. This ties it in with the literature on personal space and aggression, rather than higher cognitive functions. It is not proposed to replace one with the other, they may both occur depending upon the circumstances. It has also been suggested that for humans, at least, evaluation effects are probably more powerful than any mere presence effects. While this may be so in some settings, it will not be in others. If you are approached by a stranger in a dark alley, how that person evaluates you will be your least concern.

A second point is that this model is aimed at a common link between the animal and human work. Although effects of the presence of others may not always be the same for human and non-human animals (Freedman, 1979; Paulus, 1980), this seems to be because of special human adaptations to the same effects. That is, the same reactions may be present but humans may have some special adaptations to circumvent them. For example, we may or may not have adaptations to help us put up with crowded conditions but crowding is still felt to be aversive.

One adaptation or strategy for reducing the suggested inherent threat from the presence of others is to form groups of familiar

others who need little monitoring because their behaviour is predictable (Bertram, 1978). The time saved can be used for other purposes. For example, monitoring of outsiders can be shared between group members. This has been found many times for human and non-human populations; less vigilance is required in groups than alone (Barash,1972; Dimond & Lazarus, 1974).

There is also a more direct link with social facilitation. It has been found that facilitation of eating by animals in groups is accompanied by an individual reduction in the time spent in vigilance (Bertram, 1980; Hoogland, 1979; Jennings & Evans, 1980; Lazarus, 1979; Smith & Evans, 1973). This may be a cross-species adaptation to reduce threat-related behaviours and so allow a facilitation of other behaviours from the extra time available.

It is suggested that the conditions for mere presence effects will be those conditions for which increases in fear related behaviours are found. If the other present is not threatening then no arousal will be found. If the other is familiar or their behaviour is predictable then no effects will be found. If the other cannot be monitored so their behaviour cannot be checked, then effects will be found.

III. 3. SOCIAL CONFORMITY THEORIES

All of the theories in the present section have been put together because they relate to a few common points. They all deal with a change in the valuation of particular behaviours in the presence of other persons. That is, without directing the behaviour of the subject explicitly, the presence of another person can lead to

an increased awareness of the social valuation of certain behaviours, or of the social standards. This increased awareness can lead to increased conformity to those standards. These theories do not concern 'hard-wired' patterns, as the relevant social standards must be learnt at some point in the socialization process.

These theories are also all human-specific. With a few exceptions it is hard to see how these theories could even be adapted to explain the animal literature. The ideas in these theories have all been made in the pre-1965 literature discussed in Chapter 2. This includes the automaticity of behaviour (Triplett, 1898), the effects of conformity to social norms (Allport, 1924a), changes in self-attention (Ekdahl, 1929; Ruger, 1910) and changes towards looking good in the eyes of others (Burri, 1930; Hanawalt & Ruttiger, 1944; Murphy & Murphy, 1931; Seidman et al., 1957).

III. 3.1. Evaluation apprehension

The first example of a social conformity theory has already been dealt with. The learned evaluation apprehension models of Cottrell (1968) and Henchy & Glass (1968) are examples of social conformity models. When performing a task it is socially valued to do as well as possible and to show high task ability. When performing in front of others, therefore, subjects become apprehensive about doing well and try to conform to the expected standards.

Henchy & Glass (1968) suggest that negative evaluations from others are especially emphasized in our society where succeeding in performance and making a good show are learnt. Evaluation apprehension thus arises as the important factor when performing in front of others. This is also suggested by the interactions found

between audience effects and a knowledge of task ability (Geen,1981a; Seta & Hassan, 1980). So even in the passive presence of another person responding can become socially directed, even if the person present does not overtly direct or cue the subject. There is a norm to do well at tasks and subjects try to conform with this.

III. 3.2. Objective Self-Awareness

The second theory of social conformity effects is that of objective self-awareness (Duval & Wicklund, 1972; Wicklund & Duval, 1971). This was also the first theory to attempt a break with drive or arousal mechanisms. It suggested that an effect of the presence of another person was an increase in objective self-awareness. Objective self-awareness meant that attention was given to the self as an object-for-others, how others viewed them and valued them. The presence of others leads subjects to increase attention to how these others would see and evaluate them. Involved in this, it was argued, was the subject's appraisal of personal ideals, goals and abilities. It was further argued that we usually fall short of these goals, which some other person present would see. This falling short of abilities leads to an aversive cognitive state, which motivates to do better.

For simple tasks, the motivation to do better explains the facilitation of performance. For complex tasks, it was argued that we overstep our abilities in trying harder, which leads to a decrement in performance (Wicklund, 1975). So the passive presence of another person is sufficient to increase striving towards valued behaviours.

While this explanation has some appeal, it also has some shortcomings. First, it is difficult ever to specify which ideals or goals are being attended. It is assumed that these are the ones set

up by the experimental procedure, to do well at the task, but this cannot be adequately shown. Second, as pointed out by Geen & Gange (1977), the aversive state involved may be thought of as an arousal state. Any effects could be due directly to an increase in arousal, to aversive motivation processes, or to both.

Last, most of the experimental tests of this model have used mirrors instead of actual audiences on the assumption that they both increase self-awareness. Such studies will not be dealt with in the present work as there is uncertainty about the mirror manipulation. It has never been properly tested for distraction effects, for example. Further, a number of studies now have shown different effects of mirrors and people present (Innes & Young, 1975; Paulis et al., 1978). As the concern of the present work is with the minimal effects of the presence of other persons, the mirror work will not be reviewed further.

III. 3.3. Control Systems Model

III. 3.3.1. The model of Carver & Scheier (1978)

Perhaps the most developed model of this group is that of Carver & Scheier (1978; 1981a; 1981b; 1982). Their theory is based on a control systems model of self-attention (Carver,1979), the basis being a behaviour standard matching process. Self-attention is assumed to be a periodic control process to test behaviour against a comparison standard. The system operates in a negative feedback loop to change performance so that it matches the standard more closely.

The presence of others (or a mirror), it is argued, leads to an increase in self-attention and testing against standards. In

laboratory situations the relevant standard is assumed to be that of doing as well as possible at the task- the standard induced by the experimenter. The enhanced conformity to the standard from the presence of another person leads to the facilitation of performance at a simple task. This is not the result of motivation to reduce an aversive state (Wicklund, 1975) but of a control system discrepancy-reducing mechanism.

For the explanation of the inhibition of complex responses, no single explanation was given. Instead, a number of different mechanisms were said to operate. When attending to standards attention is taken away from the task which can lead to a worse performance on a complex task. It was also suggested that complex tasks have a number of incompatible, competing standards. If subjects try to conform to all of these it may lead to worse performances. Finally, the subjects' expectancies of doing well at the complex task may be diminished if repeated self-assessments show that the standard can not be matched. This may lead to 'cognitive withdrawl' and an impairment of performance.

A further distinction made by Carver & Scheier (1981a) is between private self-attention and public self-attention. The former refers to self-awareness of private thoughts and feelings and private standards of performing. Public self-attention refers to viewing oneself as others view, with an emphasis on public standards of behaviour.

Originally it was proposed that mirrors and audiences had the same effects (Carver & Scheier, Note 6). More recently it was suggested that whereas mirrors increase private self-attention, audiences enhance public self-attention (Carver & Scheier, 1981b),

although there is some indirect evidence against this (Diener & Srull, 1979). If an audience is evaluating an already internalized standard, then the results will be the same. This is what Carver and Scheier had tried to do in the earlier experiments: "We specifically attempted to choose a situation where it would not matter whether the subjects were trying to do well for themselves or trying to look good for the audience" (Carver & Scheier, 1981b, p.563). This condition applies to their social facilitation tests.

III. 3.3.2. Critical discussion

A number of problems with this model can be raised. In common with most self-attention models it is hard to see how the large animal literature can be explained in this way, even though, in principle, control systems theory could be applied to all self-regulating creatures. That chickens have behaviour standards for eating and have periodic self-attentive checks, is doubtful. It seems clear though, that Carver & Scheier (1981a) are only interested in human studies and in particular, in explaining the evaluative effects of an observing audience- not mere presence effects (Carver & Scheier, 1978, p.329). This is also reflected in their explication of drive-theory, where they centre on Cottrell (1968) and Henchy & Glass (1968).

A second difficulty is that of specifying which standards are operative. In their experiments, Carver and Scheier assume this to be that of trying to do well at the task, especially if there is social comparison information available to subjects. Even in the laboratory, however, there are social standards concerning how to interact with the person present, how to act like a subject, and personal standards of how to control one's outcomes. These may be trivial alongside a

salient, experimenter-induced, task performance standard, but outside the laboratory it is harder to predict the relevant standards which will influence behaviour. Even in the laboratory, subjects may feel strange when they are not allowed to interact with the person present. A number of studies report that subjects tried to interact with confederates but were dissuaded.

This problem is, in essence, the same problem as that raised earlier for drive theory. Away from the laboratory-induced response hierarchies of habits it is difficult to rank dominant responses and so predict behaviour. Testing requires the artificial induction of response hierachies, just as it requires the artificial induction of social standards. The problem is not just that these results are ecologically invalid; it is that that they may be testing artificial phenomena due to imposing unusually salient and obvious manipulations.

This highlights a further problem with Carver & Scheier's manipulations of behaviour standards. They emphasise that subjects should try and do as well as possible at the task to make salient that particular standard. The directedness of this manipulation is unlike the more subtle operation of standards in real life, and furthermore, is likely to lead to competition and other direct motivation effects when others are present. This does not affect the position of Carver and Scheier because they are interested in all such phenomena as arise from self-attention processes. It does means that their experiments are not dealing with mere presence effects.

Despite these misgivings, the model of Carver & Scheier (1981a) is probably the clearest attempt to formulate the processes mediating behaviour changes and the usually unspoken, but ever-present, social conformity processes. Indeed, most of the other

theories of social conformity and social normative processes can be explained as well in terms of the control systems model. It is suggested though, that there are separate effects of mere presence and social conformity. The former are due to arousal effects, are general and are probably hard-wired. The latter are learned, are due to self-attention processes and usually concern particular behaviours.

III. 3.4. Self-Presentation and other functional models of social facilitation

There are two models of social conformity effects based on the work of Goffman (1959), who investigated the self-presentation strategies people use to create and maintain an impression to others. One of the models relates self-presentation to Drive theory:

> "Although the mere presence of others may produce some drive....it appears that the evaluative presence of others produces even more drive, which is probably due to concerns with self-presentation" (Baumeister, 1982, p.19)

With others present we become involved in self-presentation and the possible embarrassment of negative evaluation leads to increased drive with subsequent effects. That is, it is the concern of presenting oneself as relatively normal, or conforming, that underlies these strategies. This view was not developed beyond a suggestion and suffers from the same criticisms as other drive theories.

The second account of a self-presentation theory does not use a drive mechanism (Bond, 1982). On this view, facilitation of simple

responses comes from the subject performing better to "manage a performance compatible with an image of competence" (Bond, 1982, p.1043). Only with the presence of others will impression management occur. In performing complex tasks in front of others, it was argued that loss of face from making errors leads to embarrassment which is "an indiscriminant incapacitator of continued role performance, an impediment to cognitive and motor control" (p.1043).

The "image of competence" suggests that people present themselves in a conforming way so as to avoid negative evaluations. People conform to social or private standards by presenting themselves as such. In this the theory of Bond (1982) can be seen to be one of a social conformity process.

Both of the self-presentation views relate closely to the self- awareness theories, the first to the objective self-awareness aversive drive theory, and the second to the control system model (Carver & Scheier,1981a). In this latter case, each can explain the other's viewpoint, as will be outlined.

For control system theory, the reason for engaging in self-presentation would be to reduce a discrepancy between a standard of behaviour and present behaviour. Any change in self-presentation can be explained as a part of trying to conform with a standard way of behaving. Self-presentation theory, on the other hand, can argue that a change towards a behaviour standard occurs because the subjects are trying to present a particular impression. Both theories would appear to be able to account for similar results and make similar predictions. Control systems theory describes an internal mechanism for achieving an external self-presentation strategy.

Another way to categorise the similarity between the two approaches is that they both argue that in the presence of others more control is taken over behaviour. This control of behaviour is oriented towards socially valued behaviours. One model concerns the internal workings of the controlling process, the other concerns the goals that the standards are directed towards. Both predict greater control of behaviour directed towards socially normative behaviour in the presence of others. Both are compatible.

Two other models have been proposed emphasizing the larger goals changing behaviour- the functions of social conformity. Ferris, Beehr & Gilmore (1978) used an extension of Hull's theory made by Tolman (1932), which deals with expectancy. They suggested that incentive (K) in the social facilitation situation was based upon social approval, the learned expectancy of working in the presence of others. So the effort to be given to a task will be based on the consequences, namely social approval. The presence of others will increase effort because of this expectancy and so improve simple performance. This model is one level higher than self-presentation models. It answers the question: why try to present yourself in a particular way to others? To gain social approval is the suggested answer.

The other functional approach is by Matusewicz (1974), also suggesting that wider goals can exert an influence on performance. Increases in performance can come from those conditions which increase the "consciously functioning guiding of activity" (1974, p.29). This reiterates that one effect of the presence of others is to gain more control over behaviour.

III. 3.5. Social conformity and evaluation

It is being suggested that social conformity effects can be described in a number of different ways at present. Overall, the presence of others leads to greater control of the socially relevant aspects of behaviour. The relationship of this to both mere presence and evaluation effects is less certain. It was mentioned earlier that self-attentive effects have been assumed to arise only from an observing evaluating audience. They have no bearing on mere presence effects. However, an attempt to detail a possible bearing of self-attention processes on the mere presence situation will be made later (Section III. 5.).

With regard to the relations between self-attention and evaluation apprehension, it seems that Carver & Scheier (1981a) believed it to be subsumed under control systems theory. There is a learned standard to do as well as possible at tasks so that the apprehension felt in the presence of others is a reflection of the discrepancy between standard and performance. To show this they dissected the physiological evidence for arousal during performance and concluded that what little evidence there was could be due to other factors. So it was concluded that evaluation apprehension worked through a control systems mechanism rather than through a drive mechanism.

A case can be made however, in a similar way to self-presentation theory, that the evaluation apprehension theory also contained a goal analysis of behaviour. It explained why subjects should try to behave more like the social standards. The reason was to avoid negative consequences from the audience. So like self-presentation theory, there was a goal structure, or a function, to

evaluation apprehension theory.

What there appears to be then, is a complex of theories all trying to explain why people seem to conform more to a social standard of behaviour when in the presence of another person who does not directly instruct them to behave in that manner, nor directly disapproves if they do not behave that way. In the usual laboratory case, subjects are trying to be seen to be doing well at the laboratory task. These theories can all make similar predictions and can explain similar results. They are not directly equivalent, though.

It is suggested that each of the theories may be situated at some sort of different level (Carver, 1979) and one cannot completely subsume the other. The difference between them lies in the part of the process that they explain. At one level, subjects conform to trying hard at the experimental task in order to gain social approval (Ferris et al., 1978). To do this subjects can present themselves as trying harder, by engaging in self-presentation strategies (Bond, 1982). One way of describing this whole process internally is to posit a mechanism which acts to reduce any discrepancy between the internalised social norm and current behaviour (Carver & Scheier, 1978). Differences between these theories may only be the difference between internal and external aspects of the same phenomenon, or between causal and functional aspects of the phenomenon.

This means that even if there is no arousal basis to the evaluation apprehension explanation it may still have a conceptual role to play in explaining the social conformity effects. It deals with one of the two higher level functions of conforming- the avoidance of social disapproval. The other function of comforming was

the gain of social approval (Ferris et al., 1978). It should also be pointed out that in view of the widespread notions of stagefright and audience anxiety, it is not yet clear whether Carver & Scheier (1981a) are correct in abandoning the arousal approach to evaluation apprehension.

III. 4. ATTENTION PROCESSES

The last group of explanations all deal with attentional processes. Some attention and distraction effects have already been mentioned in connection with the work of Allport (1920, 1924a), Ekdahl (1929), Meumann (1904), Pessin & Husband (1933) and Ruger (1910).

III. 4.1. Physical distraction

The first attentional effect will be called physical distraction. One effect of the presence of another person may be to watch or monitor them. In doing this, at least some time will be spent away from the ongoing activity. Depending upon that particular activity, the physical distraction of turning the head or body will have different consequences. Time away from the task could be deleterious or benificial. This factor was specifically mentioned in the early work of Dashiell (1935; Kushnir, 1978).

It was also suggested in the early work of Meumann (1904) that there may be compensatory processes for distraction. It is likely that with the experimental tasks presently used little effect of physical distraction would be noticable. There is usually no over-riding time urgency in most tasks, and subjects can occasionally glance at the the other person with little detrimental effect. If a

high precision visual tracking task were used, effects of physical distraction may be found.

III. 4.2. Cognitive distraction

A second attentional effect, noted by Allport (1924a) and Jones & Gerard (1967) will be called **cognitive distraction.** The presence of another person can be a complex event which requires some processing of information about the person. This may be to assess possible threat, to assess evaluation, to prepare to respond, or to select appropriate behaviours. In association with any other effects of this extra processing, time is taken away from the ongoing task, whether or not physical distraction is involved. The effects of this may not be lasting, especially if there is nothing unusual about the other's presence. Again, this effect may not be registered on currently used experimental tasks.

III. 4.3. Distraction-Conflict

A third attention factor is **distraction-conflict** (Baron, Moore & Sanders, 1978; Sanders, Baron & Moore, 1978). This explanation proposes that in the presence of others there is a conflict between attending to the person and attending to the task. This conflict of attention is arousing (Sanders & Baron, 1975) so the interaction effect predicted by other arousal models is also predicted. This is an arousal model based upon an attentional effect.

There are a number of problems, however, with the range of effects that this model can explain. The only reason so far tested as to why subjects should want to attend to the other person present, is to gain social comparison information about their relative

performance. To find out how well they are performing, subjects need to watch the other's performance. This will only apply in co-acting situations of course. In line with this, Sanders, Baron & Moore (1978) found social facilitation effects only when social comparison information was available- not in a control condition.

Against this it can be said that social facilitation effects have been found previously when no social comparison information was possible. Social facilitation effects have also been found when subjects could go slower and attend to both task and confederate. Where such self-pacing tasks have been used subjects have most often worked faster rather than slower with someone else present (Crandell, 1974; Markus, 1978; Rittle & Bernard, 1977; Zajonc & Crandell, Note 12). Finally, social facilitation effects have been found with the confederate sitting directly behind the subject so that subjects could not possibly watch them. So without denying the existence of some distraction-conflict effects, the model is far from explaining all the results. The effects will be strongest when there is a time urgency, as Baron, Moore & Sanders (1978) point out.

A further problem with this model concerns the measuring of distraction. It is unclear from the published accounts whether physical distraction, cognitive distraction, or both, are meant. It could be that subjects have competing responses of physically looking at the task or the person, or have competing responses of thinking about the task or the person. This lack of specificity makes precise testing of the model difficult.

A final problem is that the evidence for this view rests to a large extent on self-report data from subjects obtained after the experiments. Doubts have been raised as to the validity of self-

report measures (Guerin & Innes, 1981; Nisbett & Wilson, 1977). This issue will be addressed later.

III. 4.4. Attentional Process model

The fourth attentional model is the Attentional Process Model (Sanders, 1981). After reviewing some of the social facilitation models, Sanders proposed a synthesis of the mere presence model, the learned drive model, and the Distraction-Conflict model. It was suggested that the first two are drive-neutral attending mechanisms, one reflex and one learned. These are seen as two possible antecedents for attentional conflict and distraction-conflict. In the presence of others the initial orientation may be a reflexive response or a learned anticipation of positive or negative outcomes. The lasting effects and the direction of influence are due to distraction-conflict.

A number of criticisms have been made of this model and will not be repeated here (Geen, 1981b; Markus, 1981). As well, most of the criticisms of the Distraction-Conflict model still apply to this synthesis. A more general problem is that little by way of real detail has been given of the model so far. How the parts interact and the contexts in which they do interact are not mentioned. Further work will presumably elucidate this. The model stands to show a possible way in which a few different social facilitation phenomena may combine. Another scheme, of an automatic arousal process in conjunction with a voluntary controlling process (effort) has been very roughly outlined by Kushnir (1981).

III. 4.5. Arousal effects upon attention

A further attentional explanation of social facilitation effects stems from a review by Easterbrook (1959), which concluded that one feature of an increase in arousal was a restriction in the range of cues which were attended. The explanation for social facilitation is as follows, for simple and complex responses.

For simple tasks, an increase in arousal means that task-irrelevant cues which might have been attended to are now ignored. As only task-relevant cues are attended to some facilitation of performance is predicted. For complex tasks, the range of cues is narrowed so as to exclude some of the task-relevant ones and performance is inhibited. So if it is assumed that the presence of others increases arousal then the social facilitation interaction can be explained by a narrowing of the range of attention (Anderson & Reville, 1982; Bruning et al., 1968; Landers, Daniel, 1980; Landers, Daniel & McCullah, 1976).

There are some problems with this model to be raised (Bacon, 1974; Wachtel, 1967). One of these concerns the meaning of 'task-relevant'. Although fewer task-relevant cues might be attended as arousal increases, it has been suggested that what might be called 'life-relevant' cues gain priority even over task requirements, cues such as scanning the environment. This is a view of "defence as a problem of distribution of attention" (Wachtel, 1967, p.419). Monitoring others is another important behaviour in an unfamiliar environment. Zajonc (1980) suggested that conspecifics are important because of their unpredictability. This means that they may need watching even above task concerns. Supporting this is the study mentioned earlier, Heylen (Note 8), which used a task designed to test

Easterbrook's hypothesis. It will be recalled that even under high arousal conditions subjects still attended to the person present instead of only task-relevant cues. So if there is an effect of arousal on cue-utilization, it is not always a direct one.

III. 4.6. Manstead & Semin (1980)

A further attentional model is a combination of a few of the above explanations (Abrams & Manstead, 1981; Manstead & Semin, 1980). It suggests that simple tasks are routinized and usually performed sub-optimally. With a disruption or with an evaluative audience, controlled processing replaces automatic processing and performance improves (Norman & Shallice, Note 9; Schneider & Shiffren, 1977; Shiffren & Schneider, 1977).

With complex tasks attentional demands are heavy, so that disruptions from an audience will accentuate the demands and inhibit performance. This model uses distraction and attentional demands without an intervening arousal process. It fails, however, to say why the audience should increase demands if they are not directive or cue-giving. A similar version of this position has recently been put forward which supposes that it is the distraction-conflict of audiences which increases attentional demands (Moore & Baron, 1983).

III. 4.7. An information processing view

The final model to be discussed was an attempt by Blank (Note 5) to incorporate arousal and social factors into an information processing approach. It was suggested that an arousal increase leads to an initial filtering of stimuli and to a limited working capacity. This was based on Easterbrook's ideas (1959). The model also included

a pre-response filter which excludes sets of responses based on past experience and previous social valuations. These sets cut across dominance hierarchies. For example, in many situations whole sets of responses will not be processed including socially inappropriate responses and other responses which would lead to negative self-presentations. So at a pre-response stage there is "avoidance or retardation of responses with certain characteristics" (Blank, Note 5, p.15).

This highlights the problem with most attentional models. The question is rarely addressed as to why attention should change in the presence of others. Distraction-conflict suggests that getting social comparison information is one reason, but as was pointed out above, this cannot explain all the effects that have been found. More to the point, finding the motive for attention changes is vital to making these models predictive.

The problem is deeper than this, however. The information processing model comes close to the control systems model of Carver & Scheier (1978) except that the latter have presented more detailed descriptions, distinctions and evidence for their views. There is one problem that is common to both, though. Just as it was uncertain how to predict which behaviour standards were operative in the control systems model, so it is uncertain how to predict in advance which particular response sets will be filtered out. Blank's process of filtering out sets of inappropriate responses conceptually corresponds to Carver and Scheier's feedback mechanism which matches behaviour more closely to a standard.

III. 5. DRIVE, SOCIAL CONFORMITY AND ATTENTIONAL EFFECTS

There are a number of relationships between all the social facilitation models. Only some will be dealt with here. A first point is that most of the mere presence and social conformity models must also predict concurrent attention changes. If arousal comes from the unpredictability of others (Zajonc, 1980) then these others must have been watched at least briefly. If behaviour standard matching influences behaviour then subjects must have attended to internal standards and the external cues for the appropriate behaviour. So there must be epiphenomenal attentional changes with both these types of models. This means that it is not at all clear whether attention changes found between Alone and Presence conditions might be a product of other processes rather than a cause in themselves.

A second point concerns the social conformity models. They all suggest that in the presence of others, certain socially-approved behaviours are more frequent and certain socially inappropriate behaviours are less frequent. The different theories conceptualize these socially-valued behaviours in slightly different ways, as social standards, response sets, and self-presentation strategies. The point here is that each assumes that these behaviours can be described and can be predicted in different contexts. As has been suggested above, it is not clear that this can actually be done.

The only behaviour that has really been tested is that of doing as well as possible at a task; conforming to what the experimenter wishes. This corresponds to the self-presentation strategy of looking competent to the experimenter and to the behaviour standard of doing as well as possible. The response-set explanation

is less well developed but presumably would involve the filtering out of responses inappropriate to doing well at a task.

The suggestion has already be made that these theories are all explaining the same phenomenon but on different levels. For example, self-presentation strategies are higher level goals for conforming to social standards. The reason for matching behaviour standards might be to present oneself well and the reason for presenting oneself well might be to gain social approval (Ferris et al., 1978) or to avoid social disapproval (Cottrell, 1972).

A third point concerns some links to be made between the arousal models and the self-attention models. Arousal models suggest that in the presence of another person, the general arousal level increases. It is suggested by self-attention models, however, that when there is an increase in general activation level or bodily activity, then people become more self-attentive (Carver & Scheier, 1981a; Wegner & Giuliano, 1980). This means of course that if there is an increase in arousal from the presence of others then one should expect this to also cause an increase in self-attention. So the increases in self-focus found in the presence of others may be due to an arousal increase (Carver & Scheier, 1978). It is a difficult task to separate out these effects and to say which caused which.

A further complication is that it is reasonable to assume that self-referencing and self-focus are dominant responses. We tend to think more about ourselves than about others. This means that Drive theory can also predict that an increase in arousal would lead to an increase in self-reference and self-focus, as has been found many times. Indeed, it was this evidence of self-reference that provided the experimental foundation for self-attention theories. It is being

suggested here that Drive theory can make the same prediction. This would suggest that both Drive theories and self-attention theories are under-determined. The conditions under which they apply and their full implications have not been well developed.

III. 6. CONCLUSIONS

This review has proposed two types of social facilitation phenomena. One would appear to be a hard-wired reaction to just the mere presence of another person and may involve an alerting mechanism which prepares for a social encounter. In particular, threatening encounters would produce the strongest reaction.

The second phenomena are seen when behaviour is consciously controlled in the presence of others so as to behave more closely with social standards. Putting together the main theories of these second phenomena, the highest purpose of conformity is to gain social approval or social reinforcement. This may be achieved by creating an impression for the other of being a competent performer. This impression may be mediated by attending more closely to performance and reducing any discrepancies between actual behaviour and social standards.

The evidence for there being an arousal process distinct from the social conformity effects comes from two sources. First, there is the evidence for a physiological change in arousal in the presence of another person. As was seen in Chapter 2, however, the evidence for this is doubtful as the validity of the measures is in question (Moore & Baron, 1983). The second source of evidence comes from studies which try to avoid any social conformity effects by experimental manipulations. These will be exhaustively reviewed in Chapter 4. Particular attention will be paid there to whether there are still social facilitation effects when evaluation effects and conformity effects are reduced.

CHAPTER IV.

REVIEW OF EXPERIMENTAL STUDIES

IV. 1. INTRODUCTION

Chapters 2 and 3 have reviewed the large number of theories concerning social facilitation. It was suggested in the introduction to Chapter 3 that although most theories have been supported by experimental evidence, the evidence presented has usually been consistent with other theories as well. To ignore this in a review would lead to misinterpretations. Further, the many poorly designed studies need to be separated from the more carefully controlled ones. This is especially important with the subtle conditions necessary for tests of mere presence, which are the focus of the present work. As was pointed out in Chapter 2, many studies have had the experimenter present in the 'Alone' condition; to include these in the total review would be to blur the better studies.

The present chapter presents a review of the experimental literature on social facilitation effects, concentrating on mere presence effects. To do this, a situation-specific analysis was made of the literature. That is, each study was analysed according to a number of criteria which categorized the situation of the experiment. Each study was then examined to see what effects, if any, had been found. To carry this out, criteria were needed for a well-controlled mere presence study. These will be outlined below.

The present approach differs from traditional reviews which add up the number of studies finding a particular effect, those

finding the opposite effect and those finding no effect (Glaser, 1982; Kushnir, 1981). Most of these reviews have not been exhaustive in their literature search and have been selective. When they have been exhaustive, they have included numerous poorly run experiments on equal footing with better studies (Glaser, 1982).

The present review also differs from some forms of meta-analysis which put studies into categories and calculate effect sizes (Bond & Titus, 1983). Such reviews can suffer from a number of faults (Cook & Leviton, 1980; Green & Hall, 1984). These include dubious categories, rough categorization which ignores other aspects of the results found, and again, the inclusion of poorly controlled studies.

The present review used parts of both these types of reviews. The entire literature was searched for every study; explicit criteria were defined to separate the good studies from the others; each good study was analysed for the specific situation of the procedure; and this was related to the effects found. One advantage of this method is that if a criterion used is disputed, then the information is there to re-examine the studies affected. That is, the review is not closed. Another advantage is that by examining the procedural details of each study the review becomes exploratory.

IV. 2. INITIAL REVIEW OF STUDIES

For the initial data collection stage (Cooper, 1982), any study comparing the behaviour of people alone and people with others present was obtained. These came from the Psychological Abstracts and the references of all previous reviews and all experimental reports. Studies were excluded at this stage if they clearly involved group discussion, imitation or the exchange of reinforcements. This left

283 studies. It should be noted that some studies were located which were not included in the exhaustive review of Bond & Titus (1983), as well as a number of non-English papers which these authors had excluded without justification. The present review did leave out about 30 Dissertation Abstracts. This was done because they all provided few details of the experimental procedure- which was of prime concern.

For the first analysis, all studies were carefully examined and those with the following design faults were excluded:

1) if interaction was allowed between the subjects and the other persons present;
2) if there were instructions allowing for imitation, competition, cooperation, cueing, or other directive effects;
3) if there was no clear Alone condition in which the subjects were physically alone. Studies were excluded if the experimenter had been present in the Alone condition;
4) if there was no clear Presence condition with at least one person present not directing the subject. Excluded here were a number of studies using mirrors, one-way mirrors and videos;
5) if the studies had more general design faults such as the lack of a control group or if sufficient detail was not available.

With these criteria, only 83 of the studies remain. These studies constitute the clear tests between people behaving alone and

people behaving in the presence of a passive, non-directive other. Details of the 200 studies rejected are given in Table 1. The most frequent fault was having the experimenter present in the Alone condition. This was despite the early warning from Ekdahl (1929), who had shown effects from the experimenter's presence.

The remaining studies still do not constitute clear tests of mere presence effects. There are a number of other further criteria needed for this (Markus, 1978; Zajonc, 1965, 1980). If mere presence effects exist independently of evaluation effects, then all sources of evaluation should be taken into account. One principle source of evaluation in the remaining studies is from the use of the experimenter as the person present. It is likely that the experimenter will be treated as evaluative, as they know what is expected of subjects and they will evaluate the performance after the subject has finished. A second source of evaluation is from the persons present being able to observe the subject. Where observation is possible then greater evaluation should be expected.

Rather than just assume that experimenters and observers are felt to be evaluative by subjects, however, the actual results of such studies will also be reviewed. Altogether, then, three approaches will be made here. First, those studies which test the more stringent criteria of mere presence will be reviewed. Second, the effects of behaving in front of a passive experimenter compared to behaving alone will be reviewed. Finally, the effects of passively being observed will be reviewed.

Table 1. Studies Rejected from Review.

Abel (1938) - Ss with subnormal IQs used
Ader & Tatum (1963) - Ss could interact
Allport (1920) - Rivalry implicit
Amoroso et al. (1972) - Not enough detail
Amoroso & Walters (1969) - No Alone condition
Andersson & Brehmer (Note 1) - Interaction allowed
Baldwin & Levin (1958) - E present
Bargh & Cohen (1978) - E present
Baron (1971) - Ss had prior experience of shocks
Baumeister & Forehand (1970) - Retarded subjects used
Beasley (1958) - Cooperation allowed
Beatty (1980) - Not enough detail
Beck & Seta (1980) - Competition effects
Bell et al. (1982) - Subjects easily able to compete
Bennett (1946) - Not enough detail
Bergum & Lehr (1962) - Interaction allowed
Bergum & Lehr (1963) - Interaction allowed
Bird (1973) - E present
Bode & Brutten (1963) - E present
Bowman & Dunn (1978) - E present
Brockner & Hulton (1978) - E present
Bruning & Mettee (1966) - Competition allowed
Buck & Parke (1972) - E in contact throughout
Burri (1931) - E present
Burtt (1921) - E present
Burwitz & Newell (1972) - E present
Carlin et al. (1972) - No Alone condition
Carment (1970a) - Rivalry implicit
Carment (1970b) - Rivalry implicit
Carment & Hodkin (1973) - E present
Carron & Bennett (1976) - Competition
Carver & Scheier (1981b) - E present
Chapman (1973b) - E present
Chapman (1975) - Cueing involved
Chapman & Wright (1976) - Cueing and interaction involved
Chevrette (1968) - E present
Church (1962) - Competition
Clark & Fouts (1973) - Results not given for Pretest conditions
Clower & Dabbs (1974) - No Alone condition
Cohen & Davis (1973) - E present
Colquhoun & Corcoran (1964) - E present
Cottrell, Rittle & Wack (1967) - E present
Cox (1966) - E present
Cox (1968) - E present
Craig, Best & Reith (1974) - No Alone condition
Criddle (1971) - No real audience
Dabbs & Clower (1973) - No Alone condition
Davidson & Kelly (1973) - Interaction allowed
Davis et al. (1968) - E watching in Alone condition
Deffenbacher et al. (1974) - E present
Dey (1949) - Probably competition from familiarity, defined time limits, and ease of checking each others' performance afterwards
Duflos (1967) - E present
Duflos et al. (1969) - E present
Elliot & Cohen (1981) - E present
Epley & Cottrell (1977) - Ss probably aroused by shocks, cues available from confederate
Farnsworth & Behner (1931) - Interaction allowed

Farnsworth & Williams (1937) - Interaction allowed
Forgas et al. (1980) - No Alone condition
Fouts (1979) - Not enough detail
Fouts (1980) - Not enough detail
Froming et al. (1982) - No Alone condition
Fuller & Sheehy-Skeffington (1974) - No real audience
Gabrenya & Arkin (1979) - Small N used
Ganzer (1968) - No real audience
Gastorf, Suls & Sanders (1980) - Competition
Gates (1924) - E present
Gates & Rissland (1923) - Interaction allowed
Geen (1971) - E present
Geen (1974) - No alone
Geen (1976a) - No alone
Glass et al. (1970) - Not enough detail
Good (1973) - No real audience
Gottlieb (1982) - E present
Greenberg & Firestone (1977) - No Alone condition
Greer (1983) - Interaction present
Grush (1978) - E present and interaction allowed
Gurnee (1937) - Cooperation allowed
Gurnee (1939) - Cooperation allowed
Gurnee (1962) - E present
Haas & Roberts (1975) - E present
Hake et al (1973) - Ss explicitly videoed throughout
Hamberger & Lohr (1981) - E present periodically in Alone Condition to check electrode impedance
Hanawalt & Ruttiger (1944) - E present
Harkins et al (1980) - Cooperation allowed
Harper & Sanders (1975) - No Alone condition
Harrell & Schmitt (1973) - Cueing and competition present
Hartnett et al. (1976) - No Alone condition
Hatfield (1972) - Interaction allowed
Hicks (1968) - Interaction allowed
Higgs & Joseph (1971) - E present
Hillery & Fugita (1975) - E present
Houston (1970) - E present
Hrycaiko & Hrycaiko (1980) - No Alone condition
Hunt & Hillary (1973) - E present
Husband (1940) - Cooperation allowed
Hutchinson & Cotton (1973) - E present
Innes & Sambrooks (1969) - E present
Isozaki (1979) - E nearby throughout
Jackson & Latane (1981) - No real audience, no Alone condition
Johnson & Davis (1972) - Ss given incentives, possible competition from poker-chip cueing
Johnson & Baker (1973) - Interaction allowed
Karst & Most (1973) - E present
Kawamura-Reynolds (1977) - E present
Khalique (1979) - No Alone condition
Khalique (1980) - No Alone condition
Kieffer (1977) - No clear Alone condition
Kiesler (1966) - Competition allowed
Kissel (1965) - E in contact throughout
Kleck et al. (1976) - No real audience
Kljaic (1974) - No details given
Knowles et al. (1976) - Recorder present in Alone condition
Kohfeld & Weitzel (1969) - E present

Kozar (1973) - Competition implicit
Kumar & Bhandari (1974) - Not enough detail on E's whereabouts, order effects or the tasks used
Kumar & Kriplani (1972) - Not enough detail
Laird (1923) - Interaction allowed
Landers, Bauer & Feltz (1978) - E present
Landers (1975) - E present
Landers & Landers (1973) - E present
Laughlin et al. (1972) - E present
Laughlin & Wong-McCarthy (1975) - E present
Levin et al. (1960) - No Alone condition
Levy & Fenley (1979) - Interaction allowed
Livingston, Landers & Dorrance (1974) - E present
Lombardo & Catalano (1975) - E present
Lombardo & Catalano (1978) - E present
Mallenby (1976) - E present
Manstead & Semin (1980: Exp 1-4) - No real audience
Martens (1969a) - E present
Martens (1969b) - E present
Martens & Landers (1969) - E present
Martens & Landers (1972) - E present
Marx et al. (1972) - No Alone condition
Mash & Hedley (1975) - E present
Mayer (1904) - Competition
McCullagh & Landers (1976) - E present
McGhee (1973) - E present
Meddock et al. (1971) - No real Alone condition
Meglino (1976) - Cooperation allowed, no Alone condition
Meumann (1904) - Interaction allowed
Miyamoto (1979) - E present
Moore (1917) - Interaction allowed
Morrissette et al. (1975) - Competition implicit
Murkerji (1940) - Order effects not controlled
Noble et al. (1958) - Competition
Paloutzian (1975) - Cooperation involved
Passman (1977) - E present
Paterson et al. (1980) - E present
Pattinson & Pasewark (1980) - No Alone condition
Pederson (1970) - E present
Pennebaker (1980) - Cueing present
Perl (1933) - Interaction allowed
Perlmutter & Montmollin (1952) - Cooperation allowed
Pessin & Husband (1933) - E present
Pines (1973) - E present
Porter (1939) - Unusual population used
Poteet & Weinberg (1980) - E present
Quarter & Markus (1971) - E present
Query et al. (1966) - Interaction allowed
Rittle & Bernard (1977) - E present
Rosenquist & Shoberg (1968) - E present
Rule & Evans (1971) - No Alone condition
Sanchez & Clark (1981) - No real test made
Sanders et al. (1978) - Subjects encouraged to compete in T-S condition by later comparison
Sapolsky & Zillmann (1978) - Interaction allowed
Sasfy & Okun (1974) - E present
Scheier & Carver (1983) - No alone
Scheier, Fenigstein & Buss (1974) - Victim present in Alone condition

Schramm & Danielson (1958) - Competition
Seidman et al. (1957) - E present
Sengupta & Sinha (1926) - E present to time
Shaw (1932) - Cooperation allowed
Shrauger (1972) - E present
Siegel & Haugen (1964) - E present
Simmel et al. (1969) - Interaction allowed
Simpson & Molloy (1971) - E present
Singer (1965) - E present
Singer (1970) - E present
Soukup & Somervill (1979) - E present
Steigleder et al. (1980) - Ss had prior experience, Ss told of observation variable, and E's presence unknown
Stotland & Zander (1958) - No Alone condition
Street (1974) - Competition implicit
Strube, Miles & Finch (1981) - No real Alone condition
Terris & Rahhal (1969) - E present
Thayer & Moore (1972) - E present
Thelen et al. (1974) - Interaction allowed
Travis (1925) - E present
Travis (1928) - Unusual population used
Triplett (1898) - Rivalry present
Wankel (1972) - E present
Wankel (1975) - E present
Wankel (1977) - E present
Wapner & Alper (1952) - E present
Watson (1928) - Interaction allowed
Wegner & Zeamann (1956) - Cooperation allowed
Weston & English (1926) - Test forms not controlled
Williams et al. (1981) - Cooperation allowed - No alone condition
Wolfgang (1967) - Competition probably present
Zajonc et al. (1970) - Ss given incentives, possible competition from poker-chip cueing
Zucker (1978) - E present

IV. 3. MERE PRESENCE STUDIES

To review the mere presence studies a number of further criteria must be used. First, the subject must be truly alone and not with the experimenter partially concealed. Chapman (1974), for example, reported the same effect for a partially concealed experimenter and an experimenter present. Second, a reasonable sample size must be used. Third, only one or two others should be present. It is likely that performing in front of large crowds will have other effects. This also includes the number of co-actors.

The last condition, and the most difficult, is that evaluation effects should be low (Markus, 1978). This criterion could remove all laboratory studies as they all involve some form of testing which can be evaluated. Therefore, five conditions defining evaluation were used:

1) there should be no obvious emphasis on evaluation by the instructions or by the situation;
2) there should not be any differential emphasis in evaluation between the Alone and Presence conditions. Any inherent task evaluation in the Presence condition should also occur in the Alone condition;
3) the person present should not be the experimenter, who is likely to be perceived as evaluative;
4) the other person present should not be there to observe the subject, as this must be at least potentially evaluative;
5) the task used should not be inherently evaluative, such as the word association task which most subjects have heard of in connection with psychiatric diagnosis.

With such studies removed, there remain only 11 tests of mere presence. Details of the 72 studies which did not meet the mere presence criteria, with some indication of the limitations, are given in Table 2 along with the 11 mere presence studies. Many of these were not conducted to investigate mere presence effects and are still useful studies. As mentioned above, a number of these which did not meet criteria 3 and 4 will be reviewed shortly.

The 11 mere presence studies are shown in Table 3 with some details of their procedures and results. Of the 11, 5 found evidence for mere presence effects and 6 did not. So the model of Zajonc (1965), that mere presence is a sufficient condition for social facilitation effects, seems not to hold. The results do seem to fit, however, with the monitoring model outlined in Chapter 3.

For four of the five studies which did find mere presence effects the person present was behind the subject and could not be monitored. Markus (1978) in fact writes that the mere presence condition was designed to "make it difficult for the subject to attend directly to the audience" (p. 396). So in four of the five mere presence studies for which effects were found the subjects could not keep an eye on the other person present.

Of the studies for which the effects were not found five were co-action studies in which the co-actors were easily monitorable. It was also argued earlier that the behaviour of co-actors is more predictable and so less effect would be expected. There was only one study which did not find effects and was not a co-action study (Heylen, Note 8). In this case the confederate was facing the subject and was purposely inattentive- working away at a desk. So the confederate was presumably seen as not threatening, was easily

Table 2: Studies Included in Review

Abrams & Manstead (1981) - Evaluative task; Non-evaluative audience could still listen and evaluate
Anderson (1929) - Small sample size
Barefoot & Kleck (Note 2) - Other was close and back to back
Baron, Moore & Sanders (1978) - Observers were used
Berger et al. (Note 3) - E was the presence
Berger et al. (1982) - E was the presence
Berger et al. (1981) - E was the presence
Berger et al. (Note 4) - E was the presence
Berkey & Hoppe (1972) - Observers were used
Blank (1980) - Highly evaluative task
Blank, Staff & Shaver (1976) - Highly evaluative task used
Bond (1982) - Observers were used
Borden, Hendrick & Walker (1976) - Observers were used
Borden & Walker (1978) - E was the presence, observers used
Bray & Sugarman (1980) - Task evaluative and others could easily evaluate
Brown et al. (1973) - Observers used
Bruning et al. (1968) - E was the presence
Carment & Latchford (1970) - Effects of E watching - more responding with E present
Carver & Scheier (1978) - Observers were used
Carver & Scheier (1981b) - More letters copied with watching E
Chapman (1973a) - Observers were used
Chapman (1973b) - Lower EMG when E could not listen to Stimulus tape - E could still observe S - No Alone
Chapman (1974) - E was the presence
Chatillon (1970) - Observer used
Cohen (1979) - E in contact with Ss throughout; video present in Alone condition
Cohen (1980) - E was the presence
Cottrell et al. (1968) - E was in touch throughout; observer was used
Dashiell (1930) - Large coaction group used; observers were used
Desportes & Dequeker (1971) - E was the presence
Desportes & Dequeker (1973/74) - Effects of E watching
Desportes & Lemaine (1969) - Observers were used
Dua (1977) - Observers were used
Ekdahl (1929) - E was the presence
Evans (1971) - Coaction and easily monitorable
Farnsworth (1928) - Highly evaluative task
Fouts (1972) - E was the presence
Fouts & Jordan (1973) - E was the presence
Fouts & Parton (1974) - E was the presence
Fraser (1953) - E was the presence
Geen (1973) - E was the presence
Geen (1976b) - E was the presence
Geen (1977) - Observers were used; E was the presence
Geen (1979) - E was the presence
Geen (1981a) - Highly evaluative task, said to test ability, E was the presence
Geen (1983) - E was the presence
Gordon & Innes (Note 7) - Other was behind - no monitoring
Gore & Taylor (1973) - Large group used; observers were used; situation highly evaluative
Groff, Baron & Moore (1983) - Observers were used, E present really in both experiments

Hall & Bunker (1979) - Externals did worse in coaction whereas internals did better
Henchy & Glass (1968) - Observers were used
Heylen (Note 8) - Inattentive presence, easily monitorable
Huntermark & Witte (1978) - E was the presence
Innes & Young (1975) - Other behind not monitorable
Klinger (1969) - Coaction easily monitorable
Knowles (1983) - Observers were used
Knowles et al. (1976) - Subjects moved further away the more observers
Kobasigawa (1968) - E was the presence
Krueger (1936) - Used coaction group of 40 persons
Kushnir & Duncan (1978) - E was the presence
Laughlin & Jaccard (1975) - Observers were used
Marchand & Vachon (1976) - E was the presence
Markus (1978) - Other behind not monitorable
Manstead & Semin (1980: Expt 5) - E was the presence
Martens (1969c) - Large audience used; E interrupted to take PSI readings
Matlin & Zajonc (1968) - Highly evaluative task used
Miller et al. (1979) - E was the presence
Musante & Anker (1972) - Small sample size used
Musick et al. (1981) - E was the presence
Newman et al. (1978) - Observers were used
Paulus & Cornelius (1974) - Observers were used
Paulus & Murdoch (1971) - Observers used; non-evaluators could watch and would do the task afterwards
Paulus et al. (1972) - Large number of observing others were used
Pessin (1933) - Observers were used; E was the presence
Putz (1975) - E was the presence
Rajecki et al. (1977) - Quicker maze performance with observer
Shaver & Liebling (1976) - Small sample size used
Sorce & Fouts (1973) - Evaluation explicit in both conditions
Smith & Crabbe (1976) - E was the presence
Van Tuinen & McNeel (1975) - Coaction easily monitorable
Weiss et al. (1971) - Observers used
Yarczower & Daruns (1982) - Observers were used
Zajonc & Sales (1966) - Observers were used

Table 3. Mere Presence Studies

(a) Effects Found

Barefoot & Kleck (Note 2) - Other was close and back to back
- fars had no effect
- no monitoring

Gordon & Innes (Note 7) - Other was behind - no monitoring
Innes & Young (1975) - Other behind not monitorable
Markus (1978) - Other behind not monitorable
Rajecki et al. (1977) - Blindfolded other to side - distraction?

(b) Effects Not Found

Carment & Latchford (1970) - Coaction and easily monitorable
Evans (1971) - Coaction and easily monitorable
Heylen (Note 8) - Inattentive presence, easily monitorable
Innes (1972a) - Coaction; slower in mere coaction, back to back
Klinger (1969) - Coaction easily monitorable
Van Tuinen & McNeel (1975) - Coaction easily monitorable

monitored, and no effects were found.

The one study which does not fit into this pattern is Rajecki et al. (1977). In this case a blindfolded other was sitting to the side of the subject, purportedly to adapt their eyes to darkness ready for another experiment. As for Cottrell et al. (1968), discussed in Chapter 2, no arousal and no effects would be expected in this condition as the subjects were able to monitor the other person who was blindfolded and had predictable behaviour. It was found by Rajecki et al., however, that the subjects in this condition did learn a maze quicker and with less errors than others performing alone.

As post-hoc explanations for this study, it might be suggested that the novelty of seeing the blindfolded other increased alertness, or that there was increased effort to compensate for the increased distraction. Another suggestion might be that because it was a small blindfold, there was some arousal increase from the uncertainty of the other's behaviour. The other person could have easily slipped the blindfold off or looked underneath and so possibly interacted. There was also, of course, possible interaction from the other person talking.

Whatever the reason for this study's results, the 11 studies suggest a role for alertness increase due to unpredictability, especially in the form of unmonitorability. It may be argued that evaluation mediates these results, but in three of the four studies finding effects, the other behind could not evaluate the performance (Barefoot & Kleck, Note 2; Gordon & Innes, Note 7; Markus, 1978). So the unpredictability explanation is preferred. The relation of this to possible physical threat is also suggested by the effects being found in one study only when the other person was near, but not when

the other was far away (Barefoot & Kleck, Note 2).

These suggestions could be tested by an experiment which reduced evaluation effects and manipulated the monitorability of the person present. This will be done in Experiment 3.

IV. 4. THE EFFECTS OF THE PRESENCE OF THE EXPERIMENTER

Of the studies in Table 2, 34 were good studies but used the experimenter as the person present. These are given with some details in Table 4. Reports with two different conditions are counted here as two studies. As well, five other studies which varied the experimenter's presence but which had no Alone conditions have been included, making a total of 39 studies to be examined. These five were included because they show some effects of the experimenter's presence.

There were another four studies in Table 2 which dealt with the experimenter's presence but have been left out because of problems with interpretation. Sorce & Fouts (1973) explicitly evaluated subjects in both the Alone and Presence conditions, which may have swamped any other results. Cohen (1980) had uninterpretable results. Ekdahl (1929) had sessions separated by two weeks and gave few details in any case, especially concerning the subjects used. Manstead & Semin (1980: Expt 5) had erratic response slopes in the Alone condition compared with four previous successful replications of the same result. This may have been due to distraction or anticipated evaluation from the video cameras and monitors which were present in the Alone condition. Subjects in this Alone condition did rate themselves half way along a scale measuring evaluation.

Of the 39 studies to be reviewed, one gave direct evidence

Table 4. Effects of the Presence of the Experimenter

(a) Effects found

Berger et al. (Note 3) - Less overt practise with E "in room", Alone recalled more
Berger et al. (1982) - Effects of E watching - Less overt responding with Presence
Berger et al. (1981) - Effects of E watching - less overt responding with Presence
Berger et al. (Note 4) - Less mimicry when E watched
Borden & Walker (1978) - Better recall by those watched by E
Carment & Latchford (1970) - Effects of E watching - more responding with E present
Carver & Scheier (1981b) - More letters copied with watching E
Chapman (1973b) - Lower EMG when E could not listen to Stimulus tape - E could still observe S - No Alone
Chapman (1974) - Effects even from concealed E - behaviour of E unpredictable and "occasionally watched"
Deffenbacher et al. (1974) Effects of E watching - No Alone
Desportes & Dequeker (1971) - Effects of E watching
Desportes & Dequeker (1973/74) - Effects of E watching
Fouts & Jordan (1973) - E present and listening inhibited idiosyncratic associations
Fouts & Parton (1974) - Less novel complex behaviors with E present and watching than with E in another room working
Fraser (1953) - Better vigilance with E present
Geen (1973) - Effects of E watching
Geen (1974) - Effects of E watching - No Alone
Geen (1976b: Expt 3i) - E watching inhibited anagram task
Geen (1976b: Expt 3ii) - E watching inhibited paired-associate learning of complex task
Geen (1976b: Expt 3iii) - E watching inhibited anagram task. Effects of Expt 3i to 3iii mitigated if observation was to help the subject
Geen (1977) - Observing E had same effect as negatively evaluating E; different to both alone and positively evaluating E
Geen (1979) - E observing inhibited after failure on earlier task - Observation facilited after earlier success.
Geen (1981a) - E watching increased persistance at task after positive feedback but inhibited after negative feedback. Confounded to some extent by previous task
Geen (1983) - Effect of E observing. Less effect for helpful E.
Huntermark & Witte (1978) - Better vigilance with E present
Kobasigawa (1968) - When no cueing (Control), E inhibited children's play with sex-inappropriate toys
Kushnir & Duncan (1978) - Effects of E watching
Marchand & Vachon (1976) - Effects of E not watching same as E watching, based on repetitive motor behaviour
Miller et al. (1979) - Effects even when E could not evaluate - Behavior of E uncertain for Ss
Musick et al. (1981) - Better simple paired-associates with E and observer watching
Pessin (1933) - Effects of E watching
Putz (1975) - Better vigilance with E watching
Smith & Crabbe (1976) - Learning inhibited by observing E
Stotland & Zander (1958) - Non-expert E still seen as quite competent

(b) Effects not found

Deffenbacher et al. (1974) - E facing away busy at work different to E watching - No Alone

Fout (1972) - Repititious motor behavior of children no different with E watching or E working elsewhere; possible novelty and ceiling effects

Geen (1973) - E facing away busy at work no different to Alone - different to watching

Geen (1974) - E facing away busy at work different to E watching - No Alone

Smith & Crabbe (1976) - No effect of busy disinterested E

that experimenters are viewed by subjects as experts, and therefore probably evaluative (Stotland & Zander, 1958). This experiment had subjects work in the presence of either an experimenter who claimed to be an expert or one who claimed to know little about the research area. Although the former were rated as the more competent of the two, the latter were still rated on the scale as quite expert.

Twenty seven of the experiments had the experimenter watching the subjects, and all found social facilitation effects. This may be due to evaluation apprehension, self-presentation, self-attention or mere presence arousal. So even without direct cueing the presence of the experimenter can affect performance.

For three of the studies which found effects, the experimenter could not observe the subject's performance and so could not be directly evaluative (Chapman, 1974; Marchand & Vachon, 1976; Miller et al., 1979). If the results are still due to evaluation apprehension then it could be that just the experimenter's presence is sufficient for subjects to be aware that their performance will be evaluated. This did not occur, however, in another four studies which found no effect of just the experimenter's presence (Deffenbacher et al., 1974; Geen, 1973, 1974; Smith & Crabbe, 1976). A possible explanation will be given below.

To summarize so far: of the studies that have found effects the majority have had the experimenter watching the subject. These results could be due to evaluation apprehension or self-attention effects. Others have found an effect even when the experimenter could not watch the subjects. This suggests that if evaluation is the main cause of experimenter effects then just the passive presence of the experimenter is sufficient to cause effects. A number of other

studies, however, have found no effect of the experimenter's passive presence. This suggests that other mediating variables are present.

Five of the studies shown in Table 4 found no effect of the passive presence of the experimenter. For one of these it is very likely that there was a ceiling effect (Fouts, 1972). Ten year old children were pulling a handle at a rate of 30 to 40 pulls per minute. It is unlikely that much difference between conditions could be shown with such a task. As well, in the one minute the task took, the children were probably still aroused from the novely of the task. If it had been spread over 3 to 4 minutes more might have been found.

Two of the other studies not finding effects were based on the third (Geen, 1973). In the Mere Presence condition of this study, the experimenter sat away from the subject and was busy with work. So the experimenter's behaviour was predictable, and was unlikely to interact with the subject. The two related studies had the same situation, but did not have an Alone condition for comparison (Deffenbacher et al., 1974; Geen, 1974). When all three studies are plotted together, however, the results for the shared conditions are very similar. It is suggested that the Alone condition of Geen (1973) might be used as a comparison for the studies of Deffenbacher et al. (1974) and Geen (1974).

These three studies are all plotted together in Figure 4. It can be seen that the effects of the experimenter being present but working busily on something else is no different to being alone. So it might be again suggested that when the other person present has predictable behaviour and will not be interacting, even when this is the experimenter then no effects will be found. The same was true for Smith & Crabbe (1976).

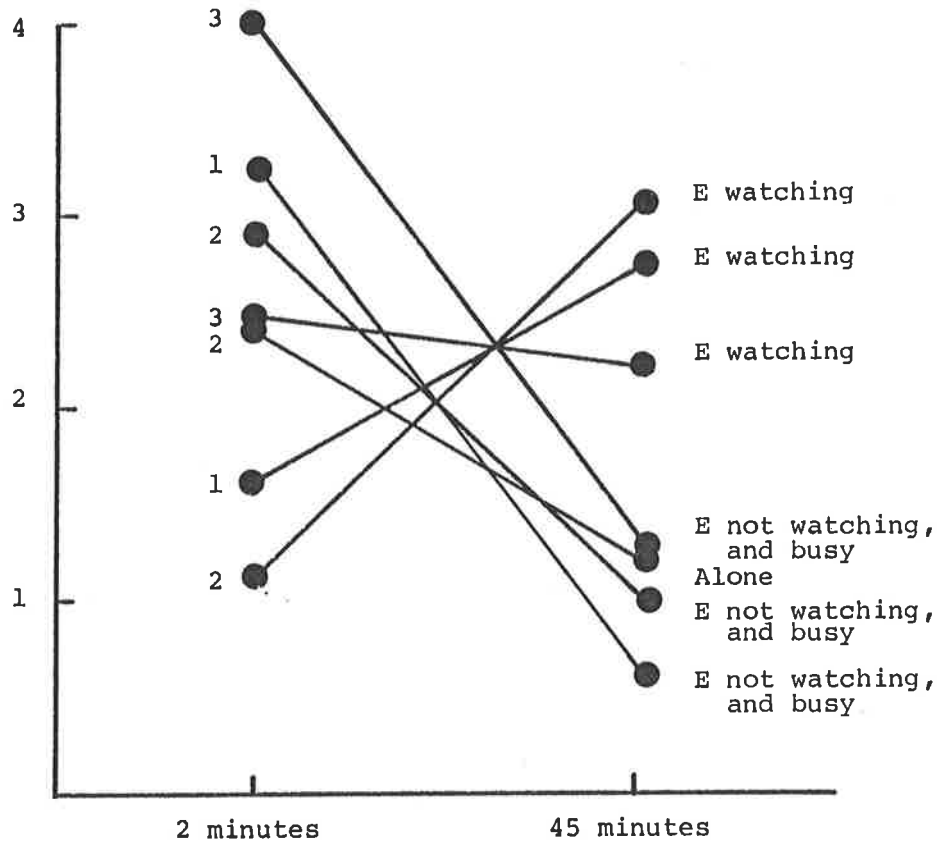

Figure 4. Graph of the number of digits recalled after 2 minutes or 45 minutes using data from three studies which used the same procedure (1=Deffenbacher et al., 1974; 2=Geen, 1973; 3=Geen, 1974. Data used by permission of authors.)

This view is also supported by the studies of Miller et al. (1979) and Chapman (1973b). In these cases the experimenter was not engaged in any work and could have interacted at any time and effects were found. With Chapman (1974) also, the concealed experimenter gave little indication of what would occur and even occasionally glanced through the screen.

So if the Geen (1973) results are robust, and the two partial replications suggest that they are, then experimenter effects may not be due to observation and evaluation potential alone. The effects in the first instance seem to depend upon whether or not the experimenter's behaviour is predictable. Where it has not been predictable then effects have been found. When the experimenter was observing and evaluating then effects have also been found. When the experimenter has been present, but would obviously not interact until after the task was completed, then no effects have been found.

This raises the question of why the uncertainty in the experimenter's behaviour should have an effect. It may be due to some inherent threat in the experimenter's unpredictable behaviour or be due to the possibility that the experimenter would come over and evaluate the performance. The mere presence results with strangers suggest a role for the threat interpretation (IV. 3). The same may be true for experimenters. The results in this section, on the other hand, suggest that experimenters may be seen as evaluative. If their behaviour is unpredictable then they may come over and evaluate. Only in cases where the experimenter has been working at a desk busily have no effects been found.

IV. 5. THE EFFECT OF AN OBSERVER

It has been shown above that there are effects from the mere presence of another person who cannot evaluate only when their behaviour is unpredictable or they cannot be watched. It has also been shown above that experimenters are seen by subjects as evaluative, and that if there is a chance that they may evaluate performance during the experiment then effects on task performance will be found. If they are busy with something else, on the other hand, or are unable to engage in evaluation, then no effects will be found.

This suggests that the exclusion from Table 3 of studies using the experimenter in the Presence condition was justified. There is more evaluation attached to an experimenter than to another person- even an expert (Miller et al., 1979). It remains to review those studies of Table 2 which had the person in the Presence condition watching the subject. It was suggested that these studies also confound evaluation. The first section here will review these studies. The following section will relate all these studies to the theories of mere presence and social facilitation.

IV. 5.1. The Studies

Table 5 presents those studies from Table 2 which used an observer. The majority of tests did find effects suggesting that it is a robust effect. In the four tests which did not find an effect the observer in each case was not in a position to evaluate the subject's performance. Desportes & Lemaine (1969) had used student observers who could not evaluate the task. For Groff et al. (1983) the observer was not able to evaluate the performance and for Markus

Table 5. Effects of the Presence of Observers

(a) Effects Found

Baron et al. (1978) - Facilitation of simple task with observer, no effect on complex task
Berkey & Hoppe (1972) - Inhibition of complex task with observer, no effect on simple task
Blank (1980) - Less objectionable associations with observer present
Blank et al. (1976) - Less unique associations with observers
Bond (1982) - Less responding with observers. No effects on overall simple task, but on overall complex task, all responses worse with observer. Ceiling effect on simple task?
Borden et al. (1976) - More attitude change when alone
Brown et al. (1973) - Pornographic viewing time shorter with observers present
Carver & Scheier (1978) - More self-references with observers present
Chapman (1973a) - More laughter with another child present, possible visual cues
Chatillon (1970) - Less tracing errors for children with observers
Cottrell et al. (1968) - More well-learned psuedorecognitions with observer
Desportes & Lemaine (1969) - Higher estimates of number of points with evaluative observer
Dua (1977) - Avoidance response acquisition inhibited by observer, extinction facilitated
Groff et al. (1983) - Faster with attention-conflict and observer
Hall & Bunker (1979) - Externals did worse in coaction whereas internals did better
Henchy & Glass (1968) - Effect of Non-expert watching, stronger effect for Expert
Knowles (1983) - Effects of number of observers not of distance from subject
Knowles et al. (1976) - Subjects moved further away the more observers
Laughlin & Jaccard (1975) - Complex learning worse with a highly evaluative observer
Matlin & Zajonc (1968) - Less unique associations and shorter latencies with observers
Miller et al. (1979) - Effect of Expert watching
Newman et al. (1978) - Effect of observers at 11 years old but not before
Paulus & Cornelius (1974) - Better gymnasts did worse with evaluative observers, possibly ceiling effects
Paulus et al. (1972) - Better gymnasts worse with audience
Rajecki et al. (1977) - Quicker maze performance with observer
Weiss et al. (1971) - More agreement when observers present
Yarczower & Daruns (1982) - Children decreased facial expressions with observers present
Zajonc & Sales (1966) - More well-learned pseudorecognitions with observers present

(b) Effects Not Found

Desportes & Lemain (1969) - Student observers had no effect on estimation task
Groff et al. (1983) - No effect of mere observer who could not evaluate
Markus (1978) - Observer no different to mere presence for nonevaluative performance
Miller et al. (1979) - No effect of Experts when they couldn't see the task

(1978) the behaviour was one that could not easily be evaluated.

For Miller et al. (1979), there was no effect of an Expert being present when they could not see the task. It will be recalled that for the same study there was an effect of the experimenter being present even if they could not see the task. So the experimenter obviously has an effect over and above being able to see the task.

The 28 studies which did find effects of an observer will be discussed according to the task which they used. Three of these used the pseudo-recognition task. This task involves exposing subjects to different nonsense words a different number of times and then getting them to guess the words after a subliminal presentation. It is thought that the more frequently seen and more well-learned words will be dominant responses and should be said more often when another person is present (Zajonc & Sales, 1966). All the studies using this task have found more well-learned responses with observers present (Cottrell et al., 1968; Henchy & Glass, 1968; Zajonc & Sales, 1966). Henchy & Glass also found a stronger effect when there was an Expert watching the subject.

Three studies used a paired-associates learning task using simple and complex associates. Baron et al. (1978) found a facilitation of the simple task and no effect on the complex task with an observer present whereas Berkey & Hoppe (1972) found an inhibition on the complex task but no effect on the simple task. Bond (1982) found no overall effect of observer on the simple task but found an inhibition on the complex task of both the complex items and the embedded simple items. Bond did use a different task from the other two studies.

The results of Baron et al. (1978) and Berkey & Hoppe (1972)

can be reconciled by considering the relative levels of performance. The subjects in the former study did better than those of the latter. The overall mean errors to criterion for simple and complex associates respectively were 0.96 and 2.99 for Baron et al. and 4.1 and 7.6 for Berkey & Hoppe. Thus all of the former subjects did well on the complex task while all of Berkey & Hoppe's subjects did poorly on the simple task. So there may have been a floor effect in Baron et al. (1978) and a ceiling effect in Berkey & Hoppe (1972). Different levels of performance between different populations have been found on this task before (Katahn, 1966).

Three studies have used a word association test. Blank (1980) found that subjects gave less objectionable associations with an observer present. Blank et al. (1976) found that subjects gave less idiosyncratic responses with an observer present. Matlin & Zajonc (1968) found that subjects gave less unique responses with an observer present and had shorter latencies. The latency finding has failed to emerge in a number of studies (Blank, 1980; Blank et al., 1976; Zajonc, unpublished data, see Blank et al., 1980, p.727).

Eight studies have used motor tasks of different sorts. Chatillon (1970) found that children made less tracing errors with an observer present. Hall & Bunker (1979), using a "roll-up" game, found that internal locus of control subjects did better co-acting whereas externals did worse. They interpreted this result as showing that externals need more social reinforcement than internals. It is not certain, however, whether competition played a role in these results. Evaluation was discouraged but not competition. The results could also be explained in terms of both arousal and attentional differences between internals and externals.

Rajecki et al. (1977) found that subjects performed a simple maze task quicker when observed but made no more errors. Knowles (1983) found worse maze performance when subjects had eight persons watching them. There was no effect of how far away the people sat. Miller et al. (1979) found that subjects did a simple rotor-pursuit task better with an Expert watching. Groff et al. (1983) found greater motor responses of squeezing when there was greater attentional conflict although they had no true Alone condition for comparison. The experimenter was nearby in each case. The effect was an immediate one- in the first trial block only.

Paulus & Cornelius (1974) and Paulus et al. (1972) found that gymnasts performing in front of observers did worse than when performing alone. This effect was greater for the better gymnasts. This result might be due to a number of things. First there could have been a ceiling effect which would be consistent with a drive interpretation (Broen & Storms, 1961). The result might also have been due to the large size of the audience. The distraction and other effects of 17 people watching may have overloaded subjects and led to a decrement in performance. The results may have even been due to self-presentation effects and trying to show off within the club. Last, there is a good chance that the gymnasts were competing between themselves and the effects were due to competition rather than passive observation.

The other 11 studies used a variety of tasks. Both Borden et al. (1976) and Weiss et al. (1971) found more attitude change and persuasion when someone was observing the subjects. While the results could be interpreted in terms of a Neo-Hullian Drive theory (Weiss et al., 1971) they can best be seen as conformity responses with subjects

going along with the persuasion. Brown et al. (1973) found that subjects looked for less time at pornography when observers were present. This can also be seen as a conformity or self-presentation effect with subjects not wanting to show themselves as interested in something like pornography.

Carver & Scheier (1978) found that subjects made more self-references with an observer present than when alone. While they interpreted this as showing greater self-awareness and self-focus with someone present, it could also be due to self-presentation effects. With someone else there subjects may have been more concerned with presenting themselves and so produced more self-references. As mentioned in Chapter 3, both these theories seem to be able to make similar predictions. It was also suggested in Chapter 3 that self-references are certainly dominant responses so more should be expected with observers present by a drive interpretation as well.

Desportes & Lemaine (1969) found that subjects made higher estimates in a guessing task with observers present. Laughlin & Jaccard (1975) found that subjects did worse on a complex learning task with an observer present. Newman et al. (1978) found that 11 year old children did better at the WISC Object Assembly task with an observer but that an observer had no effect on younger children. They suggested that social learning only begins at this age so such social effects would not occur before this. A number of other studies, however, have found effects on children less than 11 years old (Chapman, 1973a; Chatillon, 1970; Fouts & Parton, 1974; Yarczower & Daruns, 1982).

Dua (1977) found that the acquisition of an avoidance response was slower when subjects were observed, suggesting that they wished to

try fewer novel responses. This is perhaps interpretable in terms of self-presentation theory, with subjects trying not to do anything which is not obvious or conforming. Knowles et al. (1976) found that subjects veered more around confederates sitting to the side of a path when there were more confederates present. This was interpreted in terms of a personal space theory (Knowles, 1980).

Chapman (1973a) found that children laughed more when another child was watching. Although this may be due to a self-presentation strategy there may have been other cueing effects in the situation, one child providing a cue for the other to laugh. Yarczower & Daruns (1982) found that children made less facial expressions when alone than when being observed. Again, the children may be presenting themselves with others present.

IV. 5.2. The Theories

What do all these studies show? They seem to show that the presence of observers, especially evaluating observers, has a large impact on a variety of behaviours. What is more difficult is to find one overall explanation for all of the results.

Drive theory is consistent with all but 4 of the studies (Bond, 1982; Brown et al., 1973; Knowles et al., 1976; Yarczower & Daruns, 1982). With some changes it could include Bond (1982) and Yarczower & Daruns (1982). If it were assumed, for example, that facial expressions are dominant responses then it could be predicted that there would be more with observers present. This will be examined in Experiment 3.

Self-Presentation theory and Self-Awareness theory are consistent with all but a few of the studies and even these can be

included with a few assumptions. If it assumed that a self-presentation strategy is to say the most common words or the ones least likely to be wrong or to sound silly, then the pseudo-recognition results can be explained. To try and do as well as possible and to try and look as good as possible subjects would guess more of the well learned words of which they were certain. This is the result that has been found.

Likewise, if it is assumed that there is a public standard of behaviour not to move close to strangers and if subjects would look bad if they did, then the results of Knowles et al. (1976) can be explained. The only study which these theories do have trouble explaining is that of Groff et al. (1983). It is hard to see why subjects should squeeze harder on the ergograph measure, which was an incidental task, if either of these two views are taken. It was, however, only a short-lived effect.

The Distraction-Conflict and Attentional Overload theories, on the other hand, have trouble explaining most of the results except Groff et al. (1983). Their Alone condition was not adequate, it will be remembered, so this does not exclude the other explanations. In most of the other studies, where effects were found, there was often little time pressure or overload and in most cases subjects could have slowed down and done better if this was the case. So these two explanations are not necessary conditions for observer effects although they seem to be sufficient ones in some cases.

One case in which they may be useful is that of the paired-associates learning task. Here subjects are under some time constraint. Baron et al. (1978) found a correlation of some distraction measures with performance at this task but the correlation

could have been due to other mediating causes. If the effects were due to something other than Distraction-Conflict or Attentional Overload then one might have expected some concomitant distraction in any case. This will be investigated in Chapter 6.

IV. 6. CONCLUSIONS

Many suggestions follow from this review of the empirical studies. While it is uncertain exactly what mediates the effects there does seem to be effects of the passive presence of another person who does not watch or evaluate. There is some support for the notion that the inherent threat the person poses relates to the effect. In particular, whether or not the person's behaviour is predictable and whether they can be watched if it is not predictable seem to be important. Two aspects of this, monitorability and familiarity, will be pursued in Chapter 6.

There also seems to be definite effects on behaviour from being watched and from being evaluated. This seems to be implicit in the experimenter's presence, although this can be attenuated if the experimenter is seen to be busy elsewhere and not about to intrude. How these effects are explained is more doubtful. It is possible that several effects actually exist including increased drive from anticipation of evaluation, self-awareness effects and self-presentation effects. It was suggested in Chapter 3 that these latter two can be viewed as different aspects of the same effect- a conformity response.

What emerges is the idea that there is evidence for one sort of effect which is hard-wired and deals with drive and arousal levels, personal space and threats; and evidence for another sort of effect

which deals with public, personal, societal or standard forms of behaviour. In the presence of others people are likely to conform more closely to these standards for the purpose of making a particular impression and thereby gaining social approval. To look at these more closely, Chapter 5 will attempt a clear test of each.

CHAPTER V.

THE EFFECT OF MERE PRESENCE ON MOTOR PERFORMANCE AND WORD ASSOCIATIONS

V. 1. INTRODUCTION

Chapters 3 and 4 have suggested that there may be effects from both arousal due to mere presence and from social conformity effects. It was also suggested that one mediating factor in the former might be the unpredictability of the other person's behaviour. This may be due to uncertainty of threats or uncertainty regarding possible evaluation.

Some evidence for the evaluation interpretation was found in the studies using the experimenter as the person present. Experimenters were viewed as evaluative by subjects and effects were found when none were found for Experts (Miller et al., 1979). When the experimenter was busily working, however, and could not come across and evaluate then no effects were found (Geen, 1973). This would suggest that predictability of behaviour was a function of evaluation.

If mere presence effects are also considered, however, then it is still not clear whether they play a role or not. It might be that experimenters are not thought to be threatening in any case, as they must be responsible people to be in such a position. It might also be that both threat and evaluation played a part in the studies mentioned (Deffenbacher et al., 1974; Geen, 1973, 1974). The predictability of the experimenter's behaviour may have alleviated both evaluation and threat anxieties.

Experiments 1 and 2 set out to examine this issue as well as others. A confederate sat in the room with subjects in the Presence condition, worked quietly at a desk, but was not in a position to be easily watched by the subjects. On the basis of the previous work described in Chapters 3 and 4, such a situation would appear to be low in evaluation and would represent the passive presence of another person: the person is not the experimenter; the person is not watching the subject; the person is working and not about to come over and watch; and the person is quiet and not interactive.

Two tests were made using this situation. One was a motor task, which would be most receptive to any drive or arousal influences. The other was the word association task which would seem to be influenced most by the desire to make socially conforming responses. The immediate aim of the two experiments was to show the effects of just the passive presence of another person on both motor and higher cognitive tasks.

As detailed in Chapter 2, there are many problems regarding the measurement and validation of drive and arousal constructs. As they form the theoretical basis for the predictions, some attempt at measuring these was required. Physiological measures were not possible, even apart from reactive effects, so self-reports were used. Questions relating to arousal level were taken from the Activation-Deactivation Adjective Checklist and used with 7-point scales (Thayer, 1967). A further question asking for the enjoyment of the task checked for mood and a final question asking how well the subjects thought they did compared to others looked for indications of evaluation.

A further test included in both these experiments consisted of

a test of simple distraction effects, which the earlier writers thought were important (see Chapter 2). Rather than using a mechanical stimulation as Pessin (1933) had, a mirror was used. A large size image of the subjects themselves which moved when they did should provide some distraction. Self-Report measures were also taken to check on distraction. Three questions asking about the amount of distraction were taken from Baron et al. (1978) and Sanders et al. (1978).

V. 2. EXPERIMENT 1: SOCIAL FACILITATION OF A MOTOR RESPONSE

V. 2.1. Method

V. 2.1.1. Subjects

Subjects were 39 First Year Psychology students who volunteered to participate. There were 25 males and 14 females. As no sex differences were found the results have been collapsed.

V. 2.1.2. Apparatus

The task used was the rotary-pursuit task. For this a Lafayette Photoelectric Rotary Model 30014 was used. This was connected to a solid-state board which gave counter readings of the time spent on the target, a light revolving in a circle, and the number of revolutions the light went through. The rotary-pursuit was set on a low speed to make it relatively simple for subjects to follow.

This task was chosen because it was a task which seemed to depend mostly on motor responding and vision rather than cognitive

responding, was simple and reliable to use and had been used in a number of social facilitation experiments before- although few were well-controlled studies (Gore & Taylor, 1973; Lombardo & Catalano, 1975, 1978; Miller et al., 1979; Rosenquist, Note 10; Travis, 1925; Wankel, 1977).

V. 2.1.3. Procedure

Subjects were met and taken to the experimental room by either the experimenter or the confederate. The task was explained and demonstrated. Subjects were then given 2 min of practice. Following this they were tested for 3 min 30s, or about 80 revolutions. The number of revolutions ranged from 79 to 82. The machine was then switched off and subjects asked to fill in a questionnaire of 10 questions with 7-point scales.

Two of the questions asked how much the subjects enjoyed the task and how well they thought they did compared to others. These questions were to check for mood and evaluation respectively. Five questions asked how stressed, tense, calm, stirred up and aroused the subjects had felt. These were taken from the Activation-Deactivation checklist (Thayer, 1967). The three other questions asked how distracted the subjects had felt, to what extent their attention had been focussed on the task and how frequently their attention had focussed on something other than the task. These were taken from Baron et al. (1978) and Sanders et al. (1978). The questions were in a mixed order and the experimenter and confederate left the room while it was filled in. The questionnaire is presented in Appendix 1.

On this basic procedure there were three conditions. In the Alone condition the experimenter left the room while the subjects were

performing the task and quietly re-entered just before the 80 revolutions were complete. In the Distraction condition, a large mirror was placed to the side of the subjects so that there was a salient image of themselves which reflected their movements. It was put in the same position as the confederate sat in the Presence condition. For six of the Distraction conditions the experimenter ran the session; for seven the confederate ran the session. This was done to test for any differences in running the experiment between the two. Both left the room while subjects were performing the task.

In the Presence condition the confederate told subjects that the experimenter who had contacted them could not make the session but had asked the confederate to substitute. It was explained that the confederate knew nothing of the experiment except the procedure. During the experiment, the confederate remained in the room and sat quietly to one side about 3m away from the subject and read. The confederate did not face the subjects and did not watch them. The confederate was in a position such that subjects had to turn their heads considerably to watch the confederate. They could not simultaneously watch the revolving light and the confederate. In all cases the same male confederate was used.

V. 2.2. Results

V. 2.2.1. Experimenter Effects

No difference was found in the time on target, within the Distraction condition, between subjects run by the experimenter and subjects run by the confederate, $F = 0.01$, $df = 1,11$, $p < 0.92$. The respective means were 101.3s and 101.9s. It is therefore unlikely that differences between the Alone and Presence conditions were due to different people running the session.

V. 2.2.2. Task Performance

The task performance scores were analysed in a oneway analysis of variance with three social conditions. The results show a significant difference between conditions for the time spent on the target, $F = 4.46$, $df = 2,36$, $p < 0.01$. The mean values were 99.7s, 101.6s, and 113.6s, for the Alone, Distraction, and Presence conditions respectively. Thus there was no difference between the Alone and Distraction conditions but a difference between both of these and the Presence condition. Subjects performed better in front of a passive person than alone or with a distraction. This statistical separation of the Alone and Distraction conditions from the Presence condition was confirmed at the 0.05 level by a Newman-Keuls test. This result was the same both when a log transformation of the time was used and when each time measure was expressed as a fraction of the number of revolutions completed.

V. 2.2.3. Self-Report Measures

To group the ten questions they were put into an oblique factor analysis and three factors emerged. The complete factor analysis is shown in Appendix 2. The first was a clear arousal factor which loaded high on the questions asking how much the subjects were stressed, tense, calm, stirred up and aroused. The respective loadings were 0.78, 0.85, -0.81, 0.89, and 0.59. The second factor loaded the three distraction questions, 0.47, -0.50, and 0.87, as well as the question asking how well the subjects thought they did compared to others, -0.48. Those who felt more distracted felt they did less well compared to others.

The third factor grouped two questions: how distracted the

subjects felt, 0.66; and the subjects' enjoyment of the task, -0.40. The first of these had also loaded 0.47 on the second factor. Subjects who reported being more distracted also reported enjoying the task less.

The last two factors suggest that subjects had at least two meanings for distraction. One related to the attention given to the task and away from the task. The second related to the enjoyment of the task. One involved distraction as a lack of concentration on the task, the other involved distraction as boredom. This difference in meaning may explain the failure of such questions to give reliable answers in previous work (Deffenbacher et al., 1974; Sanders et al., 1978).

Despite this, no relation could be found between the factors and the three social conditions. A oneway analysis of variance showed no difference between the three conditions for Factors 1 to 3 ($p = 0.42, 0.49 \& 0.96$). When the factors were used as covariates in the main task performance analysis of variance none of the covariates were significant. The three factors were also put into a multivariate analysis of variance over the three conditions but no significant effects were found. Last, each of the 10 questions were put in a oneway analysis of variance with the three conditions but again no significant differences were found (lowest $p = 0.17$ for the tense question).

V. 2.3. Discussion

The task performance results showed a clear difference between the three conditions. Those in the Presence condition performed better than those in either the Distraction or the Alone conditions.

There was facilitation of simple task performance from the presence of a confederate who knew little of the experiment and sat passively without watching the subjects. It could still be argued, of course, that the subjects may have felt evaluated from just doing the task. The presence of the confederate may have reminded them of this.

Subjects in the Distraction condition performed no differently from subjects in the Alone condition. This could have been because distraction is not the basis of social facilitation effects so the mirror had no effect. It is more likely, however, that the mirror was not effective as a distractor and subjects just ignored it. To get direct evidence for distraction effects reliable self-report measures are needed.

Experiment 1 found a facilitation of motor performance from the passive presence of a confederate. This may have been due to not being able to monitor the subject. It might also have been due to distraction-conflict. No effect of the mirror as distractor was found, however, to verify this. Compared to the previous literature (Geen, 1973), if the effects were due to evaluation then no effect should have been found here, as the confederate was not watching or evaluating but quietly working. The only difference here was that the confederate was closer and could not be watched. So a mere presence explanation is plausible.

V. 3. EXPERIMENT 2: WORD ASSOCIATION TEST

Experiment 2 had the same aim as Experiment 1: to show the simple effects of the passive presence of another person taking into account mistakes in the design of previous studies. Whereas Experiment 1 did this with a motor task, the word association task was used in Experiment 2 because it was thought that social conformity effects were likely. That is, subjects would know about the test and know that particular words they gave could be interpreted. It was therefore thought that there would be a tendency to give socially acceptable responses. If there is an effect of social conformity or moving towards socially valued behaviours in the presence of others (Chapter 3) then subjects with a confederate present should give more socially normal responses. This prediction was tested in a number of ways in this experiment.

Previous social facilitation studies using the word association test have used different measures to rank the commonness of responses. Matlin & Zajonc (1968) ranked the frequencies of response words, with the most frequently given word having a rank of 1, and called this "response commonality". The mean response commonality for each subject was then computed. The same authors also used a measure of "uniqueness": the number of responses per subject which did not appear in the Palermo-Jenkins association norms (Palermo & Jenkins, 1964).

Blank et al.(1976) used three measures of commonness. Their "response commonness" measure was the raw frequency score for each word across all subjects. If a subject received a score of 1 then this meant that they were the only person to give that response. The

measure of "response uncommonness" was the same as Matlin & Zajonc's response commonness score: the rank of the frequency. The last measure of Blank et al. was that of "uniqueness", which was not the same as Matlin & Zajonc's uniqueness. This was simply the number of idiosyncratic responses a subject made.

The results of these two studies were as follows. Matlin & Zajonc found that subjects responded quicker in the presence of an observer but only in a condition in which the confederate left halfway through the experiment. They also found that subjects in the presence of the observer made more common responses.

Blank et al. criticised Matlin & Zajonc for having the confederate walk out half-way through the experiment suggesting that subjects may have been disillusioned by the unexplained walkout. After providing a control for this factor, however, the confederate either giving an explanation for leaving or not, they found no effect of latency anyway. As for the commonness of responses, they found that subjects made less unique responses with the confederate present rather than making more common ones.

Of the other social facilitation studies using word association, Allport (1920) probably confounded rivalry in the conditions; Travis (1928) used stutterers not directly comparable to the present experiment; Kljaic (1974) does not have enough details of the procedure to make comparisons; Good (1973) did not have a proper Presence condition; and Ekdahl (1929) used the experimenter as the observer.

While finding no effect of an observer on commonness of association, and only a slight effect on latency Blank (1980) did find an effect of an observer on the objectionable quality of words. In

the presence of an observer subjects made less objectionable responses to some double-meaning words than subjects alone. This is indicative of greater conformity in the presence of others.

With these confused results, the present experiment set out to be exploratory rather than to find a correct solution. To this end, a large number of commonness measures were used including those of the previous work.

There were other changes. One was to use (slightly) updated word association norm tables, in this case those of Postman (1970). As well, a between subjects design was used to avoid the problem of the disappearing confederate. To check whether there might have been habituation to the situation, so that effects might only appear in the early part of the session, the mean frequency, the mean ranked frequency and the mean norm scores were found for both the entire 62 words used and for the first 22 words only.

As well, the mean frequency of the responses in the English language was found for each subject. This was taken from Kucera & Francis (1967) and was the actual frequency out of 1,014,232 American-English words. Subjects may not only repond with the common associations but they might also use more common words.

Two other types of measures were also used. For one, 18 words with double meanings of a coarse, violent or obscene nature were embedded in the list of words. This had been done previously by Blank (1980). A measure was made of the number of associations to the "coarse" meaning of the words rather than to the innocent meaning. If subjects avoid non-conforming responses with the presence of a confederate then they should score lower on this measure.

The final score was of the number of times the subject made

noises during the session other than the responses. This included laughing, sighing and commenting. Both Berger et al. (1981) and Bond (1982) have found that subjects inhibit responding in the presence of others. With tape recordings being made of the experiment there was an opportunity to see if this was the case for non-task-related sounds.

In all, the study was an exploratory one, looking for conformity influences on word association responding. In summary, the following measures were used:

Missing- the number of non-responses.

Zeros- the number of words not occuring in the word association norm tables (equivalent to Matlin & Zajonc's uniqueness).

Threes- the number of words a subject used with a frequency less than three on the word association norm tables.

Ninety- the number of words a subject used with a frequency of greater than ninety on the word association norm tables.

First Norm Score- the mean word association norm frequency for the first 22 responses the subjects made.

Overall Norm Score- the overall mean word association norm frequency score for all responses.

First Rank Frequency- the mean ranked frequencies of responses taken from subjects within this experiment, but only for the first 22 responses.

Overall Rank Frequency- the mean rank frequency of responses taken from subjects within this experiment (equivalent

to Matlin & Zajonc's commonness and Blank et al.'s uncommonness).

First Mean Frequency- the mean frequency of the first 22 responses taken from subjects within this experiment.

Overall Mean Frequency- the mean frequency of all responses taken from subjects within this experiment (equivalent to Blank et al.'s commonness).

Unique Ranks- the number of ranks of value 1, indicating common responses.

Unique Frequencies- the number of frequencies of value 1, indicating idiosyncratic responses (equivalent to Blank et al.'s uniqueness).

English Frequency- the mean frequency of responses in the English language, taken from Kučera & Francis (1967).

Coarse- the mean number of responses to the obscene target words with "deviant" connotations.

Talk- the number of laughs, sighs, comments or other vocalizations made by the subject during the experiment.

Mean Latency- the mean latency of responses over all responses.

Coarse Latency- the mean latency for the obscene target words.

There were 17 dependent measures, 14 using the same data, with the two Coarse measures and the Talk measure using different data.

The same three conditions of Experiment 1 were used here in a between subjects design. Subjects either worked alone, with a

distracting mirror or with a confederate present who did not explicitly evaluate or watch. This latter condition was also different from the previous word association tests where the confederate was present to observe the subjects. The present test was thus a closer approximation to a mere presence condition. It was of interest to find out whether the mere presence of another person could cause subjects to respond with more normative responses.

V. 3.1. Method

V. 3.1.1. Subjects

Subjects were 45 First Year Psychology students who volunteered to participate. There were 22 females and 23 males, unsystematically distributed over the three cells.

V. 3.1.2. Apparatus

The word associations used were taken from the larger sample of Postman (1970). There were 62 words used, with about an even amount of words from each of the four frequency ranges given. The words were put in an unsystematic order and five filler words were added to the beginning, although the associations given for these were not used in the analysis. As well, 18 common words with double meanings of a sexual, violent, or illegal nature were used. Some of these were taken from Blank (1980) and the rest were made up. A full list of all the words used is given in Appendix 3.

The 85 words were recorded onto a cassette, with one word spoken every ten seconds. The tape lasted close to 15 mins.

V. 3.1.3. Procedure

Subjects were met by either the experimenter or the confederate at the experimental room and taken inside. The confederate told subjects that the experimenter had been unable to come and had asked the confederate to substitute. It was explained that only the instructions were known to the confederate- not what the experiment was all about. The experimental room had two tables and two chairs in it and the subjects sat at one of these. On this table there were two tape-recorders.

The experimenter or the confederate gave the instructions. It was explained that subjects would hear a series of words from the tape-recorder and that they were to respond by saying out loud the first word that they thought of. They were to only give one word and not phrases and were to give a response to each word even if they were not sure of its meaning. They were also asked not to give just the plural form of the stimulus word. Subjects were informed that the experiment would last about 15 mins.

At this point one of three social conditions was effected. For the Alone condition the experimenter switched on the tape-recorder and left the room. For the Presence condition the confederate switched on the tape-recorder and sat in the other seat to the side of the subject. The confederate had some papers and quietly read throughout without watching the subject or showing any real interest.

For the Distraction condition, there was a large mirror sitting to the side of subjects along with some other junk. This reflected their whole body. It was in the same position that the confederate sat in the Presence condition. For the Distraction condition the experimenter ran 7 of the subjects and the confederate

ran the other 8 subjects. This was done to test for any differences in running between the two. Both left the room during the experiment.

After the session had finished, the confederate or experimenter came back into the room and gave the subject a questionnaire to fill out. They were then given an explanation of the experiment but without details of its true nature. They were then asked not to discuss the experiment with anyone who they knew to be taking part and not to tell them any of the words. They were then dismissed. After all subjects had been run they were each contacted and told all about the true nature of the experiment.

The ten questions asked were the same as those used for the first experiment. Two questions asked how much they enjoyed the task and how well they thought they did compared to others. Five questions asked how stressed, tense, calm, stirred up and aroused they felt during the experiment. The last three questions asked how distracted they had been, to what extent their attention was on the task and how frequently their attention was on something other than the task. The full questionnaire is given in Appendix 1.

V. 3.2. Results

The results were scored, as set in the Introduction, by 17 measures. The 18 Coarse words were scored by two people. These two ratings were found to be highly reliable, so that only one was used in the analysis ($r = 0.93$, $N=45$, $p < 0.01$).

The other reliability check was for differences between the running of the experiment by the experimenter and the confederate in the Distraction condition. Five of the commonness measures were

compared within the Distraction condition for differences between the two people running the experiment. No significant difference was found for any of these. That is, differences between the Presence and Alone conditions were not likely to occur due to the different people who ran these conditions.

V. 3.2.1. Commonness Scores

The fourteen measures of commonness were used in separate oneway analyses of variance with the three Social Conditions as the independent variables. Of these analyses, only one was significant. The full Anova table for all variables will be found in Appendix 4. The mean values and standard deviations for all measures across the three Social Conditions are shown in Table 6.

The one significant difference was for the Zero measure. Those subjects who had the confederate present had lower scores on the Zero variable than those in either the Alone or Distraction conditions ($F = 4.20$, $df = 2,42$, $p < 0.02$). It will be recalled that this is the same measure as the uniqueness score of Matlin & Zajonc (1968). It was a measure of the number of words per subject that did not appear in the Postman (1970) word association norms for that word. That is, subjects in the presence of the confederate gave less idiosyncratic responses (mean = 11.5) than the other two groups of subjects (Alone = 14.2, Distraction = 14.7). This statistical separation of the Presence condition from the other two conditions was confirmed with a Newman-Keuls test at the .05 level.

Only one other score came close to significance. There was a marginal difference between conditions for the Threes variable ($F = 2.85$, $df = 2,42$, $p < 0.07$). This score included the Zero score of

Table 6. Means and standard deviations of all measures across social condition (n=15 in each cell) for Experiment 2.

VARIABLE	SOCIAL CONDITION ALONE	DISTRACTION	PRESENCE
Missing			
Mean	0.93	1.00	1.33
S.D.	1.39	1.31	1.29
Zeros			
Mean	14.2	14.7	11.5
S.D.	3.3	3.3	3.3
Threes			
Mean	21.3	22.0	18.1
S.D.	4.8	5.0	4.4
Ninety			
Mean	17.7	17.9	19.0
S.D.	4.0	4.2	5.4
First Norm Score			
Mean	107.6	104.9	103.5
S.D.	27.0	31.8	28.1
Overall Norm Score			
Mean	90.3	94.1	95.1
S.D.	23.5	19.8	23.7
First Rank Frequency			
Mean	5.8	6.3	5.4
S.D.	1.0	1.8	0.9
Overall Rank Frequency			
Mean	7.2	7.4	6.9
S.D.	1.1	1.5	0.8
First Mean Frequency			
Mean	8.2	7.0	7.9
S.D.	1.6	1.8	1.4
Overall Mean Frequency			
Mean	7.2	6.5	7.3
S.D.	1.6	1.2	0.8
Unique Ranks			
Mean	17.9	14.5	17.0
S.D.	5.7	4.6	4.6
Unique Frequencies			
Mean	21.1	23.3	20.5
S.D.	5.5	6.3	5.1
English Frequency			
Mean	112.5	155.7	132.9
S.D.	35.6	99.3	33.3
Coarse			
Mean	3.3	1.5	2.9
S.D.	3.6	1.9	5.1
Talk			
Mean	2.7	1.5	1.7
S.D.	2.2	1.6	2.6
Mean Latency			
Mean	2.9	2.8	3.1
S.D.	0.93	0.58	0.63
Coarse Latency			
Mean	2.7	2.8	2.8
S.D.	0.88	0.76	0.91

course. In view of the marginal significance and the risk of Type 1 errors with a large number of analyses, this result is best not interpreted as anything more than a reflection of the Zeros variable.

Each of the measures was also used in a 2 X 2 analysis of variance with Social Condition and Sex as the independent variables. Only one of these showed a significant difference. This was again for the Zeros variable. There was a significant main effect of sex, $F = 6.48$, $df = 1,39$, $p < 0.015$. The Social Condition effect was still significant. The interaction effect was not significant.

Examination of this result showed that females made significantly fewer responses that did not appear in the word association tables than did males (Females = 12.4, N = 21, Males = 14.4, N = 24). Thus there some evidence that females of this population gave less unique responses than did males. This was not, however, related to the Social Condition they were in.

V. 3.2.2. Latency Scores

The tapes of subjects' responses were scored for three further measures. First, a cumulative latency score was taken of all the 62 response words. This was done by playing the tapes through and switching a stopwatch on when a prompt word was heard and off as soon as the subject said their association. This gave a total cumulative latency for each subject over all the words. This was divided by the number of words to give a mean latency per word score for each subject. The same procedure was repeated for the Coarse words, the second latency measure, giving a mean latency per word for these words.

The third measure that was taken from the tapes was a score of

the number of times the subjects made extraneous noises, such as laughing, talking to themselves, sighing or otherwise. It was predicted that if subjects were conforming more in the presence of the confederate then they would make less task-irrelevant noises than in the other conditions.

A reliability check was made of this procedure. Ten of the tapes which had been scored at least a week before were rescored. The correlations between the two scorings were 0.85, 0.97 and 0.77 for the latency of the main words, the latency of the coarse words and the number of extraneous noises respectively. These were all significant at the 0.01 level.

It should also be noted that the scoring of latency was done blind to condition. When rating the latency scores, an attempt was made to start each subject's tape in the filler word section, so all clues as to the condition were gone. Finally, as the confederate was asked to be quiet and not to shift the chairs, it was virtually impossible to guess if someone was in the room with the subject.

It was found that the mean latency of the 62 main words correlated highly with the mean latency of the Coarse words, $r = 0.84$, $N=45$, $p < 0.001$. Subjects were consistent in the time they took to respond to the Coarse words and to the main words.

The mean latency scores for the main words, for the Coarse words, and for the amount of extraneous talking by the subjects, for each condition, are given in Table 6. Oneway analyses of variance showed that there was no significant difference between these conditions for the mean latency of the main words, $F = 0.56$, $df = 2,42$, $p < 0.58$, for the Coarse words, $F = 0.04$, $df = 2,42$, $p < 0.96$, or for the amount of extraneous noise, $F = 1.24$, $df = 2,42$, $p < 0.30$. The full analyses of variance will be found in Appendix 4.

The two latency scores were also converted to scores of speed, as had been done by Blank (1980), but this made no difference to the result of the main words, $F = 0.96$, $df = 2,42$, $p < 0.39$, nor to the result of the Coarse words, $F = 0.19$, $df = 2,42$, $p < 0.83$.

It might be suggested that there could be a relation between the score of the number of Coarse words produced and the latency of their production. Subjects who made coarse responses may have made them immediately, whereas others may have thought first of a coarse word but spent extra time to think of a socially acceptable word. There was no more than a chance relation, however, between the score for Coarse responses and the time that it took subjects to make these responses, $r = -0.06$, $N = 45$, $p < 0.69$.

Last, the two latency scores and the extraneous noise measure were all put in analyses of variance with independent variables of the Social Condition used and the sex of the subject. There were no sex effects nor interactions involving sex.

V. 3.2.3. Self-Report Measures

The ten self-report questions were put into an oblique factor analysis. Three factors emerged. The first was an Activation factor with high loadings on the questions asking how stressed (0.90), tense (0.77), calm (-0.97) and stirred up (0.66) the subjects felt. The next nearest loading was the question asking how subjects thought they did compared to other (-0.23). It is of interest that the question asking how aroused subjects were did not load on this factor (0.09).

The second factor consisted of the questions asking how distracted subjects felt (-0.52), how much their attention was on the task (0.41) and how much they were attending to something other than

the task (-0.90). The nearest other question was again the social comparison one (0.28).

The third factor consisted of the single question asking how aroused subjects felt (0.78). The nearest loading on this factor was again the social comparison question (0.29). The question asking how much subjects enjoyed the task did not load highly on any of the factors. The full factor analysis is given in Appendix 5.

These results are very similar to those of Experiment 1 with high consistency in answering the questions. Like Experiment 1, however, little relationship could be found between the three factors in the self-reports and the three Social Conditions. When three factor scores were made by summing the variables in each of the three factors no significant differences were found for any of the three scores across the three social conditions ($p < 0.14$, $p < 0.45$ for the Activation and Distraction Factors respectively). The variables making up the Distraction and the Activation factors were also put into two separate multivariate analyses of variance but no significant effect of the three social conditions was found in either case.

Last, each of the 10 questions was used in a oneway analysis of variance across the three social conditions but none of these proved to be significant (lowest $p = 0.09$ for the stress question). So in line with Experiment 1, subjects answered the questions consistently but with no relation to the social conditions.

V. 3.3. Discussion

Only one of the scores of commonness of responses proved to be affected by the different social manipulations. The other measures have only been effective in previous studies when the confederate has

left the room halfway through the session (Blank et al., 1976; Matlin & Zajonc, 1968). This was not the case in the present experiment as the confederate stayed throughout in a between subjects design. This is consistent with the hypothesis of Blank et al. that the differences had been found due to the confederate leaving. If there was a reliable commonness effect it should have shown in a between subjects design as well as in a within subjects design.

There may have been other details of the design that precluded this, such as the fact that the confederate did not watch the subjects in this experiment but had in previous studies. Observation may be necessary for social conformity effects (Chapter 4).

The one result reliably shown was that in the presence of another person less unique responses were made. This was a replication of Matlin & Zajonc (1968) with a different population and with different word association norm tables. So support is given for the hypothesis of Blank et al. (1976) that less idiosyncratic responses are given in the presence of another person. Without concurrent evidence that more common responses are given when alone the Drive theory interpretation of more dominant responses in the presence of others lacks support.

For this reason, it could be suggested that a self-presentation theory interpretation or a social conformity interpretation is more appropriate: in the presence of others certain types of responses are considered usual. Words which are uncommon or out of the ordinary will be avoided in the presence of another person.

This is not quite adequate, however. It could be that subjects may wish to present an image of themselves to others by the words they use. For example, they could present themselves as

intelligent by making very long or unusual responses to the prompts. So the opposite result could also be predicted: that more idiosyncratic responses will be made in the presence of another person. This suggests that there may be many factors operating in such a situation and a simple one-factor theory will not be useful.

It is perhaps for this reason that the latency scores have proved unreliable. Matlin & Zajonc (1968) had found a strong effect with latencies, whereas the present study and three other replications have failed to find the same results (Blank, 1980; Blank et al., 1976, 1976 Footnote 3). There may be a number of processes going on to determine the speed of saying the response word. A number of multi-stage models of word associations have been made (Blank, Note 5; Rosenberg & Cohen, 1966; Zivian & Reigel, 1969). These could interact with any social manipulations of the situation.

A multi-factor approach to elucidating word associations is also indicated by the sex effect found. The only reliable result across all studies, less unique responses in the presence of another person, was dependent upon the sex of the subject. Males made more idiosyncratic responses than did females. As there was no interaction of this with the social conditions the result tells us little concerning the main effect of social condition. It does perhaps suggest that conformity plays a role in word association task. All the previous tests of social facilitation using word associations that have been mentioned have only used male subjects. Earlier word association tests have found more common associations given by females but not less idiosyncratic ones (Innes, 1972b; Palermo & Jenkins, 1965).

V. 4. GENERAL DISCUSSION

The two main results from these studies are a facilitation of simple motor responding in the presence of a passive confederate and less unique responses given to word associations- particularly by males. The first experiment tried to reduce all evaluation effects to a minimum. If this succeeded then the results may have been due to a mere presence effect beyond evaluation, possibly reflecting implied threat. It may be, however, that evaluation effects were still present or that the results were due to distraction- conflict. To test whether the effects were due to an increase in drive or arousal, used in all the above explanations, self-reports must be used.

Overall it was found that the self-report measures were answered consistently but were not related to the social conditions nor to the task performance results. This means that they tell us little about underlying arousal or distraction processes. It may have been that subjects were not aware of their cognitions and affects (Guerin & Innes, 1981; Nisbett & Wilson, 1977) and answered off the "top of their heads" (Taylor & Fiske, 1978), or that the mechanisms asked about did not play any role in the results. That is, the arousal and distraction mechanisms may not be relevant to the effects found. Which of these is correct cannot be decided here because subjects answered the questions consistently across all groups.

The one difference found was in the answers to the question of how aroused subjects felt. In Experiment 1 this was answered similarly to the other stress and activation questions. In Experiment 2 it appeared as a single factor.

Two explanations can be given for this. First, as was stressed in Chapter 3, 'arousal' has many meanings. Subjects may have

had different meanings of the word in the two experiments. Second, if 'arousal' was taken to mean activation level then the difference may lie in the nature of the tasks. The motor task was active and so arousal level may have seemed relevant to stress and tenseness. For the passive word association task, stress and tense may have been taken to mean cognitive stress, not bodily activation. Subjects may have been bodily relaxed but still cognitively alert. Therefore arousal may have come out as a separate factor to stress and tenseness.

The question still cannot be answered, then, of whether drive or arousal effects played a role in the motor task experiment as the self-report data may be invalid. The role of physical distraction is also uncertain as the Mirror manipulation showed results no different to the Alone conditions in both experiments. The distraction may not have been salient enough, the subjects may have been able to ignore it, or it may have been distracting but this did not influence the results. Again, the self-reports cannot answer this question.

A number of the problems raised by these experiments will be addressed in Chapters 7 and 8.

CHAPTER VI.

MONITORABILITY AND FAMILIARITY AS MEDIATORS OF MERE PRESENCE EFFECTS

VI. 1. INTRODUCTION

The idea was developed in Chapter 3 that mere presence effects may be an innate reaction to the possible physical threat of having another person present, particularly if a stranger. This hypothesis gave some substance to the suggested hard-wired nature of such effects and to the proposed similarities of these effects between human and non-human animals. In Chapter 4 some support for this idea was given by a review of the experimental studies using human subjects. Especially in the cases where strictly controlled mere presence situations were used the 'threat' hypothesis appeared to be able to explain the results found.

Two aspects of this hypothesis will be examined in this chapter. First, a test of the role of monitorability will be made in line with the interpretation of mere presence studies in Table 3. Second, the role of familiarity will be tested in an experiment which will also include a test of differences between coaction situations and audience or passive presence situations. It was predicted on the basis of the threat hypothesis that there would be a greater effect from the audience paradigm than from the coaction paradigm.

VI. 2. EXPERIMENT 3: THE ROLE OF MONITORABILITY IN AN AUDIENCE SETTING

VI. 2.1. Introduction

The present experiment set out to test a number of aspects of the mere presence theories. Four social conditions were used corresponding to the suggestions of earlier chapters. Some of the subjects were required to work alone while others had a non-evaluating person in the room with them. For a third of these latter subjects the confederate was sitting directly behind them so they could not monitor the confederate's behaviour. Effects were predicted for this condition. Another third had the confederate sitting in front of them facing away from them. No effects were expected for this group. The final group had the confederate sitting in front but facing the subjects. Effects were predicted in this case due to the threat inherent in watching and possible mutual eye-contact.

The task chosen for this experiment was the paired-associates learning task which has been used many times before in this area, usually using an observer. As suggested in Chapter 4, this task is one which may be sensitive to Distraction-Conflict effects because there is a time restraint on subjects. Subjects have only a limited time between word presentations to recall the word pairs.

To test this, two measures were taken. First, to see whether distraction effects might be related to physical or cognitive distraction, as defined in Chapter 3, a concealed video recorder filmed the subjects during the experiment. With this it was possible to record how many times the subjects turned their heads to look at the confederate (physical distraction) and this could be related to

the task results. Second, most of the questions used in Experiments 1 & 2 were again used, so the distraction questions could be related to the task results. This correlation of task results with self-reports was the strategy used by Sanders et al. (1978) to demonstrate distraction effects.

The final focus of this study was the suggestion in Chapter 4 that there may be an inhibition of facial and body movements in the presence of others. The video recording was used to score these behaviours which could be related to the task results and to the questionnaire results.

VI. 2.2. Method

VI. 2.2.1. Subjects

Subjects were 81 First Year Psychology students who volunteered to participate. Of these one failed to learn the list within 30 trials and was excluded. This left 80 subjects evenly allocated to eight cells. There were 27 males and 53 females unsystematically distributed over the cells. As there were no main or interactive effects of sex the results for these have been combined.

VI. 2.2.2. Apparatus

Unlike previous paired-associates learning tasks a memory drum was not used. Instead, the word pairs were presented on a Digital display terminal, on-line to a Digital PDP-8. The practice list and the two paired-associates lists were exactly those used in previous studies (Cottrell et al., 1967; Baron et al., 1978) with one simple, non-competitional list and one complex, competitional list.

The display terminal stood in the experimental room on a table in front of a large window. The window was covered from behind by black cloth, and covered in front with a white curtain. Behind the window, directly in front of the terminal, was a video camera, with all but the lens covered in black cloth. This was connected to a video-recorder. With differential lighting in the two rooms and the texture of the white curtain, the subjects could be filmed clearly from the waist upwards without noticing the presence of the camera. No subject did report this. Two metres to the left of the terminal and slightly in front was a small table with a cassette-recorder on it. This was ostensibly connected by a grey cord to a microphone next to the display terminal. The actual microphone cord joined with the terminal cords, however, going through the ceiling to the recorder in the next room. No subjects expressed belief that the microphone cord did not go to the cassette-recorder. A diagram of the setting is shown in Figure 5.

In the experimental room there was also another chair, which varied between three positions depending upon the experimental condition. In the Behind condition the chair was 2.5 metres directly behind the subject's chair. In the Looking and Inattentive conditions the chair stood on one or other side of the cassette-recorder table so that the confederate sitting on the chair would either be looking at the subject over the table or facing away from the subject looking at the wall over the table.

The program which ran the display was flexible as regards word and list times. In all cases the times used were those of Baron et al. (1978). For the practice trials the stimulus word was presented for 2s then both stimulus and response words were presented for 2s.

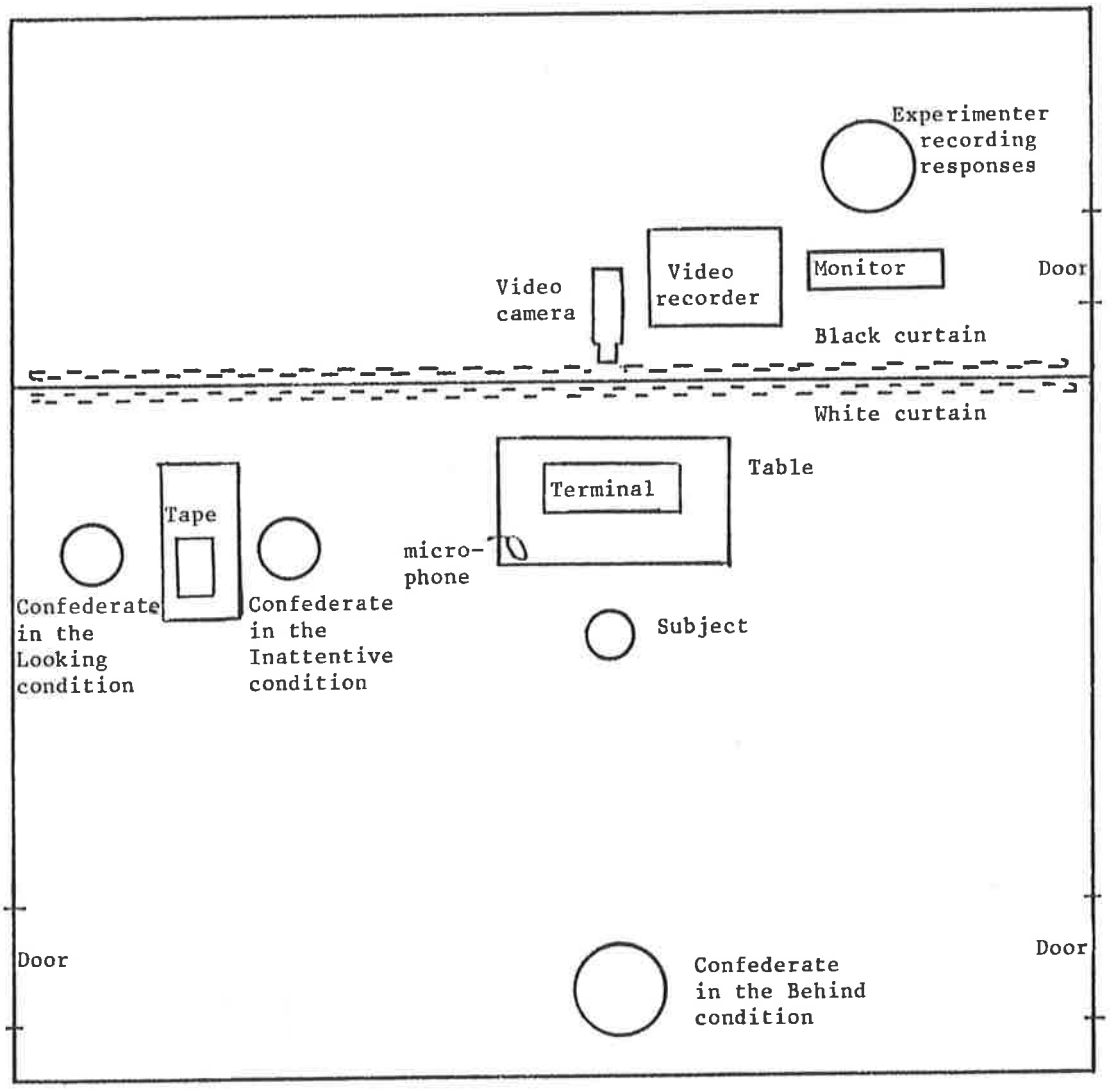

Figure 5. Plan of experimental and recording rooms for Experiment 3.

Before the response word appeared the subjects had to speak the response word into the microphone. There was a 2s pause between word pairs and a 4s pause between presentations of the lists. In the five presentations of the practice list the order of word pairs was varied but the same orders were shown to all subjects.The stimulus words for the test list were shown for 1.5s and the word pairs were then shown for 2s. There were pauses between word pairs of 2s and pauses between list presentations of 3.5s. Every time a response word was shown in any trial, the terminal beeped. This could be picked up by the microphone.

In the adjoining room with the video-recording equipment was a two choice button panel linked to the PDP-8. With this the experimenter started the practice and test trials and scored the subjects' responses as they were made. The experimenter could both see and hear the subjects clearly on a video-monitor. There was ample time to check the subjects' responses against a listing of the correct word pairs and to score a correct or incorrect response.

VI. 2.2.3. Procedure

Subjects were recruited for a Video-Learning Experiment, supposedly to look at differences between learning from computer terminals and learning from books and blackboards. They were met by the experimenter and brought into the experimental room and seated in front of the terminal. It was then explained how the task would proceed and how the performance would be measured from the cassette-recorder. It was also explained that the terminal would beep so they would not be given credit for guessing a response word after it had appeared on the screen. They were told that there would be a practice

run of five trials followed by the test run. After answering any questions the experimenter left the room and went quietly to the adjoining room to start the video-recording and the practice run.

After the five practice trials the experimenter returned to the experimental room and inquired as to how the subject had done. Any questions were answered. At this point in the three experimental conditions the confederate was introduced. It was explained that the experimenter could not get back immediately after the test run as the dectape controlling the experiment had to be rewound or it could jam and be ruined. The subject was told that a person from the computing centre who was not busy had agreed to sit in during the experiment to make sure that everything ran smoothly, to switch off the cassette-recorder, and to administer a questionnaire.

The experimenter then went to the door and called the name of the confederate, who soon came in from the direction of the computing centre, which was two rooms away. The experimenter made sure that the confederate had something to read and pointed out the chair, the cassette-recorder and the questionnaires to the confederate. The experimenter then started the cassette-recorder and left the room. The confederate was the same male person in all conditions.

In the Behind condition, the confederate sat directly behind the subject so that the terminal screen was completely blocked by the subject's body and the confederate could not see or evaluate the performance in that way. In the Looking condition, the confederate sat at the table with the cassette-recorder on the farther side, so the subject could be watched. The subject was watched for about 60% of the time. The table and chair were slightly in front of the terminal so that the confederate could not see the screen to evaluate the

performance. In the Inattentive condition, the confederate sat on the other side of the table facing the wall. Again, the screen could not be seen. In all conditions the confederate quietly read. In the Alone condition no confederate was introduced.

After two error-free trials, the terminal showed a message to say that the experiment was concluded. In the three experimental conditions the confederate switched off the cassette-recorder when no more beeps sounded, gave the subjects the questionnaire and left the room. After a few minutes, but before the subjects had finished the questionnaire, the experimenter returned and asked how it had gone. In the Alone condition the experimenter returned shortly after completion of the task and gave the questionnaire to the subject. Before all subjects left they were told something about the proposed Video-Learning experiments and something about the paired-associates task. After all subjects had been run they were each contacted and fully debriefed about the study, especially concerning the purpose and use of the video. They were all assured anonymity.

The questionnaire consisted of 13 questions with 7-point scales, three of which were filler questions. The other questions included three distraction questions used by Baron et al. (1978). These asked how distracted the subjects felt, to what extent their attention was on the task, and how frequently their attention was on something other than the task. Another four questions asked how stressed, tense, calm, and stirred up the subjects felt. These were aimed at a report of alertness or arousal. Three other questions asked how much they enjoyed the task, how well they thought they had performed compared to others and how much they thought their learning abilities were being evaluated. A 14th question was an open-ended

question asking for thoughts they had during the experiment. This was included to probe for reactions to the presence of the confederate. Except for the three distraction questions which followed each other, and the final open-ended question, the questions were in a mixed order.

VI. 2.3. Results

VI. 2.3.1. Practice Measures

The eight conditions did not differ in the number of errors made in the practice trials, $F = 1.1$, $df = 7,72$, $p < 0.37$. Further, when the practice errors were analysed in a 2 X 4 analysis of variance , with two levels of task complexity and four social conditions, there were no significant main effects or interactions. Therefore, there is no evidence of ability differences between subjects in the eight cells. Table 7 presents the means and standard deviations of these scores.

VI. 2.3.2. Task Performance Measures

For the test trials the mean number of errors per word pair was obtained for the 15 pairs of words in the simple list and for the eight non-associated word pairs in the complex list (Cottrell et al., 1967). These are given in Table 8 along with the standard deviations.

These were analysed in a 2 X 4 analysis of variance with two levels of task complexity (Simple and Complex), and four social conditions (Alone, Inattentive, Behind and Looking). A significant main effect of task was found indicating better performance at the simple task than at the complex task, as would be expected, $F = 78.3$,

Table 7. Means and standard deviations of errors in practice trials of Experiment 3 (n=10 in each cell).

TASK	SOCIAL CONDITION			
	ALONE	INATTENTIVE	BEHIND	LOOKING
Mean Errors				
Simple	36.9	35.7	39.2	47.7
Complex	39.4	37.7	38.8	42.0
Standard Deviations				
Simple	15.1	13.0	11.9	6.0
Complex	9.6	10.8	10.3	11.1

Table 8. Means and standard deviations of errors per word pair in test trial of Experiment 3 (n=10 in each cell).

TASK	SOCIAL CONDITION			
	ALONE	INATTENTIVE	BEHIND	LOOKING
Mean Errors				
Simple	1.27	1.17	0.87	1.59
Complex	3.35	3.54	5.83	5.04
Standard Deviations				
Simple	1.35	0.45	0.31	1.22
Complex	1.38	1.30	3.26	1.81

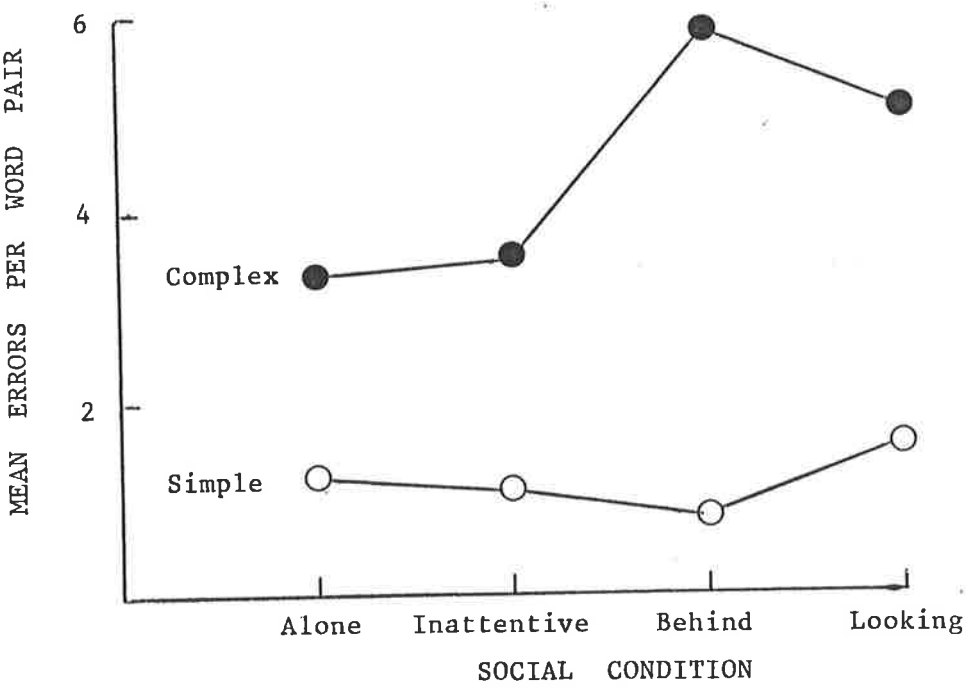

Figure 6. Mean errors per word pair across social condition for the simple and complex tasks for Experiment 3.

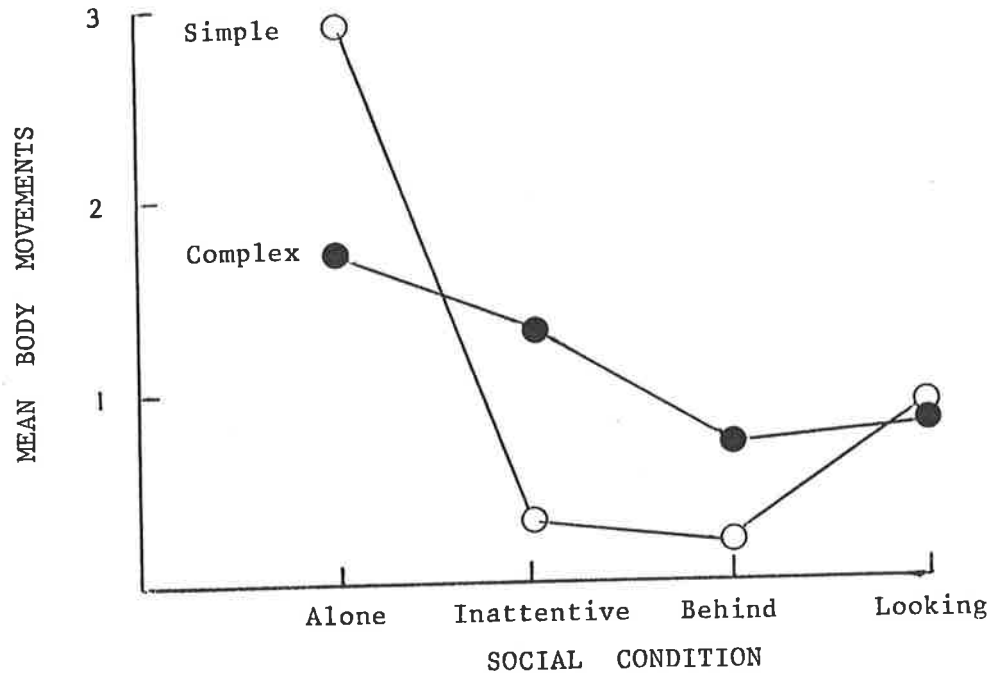

Figure 7. Mean for body movements across social condition with simple or complex task for Experiment 3.

df = 1,72, $p < 0.001$. The predicted Task X Social Condition interaction was also significant, $F = 3.2$, df = 3,72, $p < 0.028$. The main effect of Social Condition did not quite reach the standard level of significance, $F = 2.5$, df = 3,72, $p < 0.07$. Figure 6 shows the mean results.

Planned orthogonal contrasts showed no difference between the conditions for the simple task. For the complex task orthogonal contrasts showed a significant difference between the Inattentive and Looking conditions, $t = 2.13$, df = 18, $p < 0.05$, a significant difference between the Alone and Behind conditions, $t = 2.21$, df = 18, $p < 0.05$, and a significant difference between the Alone and Inattentive conditions combined and the Behind and Looking conditions combined, $t = 3.0$, df = 36, $p < 0.01$. These results show the contrast between the two conditions for which effects were predicted (Behind and Looking), and the Inattentive condition for which no effect was predicted. This only occured with the Complex task however. There was also a significant difference between the Alone and the Looking conditions, $t = 2.35$, df = 18, $p < 0.05$. This contrast is not orthogonal to the other three contrasts, so there is a probability of 0.14 that all four contrasts are not true. It should also be noted that as well as an inhibition of performance at the Complex task for the Behind condition there was more variability in the effects than for the other three conditions.

VI. 2.3.3. Self-Report Measures

In answering the open-ended question, asking for any thoughts during the task, 27 subjects mentioned the presence of the confederate. These did not differ across the three social conditions,

Chi-Squared = 0.88, df = 2, $0.75<p<0.9$.

To provide grouping of the questions, the remaining ten questions were analysed in an oblique factor analysis. Three clear factors emerged. The first factor grouped the four arousal questions, with loadings of 0.64, 0.76, -0.73 and 0.78, for the reports of how stressed, tense, calm, and stirred up the subjects felt. The next closest loading was 0.14.

The second factor grouped the three distraction questions, with loadings of 0.52, -0.56 and 0.80, for the questions asking how distracted the subjects felt, to what extent their attention was on the task and how frequently their attention was on something other than the task. The nearest other loading was -0.15.

The third factor grouped the remaining three questions asking how much the subjects enjoyed the task, how well they thought they had done compared to others and to what extent they thought their learning abilities were being evaluated. Respective loadings were 0.68, 0.57 and -0.33. The nearest other loading was -0.20. This factor indicated that subjects who enjoyed the task also felt happier about comparisons with others and did not feel their learning abilities were being evaluated. The full factor analysis is given in Appendix 6.

These results show that subjects did answer the questions consistently for distraction and arousal effects. Despite this, little relation was found between these factors and the four social manipulations. The three factors were indexed by summing the questions forming the factors with weighted factor loadings and these indices were analysed in 2 X 4 analyses of variance with two levels of task complexity and four social conditions. No main or interactive effects were significant. The same was true when the questions were

not weighted. Each of the factors was also used as a covariate in the main task performance analysis of variance but in each case this made no difference to the results.

The questions making up each factor were also analysed in a multivariate analysis of variance with two levels of task complexity and four social conditions. Only two effects from these three analyses were significant. First, there was a significant Task X Social Condition interaction with the three distraction questions, Multivariate $F = 2.15$, $df = 9,216$, $p < 0.03$, using the Pillai-Bartlett Trace V statistic (Olson, 1976). There was also a significant main effect of social condition with the same questions, Multivariate $F = 1.9$, $df = 9,216$, $p < 0.06$. Subsequent analyses showed these multivariate effects to arise from three univariate differences.

First, there was a significant main effect of task on the question asking how distracted subjects felt, $F = 7.4$, $df = 1,72$, $p < 0.01$. Subjects reported being more distracted on the complex task than on the simple task. This had been found previously by Sanders et al. (1978, p.299).

The second univariate effect was a significant Task X Social Condition interaction on this same question, $F = 4.57$, $df = 3,72$, $p < 0.01$. This was accounted for by the larger distraction difference between the two tasks for those in the Inattentive and Looking conditions. For the Simple task the mean values were 5.5, 6.5, 5.5 and 6.0, for the Alone, Inattentive, Behind and Looking conditions respectively. For the Complex task the corresponding values were 6.4, 4.2, 5.0 and 4.3. There was a significant contrast on the Complex task between the Inattentive and Looking conditions combined and the

Alone and Behind conditions combined, $t = 2.84$, $df = 18$, $p < 0.007$. It should be noted that this question has twice failed to find differences between social conditions (Baron et al., 1978; Sanders et al., 1978) as well as in Experiments 1 & 2 of the present work.

The third univariate result was a main effect of Social Condition for the question asking how frequently attention was on something other than the task, $F = 3.87$, $df = 3,72$, $p < 0.01$. This was due to those in the Looking condition more often attending to something other than the task, with respective mean values of 2.85, 3.00, 2.45 and 3.95, for the Alone, Inattentive, Behind and Looking conditions. This statistical separation of the Looking condition from the other three conditions was confirmed by a Newman-Keuls test at the 0.05 level.

Baron et al. (1978) also found a main effect on this question. Their single experimental condition most closely resembled the Looking condition of the present study, as the confederate had been present as an observer. So the correlation of self-reported distraction and task effect found by Baron et al. is replicated, but the fact that effects were also found for the Behind condition without the self-reported distraction suggests that distraction was not the cause of the task results.

VI. 2.3.4. Video Measures

The video recordings were scored for a number of behaviours for both the practice and test periods. The practice trials took 7 min 40s, while the first 7 min of the test run were scored. For one subject only the practice data were unavailable, as the video had accidentally not been switched to record. A cassette recording of this

subject's vocalizations was still usable. With the exception of the Behind condition, in which the confederate could be seen on the screen, the rating was done blind to the condition.

The first measure taken was the number of movements of the torso or body; this included rocking from side to side and moving back and forth in the chair. The number of small movements was also measured; this included scratching, rubbing, fiddling and putting the fingers into the mouth. The number of vocalizations was also taken, apart from saying the response word; this included exclamations, groans, sighs, laughs and talking to oneself. This did not include rehearsal of word pairs. Last, the number of times the subject turned and looked in the position of the tape recorder was measured. This was also the position of the confederate in the Looking and Inattentive conditions.

To gain some idea of the reliability of these scores, eight of the videos were randomly selected and scored twice. Correlations were found between the two scores for the total number of movements (body and small movements), and for the number of vocalizations. The correlations for the total movements and the total vocalizations for the practice and test periods were 0.90, 0.72, 0.79 and 0.64 respectively. All were significant at the 0.05 level.

It should first be noted that a number of subjects did spontaneously rehearse in the practice trials and some subjects in the Alone condition continued this into the test period. Only one subject, however, rehearsed in the presence of the confederate. This inhibition of overt rehearsal has also been found by Berger et al. (1981).

It was found that few subjects attended to the direction of

the confederate. In the practice trials only three out of the 79 subjects were found to look in that direction. In the test trials, 12 subjects looked in that direction. Four of these were in the Alone condition, three were in the Inattentive condition, none were in the behind condition and five were in the Looking condition. This means that we cannot attribute any task performance differences between the groups to the physical distraction of looking at the other person, because a similar number of subjects in the Alone condition had a similar amount of distraction. If there is a distraction effect it must be of a cognitive nature.

The mean scores of body movements, small movements and vocalizations for the practice trials were analysed in three 2 X 4 analyses of variance with two levels of task complexity and four social conditions. No significant main effects of interactions were found. This shows that there were no initial differences on these measures between the subjects in the different cells. The mean values are shown in Table 9.

The mean scores for body movements, small movements and vocalizations for the test trials are shown in Table 10. They are also represented graphically in Figures 7 (p. 145), 8 and 9. Each of these were analysed in a 2 X 4 analysis of variance with two levels of task complexity and four social conditions. For body movements there was a significant main effect of Social Condition, $F = 8.1$, $df = 3,72$, $p < 0.001$, and a significant interaction of task and social conditon, $F = 2.7$, $df = 3,73$, $p < 0.05$. For small movements there was also a significant main effect of social condition, $F = 12.7$, $df = 3,72$, $p < 0.001$, and the same was true for vocalizations, $F = 43.4$, $df = 3,72$, $p < 0.001$. No other main or interactive effects were significant.

Table 9. Means for body movements, small movements and vocalizations, for practice trials combining simple and complex tasks in Experiment 3.

TASK	SOCIAL CONDITION			
	ALONE	INATTENTIVE	BEHIND	LOOKING
Body Movements	1.58	1.65	1.70	2.75
Small Movements	4.21	5.50	4.70	5.45
Vocalizations	3.95	4.35	4.60	5.05

Table 10. Means for body movements, small movements and vocalizations, for the test trials in Experiment 3 (n=10 for each cell).*

TASK	SOCIAL CONDITION			
	ALONE	INATTENTIVE	BEHIND	LOOKING
Body Movements				
Simple	2.9a	0.3b	0.2b	0.9b
Complex	1.7a	1.3a	0.7a	0.8a
Small Movements				
Simple	4.8a	2.6b	1.7b	2.1b
Complex	5.6a	3.5b	1.9b	2.2b
Vocalizations				
Simple	4.1a	0.1b	0.3b	0.2b
Complex	4.8a	0.2b	0.5b	0.1b

* Cells having different subscripts within a row are significantly different at the 0.05 level by a Newman-Keuls test.

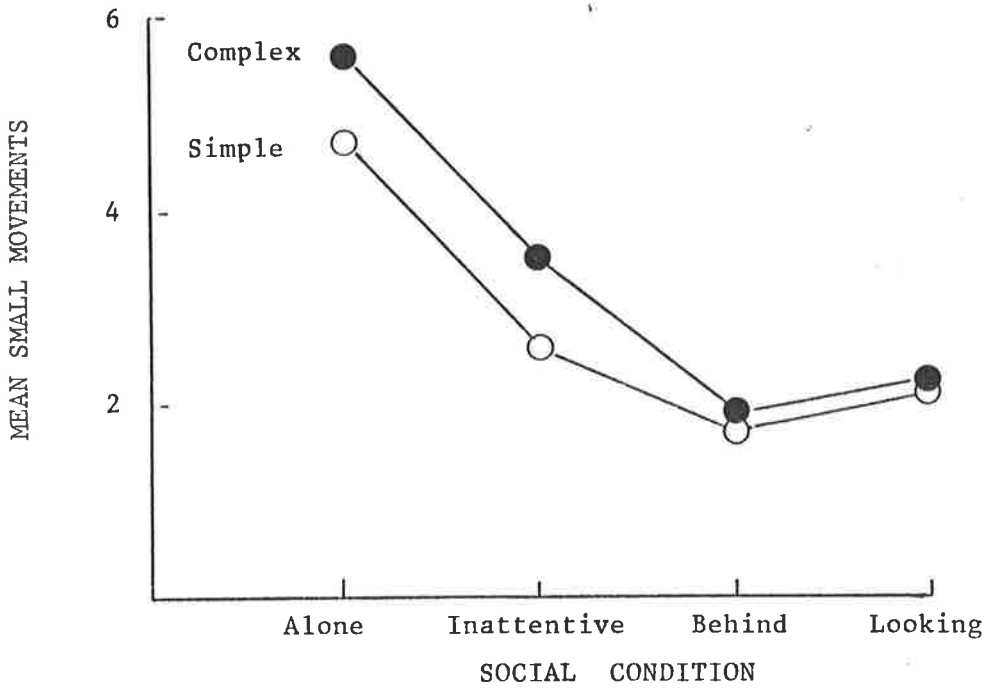

Figure 8. Means for small movements across social condition with simple or complex task for Experiment 3.

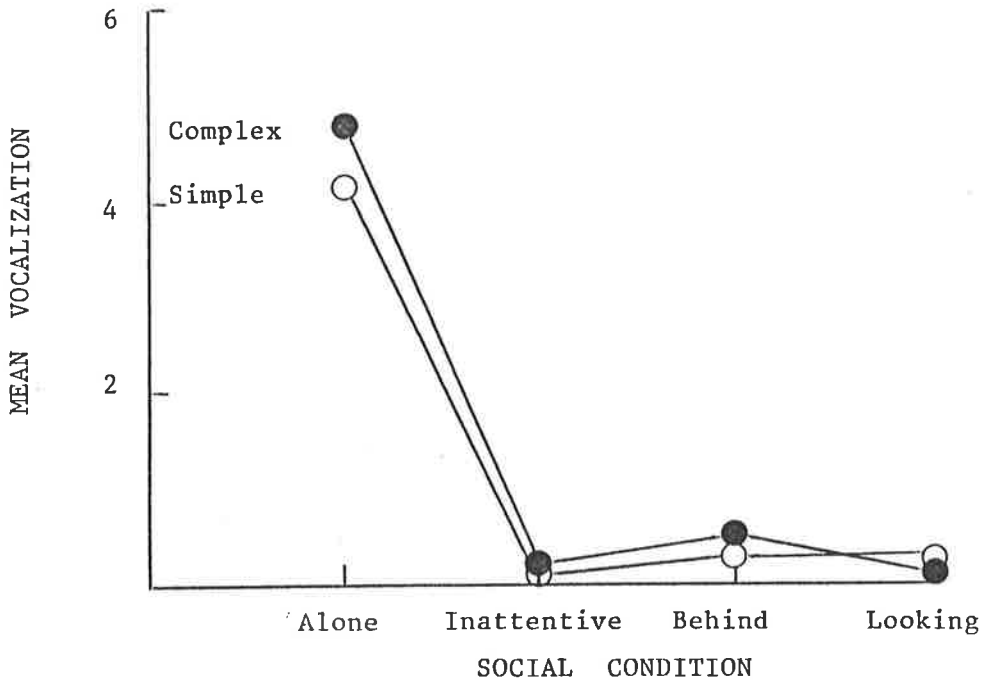

Figure 9. Mean vocalization across social condition with simple or complex task for Experiment 3.

Table 10 also shows the post hoc comparisons between the four social conditions. For both of the task levels of small movements and vocalizations, and for the simple task level of body movements, there is a significant drop in the frequency of these behaviours in the presence of the confederate. For body movements in the complex task, those in the Inattentive condition did not stop moving in the presence of the confederate. This was where the subjects could not be seen by the confederate. This accounts for the significant interaction for body movements, although the main effect was also significant. Similarly for small movements, the scores tend to be higher, though not significantly, in the Inattentive condition when the subject cannot be seen. Overall, the presence of the confederate led to restricted animation and range of behaviours displayed.

Looking at the individual vocalizations, only 2 out of the 80 subjects did not vocalize during the practice trials and only one subject out of the 20 in the Alone condition did not vocalize during the test period. For the other three conditions in the test trials, only 12 out of the 60 did vocalize, 3 in the Inattentive condition, 6 in the behind condition and 3 in the Looking condition. Each only made one noise though. The restriction on self-talk seems to be more general than just overt rehearsal of task materials (Berger et al., 1981).

For the final analysis, the scores of body movements, small movements, and vocalizations were used as covariates for the main 2 X 4 analysis of task performance. In each case this made no difference to that result.

VI. 2.4. Discussion

A number of conclusions follow from these results. There is some support for the threat hypothesis of mere presence effects. The results were as expected for the Complex task. There was an inhibition of performance only when the subject could not monitor the confederate or the confederate was watching the subject. On the Simple task, there was a trend towards facilitation in the Behind condition but not in the Looking condition.

It should also be noted that the Behind condition for the Complex task had the largest variance of all the cells, which may indicate that more is going on in this case. The effect of a confederate behind subjects may have an effect which may be different for different people.

That the Inattentive condition was no different to the Alone condition provides evidence against models which propose that any mere presence is sufficient (Zajonc, 1965).

The relation of the present results to the Distraction-Conflict model is more complex. If distraction effects are due to competing responses of physically attending to the person and to the task then the present results go against this. First, very few subjects did look towards the confederate and a number of the subjects in the Alone condition looked in this direction as well. Second, if the task effects were due just to a physical distraction then there was no reason to expect the difference found between the Inattentive and Looking conditions. Last, a physical distraction model would not have expected the effect of the Behind condition because there was no chance of attending to the confederate and so no competing responses. It is unlikely, then, that physical distraction is the basis for the

results.

On the other hand, Distraction-Conflict may refer to a cognitive distraction. The evidence for this rests on the self-report measures of Baron et al. (1978) which found a co-occurence of self-reported distraction and task effects. The present results go against this. First, the self-report question of distraction showed significant distraction differences for both the Inattentive and Looking conditions although only the latter showed task differences.

Second, for the question asking how often the subjects attended to something other than the task only the Looking condition was significantly different from the Alone condition. This replicates the result found by Baron et al. (1978), whose single experimental condition most closely resembled the Looking condition of the present study. Task effects in this study, however, were also found for the Behind condition. In this case there were no reported attentional effects. So while replicating the finding of Baron et al., the co-occurrence of self-reports and task results was not found across a wider range of experimental conditions.

This suggests that self-report measures were not being answered on the basis of true introspective awareness, which was suggested by the results of Experiments 1 & 2. In this experiment also, the questions were answered consistently but were only weakly related to the task results. That this occurred with a replication of a previous result (Baron et al., 1978) implies that such measures should be interpreted with caution.

One of the main problems that can be raised about the present design is that evaluation effects may have still been present. Subjects may have felt evaluated by both the confederate behind and

the confederate watching them. Thus the two main findings may be due to this. It can be answered to this that in both these conditions evaluation was played down by instructions and that in the Behind condition the confederate could not see the screen to check the correct answers. It still may be, though, that subjects felt evaluated all the same and they may not have realized in the Behind condition that the confederate could not see what they were doing. Evaluation may also arise from just being watched, whether from in front or behind.

There seem to be two possible ways to get around the problem of evaluation. One is to vary the level of evaluation deliberately, and to infer from this the effects of minimal evaluation. This will be tried in Experiment 5. The other way is to take greater action to control for evaluation, although many procedures have been tried in the past (Markus, 1978). This approach will be taken in Experiment 7.

An interesting finding of this experiment was the dramatic reduction of body movements, hand movements and vocalizations in the presence of the confederate regardless of the condition. This effect was notable for its strength and reliability. It could be explained in terms of an inhibition of a dominant response but the results did not follow the pattern of the task results. For this reason it might be better viewed as a social conformity phenomenon. In the presence of others one avoids unnecessary movements and talking to oneself. It suggests that the reduction of rehearsal in the presence of others is merely part of a wider phenomenon (Berger et al., 1982). This will be further investigated in Experiment 5.

VI. 3. EXPERIMENT 4: THE ROLE OF FAMILIARITY IN COACTION AND AUDIENCE SETTINGS

VI. 3.1. Introduction

Experiment 4 set out to test two other factors involved in the threat and unpredictability interpretations of mere presence. It was argued in Chapter 3 that if these mediate mere presence effects then less effect should be expected for coaction settings as the other's behaviour is more predictable than for an audience or non-participating presence. It was also predicted that there would be greater effects with an unfamiliar other present than for a familiar other. Again, this follows simply from commonsense ideas of what type of person is threatening. A stranger's behaviour is less predictable and more threatening.

The opportunity arose to run a large number of First Year Psychology students in a practical. This meant that a large scale design was possible. For this reason, as well as crossing factors of Familiarity and Coaction/Presence, three levels of Task Complexity were used in the design. One Alone condition was also run for each level of task complexity.

Although the Practical exercise was used as coursework, the present experimenter designed the experiment and ran all subjects. The subjects were all left naive about the hypotheses until after the experiment was completed.

VI. 3.2. Method

VI. 3.2.1. Subjects

Subjects were 343 First Year Psychology students who participated as part of a Practical exercise for their course. Subjects signed up for one session only and were run in groups of 4 to 12. This procedure of running in large groups meant that there was less control over the design. It was not possible to obtain the sex of the subjects but there were more females than males. It was not known, however, whether pairs of familiar subjects were more or less likely to be same-sex pairs than were unfamiliar pairs, although it seems likely that they were. It was also not possible to get equal numbers of subjects in each cell.

VI. 3.2.2. Apparatus

The task used was a letter-copying task, of a type previously shown to be sensitive to Drive, as measured by the Manifest Anxiety Scale (Taylor & Rechtschaffen, 1959). Similar tasks have also been used in previous social facilitation research (Gastorf et al., 1980; Sanders et al., 1978; Wack & Cottrell, 1969). This was used as it was a common social facilitation task that could be easily adapted to three levels of task complexity. The task was also quick and easy to administer to large numbers of people. Logistics precluded using the word asssociation task, the rotor-pursuit task or the paired-associates task.

The booklet used consisted of pages with 5 rows of 20 double-boxes on each. The top compartment of each box contained a letter of the alphabet, unsystematically assigned but with no two adjacent boxes

containing the same letter. On the front of each booklet was one practice row of double boxes.

There were three versions of the booklet differing only in the front page. One was labelled a Simple Alphabet-Printing Task and the instructions were to copy the letters in the top boxes into the box below. The other two were both labelled Reversed Alphabet-Printing Task. One instructed subjects to print the letter upside down into the box below while the other instructed subjects to print letters upside down and backwards into the box below. In each case some examples were given along with the practice row. These three booklets will be called the Simple, Complex and Very Complex tasks respectively. Subjects had 2 mins in which to copy as many of the letters as they could.

The final sheet of the booklet contained the ten questions used in the previous studies. Two questions asked how much the subjects enjoyed the task and how well they thought they did compared to others. Five questions asked how stressed, tense, calm, stirred up and aroused the subjects felt. The other three questions asked how distracted subjects felt, to what extent their attention was on the learning task and how frequently they focussed on something other than the task. Apart from the three attention questions the others were in a mixed order.

VI. 3.2.3. Procedure

Subjects were met in groups by the experimenter in a room which had a number of small rooms all adjoining. Subjects were told that they would be going into the small rooms to perform the task.

The task itself was then explained and a description was given of the Simple, Complex and Very Complex methods of copying. On this basis there were a number of experimental conditions. Apart from some subjects in the Alone condition to be mentioned later, subjects were randomly assigned before subjects arrived.

First, subjects could either work alone or in pairs. Where subjects were to work alone then every subject in one whole session worked alone. Some of the Alone subjects, however, were odd ones out in sessions which worked in pairs. In the Alone conditions, after the subjects had tried the practice examples, the experimenter told subjects to start and closed the door of their room. Upon opening the door 2 mins later the experimenter told the subjects to stop. By allowing 10s between starting each subject in a room and the same amount between stopping them, the experimenter could run up to eight Alone subjects simultaneously with exact timing. All subjects in all conditions were run by the same experimenter.

For subjects run in pairs, there were two other levels of conditions. The pairs were either friends or not friends and either both subjects did the task or one subject copied while the other subject did the timing. Overall, this meant that there was a 2 X 2 X 3 factorial design, with a single Alone comparison for each level of complexity. Subjects were with a familiar person or not, were both doing the task (Coaction) or one was timing (Presence) and were doing one of three levels of task complexity.

When the subjects arrived for the paired sessions, the experimenter asked them to sit with either a friend or someone they did not know, depending on the condition decided earlier. They were told that the experiment would best be run using friends (or

unfamiliars when that was the condition) so other effects would not occur. Any odd person in the Unfamiliar sessions was run as an Alone subject and a note made afterwards on their booklet. For the Familiar condition where there were two subjects who knew no one, they were run as an unfamiliar pair and a note made afterwards on their booklet. The subjects in these cases were told that perhaps one exception would not ruin the whole experiment. Again, any odd subjects in the Familiar conditions were run as an Alone subject.

For the Presence conditions one subject was given a stopwatch, shown how to use it and asked to time the other subject of their pair for 2 mins only. The experimenter told them to start and closed the door of their room. When this was finished the timers left the room while the other subjects filled in the questionnaires. In the rooms the chairs and desks were set up so that subjects were back-to-back. The timers were told to be quiet and not to watch the subjects copying.

For the Coaction pairs, the subjects were told that they had different levels of complexity on the tasks but were not told what complexity the other had. This was done to reduce possible social comparisons. They again worked back-to-back and were asked to be quiet. They were timed as for the Alone condition with the experimenter telling them to start and closing the door. Again, a number of subjects could easily be timed in the same session.

When all the subjects in a session had finished they were told something about the three levels of complexity and the effects this might have. They were not told about the social manipulations nor that subjects in other sessions had been run differently. They were asked not to discuss details of the experiment with friends who were still

to come. After all subjects had been run they each received some notes concerning the real nature of the experiment and some of the data to write up as a term practical.

VI. 3.3. Results and Discussion

VI. 3.3.1. Preliminary Comments

For analysis only the results of one of a coacting pair was used, chosen at random, so as to avoid any problem of group effects (Anderson & Ager, 1978; Myers et al., 1981). This was expected to be a real problem in this case because of the Familiarity/Unfamiliarity factor. It was likely that friends would exhibit less variation in behaviour than two strangers chosen at random. With the large number of students used this still left sufficient in each condition with a final N of 238.

Table 11 presents the means, standard deviations, with cell numbers, of the number of letters copied for each condition. As can be seen, there was great variation in both the variance and in the sample sizes. Although recommending that the F statistic is robust to heterogeneity of variance, Hays (1973, p.482) does suggest that where cell frequencies also differ there is some doubt as to the validity of the results. For this reason, a log transformation was applied to the measure of the number of letters copied for the analyses.

A second problem with the data was that for testing the effects of type of presence and familiarity, the Alone condition formed an odd control group, which did not fit in with a completely crossed factorial design. The procedure adopted to deal with this was the one recommended by Himmelfarb (1975) for quantitative comparisons.

Table 11. Means, standard deviations and sample sizes of the number of letters copied in Experiment 4.

TASK	SOCIAL CONDITIONS				
	ALONE	FAMILIAR/ COACTION	UNFAMILIAR/ COACTION	FAMILIAR/ PRESENCE	UNFAMILIAR/ PRESENCE
Means					
Simple	160.8	158.5	154.0	176.2	168.4
Complex	42.8	39.1	43.7	49.2	38.6
Very Complex	19.4	21.3	18.9	23.9	15.1
Standard Deviations					
Simple	30.8	42.6	32.6	40.7	16.3
Complex	9.0	18.0	12.4	19.8	15.0
Very Complex	4.4	11.0	5.8	6.8	4.7
Sample Size					
Simple	17	17	17	13	13
Complex	18	17	18	13	13
Very Complex	17	18	18	14	15

For each of the three levels of complexity, the Alone condition was randomly divided in half. One of the halves was assigned to the Familiar condition and the other half to the Unfamiliar condition. This meant that there was an overall 2 X 3 X 3 design with factors of Task Complexity, Familiarity and Type of Presence. This latter factor had levels of Coaction, Presence and the artificially divided Alone level.

The final problem concerned the Self-Report data. For the purpose of the students' writing of a Practical Report, the questions were combined into an Arousal measure and a Distraction measure, formed by simply summing the relevant questions. Experiments 1,2 & 3 provide some support for there being an Arousal factor and a Distraction factor. After this was done, and before a full analysis could be made, the original scripts were accidently destroyed. All that remained on computer storage were the two combined measures. While these results will be presented and interpreted, it should be cautioned that results found could be due to just some of the questions used in the measures. Where no effects are found, one or two of the questions alone may have revealed something. Last, the groupings made on the basis of Experiments 1, 2 and 3 may not have matched a factor analysis of the present results if it had been done.

VI. 3.3.2. Task Performance

The logarithm of the number of letters copied were put in a 2 X 3 x 3 analysis of variance with respective factors of Familiarity, Type of Presence and Task Complexity. Table 12 gives the means of each cell, while Appendix 7 gives the full ANOVA. In this analysis, three components were significant, or nearly so by conventional

Table 12. Means (logs) and sample sizes of the number of letters copied in Experiment 4.

TASK		SOCIAL CONDITION COACTION	PRESENCE	ALONE
Letters Copied				
Simple	Familiar	5.03	5.14	5.12
	Unfamiliar	5.01	5.12	4.98
Complex	Familiar	3.56	3.83	3.71
	Unfamiliar	3.74	3.58	3.76
Very Complex	Familiar	2.96	3.13	2.94
	Unfamiliar	2.88	2.65	2.93
Cell Size				
Simple	Familiar	17	13	9
	Unfamiliar	17	13	8
Complex	Familiar	17	13	9
	Unfamiliar	18	13	9
Very Complex	Familiar	18	14	8
	Unfamiliar	18	15	9

Table 13. Means of self-reported arousal and distraction in Experiment 4.

TASK		SOCIAL CONDITION COACTION	PRESENCE	ALONE
Arousal				
Simple	Familiar	7.06	7.69	4.44
	Unfamiliar	7.06	8.38	8.63
Complex	Familiar	14.82	12.38	12.67
	Unfamiliar	9.28	10.85	7.89
Very Complex	Familiar	10.78	13.07	11.50
	Unfamiliar	13.33	13.40	12.22
Distraction				
Simple	Familiar	5.24	4.92	5.67
	Unfamiliar	4.24	6.69	5.38
Complex	Familiar	5.47	5.69	3.33
	Unfamiliar	5.61	3.77	3.11
Very Complex	Familiar	5.61	7.29	3.00
	Unfamiliar	6.50	5.80	5.22

levels. First, there was a significant main effect of Complexity ($F = 871$, $df = 2,220$, $p < 0.001$). As expected, subjects did worse on the Very Complex task, next best on the Complex task and best on the Simple task.

The second result found was a near significant main effect of Familiarity ($F = 3.8$, $df = 1,220$, $p < 0.053$). As can be seen, subjects performing with a familiar other did better overall than those performing with a stranger.

This interpretation must be tempered by the third finding, a significant interaction between Familiarity and Type of Presence ($F = 4.3$, $df = 2,220$, $p < 0.015$). This interaction is represented graphically in Figure 10. The mean values suggest that coaction is not affected by the familiarity of the other person, whereas with someone passively present performance is better with a familiar other than with an unfamiliar other. A Newman-Keuls test found no significant difference between the three conditions at either level of Familiarity.

Although the effect of a non-participating presence is only a trend which must be viewed with caution there was little difference between the Coaction group and the Alone condition. This supports the hypothesis put forward in Chapter 3 that coacting presences are more predictable in their behaviour and therefore less threatening and less arousing.

Another way of interpreting the trends in the mean values is to look separately at the Familiar and Unfamiliar groups. With the presence of a familiar other performance is worse with coaction. This may have been because the familiar pairs interfered with each other more, because there may have been a behavioural norm in familiar pairs

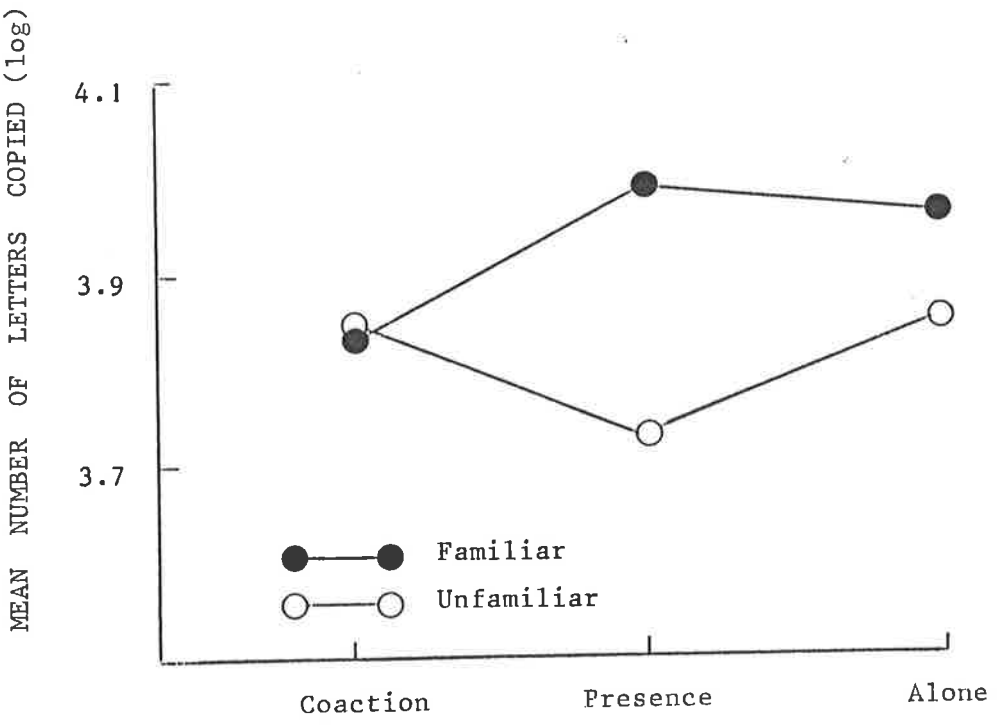

Figure 10. Mean number of letters copied (logs) by type of presence and familiarity for Experiment 4.

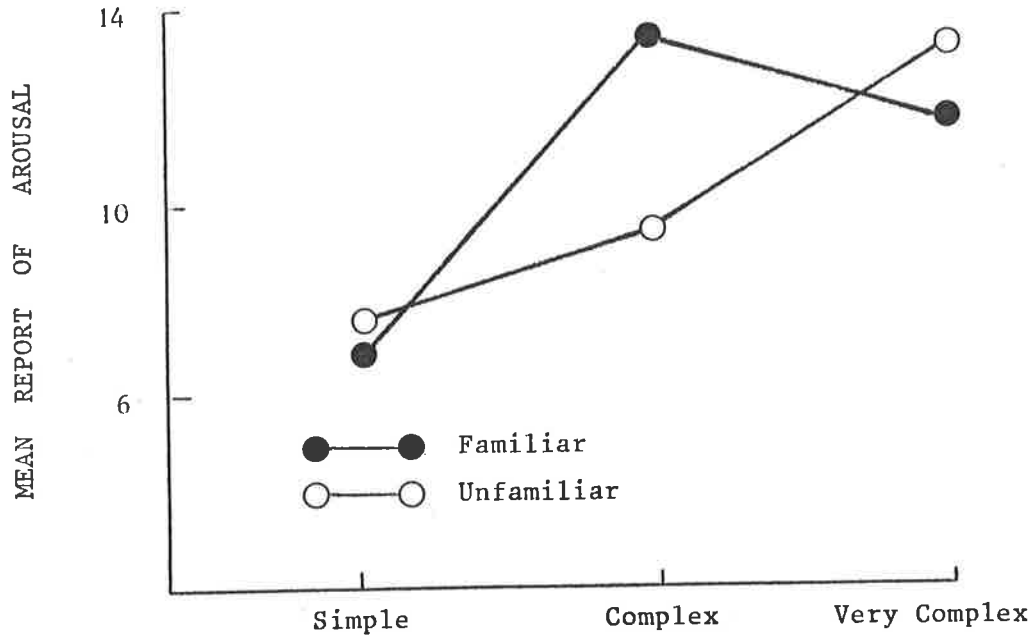

Figure 11. Mean self-report of arousal by task complexity and familiarity for Experiment 4.

not to try too hard at practical exercises, because the familiar pairs were more likely to compete and overstep their abilities, or because they were more likely to try and compare performance leading to distraction and a worse performance. Which of these is correct, or even whether only one is correct cannot be answered by the present results.

With an unfamiliar, other on the other hand, performance seems to be worse with a non-participating presence than with a co-actor. This may be due to the inability to monitor this other stranger whose behaviour was unpredictable.

Whatever the interpretation, the effects of familiarity found here are not strong. It is likely in fact that all subjects may have felt 'familiar' to each other due to all being in the same practical session, all taking Psychology as a subject and all sharing a 'similar state' (Ellsworth et al., 1978). Thus the effect may not have been as strong as if strangers off the street had been placed in a small room together and compared with lifelong friends in another room.

VI. 3.3.3. Self-Report Measures

As was detailed above, the self-reports were analysed as only two measures. One consisted of the unweighted addition of the questions asking how stressed, tense, stirred up and aroused the subjects felt, and the subtraction of how calm the subjects felt. The other was the addition of the questions asking how distracted subjects felt and how much their attention was on something other than the task, and the subtraction of how much their attention was on the task. This resulted in two scales. The Arousal scale was from 0 to 30, with a high score indicating that the subjects felt aroused or alerted.

The Distraction scale was from 0 to 18, with a high score indicating that subjects felt distracted.

Both these measures were used in a 2 X 3 X 3 analysis of variance with two levels of Familiarity, three levels of Task Complexity and three Types of Presence. The mean results for both these measures broken down by the three factors are given in Table 13 (p.166). Appendix 7 gives the full ANOVA.

The analysis of the Arousal measure showed two significant results. First, there was a significant main effect of Task Complexity. As can be seen from Table 13, subjects felt more aroused with the greater task complexity although there was not much difference between the two Complex tasks.

There was also a significant interaction of Familiarity and Task Complexity. This arose from subjects doing the middle Complex task feeling more aroused when with a friend than with a stranger. Other than this, arousal was directly proportional to task complexity. This difference was found to be significant ($t = 2.73$, $df = 77$, $p < 0.008$). The interaction is represented graphically in Figure 11 (p. 168).

Viewing this effect another way, the main arousal difference overall was between the Simple task and the two Complex tasks. There was little difference between the two Complex tasks except when the subject was with an unfamiliar other. In this case only they rated themselves as being less aroused.

If the self-reports are seen as true introspective accounts then this result goes against the arousal interpretation. Subjects should have reported more arousal with the presence of an unfamiliar other. It has been suggested above, however, that self-reports may be

unreliable accounts and may reflect other processes. A self-presentation explanation may be that subjects wanted to appear to their friends as though they had had a rough time with the Complex task and so rated themselves as more aroused by it. Alternatively, they may have wanted to present themselves to a stranger as being able to cope with the task easily and so not be as aroused. In any event it is hard to say more on this without any more evidence to go by.

The Distraction measure was put into the same three way analysis of variance and only one borderline significant result emerged. This was a main effect of Type of Presence ($F = 2.68$, $df = 2,220$, $p < 0.07$). The trend was for subjects in the Alone condition to feel less distracted than subjects in the other two conditions, with mean scores of 5.5, 5.7, and 4.3 for the Coaction, Presence and Alone conditions respectively. A test between the two Presence conditions and the Alone condition showed this contrast to be significant ($t = 2.32$, $df = 2,35$, $p < 0.021$).

Again, this result can be interpreted in a number of ways. If this is a true report of distraction then although it indicates that persons present are distracting, the distraction scores do not follow the task performance scores. The distraction cannot have influenced the task then. In fact, the correlation between the Distraction index and the task score was small and non-significant ($r = -0.04$, $p < 0.48$).

On the other hand, if subjects were answering on the basis of salient situational cues as has been suggested above, then it is not surprising that more distraction was recorded when there is another person present.

VI. 4. GENERAL DISCUSSION

VI. 4.1 Mere Presence Effects

The results of Experiments 1 and 3 give some support to the existence of mere presence effects but do not give much evidence of the mechanics of the process. Experiment 1 found an effect on a motor task of a person who did not watch subjects but sat quietly. The Inattentive condition of Experiment 3, on the other hand, found no effect of a confederate sitting quietly facing away from the subject. This difference could be due to a number of things.

It could be the different distances of the confederates that influenced the results. This has been found previously (Barefoot & Kleck, Note 2). It could also be due to differences in monitorability. In the motor task the subject had to keep watching the rotor and had little opportunity to keep an eye on the confederate. In the Inattentive condition of Experiment 3 the subjects could easily watch the confederate.

Interpreting this difference from the point of view of distraction, it could have been that subjects were overloaded with the distraction of the confederate or in a state of distraction-conflict and so the arousal from this may have led to a better performance. There was no such conflict in the Inattentive condition of Experiment 3.

It has also been mentioned already that both experiments could be interpreted in terms of evaluation effects. Subjects in the motor task may have thought that the confederate could turn and watch them, and so evaluate them. What is harder to explain is the lack of effect

in the Inattentive condition. As the confederate could not see the correct answers in either this or the Looking condition, they could only evaluate by listening to the subjects' responses. This could have been done just as easily in the Inattentive condition but no effect was found there. The effect must have come from either some general evaluation apprehension from being watched in the Looking condition or from an effect of feeling threatened by being watched.

The point being made is that the Looking effect could not have come from task evaluation apprehension but from evaluation of general behaviour characteristics. This is supported by the inhibition found in body and small movements, vocalizations and from other studies showing a general threat or arousal from being watched (Ellsworth et al., 1972; Ellsworth & Langer, 1976; Langer et al., 1976; Nicholls & Champness, 1971).

Experiments 3 & 4 have only given limited support to the threat interpretation of mere presence effects. Experiment 3 found effects only when the subjects were being watched or when the subjects could not watch the person present. If evaluation was not involved in this then it is strong support. To investigate this further, Experiment 5 varied levels of evaluation, while Experiment 7 tried to reduce possible evaluation.

Experiment 4 found limited support for the role of familiarity in mere presence effects. It was suggested that subjects may have felt some familiarity merely from taking part in the same test. If this is so then the implication is that laboratory experiments may not be useful to pursue this factor. Quasi-field experiments may be more appropriate. All subjects brought into an experiment together may feel a sense of common fate and familiarity.

VI. 4.2. Self-Report Measures

The self-report results of both studies were ambiguous. While some effects were found involving the social manipulations, doubt was placed on their interpretation. It is still not clear as to whether these measures reflect introspective accounts or the reporting of post-hoc, salient, top of the head phenomena. It may have been that in previous experiments finding a relation between self-report measures and task performance the experimental setting suggested obvious distraction and evaluation manipulations. Subjects answering questions after the experiment would remember these salient features and report greater distraction or evaluation.

Some evidence for this was provided by the greater reported distraction in the Looking condition of Experiment 3. This was the result found by Baron et al. (1978) who used an experimental setting very similar to this condition. The salient feature of this condition was that the confederate sat watching the subjects. It seems reasonable that subjects should then have reported greater distraction from this condition whether or not they were really more distracted. It is less reasonable a priori to assume distraction in the Behind condition and subjects did report it in this case. Demand characteristics may have played a role in previous self-report results (Baron et al., 1978). Experiment 7 will look more closely at this issue.

VI. 4.3. Behaviour Inhibition

The interesting finding coming from Experiment 3 was the reduction in movements and vocalizations when in the presence of the confederate. This did not follow the same pattern as the task performance results so it is likely due to some other mechanism. It

was suggested that it was a result of a self- presentation strategy. As it also occurred with a non-observing presence in the Inattentive condition, it would seem to rate mention as a mere presence phenomenon. Just the presence of the person was enough to cause the change. Experiments 5 and 6 were designed to follow this up.

CHAPTER VII.

BEHAVIOUR INHIBITION IN THE PRESENCE OF ANOTHER PERSON

VII. 1. INTRODUCTION

In Experiment 3 the finding emerged of a dramatic decrease in the number of body movements, small movements and vocalizations when there was another person present. This was not correlated with the task performance results but with the presence or absence of the other person. In the Inattentive condition the person had no effect on the task performance but there was still evidence that subjects were making less movements and were talking to themselves less.

Similar results have been found elsewhere, but only with the particular behaviours measured (Berger et al., 1981, 1982; Bond, 1982; Dabbs & Clower, 1973; Yarczower & Daruns, 1982). Berger et al. and Bond both reported that subjects made less overt rehearsals in the presence of the experimenter. Yarczower & Daruns found that children had less facial expression in the presence of an observer. Dabbs & Clower found less movement when the person was being stared at.

A number of questions can be asked about this phenomenon. First, is it just a laboratory effect concerned with keeping quiet during an experiment? Subjects may feel obliged to be silent during experiments. Second, is it related to evaluation effects or is it more general? Is it perhaps more an interpersonal accommodation phenomenon, keeping quiet so as not to disturb others around?

The effect could also be due to evaluation, conformity or self-presentation effects. If subjects feel evaluated by the presence of another person then they may keep quiet to concentrate more. This did not come out in Experiment 3, however, as there was no general task facilitation in these conditions. Rehearsal inhibition was correlated with performance in the studies of Berger et al. (1981, 1982).

Perhaps a more likely answer is that there are conventional rules for keeping some form of quiet with others around and subjects may conform to this in the presence of others. The functions for doing this could be many. It may be, as mentioned above, to stop disturbing the other person. It may also be to allow better monitoring of their behaviour. It might also be to give the other person no behaviours to evaluate. If subjects were to make movements or start talking to themselves then the other would have something to evaluate.

It is being suggested that there may be many ways to explain the effect found. How to test between them is a harder problem. The initial task of the present experiment was to try and replicate the result and to see how it might be related to evaluation effects. Experiment 5 did this. The second phase was to see if the effect could be replicated outside of the laboratory and to see how it may be related to conformity effects. Experiment 6 did this.

VII. 2. EXPERIMENT 5: THE EFFECT OF EVALUATION AND MERE PRESENCE ON TASK PERFORMANCE AND BEHAVIOUR INHIBITION

VII. 2.1. Introduction

The aim of Experiment 5 was to replicate the video results of Experiment 3 and to see whether evaluation plays a role in such effects. To this end the same video recording setting was used as for Experiment 3. As well, two levels of evaluation were induced through instructions. For one the subjects were led to believe that the experiment was only a pilot and the results would not be used. In another condition subjects were told that the results were important, that it was a test of memory ability to see how good they were, and that they would receive feedback afterwards.

To approximate a mere presence in the Low Evaluation condition, the confederate was made to read busily during the experiment. As was seen in the results of Geen (1973, 1974) and Deffenbacher et al. (1974) in Figure 4, there is little effect of a predictable person present. It was hoped that the evaluation from the instructions in the High Evaluation condition would still be strong. To help achieve this, the same recall task was used as had been used by Geen (1973, 1974) and Deffenbacher et al. (1974).

As a fourth condition, the mirror was used again, not as a distraction but as a means for subjects to see their movements. Although it had failed to influence task performance in Experiments 1 and 2, it was thought that it may influence bodily movements. If subjects could see themselves moving and fiddling and be constantly reminded of this then they may decrease those behaviours. It was put in a more salient position than had been done in the previous

experiments although it was not close and directly in front, as has been done in Self-Awareness research. It was thought that the distraction from this while subjects were trying to watch the screen would have confounded any other effects. This was not meant to be a test of Self-Awareness theory.

VII. 2.2. Method

VII. 2.2.1. Subjects

Subjects were 52 First Year Psychology students who volunteered to participate. There were 35 females and 17 males unsystematically distributed over the four cells. As no effects of sex were found the data have been collapsed. Subjects were recruited for a One Trial Memory experiment.

VII. 2.2.2. Apparatus

In the experimental room were a desk and chair at which the subjects sat, with a slide projector to the side. On the desk was a tape-recorder connected to the slide projector. In the corner on the other side of the subjects lay some boxes of paper and other junk, as well as a large mirror which either faced the subjects or faced the wall. Ostensibly it was another piece of junk. No subject questioned its presence.

Behind the subjects was a stool, on which sat the confederate. Along the wall on one side of the subject was a large glass window, which was completely covered from behind by black cloth, with a white curtain all the way along in front. This window adjoined another room which housed a video camera and video cassette recorder. These were

covered in black cloth except for the lens which was placed by the window. The subjects could be filmed with this from the waist up. The camera could not be seen from the experimental room, and no subject reported being suspicious. There was also a microphone in the ceiling so the video cassette could record the sounds.

VII. 2.2.3. Procedure

Subjects were randomly assigned to one of four conditions: Alone, Mirror, Low Evaluation, and High Evaluation. In the latter two conditions the subjects were greeted by the confederate who explained that the experimenter had been unexpectedly called away. In the other two conditions the experimenter ran all sessions. Subjects were taken to the experimental room and seated. It was explained that they would do a one-trial memory task for which they would learn pairs of nonsense syllables and numbers. They would see a nonsense syllable on the screen for 2s followed by the same nonsense syllable paired with a number for 2s.

They were told that they would then be given a test in which the syllables were shown and they would have to guess the number paired with this syllable. The syllables and most of the procedure were taken from Geen (1973). Subjects were then told how the tape-recorder ran the slide projector and that between presentation and test there would be a few questions to answer.

When the slides were finished, subjects were given a questionnaire of ten questions, all with 7-point scales. Two questions asked how much the subjects enjoyed the task and how well they thought they had done compared to others. Another five questions asked how stressed, calm, tense, stirred up and alert they had felt.

The other three questions asked how distracted they had felt, to what extent their attention had been on the task and how frequently their attention had been on something other than the task. In all cases the questionnaire imposed a gap of about 2 min between the presentation and the test, as Geen (1973) had done.

Following the questionnaire subjects were shown each of the nonsense syllables for 2s with a 4s blank between, during which they wrote their guesses on the back of the questionnaire. As for Geen (1973), these were shown in the same order as the presentation series. After this the subjects were told that they were one part of a study looking at differences in remembering abstract, nonsense and concrete words and were then dismissed. When all subjects had been run they were each contacted and told the real purpose of the experiment, especially the use of the video, and were guaranteed anonymity.

There were four manipulations on this basic procedure. In the Alone condition the experimenter left the room during the presentation and test series. This was the same for the Mirror condition except that the mirror was facing them from the side reflecting their whole body. This was salient, although no subject queried the purpose of the mirror being there. It seemed to be just part of the junk stored in the room.

In the Low Evaluation condition, the confederate stressed in explaining the task that he did not know much about the experiment and did not know the correct answers. He thought it was probably just a pilot experiment. In the High Evaluation condition the confederate stressed that it was a test of memory ability, so they should do as well as possible. It was important that the experimenter get a good idea of the subject's performance. It was also pointed out that the

test would be scored straight after it was finished so that subjects could find out how good they were.

In both of these conditions the confederate sat 4m behind and to the left of subjects and quietly read without looking at the subject. In both conditions the same male confederate was used.

VII. 2.3. Results

VII. 2.3.1. Task Performance Measures

The number of correct answers was analysed using a one-way analysis of variance with four conditions; Alone, Mirror, Low Evaluation and High Evaluation. The means and standard deviations are shown in Table 14. The analysis showed no significant difference in correct answers between the four groups, $F = 0.24$, $df = 3,48$, $p < 0.87$. Unlike Geen (1973), there was little effect of the social conditions on task performance measures.

VII. 2.3.2. Video Measures

The four manipulations did have a marked influence on the behaviour of the subjects. The video cassettes were scored for the number of large body movements such as moving the torso or sitting back in the chair; the number of smaller movements such as moving the head or hands; and the number of noises or vocalizations such as laughing, talking and sighs. The tapes were scored from the time the experimenter or confederate switched on the tape to the time it was switched off. In all cases this was very close to 1 min 30s.

To gain some idea of the reliability of these measures, 16 of the cassettes were scored twice, with at least three days between the

two ratings. The overall correlation was highly significant, $r = 0.87$, $df = 14$, $p < 0.001$. The correlations for body movements, small movements and vocalizations were 0.83, 0.89, and 0.82 respectively- all significant at the 0.001 level. On these and other grounds (Johnson & Pennypacker, 1980) multiple observers were not deemed necessary.

The results of body movements, small movements and vocalizations were analysed separately in analyses of variance. The mean values are given in Table 15 and they are represented graphically in Figure 12. Significant differences were found between the four social conditions for body movements, $F = 4.14$, $df = 3,48$, $p < 0.01$; small movements, $F = 7.82$, $df = 3,48$, $p < 0.001$; and vocalizations, $F = 6.73$, $df = 3,48$, $p < 0.001$. In each case a Newman-Keuls test at the 0.05 level showed a statistical separation of the Alone and Mirror conditions from the two Evaluation conditions.

So there was a difference between conditions for which subjects were alone and conditions in which someone was present. In each case there was a marked drop in the number of behaviours when the person was present. The scores for body movements, small movements and vocalizations were also used as covariates in the main recall measure analysis of variance. This made no difference to that analysis and no covariate was significant.

Correlations were computed between the number of correctly recalled digits and the three video measures. In each case the correlation was not significant. The values were -0.14, -0.21, and 0.07 for the body movements, small movements and vocalizations respectively ($N=52$). This means that there was no linear relationship between the movements and noises made and how well the subjects

Table 14. Means and standard deviations of the number of correctly recalled digits in Experiment 5 (n=13 in each cell).

	SOCIAL CONDITION			
	ALONE	MIRROR	LOW EVALUATION	HIGH EVALUATION
Mean	3.08	2.77	3.30	3.08
Standard Deviation	1.32	1.36	1.84	1.89

Table 15. Means for body movements, small movements and vocalizations in Experiment 5 (n=13 in each cell).

	SOCIAL CONDITION			
	ALONE	MIRROR	LOW EVALUATION	HIGH EVALUATION
Body Movements	1.77	1.69	0.77	0.85
Small Movements	3.69	3.08	1.61	1.00
Vocalizations	2.15	1.23	0.08	0.08

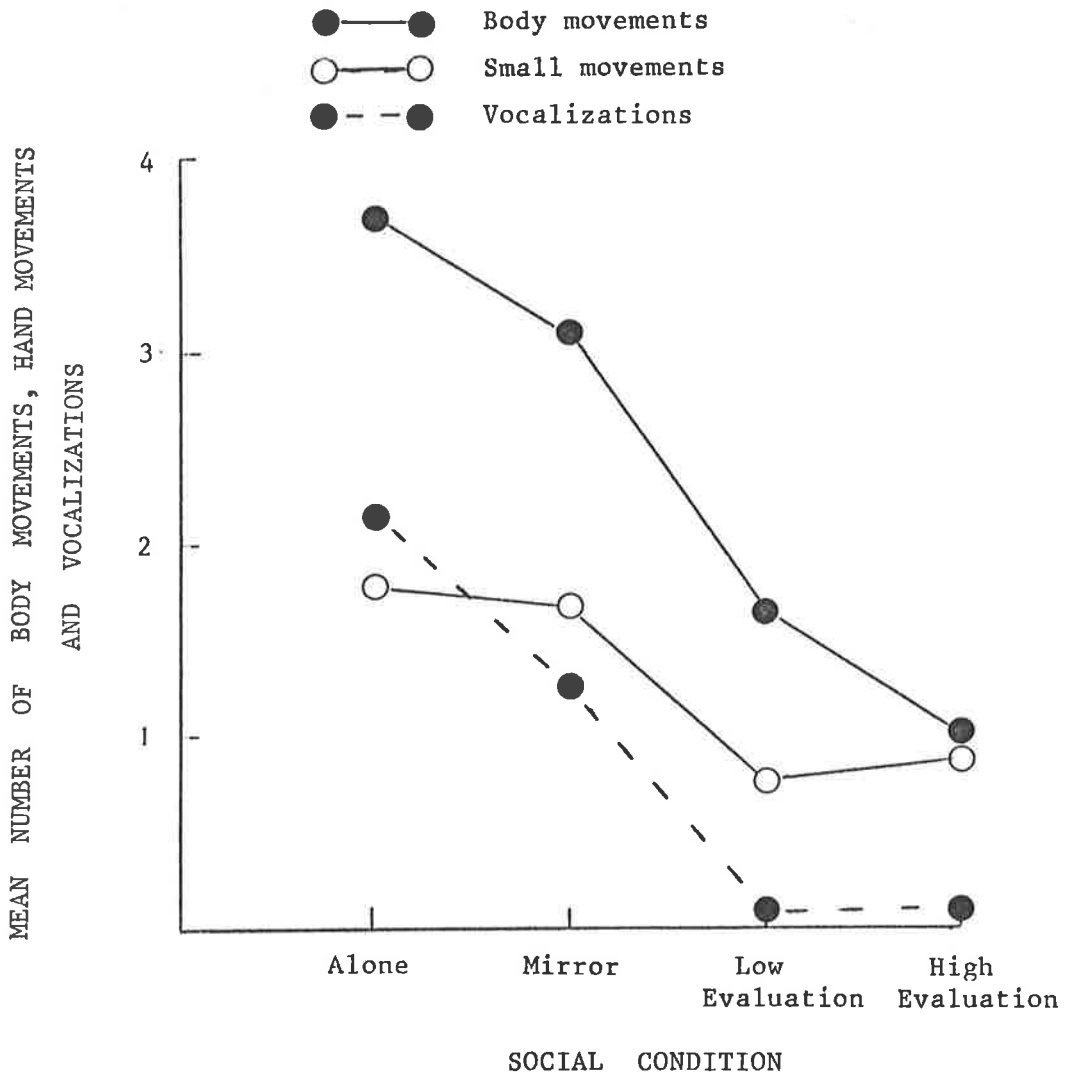

Figure 12. Means for body movements, small movements and vocalizations across social conditions for Experiment 5.

performed at the task.

The last result to note is that of all 52 subjects, only 3 overtly rehearsed, and they were all in the Alone condition.

VII. 2.3.3. Self-Report Measures

The ten self-report questions were put into an oblique factor analysis and three factors emerged. The first factor grouped four questions relating to arousal. Questions asking how stressed, tense, calm and stirred up the subjects felt loaded 0.81, 0.66, -0.74 and 0.80 respectively. It should be noted that the question asking how alert the subjects had felt did not load on this factor (-0.02).

The second factor grouped the questions asking to what extent their attention was on the task and how frequently they focussed on something other than the task with loadings of 0.80 and -0.79 respectively. The third factor grouped the questions asking how much they enjoyed the task, how calm they felt and how well they thought they had done compared to others with loadings of 0.73, 0.57, and 0.59 respectively. The two other questions asking how alert the subjects had felt and how distracted they felt loaded weakly on each of the three factors with no clear pattern emerging. The full factor analysis is given in Appendix 8.

Overall there seemed to be three factors of arousal, attention, and enjoyment/evaluation. No relationship was found though between these factors and the social conditions. Multivariate analyses of variance on each factor found no significant difference between the four conditions for any factor. The same was true of oneway analyses of variance on each of the factors with weighted or unweighted components and for each of the ten questions treated

separately. When each factor was used as a covariate in the main recall measure analysis of variance no change was found and no covariate was significant. So although there was some consistency in how subjects answered the questions, no differences between conditions were found.

VII. 2.4. Discussion

The main effect of a decrease in bodily movements and talking again came out very strongly. When in the presence of a passive person who was busy with other things the effect was still present. The results suggest that the person had no effect on task performance in the Low Evaluation condition. There was also no effect on performance in the High Evaluation condition, however. This suggests that the manipulation was not effective. It could be that even when performance is being evaluated, subjects need reminding of this by having someone watch them or by having someone there who may be watching them. This sort of interpretation is also indicated by the results of Miller et al. (1979) discussed in Chapter 4.

The mirror manipulation did not affect performance as had been hoped. Subjects may have been able to ignore it or else were not bothered by seeing themselves moving and talking. Again, self-report measures showed no relation to any of the conditions so these cannot tell us what was happening. Experiment 7 will examine the question of whether subjects may be answering such questions off the top of their heads, whether or not they could really introspect and get true answers.

A question that remains is the extent to which the reduction in body movements and vocalizations is due to the experimental

setting. Subjects know they are supposed to be working and so may keep quiet with someone else there. The confederate was also in a position to watch movements even if he was not interested in the performance. Experiment 3 had found less inhibition in the Inattentive condition, where the confederate could not check the movements. To test this a field experiment was carried out.

VII. 3. EXPERIMENT 6: A FIELD TEST OF BEHAVIOUR INHIBITION

VII. 3.1. Introduction

It is being suggested that if there is a reason for decreasing movements and vocalizations in the presence of others then this may only occur when the other persons can watch or at least check. This is consistent with the results of Experiments 3 and 5. When the confederate could check inhibition was found. When the confederate could not check (Inattentive condition) less effect was found.

To test the generality of the phenomenon and to investigate further the idea of the role of observation, a library setting was used for a field test. There should be in a library a strong norm of being quiet and not making distracting movements. Subjects were first observed alone to get a base measure of the number of body and small movements made. A confederate then sat either behind them or in front of them while the measures were taken again. Unfortunately, it was impossible to measure the subjects' vocalizations.

The test was made to find out first whether the behaviour inhibition extends outside of the laboratory; and second, whether the possible observation when the confederate sits behind produces different behaviour to when the confederate sits in front of the subjects. No attempt was made to answer the more difficult question of why subjects might inhibit their behaviour with the confederate present. Any of the explanations given above could account for the results.

VII. 3.2. Method

VII. 3.2.1. Subjects

Subjects were 42 students who were unobtrusively observed in the Barr Smith Library of the University of Adelaide, 32 males and 10 females. Of the 53 students approached 6 either left or had friends arrive in the first five minutes of observation. This happened for 5 more during the second five minutes of observation. Of the these five, 3 were in the Front condition and 2 in the Behind condition. The impression was that they did not leave because of the presence of the observer or confederate.

VII. 3.2.2. Procedure

At various times over a two month period students sitting in the library were observed for 10min. Subjects were chosen if they were sitting alone and working, with no one close around them. Because of this criterion, it was not possible to get equal ages and sex in the two condiitons. The study was conducted in various locations in the library. It was made over two months so that regular library users would not become suspicious. Care was taken that the same subject was not used twice.

Upon selection of a subject the observer sat at a good distance and observed the subject for 5 min. The observer had a few books, appeared to be working quietly and was always in a good position for unobtrusive observation. Measures were taken of large (torso) body movements, such as leaning back or stretching, and the number of smaller movements such as scratching, fiddling or gesturing.

No reliability checks could be made, of course, but the

observer had previous experience in these measures with high reliability (Chapters 6 and 7). It was not a hard or taxing task. It should also be noted that for the 5 min of observing the subject alone, the observer was blind to the experimental condition.

After five minutes of observation the observer signalled the confederate a short distance away who proceeded to act as if selecting a book and then sat near the subject in one of two positions. In the Behind condition the confederate sat directly behind the subject, facing the subject's back and quietly read the book. In the Front condition, the confederate sat in front of the subject facing away and again quietly read. The confederate did not look at the subject beyond an initial glance.

After 5 min of observation of body and small movements, the observer packed up and left, followed shortly after by the confederate. The observer also recorded the sex of each subject and whether the subject was of student age or older.

VII. 3.3. Results

The body and small movements were analysed separately in analyses of variance with repeated measures on the presence or absence of the confederate and with subjects nested under the two conditions. There were no main effects or interactions of either sex or age with either dependent variable so these have been collapsed. This was perhaps not surprising because of unequal cell sizes and the rough measure of age. A more reliable test may still find some difference here.

For body movements the only significant effect was a Presence X Condition interaction, $F = 4.49$, $df = 1,12$, $p < 0.05$. The main

effect of Presence did not quite reach significance, $F = 3.52$, $df = 1,12$, $p < 0.09$. For the small movements the only significant effect was again a Presence X Condition interaction, $F = 4.54$, $df = 1,12$, $p < 0.05$.

Table 16 gives the mean number of body and small movements for each condition. Figures 13 and 14 present these results graphically. For the Behind condition planned comparisons show a significant drop in the presence of the confederate for body movements, $t = 3.67$, $df = 20$, $p < 0.01$, and small movements, $t = 2.69$, $df = 20$, $p < 0.05$. No such drop was found when the confederate sat in front for body movements, $t = -0.25$. For small movements, there was a marginally significant increase with the confederate present in front, $t = -2.07$, $df = 20$, $p < 0.08$.

Two further comparisons showed significant differences between the confederate sitting behind and in front, for body movements, $t = 2.82$, $df = 40$, $p < 0.007$, and for small movements, $t = 2.46$, $df = 40$, $p < 0.02$.

VII. 4. GENERAL DISCUSSION OF BEHAVIOUR INHIBITION

These results suggest that behaviour inhibition in the presence of another person is a more general phenomenon than just a laboratory artifact. It occurred in a library setting but only when the confederate was able to observe the subjects from behind. When sitting in front there was no effect on body movements but something of an increase in small movements.

The results from Experiments 3, 5 and 6 seem to be explained most easily by control systems theory or self-presentation theory. When someone else is present then there is greater conformity to

Table 16. Mean number of body movements and small movements in Experiment 6.*

	SOCIAL CONDITION	
	ALONE	PRESENCE
Body Movements		
Front	2.52	2.62
Behind	2.81	1.24
Small Movements		
Front	3.81	4.81
Behind	3.81	2.81

* n=42, 21 in Front and 21 in Behind with repeated measures over social condition.

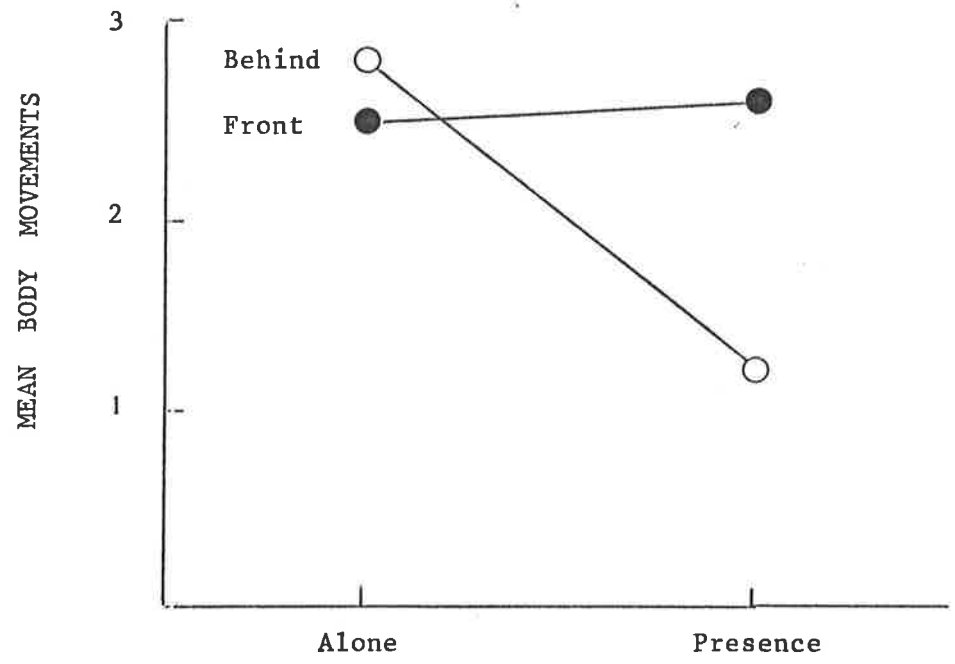

Figure 13. Mean body movements alone and with presence for the Front and Behind Conditions for Experiment 6.

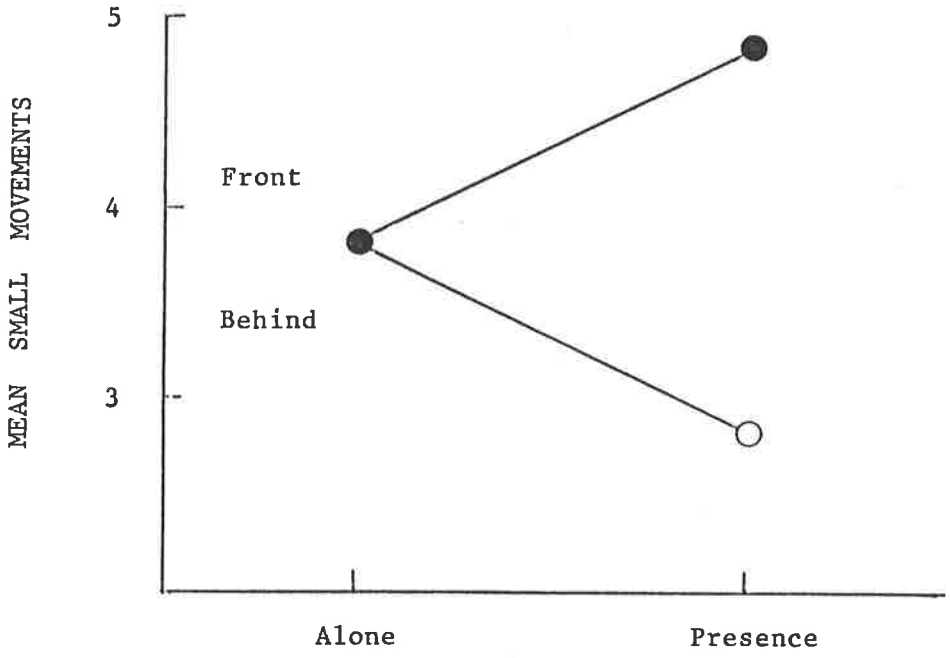

Figure 14. Mean small movements alone and with presence for the Front and Behind Conditions for Experiment 6.

standards of behaviour such as not being distracting in a library. This occurs only when the behaviours can be seen and evaluated as in the Behind condition. It has also been established is that it occurs outside the laboratory and that here too it requires observation to be effective.

Both the settings that have tested these effects have had strong norms concerning behaviour. In the laboratory subjects are expected to keep docile and just work; likewise in the library. What also needs to be tested are places without such norms such as a cafeteria or a party. If similar effects can be shown in such settings then there is reason to suggest that the inhibition phenomenon is more general still.

The general thrust being proposed is that the best explanation for the behaviour inhibition effects that have been found is by reference to social conformity. To gain social approval, people attempt to present themselves as well as possible. To do this one must keep in mind how others are evaluating and try to act in accordance with this. Often this means following standard patterns of behaviour- at least while being watched. At other times it might require acting imaginatively or independently and going against some normative behaviours, but only if approval is gained by being seen as imaginative or independent.

While this general approach is the best one at present it does make many assumptions about the nature of behaviour and the motives for behaving in a particular way. It is, however, perhaps the best framework for explaining the decrease in movements and vocalizations at the present time. Its main problem is its generality. It does not specify any conditions that allow people to act independently-

independently of what others think and how others evaluate.

There is another line of argument which suggests that the results could be due to alertness or to the possible threat from the person present. Many personal space studies, some in libraries, attest to the aversion subjects have for others sitting close by, especially where they cannot be watched (Barash, 1972, 1973; Felipe & Sommer, 1966; Fisher & Byrne, 1975; Hayduk, 1983). Subjects may keep still so they can more easily monitor the confederate's behaviour.

A more parsimonious explanation might reinterpret the personal space results in terms of behaviour standards. It is proposed that the results of Experiments 5 and 6, and the personal space literature might be explained in this way. There may be standard ways of behaving which subjects follow so as to avoid social disapproval. When someone sits too close they may be breaking a rule so the situation is aversive. This would account for rapid departures from such a situation (Barash, 1973). If the subjects are in a situation where they should be working, as in a library or laboratory, then they will keep quiet and still to give the impression of doing this.

Experiments 3, 5 and 6 have established that behaviour inhibition is a more general phenomenon than simply a reduction of rehearsal (Berger et al., 1982). They have also established that the effects are strongest when the person present is watching the subject. Mere presence is not as strong (Experiments 3 and 6). Experiment 6 found the same effects outside of the laboratory. The results seem best explained as subjects conforming with social coditions and standards so as to avoid social disapproval.

CHAPTER VIII.

THE MEDIATION OF MERE PRESENCE EFFECTS BY MONITORABILITY

VIII. 1. EXPERIMENT 7: INTRODUCTION

The final experiment of the present work tried three new methods to make a better test of mere presence effects. The first was a method of reducing evaluation effects. It has been mentioned earlier that the two ways of dealing with evaluation are to manipulate it and assume that the Low Evaluation condition most closely resembles mere presence, or to try and be rid of evaluation by the setting chosen. The first of these approaches was tried in Experiment 5 without success, as the manipulation did not seem to work. The second approach was attempted here.

The present experiment tried a new method. In this case, subjects were told that the person who would be present during the experiment was part of a 'blind experimenter' procedure (Rosenthal, 1966). The person was present to do the timing but did not know what the experiment was about or even what the task was that the subjects were doing. Further, it was emphasized that the person present was not allowed to know what it was all about. By this means it was not left to the subjects to infer for themselves that the person could not evaluate what they were doing- as all previous studies have done. It was made explicit that the person was not to know what the subjects were doing.

The second purpose of Experiment 7 was to test again the threat interpretation of mere presence effects. Some evidence was

suggested by Experiment 3 but an evaluation interpretation was also plausible. If evaluation could be reduced by the above-mentioned means then mere presence effects may be found.

To this end, some of the subjects worked at the task with the confederate sitting in front of them facing away. As for Experiment 3, no difference was expected between this condition and the Alone condition as subjects could easily monitor the confederate. For the other two conditions, two levels of threat and uncertainty were created. Specifically, for one group of subjects the confederate sat at a desk behind the subjects. This meant that subjects could not monitor him so effects on task performance were predicted. For the fourth condition the confederate sat behind the subject but without a desk between them. A stranger sitting in this position should be more threatening and produce a stronger response.

The third new method of Experiment 7 concerned the post-experimental questionnaires. It has been suggested from the results of Experiments 1, 2, 3, 4 and 5 that subjects may be answering off the top of their heads. As an initial attempt at testing this directly the procedure of similar studies was followed (Guerin & Innes, 1981; Nisbett & Bellows, 1977). As well as subjects with the confederate present answering questions about the effect of his presence, subjects in the Alone condition were asked to imagine that someone had been present and to answer the same questions. This corresponds to the 'observer prediction' condition of the two studies mentioned. Some of the questions from Experiments 1 to 5 were used, as well as some new ones directly asking about the effect of the confederate. It was expected that if subjects were answering off the top of their heads then the 'reports' of the Alone condition should be no different to those of the other three conditions.

VIII. 2. METHOD

VIII. 2.1. Subjects

Subjects were 48 First Year Psychology students who volunteered to participate. There were 18 males and 30 females randomly allocated over four conditions.

VIII. 2.2. Procedure

Subjects were met by the experimenter, taken to the experimental room and seated at a desk. It was explained that they would be doing a simple copying task. In front of them on the desk was a booklet consisting of pages of 100 double-boxes in five rows of 20. In the top boxes of each row a letter was printed. These were similar to the ones used in Experiment 4.

The subjects were asked to copy as many of these letters as possible in a short time into the blank box below until told to stop. They were shown two pages of questions at the back of the booklet to fill in when they stopped. They were finally instructed to come to the adjoining room when finished where the experimenter would be working. These instructions were aimed at assuring subjects in the Alone condition that they would be left completely alone and that the experimenter would not appear half way through. As was seen in Chapter 4, uncertainty in the experimenter's behaviour can influence the results (Geen, 1973, 1974).

On this basic procedure there were four conditions. In the Alone condition subjects were instructed to commence copying when the experimenter gave two knocks on the door after leaving the room, and to stop copying when the next two knocks came. As mentioned above,

they were then to fill in the questions and leave.

For the other three conditions subjects were briefly told about the purpose of blind experiments and how otherwise experimenters may unconsciously bias the results. For this reason, it was explained, someone else would be timing the experiment. This person would know nothing of the experiment and was not even allowed to know about the task. They would merely time the experiment and then leave. When the confederate had left the subjects were to fill in the questions and bring them to the experimenter who would be working in the adjoining room.

There were three conditions with these instructions. For the Front condition the subject's desk was directly behind another desk and chair at which the confederate sat facing away from the subject. In the Behind Desk condition these positions were reversed so the confederate sat behind the subject at a desk. In the Behind condition this was the same position but with the confederate's desk removed. In this case the confederate sat about 1.5m directly behind the subject but with nothing between them.

When subjects in these three conditions were sure of the procedure the experimenter brought in the confederate and immediately shut the door. The confederate told the subject to commence and timed them, after which they were told to stop. The confederate then left the room closing the door. In all three conditions the same male confederate was used. He remained silent throughout the test period.

All subjects were given 3 mins to copy letters as well as a line of 20 boxes for practice. The practice was done while the experimenter was present in the Alone condition and while the experimenter fetched the confederate in the other three conditions.

The simple copying task had been previously used in social facilitation research (Sanders et al., 1978). One modification was that on the first page of boxes, there were 7 short English words formed by the successive letters, such as 'fit' and 'not'. As will be outlined shortly, this was done to see how much attention subjects were paying to the letters.

Subjects were asked different questions to those previously used (Experiments 1 to 6). Five questions asked how alert, involved and bored the subjects felt, how much they thought their ability was being tested and what percentage of their attention was on the task. A further question asked subjects to recall as many words as they could which were formed by the successive letters on the first page of the copying task. This was aimed at a measure of spare cognitive capacity to see whether subjects in different conditions were more or less fully occupied by the task or by thinking about the confederate. Another method of testing this was also used. Subjects were asked what sorts of things they were thinking about during the experiment besides the task.

The final three questions asked how much subjects felt disturbed, evaluated and threatened by the person present. For those in the Alone condition, this was prefixed with: "Imagine that someone had been in the room with you during the experiment. Now answer these questions." A copy of the complete questionnaire is in Appendix 9.

VIII. 3. RESULTS

VIII. 3.1. Task Performance Results

Measures were taken of the number of letters copied in 3 mins and the number of mistakes. In line with previous work, errors were few with means of 0.9, 1.1, 1.0 and 0.75, for the Alone, Front, Behind Desk and Behind conditions respectively. There was no significant differences in errors between the four conditions, $F = 0.23$, $df = 3,44$, $p < 0.87$.

Although males and females had not been evenly distributed over the four cells the frequency distribution over cells was no different from chance level, Chi-Squared = 3.2, $df = 3$, $p < 0.36$. There were no significant main effects or interactions of the task with sex so the results have been collapsed.

Table 17 and Figure 15 present the means and standard deviations of the number of letters copied in each of the four conditions. A significant difference was found between the four conditions, $F = 3.19$, $df = 3,44$, $p < 0.03$. Planned orthogonal contrasts showed that the Alone and Front conditions combined were significantly different from the Behind and Behind Desk conditions combined, $t = 2.9$, $df = 44$, $p < 0.006$. The Alone and Front conditions were not different ($p < 0.40$) nor were the Behind and Behind Desk conditions ($p < 0.53$). Thus there was a separation of the two behind conditions from the Alone and Front conditions.

VIII. 3.2. Self-Report Measures

For the question asking what sorts of things the subjects thought about besides the task, thoughts were reported by 10, 4, 3 and

Table 17. Means and standard deviations of the number of letters copied in Experiment 7 (n=12 in each cell).

	SOCIAL CONDITION			
	ALONE	FRONT	BEHIND DESK	BEHIND
Mean	251.3	263.9	292.4	283.0
Standard Deviation	28.0	43.8	43.9	23.0

Table 18. Means of self-reported disturbance, threat and evaluation in Experiment 7 (n=12 in each cell).

	SOCIAL CONDITION			
	ALONE	FRONT	BEHIND DESK	BEHIND
Question				
Disturbance	4.1a	2.3b	1.9b	2.0b
Threat	3.3a	1.8a	2.3a	2.0a
Evaluation	4.1a	2.3b	3.3ba	1.9b

* Cells in a row with different subscripts are significantly different at the 0.05 level by a Newman-Keuls test.

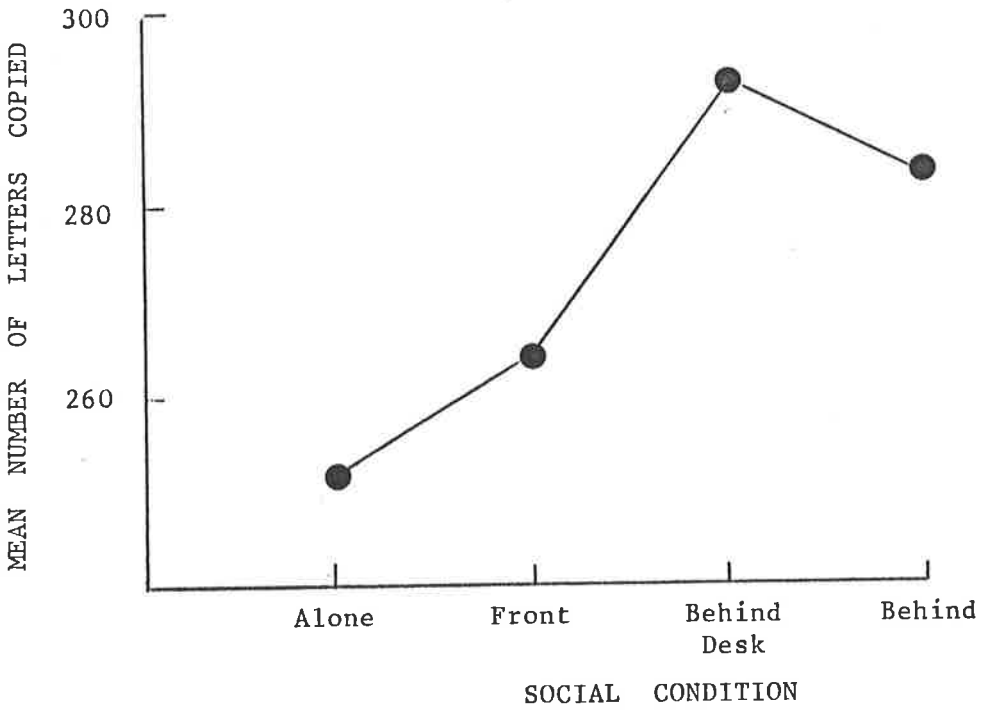

Figure 15. Mean number of letters copied across social conditions for Experiment 7.

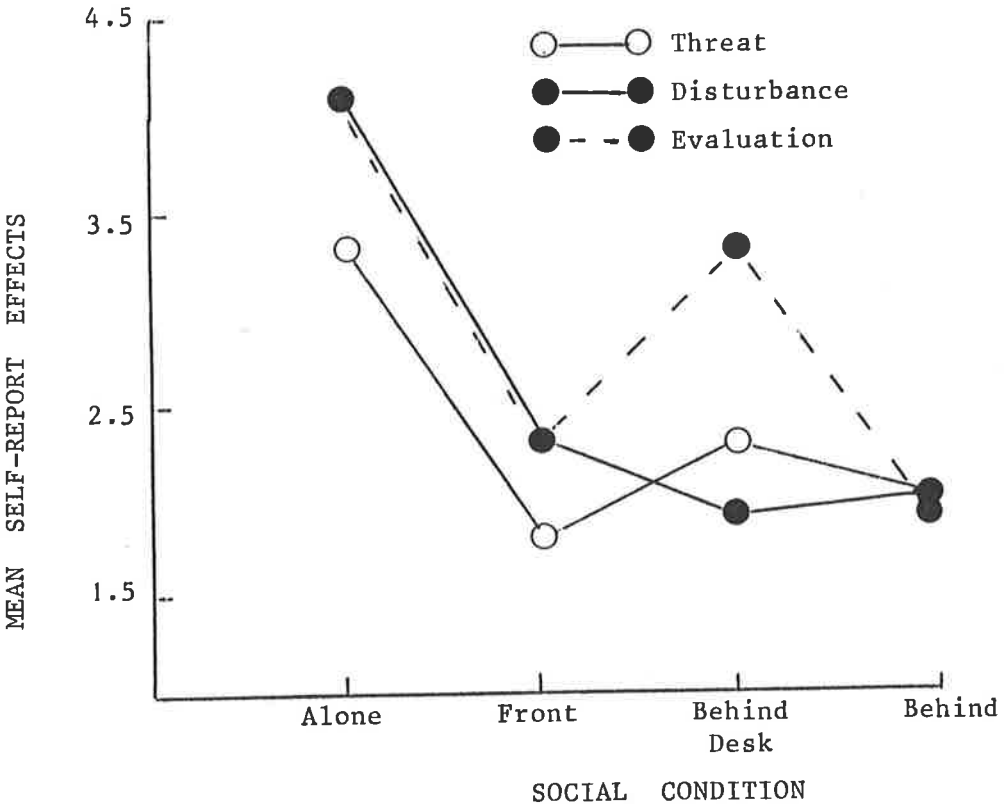

Figure 16. Mean self-report effects concerning the presence of another person across social conditions for Experiment 7.

zero subjects in the Alone, Front, Behind Desk and Behind conditions respectively. Although there looks like a difference here, the difference is only a chance one, Chi-Squared = 0.004. The impression given by subject's comments afterwards was that answering depended more on how quickly the subjects wished to leave rather than any true report of cognition.

The question asking how many English words there were on the first page of copying similarly showed no differences between the conditions. Only 12 of the 48 subjects noticed any of the words at all, 2, 5, 2, and 3, respectively, from the Alone, Front, Behind Desk and Behind conditions. Two subjects in the Front condition recalled 3 and 2 words apiece while the other 10 of the 12 recalled one word each. There was no significant difference in frequency of words recalled between conditions by a Chi-Squared test, $p < 0.63$.

The five other questions given to all subjects were analysed in separate oneway analyses of variance across the four conditions. None showed any significant differences between the conditions. The five questions were also put into a multivariate analysis of variance across conditions but no significant effect was found.

The last three questions asked subjects directly about the effect of the confederate's presence. Table 18 gives the mean values of these three questions across the four conditions. Figure 16 shows the values of these three scores. The question asking how threatened subjects felt by the confederate's presence showed no difference between conditions, $F = 1.62$, $df = 3,44$, $p < 0.19$.

There were differences, however, between the conditions for the questions asking how disturbed subjects felt, $F = 5.53$, $df = 3,44$, $p < 0.003$, and how evaluated they felt, $F = 3.72$, $df = 3,44$, $p < 0.02$. For the disturbance question, subjects in the Alone condition

rated themselves as more disturbed than subjects in the other three conditions, albeit in imagination. This was the same for the evaluation question except that there was no difference between the Alone and Behind Desk conditions. Both these felt, or imagined they would feel, more evaluated than the other two conditions. This was not significant though for the Behind Desk condition. This over-rating by the Alone subjects was also present as a trend in the Threat question.

These results show that the self-report measures are independent of the task scores. The reports of disturbance and evaluation in particular show a different pattern to the number of digits copied. This suggests that subjects are answering on some basis other than a correct self-report or that the questions have nothing to do with the task performance. It may be that subjects have little introspective awareness of their cognitive processes (Nisbett & Wilson, 1977) or that for other reasons, such as self-presentation, they choose to answer otherwise.

Unfortunately, the Alone subjects seemed to answer the question differently to all other conditions so their results do not tell much. Their question was different however, in asking for how they imagined they would feel. In informal talk with these subjects afterwards some said that they were not too sure of their answers because it would all depend upon where the person present sat and what they were doing there. This reflects that their questions as asked had a generality not shared in the other three conditions.

VIII. 4. DISCUSSION

The task performance results found a difference between the Alone and Front conditions and the two Behind conditions. It is suggested that this was due to the greater alertness of subjects in the latter two conditions for whom the confederate posed a greater threat. It could be argued that the results are due to the greater possible evaluation in the two Behind conditions. Against this it can be said that the manipulation made explicit to subjects that the confederate could not evaluate their performance.

The former explanation is preferred unless it can be shown that there is always evaluation in laboratory settings. It is sometimes argued that measuring task performance always involves evaluation. If this is so then all future studies will have to be field ones as no test in the laboratory can obviously satisfy such a criterion. It is also true, in reply to such arguments, that such evaluation would be present in Alone conditions as well.

The evidence that has been used by previous studies to show that the evaluation approach is not applicable has usually come with self-report measures. Doubt, however, has been placed on these. The present self-report measures unfortunately tell little about the role of introspection in such measures. The Alone subjects reported more (imagined) effect of the confederate than the three conditions with a real audience. This, of course, means that it is difficult to interpret.

The fact that subjects in the Front condition answered no differently from the other two 'presence' conditions, even though they performed differently, is suggestive. It may be that this shows that they are 'guessing' their answers but it might also show that the real

causes of the performance differences were not on the questionnaire. There is other evidence that subjects cannot report on the causes for their behaviour (Johnson, 1981; Nisbett & Ross, 1980).

The results of Experiments 3 and 7 suggest a role for the threat interpretation proposed in Chapter 3. After measures were taken to remove evaluation apprehension from the situations effects were found only when the subjects could not monitor the confederate or the confederate was watching them. This is in accordance with the results of the review of mere presence effects (Table 3). This seems especially clear in Experiment 7 for which the confederate knew nothing of the task and so evaluation could not take place. Any evaluation due to other causes would also have been present in the Alone condition.

That the threat and unpredictability effects were due to an increase in arousal level is harder to show. As pointed out in Chapter 2, physiological measures are doubtful for a number of reasons. It has also been suggested that self-reports are also doubtful. This of course means that there is no way, at present, of definitely placing the ultimate causes for social facilitation effects. It is suggested, though, that possible physical threat does mediate these causes.

CHAPTER IX

SUMMARY AND CONCLUSIONS

IX. I. THE THEORIES

It was shown in Chapter 3 that there has been a proliferation of theories concerning social facilitation. At least 16 theories are currently available, most developed since 1978. There might be several responses to deal with this large number. First, as in Chapter 3, the theories can be divided into sub-groups which share a similar theme. It was suggested that there may be effects due to changes in attention processes, effects due to conformity-like processes concerned with the valuations others make, and some drive or arousal based hard-wired effects.

A second response to the large number of theories of social facilitation is to try and combine some or to find plausible links and relations between them. This has been attempted in a model integrating the effects of mere presence, evaluation apprehension and distraction-conflict (Sanders, 1981). Unfortunately, most presentations of new models have either ignored most previous models or else assumed that the new model can completely explain the old model.

The review presented here suggested a number of links between theories. It was pointed out that there was little evidence that distraction and other attentional effects were causes in themselves and not epiphenomena of other processes. All of the other changes predicted to take place in the presence of another person also predict some sort of attention change. The only strong evidence for

distraction-conflict effects rested heavily on the correlation between performance and distraction (Sanders et al., 1978). This is equally consistent with an epiphenomenal view of distraction effects.

It is not being suggested that distraction effects are not important. Rather, the theories need to be refined and have the specific relations with other theories spelled out. It is likely that attentional overload plays a determining role in task performance under high time pressure but social facilitation effects have also been found with no time pressure. No specific predictions in these latter cases can be made by such a theory.

A second major link between theories concerned the most important social conformity theories. It was suggested first that each could explain any result that the other could, by making a new assumption. For example, with respect to the behaviour inhibition found in Experiments 3, 5 and 6, control systems theory could assume that there is a standard of not making extraneous movements when you are supposed to be doing a task. Self-presentation theory could assume either that people like to present themselves as studious and working at the task or that people keep still so as not to behave strangely in a new situation and appear as socially inept.

With both theories making similar predictions it was further suggested that they could be reconciled. Specifically, while control systems theory concentrated on the causal factors or the mechanisms for the effects, self-presentation theory concentrated on the functions of the behaviour changes: what might be gained by behaving in line with social standards. A further, little discussed, theory has suggested social approval (or at least avoidance of social disapproval) as a higher function of behaving in line with social

expectations (Ferris et al., 1978).

At this higher level, however, it is harder to make specific predictions of exactly how social approval may be gained in a particular situation. It is here that mechanistic theories become more useful, although they have trouble explaining why people would want to behave in line with social standards in the first place. So the theories can be viewed as quite compatible, each trying to get at the same phenomenon of greater conformity in the presence of others.

A third relation between theories was to suggest that one way of viewing a number of the social conformity theories was to see that they each implied that greater control is taken over behaviour in the presence of another person. In the presence of others there is more checking on behaviour standards, more self-presentation changes, more controlled processing of information and generally, greater care is taken over behaviour. Although this makes a nice conceptual generalization, there is little in the way of a general theory of controlled versus automatic behaviour which can be used, except in the case of attentional processes (Norman & Shallice, 1980; Schneider & Shiffren, 1977; Shiffren & Schneider, 1977).

The first approach taken above for dealing with the multitude of social facilitation theories was to put them into groups of similar content. The second approach was to suggest connections and relations between them. A third way that has been suggested is that there may, in fact, be several valid phenomena which need to be dealt with by a number of different theories. There may not be one theory which explains the social facilitation phenomenon nor a single theory which explains the many social facilitation phenomena.

On the basis of previous theories and some of the evidence it

was proposed that at least two groups of phenomena may be determined. The first were the supposedly innate or hard-wired effects which concerned initial reactions to the presence of others, mediated by an increase in arousal, alertness or drive. These effects are easily comparable to effects found in non-human animals and may show cross-species generality. For various reasons which specific theories delineate, just the immediate or mere presence of another animal is enough to cause some changes in alertness and general arousal.

The second group of phenomena have been dealt with above. These all concern the social valuation of behaviours which becomes effective when there is another person present. The general result is one of greater conformity to some social standards of behaviour in the presence of another person. This presumably is a learnt phenomenon and must involve the internalization of social norms during development by reinforcements, modeling and imitation. It is unlikely that this is a single phenomenon as people do not always seem to conform to social rules. So the conditions for its occurrence must still be spelt out by the theories.

A possible third phenomenon has been mentioned which may be present in some social facilitation situations. This is the effect of overloading cognition by distraction and time pressure. It must be made clear, however, whether a person's presence is a necessary component of this situation or whether it is just another overload which could as easily be replaced by a non-social distractor.

The other theories of social facilitation are either equally well explained by another model or else are specific to a particular situation. For example, evaluation apprehension seems to be specific to situations in which behaviour is particularly accountable to others, such as performing in front of observers or audiences or performing at an experimental task which is obviously being evaluated.

IX. 2. THE EXPERIMENTAL EVIDENCE

IX. 2.1 Mere Presence effects

Chapter 4 reviewed the social facilitation experimental literature and suggested again that there may be a number of social facilitation phenomena. There was strong evidence for the effects of a passive observer. This seems to be related to the ability of the observer to evaluate performance or at least provide approval or disapproval. There was good evidence again that the experimenter can have a particularly marked effect on behaviour, supporting the exclusion of studies which had the experimenter present in the Alone condition.

It was also suggested that the predictability of the experimenter's behaviour mediated these effects. Miller et al. (1979) found no effect from the presence of an Expert who could not see what the subjects were doing whereas there was an effect from the experimenter in the same situation. It may be that the presence of the experimenter is enough to remind subjects that their work will be evaluated but it might have been expected that the presence of an expert would also do this. It was suggested that it was the ability of the experimenter to move about and watch and the unpredictability of them doing just this, that led to the effects. The behaviour of the Expert may have been more restricted.

The evidence for mere presence effects was not as strong as the other two results. First, only half the studies conducting clear tests found effects. This was still consistent with the mere presence theory proposed in Chapter 3, however, which was based on conditions for perceived threat. This notion suggested that there was a mere

presence effect based on initial reactions or orientations to the presence of others, particularly strangers. The animal literature and the personal space literature are replete with examples of similar effects.

The problem with the mere presence literature has been, of course, that performing a task in the laboratory is likely to evoke evaluation effects in any case. If this is ignored there is good evidence for mere presence effects. Experiment 1 found effects on a motor task when the confederate was not watching but was not necessarily going to stay seated and busy. The possible evaluation from just performing a motor pursuit task cannot, however, really be ignored.

A similar argument can be made for Experiment 3. Here effects were found only when the subject could not watch the person present or when the person present was watching them. Although the confederate in the Behind condition could have moved slightly to evaluate the subject's performance, this was more difficult in the Looking condition. The confederate could not see the terminal screen and was seated behind a desk. In this case the staring may have been enough to cause effects.

In any event there is not strong evidence for a threat interpretation of mere presence in Experiment 3. Experiment 4 found some effect of manipulating familiarity although it was suggested that all subjects may have felt familiar through a common fate. Some differences were found between an audience setting and a coaction setting. This was consistent with the threat model: persons not engaged in another activity are less predictable in their behaviour and should have a greater influence on task performance. It may also

be that audiences are in a better position to evaluate performance and so have more effect, except that in Experiment 4 the person present was facing away from the subject and could not watch them.

It was suggested that there are at least two ways of reducing evaluation effects in the design of mere presence studies. One was to vary evaluation level and see what happened at the lower levels; the other was to try and reduce evaluation directly by instructions and manipulations. Both of these were tried.

Experiment 5 tried to manipulate two levels of evaluation. Unfortunately, the main task showed no effect of either level. In hindsight, comparing the results of this study with those using the same task in Figure 4, the results fall in line with other studies where the Alone condition was no different from the Presence condition. It has already been suggested that the reason for this was that the person present in each case was seen to be busy. This predictability of their behaviour may have reduced the effects. In Experiment 5, similarly, the confederate had been instructed to read quietly and not disturb the subject.

Experiment 7 tried to reduce evaluation by setting up a siuation whereby subjects could be explicitly told that the confederate present was not allowed to know even what task was being used. Other experiments have left it to the subject to infer that evaluation is not possible. This procedure made it quite explicit. Another attempt was made to test the threat hypothesis by arguing that a confederate directly behind the subjects would be more threatening than one behind the subject but with a desk between. Again, it was predicted that a confederate sitting in front facing away would have little effect. Care was also taken that the subjects in the Alone

condition would not think that the experimenter might barge in halfway through the session.

Experiment 7 found a strong facilitation effect for both conditions in which the confederate sat behind. The confederate sitting in front was no different to working alone. In this case it is much harder to argue that the confederate behind could evaluate while the confederate in front could not. As far as subjects were aware the confederate did not know enough about the experiment to make any evaluation. So the effects must be due to the uncertainty in the confederate's behaviour when behind or perhaps the same effect of staring as in the Looking condition in Experiment 3.

It might still be argued that there is evaluation implicit in the whole laboratory setting. If this is so then field studies would appear to be the only solution, although they raise problems of their own.

Perhaps more importantly, the question arises of how one could possibly check for evaluation effects to actually find out if they are present. The only real solution is to get subjects to report afterwards. To find this out by experimental manipulation would require one condition set up with evaluation and one without- to test for a difference. The setting up of the evaluation-less condition is, however, the crux of the whole matter. The question of using self-report measures will be addressed shortly.

In summary, the question of mere presence effects is left open to some extent. Reliable cases of there being no effect of a passive confederate sitting in front but facing away have been shown (Experiments 3 & 7) so mere presence alone is not a sufficient cause of the effects. Beyond this, the results still depend upon how much

evaluation is present in the situation. Experiment 7 and Markus (1978) both seemingly reduced it to a low level and still found effects. It has been suggested above that to show more than this may require self-report data on perceived evaluation.

As far as the drive and arousal construct go the present series of experiments did not directly test for this. It was pointed out in the review of Chapter 3 that the status of both concepts was doubtful. The best approach recommended was an exploratory one, trying to find relations between different physiological measures (Moore & Baron, 1983). For this reason no direct test of arousal was made. It was only inferred, in line with the rest of the literature, that arousal was mediating the effects found. They could, however, be due to a number of processes. Hopefully, the promise of new advances in physiological measures may provide something more definite on this issue.

IX. 2.2 Self-report measures

The factor analysis of the Experiment 1 questionnaire showed high consistency between answering question but no relation between the answers and the experimental effects. This could, of course, be because the questions were not tapping the important mediating variables of the effects. The questions, however, were mostly taken from previous studies which had found effects and so the same procedure and most of the same questions were used for Experiments 2, 3, 4, and 5. With one exception, the same finding was there-consistency in answers but no relationship to the task performance.

The one exception was in Experiment 3, where the distraction questions showed a similar pattern to the study from which they were

taken (Baron et al., 1978). This only occurred for the Looking condition, however, which had the same experimental set-up as Baron et al. who used this correlation of self-reported distraction and task performance to argue that the distraction caused the performance changes. In Experiment 3, on the other hand, similar performance changes were found in the Behind condition although subjects did not rate this as a highly distracting situation.

This suggests, first of all, that the distraction may only be a epiphenomenon of other processes and not the cause in itself. It also leads to the question of why subjects reported high distraction in this condition.

It was proposed that subjects may be answering self-report questions off the top of their heads, based on salient features of the situation and demand characteristics of the experimental procedure. Having someone seated in front watching must surely be rated as distracting by most people whether or not it actually has any measurable effect on task performance. This is less likely in the case of the confederate sitting behind, especially if subjects take distraction to mean visual distraction.

As a first attempt at testing this notion, Experiment 7 had subjects in the Alone condition rate the imagined influence of someone being in the room with them. This did not work, however, as Alone subjects rated more imagined effects than those who were actually affected in the three Presence conditions. Subjects queried what the person would be doing in the room and where they would be sitting. So for a better test, Alone subjects would need to be given more precise details of the person's whereabouts. The results of Experiment 7 do not go against the hypothesis as a proper test was not made.

One result which did favour the top of the head hypothesis was that subjects in the Front condition, who were not affected by the presence of the confederate, gave the same self-reported disturbance as the other two presence conditons. This does perhaps imply that they were not giving correct introspections. However, a proper test has not yet been made.

IX. 2.3 Behaviour Inhibition

An unexpected finding in Experiment 3 was the reduction in body movements and vocalizations. In the presence of an unattending passive person the frequency of these behaviours dropped. This result was replicated in the laboratory in Experiment 5 and in a field setting in Experiment 6. The result seems quite clear. The explanation for it is less clear.

Although it seems to occur in a mere presence setting, it seems not to be the a result of the same process as produced the task performance changes in the mere presence situation. Whereas the Inattentive condition of Experiment 3 showed behaviour inhibition, albeit weaker, it did not show any task performance effects. Likewise, no task performance effects were found in Experiment 5, but strong behaviour inhibition effects were found.

A number of explanations for the effect are possible, and there is little in the data to decide between them. It could be that subjects present themselves in this way, either to avoid social disapproval by not making any foolish or inappropriate behaviours or comments, or to gain social approval, by appearing as studious and getting on with the task in hand.

The control systems perspective of claiming that there must be

a social standard of keeping still and quiet is less plausible and less useful, although it may be true within the laboratory situation and the library situation. The function for behaving in line with these standards would be the social approval posited by self-presentation theories. It may also be that to gain social approval the subjects imitate the behaviour of the confederate, who was sitting quietly and working in each case.

Another explanation for behaviour inhibition is that subjects wish to monitor the other person for particular reasons and this is easier done if they keep quiet and still. They may wish to monitor to see whether the person is evaluating them, to monitor them for possible threat, or to keep predicting their behaviour. There are no data to decide between these.

Of interest in connection with behaviour inhibition is the reduced rehearsal found in the presence of others (Berger et al., 1981, 1982). It seems that the phenomenon may be broader than just rehearsal of task material. Many behaviours may be inhibited by the presence of others, at least in the present settings. Clearly, more work needs to done on this to discover the generality of the finding and the mediating causes.

IX. 3. CONCLUSIONS

The overall conclusions must be similar to those made of Dashiell's (1935) work in Chapter 2. There has been a great deal of conceptual development and delineation of possible variables involved in social facilitation effects but little clean data. Common design faults are given in Chapter 4 and most critical tests of models fail to take into account all possible sources of variance and all possible

interpretations. It is suggested again that there are several social facilitation phenomena and so critical tests cannot possibly deal with all of these.

What this means is that future models and theories should be more strict in giving their scope conditions (Freese, 1980). That is, conditions under which the theory does or does not apply should be specified. For example, Distraction-Conflict theory has been suggested to apply only under time stress, although the particular types of time stress are not specified. It is mostly left in the air as to whether social comparison is a necessary or sufficient condition as well as time urgency.

With many phenomena present the particular circumstances of each need to be spelt out. This was partially attempted by Sanders (1981) but his model tried to join three other models to explain one effect. The suggestion here is that theorising should work towards showing how one or other effect predominates in a particular setting and how one or more theories can be used at the same time or at different times. There can be threat reactions taking place at the same time as self-presentation changes. Finding the theory of social facilitation would now appear to be a fruitless and misplaced project.

This means that to pursue mere presence effects, as conceptualized here, the conditions for alertness and threat need to be delineated clearly. A number of these have already been suggested in Chapter 3. There was indirect evidence in Experiment 3 that staring or close observation played a role in the effects. Likewise there is enough indirect evidence and interpretations in Chapter 4 to implicate the predictability of the other's behaviour as being important in causing effects with a passive person present (Zajonc,

1972, 1980). So some idea is already possible for the conditions for mere presence effects.

With regards to social conformity influences, the conditions for this have been suggested in discussion to coincide with the conditions for social approval or social disapproval. As mentioned earlier this is rather general and more specific predictions will need to be drawn out with respect to particular settings. The present theories deal mainly with avoiding social disapproval from the experimenter. This needs to be expanded. Whether this requires new theories or adaptations of the old theories remains to be seen. A lot of work in other areas of psychology, notably reinforcement theories concerned with social approval, should provide a background for this.

LIST OF APPENDICES

Appendix 1. Post-experimental questionnaire for Experiment 1.

Please circle your answer.

1.	How much did you enjoy this task?	+3 very enjoyable	+2	+1	0 undecided	-1	-2	-3 no at all enjoyable
2.	How stressful was the task?	+3 very stressful	+2	+1	0 undecided	-1	-2	-3 not at all stressful
3.	How well do you think you did compared to others?	+3 better than most others	+2	+1	0 same as others	-1	-2	-3 worse than most others
4.	How tense were you in this task?	+3 very tense	+2	+1	0 undecided	-1	-2	-3 not at all tense
5.	How distracted did you feel?	+3 very distracted	+2	+1	0 undecided	-1	-2	-3 not at all distracted
6.	To what extent was your attention focussed on the learning task?	+3 not at all	+2	+1	0 somewhat	-1	-2	-3 totally
7.	How frequently did your attention focus on something other than the task?	+3 very frequently	+2	+1	0 sometimes	-1	-2	-3 never
8.	How calm did you feel during the task?	+3 not at all	+2	+1	0 undecided	-1	-2	-3 very calm
9.	How stirred up did you feel during the experiment?	+3 very stirred up	+2	+1	0 undecided	-1	-2	-3 not at all stirred up
10.	How aroused did you feel during the experiment?	+3 very aroused	+2	+1	0 undecided	-1	-2	-3 not at all aroused

Appendix 2. Factor loadings from oblique factor analysis of self-report questionnaire for Experiment 1.

QUESTION	FACTOR 1	FACTOR 2	FACTOR 3
Enjoy	.10	.01	- .40
Stress	.78	- .36	.23
Comparison	- .02	- .48	.02
Tense	.85	.10	- .08
Distraction	.16	.47	.66
Attention on Task	.27	- .50	- .35
Attention off Task	- .13	.87	.20
Calm	- .81	.02	.14
Stirred	.89	- .01	- .02
Aroused	.59	- .26	- .27

Appendix 3. Words used for Word Association Task of Experiment 2: First five words used as fillers only - words with an asterisk indicate a double meaning (coarse) word.

chair
dog
book
guitar
cup
doctor
message
discord
gullet
oboe
grocer
oven
* skull
morning
circus
basin
story
tourist
mermaid
* limp
biscuit
table
* jade
glory
hermit
stanza
relic
fetish
author
window
* bull
oyster
wickets
* crabs
building
forest
preview
omen
tortoise
region
order
* root
office
minstrel
garden
* pull
colour
* sock
carbon
decoy
welfare
* hump
caucus
panic
* homo
buffoon
traitor
dinner
* screw
bramble
* come
monsoon
oxide
* butch
business
farthing
oatmeal
lorry
wafer
reason
* grass
placard
sofa
woman
paper
* acid
* letter
belief
tempest
sequel
wisdom
* gay
dogma
curfew
* leather

Appendix 4. ANOVA for each measure of Word Association Task (Experiment 2) across three levels of Social Condition (d.f. = 2,42).

	Between MS	F Ratio	F Probability
Missing	0.69	0.39	0.68
Zeros	46.07	4.20	0.02
Threes	64.09	2.85	0.069
Ninety	7.47	0.36	0.70
First Norm Score	66.29	0.08	0.93
Overall Norm Score	93.40	0.19	0.83
First Rank Frequency	3.26	2.02	0.15
Overall Rank Frequency	1.16	0.84	0.44
First Mean Frequency	5.67	2.20	0.12
Overall Mean Frequency	2.76	1.78	0.18
Unique Ranks	46.29	1.87	0.17
Unique Frequencies	30.96	0.98	0.39
English Frequency	7027.6	1.72	0.19
Coarse	13.76	1.05	0.36
Talk	5.96	1.24	0.30
Mean Latency	1144.5	0.56	0.578
Coarse Latency	10.21	0.043	0.958

Appendix 5. Factor loadings from oblique factor analysis of self-report questionnaire for Experiment 2.

QUESTION	FACTOR 1	FACTOR 2	FACTOR 3
Enjoy	- 0.17	0.25	- 0.06
Stress	0.90	0.11	- 0.16
Comparison	- 0.23	0.28	0.29
Tense	0.77	- 0.11	0.14
Distraction	0.18	- 0.52	0.16
Attention on Task	- 0.01	0.41	0.12
Attention off Task	- 0.20	- 0.90	- 0.03
Calm	- 0.97	0.03	- 0.03
Stirred	0.66	- 0.03	0.16
Aroused	0.09	0.02	0.78

Appendix 6. Factor loadings from oblique factor analysis of self-report questionnaire for Experiment 3.

QUESTION	FACTOR 1	FACTOR 2	FACTOR 3
Enjoy	0.05	0.00	0.68
Stress	0.65	- 0.01	0.01
Comparison	- 0.07	0.08	0.57
Tense	0.76	0.09	0.17
Distraction	0.15	0.52	- 0.20
Attention on Task	0.03	- 0.56	- 0.07
Attention off Task	- 0.01	0.80	0.01
Calm	- 0.73	0.12	0.15
Stirred	0.78	0.10	- 0.10
Evaluated	0.06	- 0.15	- 0.33

Appendix 7. ANOVA for number of letters copied, Arousal measure and Distraction measure for Experiment 4 across three levels of Social Condition.

	df	MS	F Ratio	F Probability
Letters Copied				
Familiarity	1	0.41	3.80	0.053
Type of Audience	2	0.051	0.47	0.627
Complexity	2	94.18	871.17	0.001
Familiarity x Audience	2	0.47	4.31	0.015
Familiarity x Complexity	2	0.25	2.30	0.103
Audience x Complexity	4	0.05	0.45	0.770
Familiarity x Audience x Complexity	4	0.16	1.48	0.208
Arousal				
Familiarity	1	13.96	0.32	0.571
Type of Audience	2	33.76	0.78	0.460
Complexity	2	597.44	13.79	0.001
Familiarity x Audience	2	5.45	0.13	0.882
Familiarity x Complexity	2	187.41	4.33	0.014
Audience x Complexity	4	6.93	0.16	0.958
Familiarity x Audience x Complexity	4	31.45	0.73	0.575
Distraction				
Familiarity	1	0.32	0.03	0.874
Type of Audience	2	33.62	2.68	0.071
Complexity	2	22.31	1.78	0.171
Familiarity x Audience	2	5.53	0.44	0.644
Familiarity x Complexity	2	5.10	0.41	0.667
Audience x Complexity	4	19.76	1.58	0.182
Familiarity x Audience x Complexity	4	19.16	1.53	0.195

Appendix 8. Factor loadings from oblique factor analysis of self-report questionnaire for Experiment 5.

QUESTION	FACTOR 1	FACTOR 2	FACTOR 3
Enjoy	- 0.26	0.31	0.73
Stress	0.81	- 0.12	- 0.33
Comparison	- 0.23	0.16	0.59
Tense	0.66	- 0.31	- 0.35
Distraction	0.50	- 0.35	- 0.43
Attention on Task	- 0.22	0.80	0.23
Attention off Task	0.33	- 0.79	- 0.21
Calm	- 0.74	0.44	0.57
Stirred	0.80	- 0.17	- 0.06
Alert	- 0.02	0.35	0.26

Appendix 9. Post-experimental questionnaire for Experiment 7.

1. How involved were you in the task?

-3	-2	-1	0	+1	+2	+3
not at all		not much		somewhat		completely

2. How much do you think your ability was being tested?

-3	-2	-1	0	+1	+2	+3
not at all		not much		somewhat		a lot

3. How bored or interested were you?

-3	-2	-1	0	+1	+2	+3
very bored		a little bored		interested		very interested

4. About how much of your attention went on the task?

5%	20%	35%	50%	65%	80%	95%

5. Can you remember what sorts of things you were also thinking about besides the task?

_____

_____

_____

_____

6. How awake or alert did you feel?

-3	-2	-1	0	+1	+2	+3
not at all		not much		somewhat		very alert

7. Can you remember whether successive letters you copied on the <u>first</u> page you did formed English words.

Can't remember
There were none
There were some, but don't know how many
Only one of them
About 3 of them
About 5 of them
About 8 of them
About 10 of them
About 12 of them
More than 12
Other .....

(Please do not guess at a figure - answer <u>just</u> what you can remember.)

Appendix 9. cont.

8. Can you remember any of these words? Write them.

_____

_____

9. Any other comments?

_____

_____

_____

Appendix 9. cont.

A) This page was a separate sheet given to subjects in the Behind, Behind Desk and Front conditions.

1. How much do you think the person disturbed you?

-3	-2	-1	0	+1	+2	+3
not at all		not much		somewhat		a lot

2. Did you feel worried or threatened by them being there?

-3	-2	-1	0	+1	+2	+3
not at all		not much		somewhat		a lot

3. How much do you think they were judging or evaluating you?

-3	-2	-1	0	+1	+2	+3
not at all		not much		somewhat		a lot

4. Any other comments?

_____

_____

_____

_____

Appendix 9. cont.

B) This page was a separate sheet given to subjects in the Alone condition.

Imagine that someone had been in the room with you during the experiment. Now answer these questions.

1. How much do you think the person disturbed you?

-3	-2	-1	0	+1	+2	+3
not at all		not much		somewhat		a lot

2. Did you feel worried or threatened by them being there?

-3	-2	-1	0	+1	+2	+3
not at all		not much		somewhat		a lot

3. How much do you think they were judging or evaluating you?

-3	-2	-1	0	+1	+2	+3
not at all		nit much		somewhat		a lot

4. Any other comments?

_____

_____

_____

_____

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Note

One examiner of this thesis has recommended that the term 'physical threat' be replaced by 'psyschological threat' on pages xi, 135, 208 and elsewhere.