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Subjects' perception of and responses to punishment: A study of perceived severity of the punishing stimulus, perceived locus of control, and perceived control over the punishing stimulus

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SUBJECTS' PERCEPTION OF AND RESPONSES TO PUNISHMENT: A STUDY OF PERCEIVED SEVERITY OF THE PUNISHING STIMULUS, PERCEIVED LOCUS OF CONTROL, AND PERCEIVED CONTROL OVER THE PUNISHING STIMULUS.

A thesis submitted in fulfilment of the requirements for the award of the degree of

MASTER OF ARTS

from

THE UNIVERSITY OF WOLLONGONG

by

Hilary A. Maitland, B.A. (Hons.)
I wish to thank my supervisor, Professor A.M. Clarke, The University of Wollongong, for the assistance and advice he gave me during the preparation of this thesis. I also wish to thank Associate Professor L. Viney, The University of Wollongong, for her helpful comments on the draft of the thesis and, Mr. D. Cornford and Mr. S. Harrison (both at The University of Wollongong) for their assistance with statistical problems. Finally, I wish to acknowledge the assistance given by the Illawarra County Council who manufactured the apparatus necessary for the study.
This study was designed to investigate whether there is any relationship between the recipient's subjective perceptions of the punishment situation and the effect the punishing stimulus will have upon the recipient's overt behaviour. The subjects were 49 female and 52 male first year students from the University of Wollongong. The experiment was conducted in two sound attenuated cubicles one containing the subjects' response panel, table chair and two speakers, the other containing the experimenter's response panel, table and chairs. Each subject participated individually completing the I-E Scale (Rotter, 1966) followed by a cross modality matching task and then the practice, learning and punishment trials for the button pressing task they were required to perform twice. Following each punishment phase the subject rated the punishing stimuli (strobe light and throbbing noise) on five separate rating scales.

The results of the investigation revealed a main effect that internally oriented individuals took longer to cease responding than externally oriented individuals and that as a subsidiary result, the punishing stimulus was rated less severely following its use as a punishment than when it had been presented prior to punishment. The results also revealed that the relationship between the recipient's subjective rating of the severity of the punishing stimulus and recipient's responding in the punishment situation was not a direct one, as was hypothesised, but appeared to be modified by the recipient's level of perceived locus of control.
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CHAPTER 1

THE IMPORTANCE OF SUBJECTIVE PERCEPTIONS
IN THE PUNISHMENT SITUATION

Punishment has been employed for centuries in an attempt to control both human and infrahuman behaviour. More recently, researchers have attempted both to define punishment and to investigate the punishment situation in general. Researchers have been especially interested in discovering how the different behavioural aspects of the punishment situation interact to produce variations in the effectiveness of particular punishments. For example, varying the nature, the intensity, the duration and the timing of the punishing stimulus have been found to produce variations in the effect the punishing stimulus will have upon overt behaviour (see Azrin, 1959; Hake, Azrin and Oxford, 1967; Cheyne, 1971.)

The majority of investigations into the effectiveness of punishment, however, have been concerned only with the effect the punishing stimulus will have upon overt behaviour. A review of the literature reveals that very few studies (if any, especially with human recipients) have attempted to discover whether the recipient's subjective perceptions of the punishment situation (especially of the punishing stimulus) will influence the effectiveness of the punishment.

Bowers' (1973) comments on situationism in general are relevant to this lack of investigation into subject variables in the punishment situation.
Bowers (1973) critically analysed the current trend in psychology "to account for human behaviour...in terms of the situation in which it occurs," (p. 307) at the expense of organismic determinants of behaviour. Very often, Bowers (1973) comments, situationists (especially S-R supporters) imply that "individual differences are reducible...to the cummulative impact of empirical differences in the situation," (p.310), that is, the environment accounts for behaviour. Bowers (1973) suggests, however, that there are problems with this approach (metaphysical, psychological and methodological).

Bowers (1973) also criticized trait psychologists who took the opposite approach to situationism implying that person variables were far more important than situation variables. He suggested that research that has investigated the magnitude of person and situational influences on behaviour reveal that "...the person and the situation are codeterminers of behaviour," (p.322).

Bowers (1973) concluded by arguing in favour of an "interactionist (or biocognitive)" approach which "fully recognizes that whatever main effects do emerge will depend entirely upon the particular sample of settings and individuals under consideration," (p.327), and that "situations are as much a function of the person as the person's behaviour is a function of the situation," (p.327).
It seems reasonable to suggest that the perceptions of the recipient are a person or subject variable which could play an important role in the punishment situation. For example: in a classroom situation in which children are verbally reprimanded for displaying inappropriate behaviour, the teacher may discover that some children respond to this form of punishment by ceasing their inappropriate behaviour whilst others may persist, paying no attention until some other form of punishment is introduced. This type of situation and many other everyday experiences would suggest that it is possible for a particular stimulus to be perceived as being punishing by one individual but not by another.

Furthermore it is suggested that the degree to which the punishing stimulus is perceived to be unpleasant or punishing will also influence the effectiveness of a particular punisher being employed with a particular individual. To extend the illustration used before: the children in the classroom situation may vary in the way they perceive the punishing stimulus of verbal rebuke so that some may respond immediately by ceasing their inappropriate behaviour, others may persist for a short time before ceasing their inappropriate behaviour, while others will not react in the desired way at all. In this illustration those individuals who reacted in the desired way immediately may be considered to have perceived the punishing stimulus as more unpleasant than those who persisted for a while before reacting in the desired way. The latter individuals may only have perceived
the stimulus to be mildly unpleasant. Finally, those who persist in the undesired behaviour without any alteration could be considered as having not perceived the punishing stimulus as unpleasant (or punishing) at all.

Variations in subjective perceptions of the punishment situation, especially with human recipients, may indeed have far reaching consequences. This may (as it has been suggested) explain why some stimuli are effective punishers with some individuals but not with other individuals. Furthermore, it may help to explain why a particular punishing stimulus is effective in suppressing undesired behaviour in one situation with a particular individual but not in another situation with the same individual.

Knowledge of the way in which the individual perceives various prospective punishing stimuli would be very useful in many situations especially those in which the individual administering the punishment will spend considerable time and effort with a particular recipient, for example, in the home, classroom and institutions. In such situations the authority figure is likely to become reasonably well acquainted with the recipient. Knowledge of the recipient's perceptions with regard to individual punishers would make it possible for the punisher to select punishments to be used with a particular recipient on the basis of their appropriateness and effectiveness with that individual recipient rather than on the basis of some arbitrary measure of effectiveness in general.
This will effect both the nature and intensity of the punishing stimulus.

Since it would appear that the subjective perceptions of the recipient in relation to the punishing stimulus employed in the punishment situation is of considerable importance but has been largely ignored by investigators, it would seem to be an area which still requires empirical investigation. Related to this is the attempt of Maitland and Clarke (1980) to define punishment in a way that would include a consideration of the recipient's subjective perceptions of the punishment situation. They stressed this aspect when they suggested that the punishment situation should be discomforting or displeasing to the recipient.

Related to the above discussion of the importance of subjective perceptions of the punishment situation is the possibility that there are variables other than the recipients' perceptions of the punishing stimulus which combine to produce the recipient's overall perception of the punishment situation. One such variable is perceived locus of control. However, research with regard to perceived locus of control in relation to punishment is scarce.

Another variable which may influence responding in the punishment situation is the recipients' perceptions of control over the punishing stimulus. This variable may effect the way in which the recipient perceives the punishing stimulus with regard to its aversiveness or severity. Researchers, however, have not investigated the effects of control over the aversive stimulus in the
punishment situation, especially in relation to how it effects perceptions of the punishing stimulus.

The aim, therefore, of the following review of the literature is to attempt to discover whether there is any relationship between the recipient's subjective perceptions of the punishment situation (including severity of the punishing stimulus, perceived locus of control, and perceived control over the punishing stimulus) and the effect the punishing stimulus will have on the recipient's overt behaviour.

The first section of this review (Chapter 2) will concentrate upon the literature in the area of punishment to demonstrate that the recipient's subjective perceptions of the punishment situation are important but have been neglected in the research. The second section (Chapter 3) will review the research in the area of perceived locus of control in an attempt to both relate it to punishment and to reveal the neglect of the punishment situation in the perceived locus of control research. The third section (Chapter 4) will review the research in the area of perceived control in an attempt to demonstrate that it may affect subjective perceptions of unpleasant stimuli and responding in their presence. At the completion of this review it will then be possible to look in detail at an experiment designed specifically to make clearer the relationship between subjective perceptions (perceptions of the severity of the punishing stimulus, perceived locus of control and perceived control) and responding in the punishment situation.
CHAPTER 2

SUBJECTIVE PERCEPTIONS OF THE PUNISHING STIMULUS AND RESEARCH IN THE AREA OF PUNISHMENT

In a review of the various definitions of punishment proposed by different researchers, Maitland and Clarke (1980) concluded that none could be regarded as "totally adequate or sufficient" (p.1). The problem, they saw with the majority of definitions was that they did not provide a comprehensive picture of what was basically involved in punishment. The definitions emphasised the nature of the punishing stimulus and/or the effect the stimulus would have upon the punished response, however Maitland and Clarke (1980) suggested that this was not enough, that is, the recipients' perceptions with regard to the punishing stimulus should also be taken into consideration when defining punishment.

As a result, Maitland and Clarke (1980) proposed a definition of punishment which did take this aspect into consideration as well as the nature of the punishing stimulus and the effect the stimulus will have upon responding. They defined punishment as:

...a procedure which involves the occurrence of: (a) an external physical stimulus (such as an electric shock or a period of imprisonment) temporally contingent upon an overt response (such as bar pressing in a rat or bank robbing in a human being), and/or, (b) an internally aroused autonomic nervous system stimulus (such as sweating, increased heart rate and feelings of churning in the stomach) temporally contingent upon a covert response (such as the recall into memory of a previous hurtful event), which lead to feelings of physical and/or mental
discomfort by the recipient, resulting in the reduction of the probability of future occurrences of the response, that is, in its suppression. (p.7)

The definition would suggest that it is the feelings (subjective perceptions) aroused by the punishing stimulus which result in the suppression of the punished response (overt response).

No research so far has investigated the validity of Maitland and Clarke's (1980) assertion that the recipient's perceptions of the punishing stimulus (resulting in physical or mental discomfort) should be included in a definition of punishment. Furthermore, a review of the literature will reveal a lack of empirical investigations into the punishment procedure that have taken this aspect into consideration with either infrahuman or human recipients.

2.1. Empirical Investigations Involving Infrahuman Recipients

Researchers have attempted to investigate the punishment situation in general using a variety of infrahuman recipients and a variety of punishing stimuli (for example, Sears, 1974; Barrett, 1972; Quinsey, 1972; Dunham, 1972 and Bond, Blackman and Scruton, 1973). These researchers have generally found that stimuli, such as electric shock, are successful in suppressing the punished response.

Researchers have also concentrated on investigating specific aspects of the punishment situation. Studies investigating the effects of varying the intensity and duration of punishment have
generally found that suppression of punished responses is more successful at higher intensities and with longer durations (for example, Azrin, 1959; Brethower and Reynolds, 1962; Karsh, 1962; Holz and Azrin, 1963; Boroczi, Storms and Broen Jr., 1964; Boe, 1966; Hake, Azrin and Oxford, 1967; Azrin, 1970; Davison, 1970; and Todorov, 1971).

Studies investigating the effect of delaying the presentation of the punishing stimulus have shown that the effectiveness of the punishment is reduced as the delay is increased. This has been found by researchers such as Baron (1965), Camp, Raymond and Church (1967) and Solomon, Turner and Lessac (1968). Other researchers have demonstrated that different schedules of punishment have differing effects upon punished responses (for example, Azrin, Holz and Hake, 1963; Camp, Raymond and Church, 1966) while others have demonstrated that the effects of a punishing stimulus is influenced by the schedule of reinforcement employed to maintain the response undergoing punishment (for example, Azrin, 1959; and Azrin and Holz, 1961).

The research mentioned above has revealed the effectiveness of various stimuli as punishers. Furthermore, they have shown that this effectiveness may be reduced or enhanced by varying different aspects of the punishment procedure. Few studies have investigated the influence of subjective reactions on the part of the recipient upon responding in the punishment situation. Some investigators have attempted to take this into consideration by looking at emotional responses exhibited by infrahuman recipients
Baron (1965) mentioned qualitative observations of behaviour during punishment which could be considered evidence of emotional behaviour when investigating delayed punishment of a runway response with albino rats. He found that following a trial on which punishment occurred the rats were slow to leave the goal box and that on subsequent trials they made only tentative approaches to the goal box, until they entered the goal box and received punishment again. He suggests that,

...punishment provides the possibility of conditioning of emotional reactions to cues within the environment where punishment occurs. Subsequent entry into this environment would then result in the onset of immediate response - contingent conditioned punishment. (p.134)

He further suggested that such conditioned punishment may maintain the suppression of behaviour in situations in which the punishing stimulus is delayed.

Rachlin (1966, experiment 2) compared the emotional effects of mild shock with the behavioural effects of mild shock with pigeons. Rachlin (1966) found that the introduction of shock resulted in a drop in responding in the presence of the stimulus paired with punishment with subsequent recovery, however, that this recovery decreased as the experiment progressed. Rachlin (1966) saw the sharp suppression followed by recovery which occurred each time shock was introduced as a reflection of the emotional effect of the sudden shock. This he considered a temporary effect which was superseded by the more permanent
suppression of responses in the presence of shock. He concluded that the emotional effect of the mild shock could be considered independent of any correlation between the punishment and the punished responses, whereas, the more permanent behavioural effect depended on a correlation between the punishment and responses. However, he suggested that these two effects (emotional and behavioural) overlap.

Hoffman, Searle, Toffey and Kozma Jr. (1966) investigating the effect of electric shock upon distress calling in Peking ducks, found that immediately shock was introduced a burst of distress calls were emitted followed by an increase in key pecking behaviour which produced an imprinting stimulus (reinforcement). It would appear from these findings that exposure to the aversive stimulus initiated emotional behaviour and a seeking out of a "comforting" stimulus (the imprinting stimulus).

Solomon, Turner and Lessac (1968) investigating the effect of delay of punishment on resistance to temptation in beagle dogs commented on behaviour exhibited by the dogs which could be considered evidence of emotional reactions during training with the punishment and during the testing session. During training they found that the dogs in the immediate punishment group when brought into the training room after one or two previous punishment sessions would: slink around the room avoiding the experimenter and the food; urinate and defecate; avoid the forbidden (punished) food and hesitantly approach
the dry chow; and eat this quickly. Dogs in the intermediate delay group were also found to be hesitant in the approach and eating of the food they selected, and, in contrast to the no delay group, would sometimes touch the forbidden food before eating the chow. Finally, the longest delay group exhibited erratic behaviour, that is excitement upon entering the room followed by fearfulness (urinating, defecating and crawling on their bellies) while eating the chow. Dogs in this group also tended to snatch pieces of the forbidden food, running away from the experimenter to eat it.

During testing with the experimenter absent, the dogs trained with immediate punishment ate only dry chow and took several days before they eventually approached and ate the forbidden food. Dogs in the two delay groups were found to eat the chow and then approach the forbidden food sooner than the no delay group, however, they still exhibited the fearful behaviour while they ate whereas the no delay group did not.

Wong (1971) commented on the emotional behaviour exhibited by rats who were coerced (with shock) or punished (for exhibiting competing responses) in an attempt to make them run to a goal box. When discussing punishment training, Wong (1971) described approach to the goal box as fear motivated behaviour. He also commented that the fear response was not restricted to the runway. The rats resisted being placed in the start box and also resisted being taken from their home cages.

Finally, Barrett (1972, experiment 2) investigating the
effects of punishment, response independent shock and delayed shock on pole pecking (which produced an imprinting stimulus) in Peking ducks, recorded distress calls exhibited by these subjects. In the punishment condition he found that pole pecking was suppressed by shock, however, distress calls continued to be produced in the absence of the punishing stimulus, that is, the ducklings would approach the pole but would retreat to a corner and begin distress calling.

Studies like the above demonstrating that punishment does have an emotional effect upon the infrahuman recipient would suggest that subjective perceptions of the punishing stimulus influence the way in which the recipient responds to that stimulus. This argument is strengthened by the studies that have investigated punishment in the form of the withdrawal of positive reinforcement with infrahumans (for example, Ferster and Appel, 1961; Zimmerman and Ferster, 1963; Tolman and Mueller, 1964; Hoffman, Stratton and Newby, 1968; McMillan, 1969). In such studies the punishing stimuli cannot be considered physically painful to the recipient in the way that stimuli like electric shock are painful, however, they suppress behaviour in a similar fashion. Perhaps this is because the infrahuman recipient perceives the stimulus to be unpleasant (or, as Maitland and Clarke suggest, discomforting) because of its consequences even though it is not physically noxious.

Obviously, it would be difficult when dealing with infrahuman recipients to accurately measure the recipient's subjective
perceptions since it is impossible to ask such a recipient to
describe how the stimulus causes it to feel. However, despite
this, it may be possible to estimate such perceptions from
observing (as researchers mentioned earlier have done) in
detail the emotional behaviour exhibited by such recipients.
As well as this, emotional reactions within the recipient could
be studied by measuring changes in such behaviour as heart rate,
muscle tension, and vocalizations.

Perhaps the lack of consideration of this important aspect
of the punishment situation may stem from researchers' desires
to quantify behavioural reactions as accurately as possible.
As a result, those reactions which are difficult to control and
assess are often ignored. Even in those studies in which
emotional reactions are mentioned they are not usually described
in detail but rather in the form of a passing observation. This
problem is not restricted to investigations involving infrahuman
recipients. The following section will demonstrate that
investigations involving human recipients also suffer from the
same deficiency.

2.2. Empirical Investigations Involving Human Recipients

Researchers have investigated various aspects of the
punishment situation employing a variety of punishing stimuli
using human recipients. The studies employing externally
presented stimuli in general, have obtained similar findings
as those involving infrahuman recipients mentioned earlier, that
is, the suppression of the responses upon which the punishing
stimulus was contingent (for example, Tate and Baroff, 1966; Vogel-Sprott and Racinskas, 1969; Fraas, 1972; La Voie, 1973; Merbaum, 1973; and Singh, 1975).

As well as investigating punishment in general, researchers have examined specific aspects of the punishment situation. Researchers investigating varying the timing of punishment (immediate punishment versus delayed punishment) have found that punishment was less effective as the delay between the response and presentation of the punishing stimulus increased (for example, Banks and Vogel-Sprott, 1965; and Cheyne, 1971).

Researchers have also found that different schedules of punishment have different suppressive effects (for example, Crider, Schwartz and Shapiro, 1970; and Romanczyk, 1977). Finally, researchers have looked at the effect of introducing an alternative response into the punishment situation and have found that while the punished response is suppressed, responding on the alternative response often increases markedly (for example, Herman and Azrin, 1964; Paluck and Esser, 1971; and Perry and Parke, 1975).

The above studies employing human recipients with a variety of externally presented punishing stimuli demonstrate with human recipients, as with infrahuman recipients, the effectiveness of punishment as a technique for suppressing undesired behaviour (for example, stuttering, self injurious behaviour, hysterical fits and touching forbidden objects). They also show that this effectiveness can be reduced or enhanced by varying different
aspects of the punishment situation. Few studies employing externally presented stimuli have included a consideration of the subject's perceptions within the punishment situation, although some researchers have commented upon emotional reactions to the punishing stimulus.

Cheyne and Walters (1969) investigating the effects of intensity and timing of punishment as well as cognitive structure (in the instructions) on response inhibition looked at both behavioural effects and physiological reactions to punishment. The physiological (heart rate) data was obtained in order to investigate the emotional impact of the experimental manipulations. They found that during training with punishment the timing of punishment significantly affected startle responses to the punishing stimulus with subjects in the early punishment conditions exhibiting more startle responses than those in the late punishment conditions. They suggested that these responses reflected the subject's reaction to the sudden and unexpected punishing stimulus. They also examined heart-rate change scores associated with the response to deviation test to investigate subject's emotional reactions to deviation, finding that these were different depending on the training the subject had experienced especially with regard to cognitive structure.

Cheyne and Walters (1969) suggested that the physiological data for the high intensity - early punishment and high cognitive structure - late punishment groups imply that the response inhibition induced during the experiment may have been induced
in different ways (through emotional arousal or cognitive structuring respectively) even though the behavioural responses were very similar for both groups. They likened the emotionally induced inhibitions to fear controlled behaviour and the cognitively induced inhibition to guilt controlled behaviour.

Merbaum (1973) employing electric shock (via a prod) for self abusive behaviour in a twelve year old autistic boy, commented on the emotional reactions that the punishment of self hitting behaviour produced. Merbaum (1973) pointed out that to begin with, the child exhibited emotional reactions such as crying and fear of the prod while at the same time ceasing to hit himself for two hours while the prod was visible. Merbaum (1973) also commented that as training progressed and the child's mother administered the punishment at home, she indicated that the mere sight of the prod resulted in the boy behaving himself and not hitting himself.

Finally, Maier (1949) commented upon the importance of investigating the recipient's perceptions and emotional reactions within the punishment situation when discussing the problems involved in employing physical punishments with both infrahuman and human recipients. Maier (1949) believed that the problem with punishment was that it could serve as a stimulus for frustration which could prevent new learning of the desired behaviour occurring. He pointed out that,

...punishment given in a situation that permitted learning was less likely to frustrate than punishment given in an insoluble problem. (p.201)
Studies like the above which demonstrate that punishment leads to emotional behaviour within the human recipient would suggest that the subjective perceptions of the recipient are an important part of the punishment situation which may influence the effectiveness of the punishing stimulus and thus needs to be examined. Studies employing punishment in the form of the withdrawal of positive reinforcement with human recipients further supports this argument.

Research has been conducted for many years employing various forms of withdrawal of positive reinforcement (for example, time out and response cost) to eliminate undesirable behaviour in human beings (for example, stuttering, self injurious behaviour and disruptive behaviour). Consequently, various researchers (for example, Leitenberg, 1966) investigated whether or not such a procedure could be considered aversive or punishing. As a result, most researchers have agreed that the response contingent withdrawal of positive reinforcement (in the form of time out and response cost) does qualify as a punishing event (for example, Azrin and Holz, 1966; Leitenberg, 1966; Kanfer and Phillips, 1970; McBeath, 1973; McReynolds and Huston, 1971; Halvorson, 1971; Borresen, 1973; Constantine and Hoving, 1973; and Costello and Ferrer, 1976).

Those researchers that have found it ineffective as a punishment (for example, Holz, Azrin and Ayllon, 1963; Baron, Kaufman and Rakauskas, 1967; Doleys, Wells, Hobbs, Robert and Cortelli, 1976; and Solnick, Rincover and Peterson, 1977) have usually
attributed this to faults in the experimental procedure. These studies do not suggest that the withdrawal of positive reinforcement is not an effective punisher. They highlight that, as in situations employing so-called "aversive" stimuli such as electric shock, "...a punisher procedurally, is not necessarily a punisher functionally." (Costello and Ferrer, 1976, p.57). This last point hints at the possibility that there is more involved in the suppression of punished responses, namely, that the subjective perceptions of the recipient with regard to the punishing stimulus are an important aspect of the punishment situation.

Many researchers have demonstrated that the withdrawal of positive reinforcement (especially time out and response cost) is effective in suppressing (or eliminating entirely) the behaviour on which it is made response contingent and at the same time often enhancing appropriate behaviour. Time out and other forms of the withdrawal of positive reinforcement has been found effective in:

1) the treatment of stuttering (for example, Halvorson, 1971; Martin and Haroldson, 1977);
2) shaping verbal responses (for example, Blake and Moss, 1967; McReynolds and Huston, 1971);
3) the treatment of self-injurious behaviour (for example, Tate and Baroff, 1966; Hamilton, Stephens and Allen, 1967);
4) the treatment of fit behaviour (for example, Adams, Klinge and Keiser, 1963; Singh, 1975); and
5) the treatment of disruptive and aggressive behaviour (for example, Ayllon, 1963; Harris, Wolf and Baer, 1964; Burchard and Tyler, 1965; Tyler, Jr., and Brown, 1967; Bostow and Bailey, 1969; Wasik, Senn, Welsh and Cooper, 1969; Sibley, Abbot and Cooper, 1969; Barton, Guess, Garcia and Baer, 1970; Pendergrass, 1971; Clark, Rowbury, Baer and Baer, 1973; Drabman and Spitalnik, 1973; Whitehurst and Miller, 1973; Calhoun and Matherne, 1975).

Other researchers have investigated the effect of varying aspects of the time out and response cost procedures (for example Zimmerman and Baydan, 1963; Martin and Hasbrouck, 1977; and Verna, 1977).

The above studies employing the withdrawal of positive reinforcement, as mentioned earlier (and in the section dealing with studies involving infrahuman recipients) support the notion that the subjective perceptions of the recipient, especially with regard to the punishing stimulus, may be influential in the punishment situation. This support is related to the observation that the above time out and response cost studies demonstrate that it is possible for non-physically painful stimuli to be effective punishers. It is suggested that these non-physically painful stimuli may be effective as a result of the subjective responses (for example, feeling of discomfort) they may arouse within the recipient.

Some researchers have commented on these subjective responses when investigating the effect of the withdrawal of positive reinforcement. Tyler Jr. and Brown (1967) investigating the use of
time out with institutionalized delinquents, commented on the boys' reactions to being placed in the time out booth. They said that the boys accepted the consequences of being placed in the time out room. They suggested that this was because "...it was not a severe disgrace in the eyes of the group nor was it grounds for peer expressions of sympathy." (p.6)

Pendergrass (1971) investigated the effect of intermittent and continuous time out in suppressing the aggressive behaviour (hitting) of a five year old brain damaged girl. The girl was told not to hit following a hit and was then taken to the time out booth. Pendergrass (1971) mentioned that the subject "...developed strong emotional responses of trembling and crouching..." (p.79) when told not to hit which was followed by urinating in the time out chamber. The subject also spent long periods of time lying on the floor, face down, when not in the time out chamber during the continuous time out segments of the study.

Finally, McReynolds and Huston (1971) investigating token loss in speech initiation in two children finding it to be virtually ineffective, suggested that this could have been the result of emotional reactions of the subjects to the token loss. Subjects were found to squirm in their chair, face away from the experimenter, played with the chair, clothes or wall, while some self destructive behaviours, for example, hand biting, also occurred in one subject. These behaviours McReynolds and Huston (1971) suggested, were designed to terminate the punishing stimulus and as a result disrupted the training session.
These timeout studies investigating subjects emotional reactions support the notion that the effect of the punishing stimulus with human recipients is possibly mediated by the subjective perceptions of the recipient with regard to the punishing stimulus.

2.3. Concluding Remarks

The review of studies involving both infrahuman and human recipients have demonstrated that little research has been conducted to investigate the importance of the recipients subjective perceptions with regard to the punishing stimulus in the punishment situation. Studies employing the withdrawal of positive reinforcement and those mentioning the emotional reactions of recipients to the punishing stimulus, suggest that subjective perceptions may indeed influence responding in the punishment situation. It could be this aspect of the punishment situation, in part, which will result in a particular stimulus being punishing with one recipient but not with another in the same situation. Maier (1949), as mentioned earlier, also considered this one aspect of the punishment situation which could result in that situation becoming a frustration situation.

Clearly, this aspect of the punishment situation, which has not received adequate attention in the research up to date, needs to be examined further, especially with human recipients. Perhaps one reason why this has not occurred is that it is very difficult to obtain a reasonably valid and reliable measure of the recipient's subjective perceptions.
CHAPTER 3

PERCEIVED LOCUS OF CONTROL AND RESPONDING
IN THE PUNISHMENT SITUATION

The previous section focused on the suggestion that the recipient's subjective perceptions with regard to the punishment situation could be influential in determining how the recipient will react to a particular punishing stimulus. The possibility also was suggested that, if this is found to be the case, then other variables which may be related to or may influence these perceptions, could also be influential in determining how an individual recipient will react in a punishment situation. Perceived locus of control is one such variable that so far has received little attention from researchers in the area of punishment. The aim in this chapter, therefore, is to first define perceived locus of control and then to discuss the research in this area which implies that it is possible that perceived locus of control may influence how individual recipients respond in a punishment situation.

3.1. The Concept of Perceived Locus of Control

When discussing his research in the area of social learning theory, especially in relation to perceived locus of control Rotter (1971, p.37) stated that this research had originated as a result of his conviction that,

...the important factors in learning were not only the strength and frequency of rewards and punishments but also whether or not the person believed his behaviour produced the reward or punishment.
Rotter (1966) discussed in detail what he meant by internal and external control. He said that,

When a reinforcement is perceived by the subject as following some action of his own but not being entirely contingent upon his action, then in our culture, it is typically perceived as the result of luck, chance, fate, as under the control of powerful others, or as unpredictable because of the great complexity of the forces surrounding him. When the event is interpreted in this way we have labelled this a belief in external control. If the person perceives that the event is contingent upon his own behaviour or his own relatively permanent characteristics, we have termed this a belief in internal control. (p.1)

Other researchers (see Rotter, Seeman and Liverant, 1962; Gore and Rotter, 1963; Lefcourt, 1966; Davis and Phares, 1967; Phares, Ritchie and Davis, 1968; Doctor, 1971; Phares, Wilson and Klyver, 1971; and Davis and Davis, 1972) have also defined internal and external control in a similar way.

Lefcourt (1976) stressed that "the generalized expectancy of internal versus external control" (p.28) did not simply involve registering success and failure experiences, but rather that it involved how the causes of these experiences were interpreted by the individual. Rotter (1966, p.4) also emphasised this aspect when he stated that he was interested in "...whether or not an individual believes that his own behaviour, skills, or internal disposition determine what reinforcements he receives."

Rotter (1971;1975) and Lefcourt (1976) also emphasised that to divide people into internals and externals did not mean that there was a behavioural trait of perceived locus of control.
Rotter (1971, p. 58) pointed out that "...there is a continuum, and that persons have varying degrees of internality or externality." Lefcourt (1976, p. 141) developed this idea further when he said, with regard to perceived locus of control,

...it can be more fruitfully defined as a circumscribed self-appraisal pertaining to the degree to which individuals view themselves as having some causal role in determining specified events.

Before concluding this discussion of what is meant by internal and external locus of control it must be pointed out that some researchers (for example, Davis and Davis, 1972; and Rotter, 1971) have suggested that it may be possible to distinguish between two types of external individuals. "Defensive" externals, according to Davis and Davis (1972) are individuals who are identified as externals by their I-E scale scores but who behave more like internals in situations where failure is not a likely outcome. These externals, they suggest, have "adopted this orientation as a defence against failure." (p.133). The other group of externals (Rotter, 1971 called them "passive" externals) are individuals who are identified on the basis of their I-E scale scores and whose scores accurately reflect their life situation. They are, as Jolley and Speilberger (1973) suggest, true externals.

Having looked briefly at what the researchers define as perceived locus of control it will be possible in the following section to review the research in this area, especially as it may relate to the punishment situation. Lefcourt (1976) in
his review of the perceived locus of control research mentioned that investigators have looked at the origins, changes in, and assessment of perceived locus of control, as well as its role in resistance to influence attempts, cognitive activity, achievement and psychopathology. One thing that this review of the research into perceived locus of control has also revealed is the lack of research into perceived locus of control and its relationship to responding in a punishment situation.

3.2. Empirical Investigations In The Area of Perceived Locus Of Control Which are Relevant To The Punishment Situation

No known research has directly investigated whether perceived locus of control is a relevant variable that may influence responding in punishment situations. Studies investigating control and lack of control over aversive stimulation in relation to perceived locus of control are relevant in this area since they and punishment situations both employ aversive stimuli.

Siegel (1973) investigating the effects of perceived control and actual control over viewing unpleasant slides (pictures of people who died violently) found no support for her prediction of a positive correlation between perceived locus of control and reaction time, the latter being the means by which some groups of subjects could avoid viewing the slides.

Houston (1972) looking at the effect of perceived locus of control and control over stress upon responding in a stressful situation (threat of shock for making mistakes on the task) found that perceived locus of control was not related to the amount of
of stress (or anxiety) evidenced by the subjects however, that it interacted with treatment conditions. This interaction indicated that subjects performed best in those situations in which their perceived locus of control was congruent with the type of control in the particular situation in which they were tested, that is externals performed best in the conditions which involved the threat of unavoidable shock, whereas internals performed best in the conditions which involved the threat of avoidable shock.

Anderson, Hellriegel and Slocum, Jr. (1977) investigated coping behaviours in response to environmentally induced stress (flood damage) in relation to perceived locus of control. They found that internals perceived less stress than externals. They also found that internally oriented individuals were likely to employ coping behaviours which aimed at solving the problems they faced whereas externally oriented individuals were likely to employ coping behaviours aimed at dealing with the emotions (for example, tension) that the stress had created.

Finally, Lundberg and Frankenhaeuser (1978) investigating the effect of control and perceived locus of control in a situation in which the subject performed mental arithmetic whilst exposed to noise of varying intensities, found that perceived locus of control correlated with stress level. Specifically, internals tended to exhibit lower stress levels when they had control over the noise intensity than when they did not, whereas externals exhibited less stress when they did not have control
over the noise intensity.

These studies suggest that individuals classified as externals and those classified as internals may differ in their response to aversive situations. It is reasonable to suggest that they may also differ in their response to punishment situations, since these situations generally employ aversive stimuli. How the response of internals and externals may differ will be looked at in the following sections.

3.2.1. Studies in the areas of compliance and resistance to influence

Research conducted to investigate the way in which individuals identified as internal or external on various locus of control measures respond in situations in which attempts are made to change their behaviour or opinions are perhaps the most relevant to the punishment situation. The reason for this is that it is possible to view the traditional punishment investigations (employing human recipients) as involving situations in which the experimenter deliberately attempts to alter (or influence) the recipient's behaviour.

Rotter (1966, pp. 22-23) suggested,

It seems that internals would be more resistive to manipulation from the outside if, in fact, they are aware of such manipulation. If they were aware, they would feel deprived of some of their control of the environment. Externals expecting control from the outside would be less resistive.

Rotter (1966) also pointed out, however, that if the internally oriented individuals believed it was to their advantage to conform
then they would do so willingly. He referred to the work of Strickland (1962), Getter (1962) and Gore (1962) to support this view with regard to subtle influence attempts.

Strickland (1962, cited in Rotter, 1966) using a verbal conditioning paradigm found when looking at conditionability for aware subjects that those aware subjects who did not condition were more internal than the aware subjects who did condition. This research conducted by Strickland has been used by writers (for example, Rotter, 1966) to suggest that internals will react against covert or subtle influence attempts.

Strickland (1970) further investigated the performance if internals and externals in another experiment involving verbal conditioning. Strickland (1970) employed female university students and a modified version of the Taffel-type (1955) task to investigate the effect perceived locus of control, need for approval and intelligence may have upon verbal conditioning, extinction and awareness.

On the basis of her findings with regard to perceived locus of control Strickland (1970, p. 376) concluded,

The more external the subject the more likely she was to be amenable to influence by the experimenter, providing she was aware of the situation. Subjects characterised as internal tended to deny the influence of the experimenter and appeared to follow their own inclinations in regard to giving the correct responses.

This latter comment with regard to internals stems from Strickland's (1970) findings that: first, in the denied influence
group those females who did not condition were more likely to be internal than those females who conditioned (although this finding just failed to reach statistical significance at a generally accepted level); and second, this group showed a significant increase in the conditioned response at the end of the extinction trials. Lefcourt (1976, p.43) suggested that,

In essence, this small group of subjects seemed to say - "I know what you're trying to do to me and I'll show you that you can't make a fool out of me", in essence a reassertion of "I, the actor" and a denial of "me - the object of manipulation".

Strickland (1970), however, did not comment on the performance of internals and externals in any of the other groups that conditioned.

Getter (1966) also investigated perceived locus of control in a verbal conditioning experiment. He suggested that the performance of internally oriented individuals and externally oriented individuals may vary in such a situation as a result of their attitudes towards the experimenter's influence.

Getter's (1966) experiment involved male and female undergraduate students who were reinforced with "mm-hmm" and a nod from the experimenter whenever they emitted the desired response during the acquisition trials. Baseline trials (prior to acquisition) and extinction trials (following acquisition) were also included for these subjects as well as a separate control group.
Looking at the relationship between perceived locus of control and verbal conditioning, Getter (1966) found that subjects who conditioned during acquisition were more externally oriented than the other groups (non-conditioners, subjects who did not emit the conditioned response until during extinction, and conditioned extinguishers). He further found that subjects who did not emit the conditioned response until during extinction were the most internal group of all which supports the findings of Strickland (1970).

Getter (1966) concluded that these findings lend support to the suggestion that externals "...are more suggestible and dependent on cues from another person..." (p.104) than internals. As well as this he concluded that internally oriented individuals, 

...are apparently attuned to the reinforcement contingency, since increment eventually occurs, but they do not allow themselves to show it. It is only during the subsequent extinction trial when they feel 'on their own' that the conditioning is exhibited. (p.104)

Doctor (1971) was also concerned with investigating perceived locus of control and experimenter influence in a verbal conditioning experiment in which both subjects and experimenters were divided into internal and external individuals. Doctor (1971) found that external subjects emitted more reinforced responses than internal subjects. With regard to awareness and locus of control, Doctor (1971) found that the majority of performance gains in aware subjects were accounted for by the performance of aware external subjects. Aware internal subjects, he found
performed in a similar manner to controls and unaware subjects.

Finally, Trowbridge (1974) conducted a study into the effect of alcoholism and perceived locus of control on persistence during extinction trials following acquisition on a switch throwing task which could be considered relevant in this area. Trowbridge (1974) found that internal subjects exhibited significantly more responses during extinction than external subjects, indicating that internally oriented subjects persisted in exhibiting the previously reinforced response even though the reinforcement had been discontinued. This finding is consistent with those of Getter (1966) and Strickland (1970). Unfortunately, the subjects' performance on the acquisition trials was not examined in relation to perceived locus of control. If Trowbridge (1974) had found evidence of more trials to criterion for internal subjects during acquisition, this, together with the extinction findings, would have lent more support to the notion that internals tend to resist the influences of the experimenter.

Not all the research has revealed that internals are resistive to influence or are more likely to become aware during the verbal conditioning procedure. Baron (1969) investigating the effect of perceived locus of control and inter-trial activity upon awareness and performance in a Taffel-type verbal conditioning study found no evidence of internals being resistive to experimenter influence. Baron (1969) found that perceived locus of control had no effect on which subjects became aware of the reinforcement
contingency, or which subjects conditioned during the acquisition trials. Inter-trial activity was found to have a detrimental effect upon the conditioning of subjects, especially, subjects classified as externals.

Jolley and Spielberger (1973) investigated the influence of both perceived locus of control and anxiety upon performance in a verbal conditioning study similar to the one conducted by Strickland (1962). They found that both these variables had little influence on the incidence of subjects demonstrating awareness of the reinforcement contingency and that there was no support for the contention that internals resist influence in the verbal conditioning procedure. They found instead that perceived locus of control and anxiety interacted to influence the performance of subjects aware of the reinforcement contingency (high anxiety externals being more responsive to the reinforcement than high anxiety internals, while low anxiety internals were more responsive than low anxiety externals).

Jolley (1974) further investigated the effect of perceived locus of control and anxiety upon verbal conditioning performance, however, stress was introduced as an additional variable. Stress was induced by informing the subjects that the task was an intelligence test. Jolley (1974) found, as did Jolley and Spielberger (1973), that neither perceived locus of control nor anxiety were related to whether or not subjects became aware of the reinforcement contingency. She also found, as did Jolley and Spielberger (1973) (and contrary to Getter, 1966 and Strickland, 1970) that only aware
subjects conditioned and that subjects classified as internals or externals differed in performance depending on their level of anxiety. Furthermore she found that there was no significant difference in the percentage of internal and external subjects who denied being influenced (contrary to Strickland, 1970). Overall, aware subjects who admitted being influenced, regardless of their perceived locus of control, had the greatest increase in the reinforced response during acquisition.

Spikol (1975) investigated the effect of ambiguity upon verbal conditioning. Spikol (1975) hypothesized that the greatest difference in performance of subjects classified as internals or externals should occur when the task is extremely ambiguous. Using the Greenspoon (1955) procedure (because of its ambiguity in comparison with the Taffel-type verbal conditioning procedure) Spikol (1975) found that locus of control was not related to performance on the acquisition trials, that is, internals did not exhibit poorer performance than did externals.

Finally, Highlen and Nicholas (1979) looked at the effect of verbal conditioning and instructions upon subjects classified as internal and external in a counselling interview. They predicted that internal subjects would resist cues given to them via the instructions of the counselor whereas externals would utilise the information given to produce the desired response (self-disclosure). These instructions were combined with reinforcement for producing the desired response. They found, however, that both internal and external subjects were
equally responsive to the cues about the desired response provided by the counselor's instructions. This would suggest that internals were not resistive to influence in this situation.

When considering the above studies which appear to go against the findings of Getter (1966), Strickland (1970) and Doctor (1971), Rotter's (1966) comment that internally oriented individuals will conform willingly if they see that it is to their advantage to do so, should be kept in mind. This may help to explain the findings of Jolley (1974) and Highlen and Nicholas (1978).

In Jolley's (1974) study, subjects were led to believe that the task was an intelligence test and internals may have attempted to perform well on this task to give a good impression. This must be taken into account, especially, since the sample consisted of university students who would more than likely wish to appear fairly intelligent. Highlen and Nicholas' (1978) study involved a counseling situation and it is feasible to suggest that the subjects (undergraduate students) may have felt that it was to their advantage to do as the counselor's instructions suggested was appropriate.

The findings of Strickland (1962;1970), Getter (1966), Gore (1962) and Doctor (1971) have been taken by researchers (such as, Rotter, 1966; Ritchie and Phares, 1969; Joe, 1971; and more recently, Lefcourt, 1976) to indicate that under covert or subtle influence attempts, but not under overt or obvious attempts,
internals will react resistively. Biondo and MacDonald (1971), however, have disagreed with this conclusion.

Biondo and MacDonald (1971) questioned the assumption that under overt influence internals would not exhibit resistance (or reactance as they described it). They suggested that, first, overt influence, if it was not very strong, may not produce resistance in internals; and second, resistance in the presence of overt influence may be restricted to situations where the outcomes are important or relevant to the individual.

Biondo and MacDonald (1971) conducted an experiment with male and female undergraduate students in an attempt to compare the effect of low and high influence messages upon internals and externals with regard to rating change. Subjects rated a grading procedure on a ten point scale, and handed these back to the experimenter. Another individual was introduced to the subjects who handed out information sheets relating to the grading procedure they had just rated (these varied for level of influence; low, high or none) to them. Subjects were then asked to rate the grading procedure a second time on a ten point scale. The importance of the issue and the felt competence of the subjects was also assessed.

Biondo and MacDonald (1971) found that externals in both the low influence and high influence conditions were significantly conforming. Internals, however, in the high influence group reacted against the high influence message, whilst in the low influence group they did not react against the low influence message.
Lefcourt (1976) has criticised Biondo and MacDonald's (1971) procedure suggesting that in such a situation in which subjects are influenced to alter their ratings very rapidly without much consideration or debate, internals should resist regardless of whether the influence attempts is low or high. However, this still does not explain Biondo and MacDonald's assertion that low influence attempts were ineffective in producing resistance in internals.

Some studies looking at what Biondo and MacDonald (1971) call overt influence have not found subjects classified as internals to be more resistive to influence than subjects classified as externals. Gurtman (1974) investigated the effect of task feedback and overt influence messages in relation to perceived locus of control on performance at an electric dart game (with fifth grade children as subjects) and failed to support her prediction that internals with total feedback would resist the experimenter's attempt to influence their performance on subsequent trials. The task selected, however, may not have been appropriate for use with fifth graders, since such a task is usually very attractive to children of this age, and any assistance given to improve performance may have been viewed as helpful rather than an attempt to make the subject perform in a way in which they did not wish. Furthermore, the task itself enabled the subject to reinforce themselves since accurate performance led to high scores on the task. The subjects probably would have, as a result, found the task
rewarding, especially if they were successful at it, and would have used any information available in order to improve their success rate.

Finally, Egan (1975) investigating the effect of perceived locus of control on opinion change with third grade children found that externals did not exhibit more opinion change than internals. Other variables, for example, school attended and who administered the survey, accounted for any differences found.

The studies presented above in the area of verbal conditioning and opinion change demonstrate that there is evidence (Strickland, 1970; Getter, 1966; Doctor, 1971; and Biondo and MacDonald, 1971) that subjects classified as internals and externals react differently to attempts to influence their behaviour. The evidence, however, is far from conclusive as other researchers have pointed out (for example, Jolley and Spielberger, 1973 and Jolley, 1974).

Several studies, which were not looking directly at compliance on the part of externals and resistance to influence on the part of internals, have suggested that internals and externals may respond differently to experimental instructions. Lefcourt (1967) conducted an experiment employing undergraduate students to investigate whether behaviour related to external control could be altered by varying task instructions.

Lefcourt (1967) employed Rotter's Level of Aspiration Board task (1954) with both internal and external subjects. Three conditions in which instructions varied were employed (each condition
contained both internal and external subjects). Condition 1 was a low-cue condition with only the basic instructions regarding the task given to subjects. Condition 2 was a moderate-cue condition in which the task was described as a skill task with some importance placed on succeeding. Finally, condition 3, the high-cue condition, contained instructions which made the purpose of good performance very clear.

Lefcourt (1967) hypothesised that externals would behave more like internals in the condition which most clarified the purpose of the task. Internals, he suggested, would show little difference in performance as a function of clarified instructions. Lefcourt (1967) found that external subjects did exhibit a change in behaviour across conditions and actually surpassed the performance of internal subjects in the high-cue condition. Internal subjects, however, as hypothesised, performed fairly consistently across all three conditions. Lefcourt (1967, p.377) concluded that his finding,

...suggests that external control individuals may be extremely ready to benefit from external direction, more so than the internal control person who...already has decided what reinforcements are available.

Lefcourt, Lewis and Silverman (1968) conducted an experiment with male and female undergraduate students in which subjects performed the same task (Rotter's (1954) Level of Aspiration Board) but were given either chance or skill instructions. At the completion of the experiment subjects were required to answer a questionnaire which was designed to reveal their subjective
perceptions with regard to the experiment.

Analysing these questionnaires Lefcourt, Lewis and Silverman (1968) found that 70% of internal subjects and 60% of external subjects accepted the skill directions, while only 35% of internal subjects and 45% of external subjects accepted the chance instructions. Lefcourt, Lewis and Silverman (1968) concluded that internal subjects would more readily accept instructions emphasising skill when the task implied that skill could be involved. However, they would be less likely to be influenced by chance instructions if they perceived some sense of control in the task itself. Lefcourt (1976) when discussing this experiment suggested that,

...internals were less compliant than externals to directions which challenged their own more probable interpretations. (p.47).

The above studies looking specifically at the effect of the experimenter's instructions upon internal and external subjects reveal two important aspects. First, these studies demonstrate, as do the earlier studies mentioned with regard to compliance that those individuals identified as externally oriented on a measure of perceived locus of control tend to readily accept and comply with external influence. Second, these studies indicate that individuals identified as internals on such measures need not be resistive when confronted with influence from an external source. With regard to this latter point, Lefcourt (1976, p.44) suggested that perhaps "internals are not simply resistant to influence but are discriminating about what influences they will accept."
The research in this area of perceived locus of control, compliance and resistance to influence suggests that those individuals identified as externals on measures of perceived locus of control tend to be influenced by external sources and generally comply with this influence (for example, Getter, 1966; Strickland, 1970; Lefcourt, 1967; and Biondo and MacDonald, 1971). With regard to individuals identified as internals on measures of perceived locus of control, the research suggests three possibilities: first, that they may resist external influence, especially if they view it as a subtle attempt to alter their behaviour (for example, Getter, 1966; Strickland, 1962), although overt influence has been shown by Biondo and MacDonald (1971) to be resisted; or second, that they may not resist external influence, but rather they may ignore it and be unaffected by it (for example, Lefcourt, 1967; Lefcourt, Lewis and Silverman, 1968); or third, they may not wish to resist the external influence since it would not be to their advantage to do so (Rotter, 1966; Jolley, 1974; Highlen and Nicholas, 1978).

Having reviewed the research in the area of perceived locus of control, compliance and resistance to influence, it is now possible to relate the findings in this field more specifically to investigations in the area of punishment. It is difficult to say whether the influence exerted by the experimenter in the punishment situation via the response contingent application of the punishing stimulus (or the response contingent withdrawal of a positive reinforcer) could be considered, by the recipient,
as covert or overt. It seems reasonable to suggest that the punishment situation provides the recipient with a clearer perception of the connection between the recipient's responses and the punishing stimulus, than exists between responses and positive reinforcement in the verbal conditioning paradigms which have been used to investigate subtle influence.

As a result the punishment situation may be viewed as one in which the influence could be considered more overt than the influence exerted in verbal conditioning studies. However, whether this influence is as overt as the high influence message presented to subjects in the study conducted by Biondo and MacDonald (1971) is difficult to say.

With this in mind, it is suggested that the following behaviour may occur in the punishment situation. Externals, who have been shown to respond favourably to influence attempts, may be more responsive to the punishing stimulus than internals, that is, they may cease to respond with the behaviour upon which the punishing stimulus is made contingent in fewer trials than internals. If internally oriented subjects react against the influence exerted by the punisher, then it would be anticipated that, although they will probably cease exhibiting the punished response, as a result of the nature of the punishing stimulus, they may take longer to do this than externals.

3.2.2. Structure of the experimental situation

One problem that may arise when investigating perceived locus of control is related to the degree of structure in the
experimental situation since perceived locus of control is a
generalized expectancy. Rotter (1966) pointed out that
specific expectancies the individual may hold with regard to
"the causal nature of behaviour - outcome sequences in
different situations would also affect behaviour choice." (p.2).
He concluded that,

...the more clearly and uniformly a situation
is labelled as skill or luck determined, ... the
lesser the role such a generalized expectancy
would play in determining individual differences
in behaviour. (p.2).

Feather (1967) pointed out that the individual would be
assisted by specific situational cues in highly structured task
situations when trying to attribute responsibility for success
or failure. Feather (1967) suggested that an individual's
generalized expectancies about control might play a more
important role in situations that were more ambiguous. Du Cette
and Wolk (1972) believed that it was possible to mask any
relationship between a specific behaviour, a predictor variable
and perceived locus of control by either overstructuring the
task presented to the individual or by obtaining data from
repeated exposures with the same task.

Davis and Phares (1967) considered this problem when comparing
information seeking of internals and externals in ambiguous, skill
and chance situations. They suggested that if structuring the
situation lessened the importance of perceived locus of control,
then internals should seek more information than externals in the
ambiguous situation than in the chance and skill conditions.
Phares and Wilson (1972) when investigating responsibility attribution found no relationship between perceived locus of control and ambiguity of the situation.

The problem of task structure is relevant when investigating perceived locus of control and its relationship to performance in a punishment situation. In the punishment situation the recipient is provided with a reasonably clear indication of the connection between their responses and the punishing stimulus, especially in those situations in which the punishing stimulus is presented response contingently, with minimal delay and on a continuous schedule. The perceived connection between the punishing stimulus and the punished response, however, may become less distinct as the delay between responding and the presentation of the stimulus is increased, and when schedules are employed which allow many responses to occur which are not punished.

In punishment situations in which the connection between responding and the punishing stimulus is fairly clear, there are two possible effects that the structure within the situation may have on the influence of perceived locus of control. One possibility is that structuring the situation may, as some researchers suggest (for example, Rotter, 1966; Feather, 1967; and DuCette and Wolk, 1972), reduce the importance of perceived locus of control in this situation. This would result in a minimizing (or masking as DuCette and Wolk, 1972 suggest) of any differences that may exist between internally oriented and externally oriented individuals.

The other (more likely) possibility is related to the reports
mentioned previously dealing with compliance and resistance. The structure within the punishment situation may make it easier for externally oriented individuals to perceive the nature of the connection between their responses and the punishing stimulus which may assist them in complying with the demands of the experiment. With regard to the reaction of internally oriented individuals it is possible that the structure within the punishment situation may reinforce their view that the experimenter is attempting to manipulate their behaviour. As a result these individuals may react by resisting this influence.

It was suggested earlier, when introducing the concept of perceived locus of control, that perceived locus of control was one variable which may be related to, or may influence, an individual's perceptions (and hence, performance) in the punishment situation. The review of the research into compliance, resistance to influence, and the effect of structuring the experimental situation in relation to perceived locus of control provides some evidence for anticipating that individuals identified as internal or external on a measure of perceived locus of control may perform differently in a punishment situation.

On the basis of research into compliance and resistance to influence it has been suggested that externals, being compliant to external influence, would cease responding with the punished behaviour sooner than internals. The latter individuals, it has been reasoned, may resist the external influence in the punishment
situation, and may, therefore, be expected to take longer to cease responding with the punished behaviour. The research into structuring the experimental situation adds further credence to these hypotheses.

A more recent study conducted by Holmes and Jackson (1975) employed both positive reinforcement (positive feedback by the experimenter) and punishment (negative feedback by the experimenter) in an attempt to investigate the influence of perceived locus of control on interpersonal attraction and affective reactions. They found that their study supported the hypothesis that external subjects were more sensitive to punishment since external subjects exhibited more anger in the experimental situation.

The findings of Holmes and Jackson (1975), together with the other research mentioned above, suggests that it may be fruitful to investigate the relationship between perceived locus of control and responding in the punishment situation more thoroughly. Specifically, it would be worthwhile to investigate the validity of the hypotheses put forward earlier with regard to differences in performance in the punishment situation on the part of internal and external individuals. On the whole, the previous research in the area of perceived locus of control and reactions to punishment has largely been overlooked.
3.3. Three Issues Which May Affect The Investigation Of Perceived Locus Of Control

There are three issues that should be mentioned briefly before concluding this discussion of studies of the relationship between perceived locus of control and responding within the punishment situation. These variables relate to the problem of investigating perceived locus of control in general more than to investigating it in the punishment situation specifically. These are: first, whether there are differences between males and females in the area of perceived locus of control; second, the possible multidimensional nature of perceived locus of control; and third, the division of subjects into internals and externals on the basis of a score obtained on measures of perceived locus of control.

3.3.1. Sex differences in the area of perceived locus of control

Rotter (1966) presented the means and standard deviations for several different populations and concluded that sex differences were minimal except in the case of one population. Feather (1967) when correlating perceived locus of control with various other measures found, however, that in one group of subjects first year undergraduate females were significantly more external than the males in the same group, whereas this was reversed in the second group of subjects who were more mature age students. Feather (1967) concluded that this may suggest that differences in perceived locus of control found between males and females may be
dependent on the age of the subjects being investigated, and that a difference was more likely to occur with a younger sample, especially in the direction of greater externality for females.

Joe (1971) reviewing sex differences and the internal-external (I.E.) scale pointed out that studies like the one presented above found differences between males and females, with females tending to obtain more external scores than males. McGinnies, Nordholm, Ward and Bhanthunnavin (1974) obtained data with regard to perceived locus of control for both males and females in five countries. They found that the main effect of gender was significant with females obtaining more external scores than males, although only for two of the five countries investigated. Zerega Jr., Tseng, and Greever (1976) also found that females (high school age) were more external than males. It must be pointed out that McGinnies et al (1974) and the Zerega Jr., et al (1976) study employed a young sample. This may account for the differences they obtained.

Chandler and Dugovics (1977), however, investigating sex differences using the Adult Norwicki-Strickland I-E Scale found no significant difference when comparing means of total scores of males and females. Factor analyses, using individual item responses for each sex separately, revealed a similar factor structure for both sexes, however, there was a difference in the items making up each of the four factors found for males
and females. They concluded that,

...no significant difference was found between the means of the total scores for males and females shows that these individual item differences tend to balance out in the long run. (p.52)

Although Chandler and Dugovics (1977) employed introductory sociology students the age is not specified, so it is difficult to compare these findings with the two previous studies.

The above sample of studies investigating sex differences with regard to perceived locus of control suggest that in some situations females obtain more external scores than males. On the basis of this evidence it would seem reasonable to suggest that when investigating perceived locus of control in the punishment situation, the sex of the subject should be taken into consideration.

3.3.2. The multidimensionality of perceived locus of control

The second issue that must be mentioned is the multidimensional versus unidimensional nature of the perceived locus of control construct. Reid and Ware (1974, p.131) have pointed out that,

Most studies incorporating Rotter's (1966) scale of Internal versus External Control (I-E) have applied it as a unidimensional construct. Nevertheless, several authors have found reason to suggest that I-E may be multidimensional.

Factor 1, was concerned with,

...the respondent's inclination to assign greater or lesser importance to ability and hard work than to luck as influences which determine personally relevant outcomes (p.277).

Factor 2, was concerned with,

...the respondent's acceptance or rejection of the idea that a citizen can exert some control over political and world affairs (p.288).

Reid and Ware (1973) also identified two factors (called fatalism and Social System Control), in perceived locus of control which were similar to those identified by Mirels (1970). Viney (1974), employing two Australian samples, also found two factors similar to those identified by Mirels: Factor 1 which involved personal responsibility; and Factor 2 which involved social responsibility although, she commented that the two factors accounted for only a small percentage of the variance. Viney (1974) also pointed out that the items in the I-E scale appeared to be independent.

Reid and Ware (1974) investigated the two factors they identified in an earlier study (1973) and found evidence of a third factor involving "Self-Control of impulses, desires and emotional behaviour" (p.135). They concluded that further research was necessary to "look more carefully at both the appropriateness of the measures being used and the interpretations being made" (p.140). Gootnick (1974) also argued in favour of a multidimensional approach to perceived locus of control.
Sugden (1974) also proposed that the perceived locus of control construct was multidimensional, however, pointed out that there were problems with studies using factor analysis to investigate this aspect of the I-E scale (Rotter, 1966) especially relating to the subjective decisions the researcher makes which ultimately effect the results obtained (for example, what variables to put into the analysis, the number of factors to be rotated, the composition of each factor and naming, and interpreting the factors). Sugden (1974, p.2) suggested that,

It is...important not to think of the results of factor analysis as purely objective measures for reality when reading or dealing with factor analytic research.

Factor analysis of the I-E Scale (Rotter, 1966) carried out by Sugden (1974) revealed five factors. To test the meaningfulness of the factors Sugden (1974) made certain predictions about the performance of internals and externals based on interpretations of the factors obtained, however, they were not supported. He concluded that,

Overall the results imply the importance of testing the meaningfulness of factors...by their ability to predict differential behaviour rather than their existence at the end of a factor analysis. (p.44)

Rotter (1975) discussed the problem of multidimensionality versus unidimensionality and pointed out that the factors identified varied from study to study and between the sexes. Furthermore, he suggested that factor analysis did not reveal "...the true structure of the construct." (p.63).
Lefcourt (1976) has pointed out that "...the discovery of multidimensionality is not surprising..." (p.33) nor was it a criticism of the "...robustness of locus of control as a personality construct." (p.100). He further suggested that the evidence with regard to the assessment tools available in the area of perceived locus of control was strong enough for investigators to continue to use existing measurement devises as well as to develop new measures. With regard to new measures, Newman (1977) comparing the I-E Scale (Rotter, 1966) with a specific expectancy measure to predict risk taking, found that the specific measure was successful in differentiating internals and externals in the specific situation. Newman (1977) concluded by suggesting that specific measures may be more suitable in well defined task situations. Finally, Lefcourt (1976) concluded that the I-E Scale (Rotter,1966) was still a suitable device to use despite its weaknesses if "...the investigator's purposed are to expand upon the nomological network within which locus of control may operate..." (p.137)

3.3.3. **Division of subjects into internals and externals on the basis of a score obtained on measures of perceived locus of control**

Reviewing the literature in the area of perceived locus of control, reveals that researchers use varying criteria for dividing subjects into internal or external on the basis of scores obtained on such measures as the I-E Scale (Rotter, 1966).
Some researchers choose not to divide subjects into groups, preferring to use correlational techniques to analyse their data (for example, Butterfield, 1964; Watson, 1967 and Gootnick, 1974) or to compare mean I-E scores across experimental groups (for example, Gore and Rotter, 1963; and Brecher and Denmark, 1972).

Those researchers who divide subjects on the basis of locus of control scale scores tend to do so in one of the following ways:

1) on the basis of a median split (for example, Lefcourt, 1967; Lefcourt, Lewis and Silverman, 1969; Trowbridge, 1974; Spikol, 1975; and Lundberg and Frankenhaeuser, 1978);

2) by selecting only those subjects who fall one standard deviation above and below the mean for the sample (for example, Phares, Wilson and Klyver, 1971);

3) by dividing the distribution into thirds and usually excluding the middle third (for example, Liverant and Scodel, 1960; Biondo and MacDonald, 1971; Vantress, 1976; and Egan, 1975);

4) by selecting only those subjects in the upper and lower quartiles of the distribution (for example, Jolley and Spielberger, 1973; and Jolley 1974);

5) by selecting only those subjects who fall in an upper and lower percentage (varying from ten percent to thirty-one percent) of the distribution (for example, Davis and Phares, 1967; Watson and Baumal, 1967; Phares, 1968; Phares, Ritchie and Davis, 1968; Baron, 1969; Ritchie and Phares, 1969; Davis and Davis, 1972;
Gurtman, 1974; and Zerega Jr., Tseng and Greever, 1976); and,

6) by selecting only those subjects that fall below and above a particular score without specifying why they choose these scores as cut off points for the groups.

It should also be pointed out that some researchers do not specify at all how they divided subjects into internals and externals.

It is difficult to decide which method is the most suitable especially since perceived locus of control as measured by such scales as the I-E Scale (Rotter, 1966) has been seen to represent scores along a continuum from extreme internality to extreme externality. Another problem that hinders this decision is that many researchers, especially those employing procedures five and six, do not specify the reason for the division they have used.

There are problems with employing the median split to divide subjects since although this method includes all subjects in the distribution, those very close to the median on either side are placed into two different groups when their scores are fairly close to one another. Also, on another test occasion (according to the reliability level of the test being used) the fluctuation of a person's score close to the median may result in a reclassification from E to I or vice versa. Another problem with this technique, is that subjects who are classified as internals in one sample may be considered externals in another depending on the distribution of scores.
Another consideration to be kept in mind when deciding how to divide subjects into groups on the basis of I-E scores, is whether the researcher is interested in looking only at those subjects who are at the extreme ends of the distribution or whether (s)he is interested in examining the performance of all subjects, that is, internals, externals and those in the middle zones. It would seem appropriate when investigating perceived locus of control to look, not only at the extremes but at those subjects in between, since many subjects fall within this group. Therefore, it is suggested that the most satisfactory way of dividing subjects into groups, with these things in mind, would be to divide the distribution of scores into thirds or quartiles and examine the results of all of these groups.

3.3.4. **Concluding Comments**

The above review of sex differences in the area of perceived locus of control, multidimensionality of perceived locus of control and classification of subjects as internals and externals on the basis of locus of control scale scores, have implications for investigations into the relationship between perceived locus of control and responding in the punishment situation. First, it would seem appropriate to examine the performance of males and females separately to see whether there are any differences between the sexes in the area of punishment as a result of locus of control. Second, it would also seem appropriate to see if there are any sex differences apparent in perceived locus of control in the sample
being studied. Third, even though the data show that perceived locus of control is probably a multidimensional construct, it does not necessarily follow, as Lefcourt (1976) and Rotter (1975) have pointed out, that the I-E Scale (Rotter, 1966) is not a suitable instrument for measuring perceived locus of control. It would, therefore, still seem feasible to employ the I-E scale (Rotter, 1966) when investigating the relationship between perceived locus of control and responding in the punishing situation.
CHAPTER 4

PERCEIVED CONTROL OF THE PUNISHING STIMULI 
AND THE PUNISHMENT SITUATION

It was suggested in the previous chapters that both the subjective perceptions of the recipient with regard to the punishing stimulus and perceived locus of control, both of which may be related to the individual's subjective perceptions of the punishment situation, will influence responding as a result of that procedure. It is also possible that another variable (related to perceived locus of control, see Seligman and Maier, 1967; Lefcourt, 1976), perceived control over the punishing stimulus, may be influential in determining how the recipient will subjectively perceive the punishment situation.

Research into the effect of predictability and control upon responses and perceptions in the presence of aversive stimulation provides the basis for this suggestion.

When defining control, Seligman, Maier and Solomon (1971) pointed out that they defined it on the basis of how the experimenter arranged events in the experimental situation. Specifically, they suggested that whenever the subject could do or refrain from doing something that changed what the subject received, it had control. The punishment situation is clearly one in which the recipient can control the outcome (that is, whether or not he receives the punishing stimulus) by refraining from performing the behaviour upon which the punishing stimulus is response contingent. There is evidence in the literature to suggest that such control may lessen the aversiveness of such
stimuli as well as having other effects.

4.1. Predictability And The Effect Of Aversive Stimulation

Related to the concept of control is whether or not the aversive stimulus is predictable. Seligman (1968) experimented with albino rats to investigate the effect of predictable shock and unpredictable shock on bar pressing. He found that rats in the unpredictable group entirely ceased bar pressing during the shock sessions. Furthermore, these subjects only slowly recovered bar pressing once shock was removed and when predictable shock was introduced, following this they reacted in the same way as they did in the unpredictable shock situation. Six of these eight subjects also developed stomach ulcers. The rats in the predictable group in contrast, only ceased pressing in the presence of the signal predicting shock and did not develop stomach ulcers.

These findings are contrary to those of Pare (1964). Investigating the effect of signalled versus unsignalled shock on rats, Pare (1964) found that on examination the rats in the signalled shock condition showed evidence of ulceration, weight loss and adrenal hypertrophy. Pare (1964) concluded that tone may enable the animal to prepare for the onset of the aversive stimulus but that these preparatory responses appeared to be detrimental.

Lovibond (1968) conducted two experiments with female undergraduate psychology students to investigate the effect of
uncertainty on the aversiveness of shock. Specifically, he hypothesised that,

...the aversiveness of a series of painful events is a function of two additive components: non-specific arousal arising from uncertainty concerning future stimulation, and aversive or defensive arousal arising from the application of the painful stimulus itself (p.86).

In the first experiment Lovibond (1968) compared the effect of regular and irregular shock upon aversiveness ratings of the final shock presented to each subject (all shocks were of the same intensity for each individual, although they may have varied from individual to individual) and galvanic skin response (GSR) changes during the repeated shock presentations. Lovibond (1968) found that the mean aversiveness rating of the last shock was lower for the regular shock group than for the irregular shock group. He also found that for subjects in the regular shock group GSRs declined with repeated shock presentations (as predicted), whereas they remained constant for subjects in the regular shock group. Post-experimental enquiries also revealed that more subjects in the regular shock group than in the irregular shock group indicated that either the intensity of the shock or their subjective reactions to the shock had decreased with repeated presentations.

In Lovibond's (1968) second experiment, subjects were presented with two trial blocks of shock presentations. On one block of trials, shock was presented on a continuous
schedule, that is, each time the subject pressed the push button. On the other block, shock was presented on one of five intermittent schedules. A third block of trials followed these two in which the subject selected a repetition of either of the first two trial blocks. When plotting the aversiveness ratings of the intermittent shocks the subjects received during this experiment Lovibond (1968) found that the curve corresponded closely to the curve expected from a combination of shock density and uncertainty as his original hypothesis had predicted.

Glass, Singer and Friedman (1969, Experiment 1) conducted an experiment with female undergraduate students to test the hypothesis that,

...the greater energy expenditure needed for adaptation to loud unpredictable noise, is reflected in a lower tolerance for frustration, and in greater deterioration in performance on tasks requiring care and attention. (p.201).

They found that there was evidence that the subjects did adapt to the noise in both the unpredictable and predictable groups but that there was also evidence of lower tolerance for frustration and deterioration in performance on the two tasks employed in the unpredictable noise group.

Finkleman and Glass (1970) also conducted an experiment involving undergraduate students to investigate the effect of predictable and unpredictable noise on human performance. They supported their prediction that more errors would occur on a subsidiary task in the presence of unpredictable noise
than in the presence of predictable noise.

Staub, Tursky and Schwartz (1970) conducted two experiments involving human subjects to investigate the effect of both control and predictability upon evaluation and tolerance of electric shock. In Experiment 2 Staub, Tursky and Schwartz (1970) found that both control and predictability influenced the evaluation of the aversiveness of the shocks and the willingness of the subject to endure them.

Clearly, the research in the area of predictability and the effect of aversive stimulation would suggest that predictable aversive stimulation does not have the same debilitating effect upon performance as unpredictable aversive stimulation (see Seligman, 1968; Glass, Singer and Friedman, 1969; and Finkleman and Glass, 1979). Furthermore, predictable aversive stimulation would appear to be less emotionally debilitating than unpredictable aversive stimulation (Lovibond, 1968; Staub, Tursky and Schartz, 1970; Seligman, Maier and Solomon, 1971).

These findings are important when considering the effect of aversive stimulation (the punishing stimulus) in the punishment procedure. The reason for this is that when a punishing stimulus is consistently presented contingent upon a specific response then it is possible to consider this form of aversive stimulation predictable. It may be that to begin with, that is, when the punishing stimulus is first presented, the recipient may not perceive the stimulus as predictable. However, after several presentations of the response contingent stimulus, especially on
a continuous schedule, the recipient should make the connection necessary between responding and the stimulus to enable him/her to predict when the punishing stimulus will occur next. Furthermore, once the recipient is able to predict when the punishing stimulus will occur, it would then be possible for the recipient to actually control (by ceasing to perform the punished response) whether or not he will receive the stimulus during the punishment session.

It would, therefore, be reasonable to suggest that predictability in relation to the punishing stimulus during the punishment procedure may be related to perceived control within the punishment procedure. It would appear that the predictable nature of the punishing stimulus would enable the recipient to control, via their responses, the presentation of the punishing stimulus. The following section will attempt to demonstrate that, if this is the case, then such perceived control over the punishing stimulus may reduce the "unpleasant" nature of the punishing stimulus to a certain extent. This suggestion is based upon the reasoning (presented earlier) that predictability with regard to an aversive stimulus (for example, stimuli similar to those often employed in the punishment procedure) has been found to lessen the debilitating effects of that stimulus. Extending this argument further, perceived control over the aversive stimulus, should heighten this effect.
4.2. Perceived Control And The Effect Of Aversive Stimulation

Several researchers have investigated what could be considered as control over aversive stimulation using infrahuman subjects. Such control has been in the form of, for example, the possibility of avoiding the aversive stimulus.

Brady, Porter, Conrad and Mason (1958) investigated the effect of avoidance behaviour upon the development of gastrointestinal ulcers in rhesus monkeys. In this study eight monkeys were restrained in chairs in a yoked chair avoidance procedure. One monkey of each pair (the monkey who developed avoidance lever - pressing first of each pair during the preliminary sessions) was classified as the experimental monkey and was trained to press a lever to avoid electric shock.

After the preliminary sessions each pair of monkeys participated in the yoked chair avoidance procedure in six hour sessions which alternated with six hour off sessions for many days. Brady, Porter, Conrad and Mason (1958) subjected the monkeys to brief electric shocks to the feet during the avoidance sessions which could be avoided if the experimental monkey of each pair pressed the avoidance lever.

Brady, Porter, Conrad and Mason (1958) were concerned with the development of gastrointestinal lesions in both the experimental and control monkeys of each pair. They found that post mortem examinations of these monkeys revealed "...the presence of extensive gastrointestinal lesions with ulceration as a prominent feature..." (p.72) in the four experimental monkeys
but not in the control monkeys. Brady (1958) and Porter, Brady, Conrad, Mason, Galambos and McKRioch (1968) reported the findings of various studies with regard to the development of ulcers in monkeys which revealed similar findings to those of Brady et al. (1958).

Brady (1958) suggested that one possible reason for the development of such gastrointestinal abnormalities in the "executive" monkey may relate to the six hour avoidance/six hour rest schedule employed, since experiments employing different avoidance/rest schedules (even lengthening the stress period) had not produced the same effect in other monkeys. Brady (1958, p.98 and 100) concluded that,

...the crucial factor was not the degree or even the frequency of stress but was to be sought in the relationship between the length of the stress period and that of the rest period.

He also pointed out that the studies tended to suggest that for ulceration to occur emotional stress needed to be intermittent.

Weiss (1968) conducted two experiments using albino rats to examine the amount of stress exhibited by the rats in avoidance, yoked and no shock conditions. The avoidance group of rats were considered to have control in these experiments since they could control, via avoidance, the occurrence and duration of the shock.

In Experiment I Weiss (1968) found that rats in the yoked (no control) condition exhibited more stress (as indicated by
various measures, for example, weight loss during stress sessions, weight gained following stress sessions and defecation) than rats in either the avoidance (control) or no shock conditions. In Experiment 2 (a more stressful situation than Experiment 1) another measure of stress was obtained by examining the stomachs of the rats for the presence of gastrointestinal lesions. Weiss (1968) found more extensive lesions in the yoked subjects than in either the avoidance or no shock subjects which, he suggested, would indicate more stress occurring in the yoked subjects.

These findings are different to those of Brady, Porter, Conrad and Mason (1958), Brady (1958) and Porter, Brady, Conrad, Mason, Galambos and McKRiock (1958). Weiss (1968) commented on the difference of his findings with rats and the Brady, Porter, Conrad and Mason (1958) study with monkeys suggesting that the Brady, Porter, Conrad and Mason (1958) study differed from his in several respects such as: the monkeys were stressed for several days while the rats were stressed only for several hours; the monkeys did not receive a warning signal prior to each shock, but rather were required to respond every 20 seconds; and that the experimental monkeys of each pair were not randomly chosen, rather they were the monkeys who acquired the avoidance response first of each pair. Weiss (1968) speculated that these differences may have led to different results.
Looking specifically at control in the presence of aversive stimulation with human subjects, Pervin (1963) used male undergraduate students to investigate the effect of certainty and control upon the effect of shock. Pervin (1963) found that subjects preferred to be able to control the onset of the shock rather than to have this controlled by the experimenter.

On the basis of introspective reports obtained from subjects, he found that control was preferred because subjects believed they could shorten the duration of the shock; it reduced surprise; and it gave subjects the feeling of "mastery, freedom, choice" (p.579). However, Pervin (1963) pointed out that subjects indicated several disadvantages of control: conflict with regard to activating the switch; increased concentration on the signal; and perceiving the situation as a punishment of the self.

Bowers (1968) conducted an experiment with male students to investigate the effect that perceived control would have upon shock levels selected and ratings of the painfulness of the shock levels selected by subjects. Bowers (1968) manipulated the subject's perception of control with regard to the shock by presenting instructions implying either that the shock could be avoided or that the shock would be randomly administered. Another manipulation involved the timing of these instructions with some subjects receiving them before they selected the shock levels they would receive during a
maze task, and other subjects receiving them after they had selected the shock levels they would receive.

Bowers (1968) predicted that the perception of control given to some subjects via the instructions would produce differences in the levels of shock selected between the random shock (RS) group and the should avoid (SA) group in the before condition. He found that subjects in the SA before condition selected significantly higher levels of shock than subjects in the RS before condition for both the shocks they perceived as "painful but tolerable" (p.598) and "maximally painful" (p.599).

Bowers (1968) did not find (although he predicted that a difference would exist) any differences between RS and SA subjects (before and after condition) with regard to their post experimental pain ratings of the shocks they selected and received. Bowers (1968) commented that this latter finding for the before condition would suggest that the significantly higher levels of shock selected by the SA before subjects were not rated as any more painful than the lower levels of shock selected by the RS before subjects. Other indications that the RS condition was more aversive than the SA condition, mentioned by Bowers (1968) were: first, SA before subjects rated themselves as less anxious than RS before subjects; and second, of the six subjects who left the experiment before it was "really" over, five were in one or the other of the two RS conditions. Overall the findings
presented by Bowers (1968) stressed the importance of perceived control over aversive stimulation.

Glass, Singer and Friedman (1969, Experiment 2) involved female undergraduates in a study to investigate whether subjects who experienced feelings of control over a loud unpredictable noise, would experience less of a decrement in tolerance for frustration and proof-reading than subjects who did not experience such feelings of control. In this experiment, control (Button) subjects were shown a button and were instructed that they could terminate the noise if they wished to by pressing the button. No control (No Button) subjects were not given this option.

Glass, Singer and Friedman (1969, Experiment 2) found that: first, subjects did adapt to the noise (as demonstrated by phasic skin conductance results); second, the Button subjects exhibited a higher tolerance for frustration than the No Button subjects; and third, the Button subjects made fewer errors on the proof-reading task than subjects in the No Button condition. Furthermore, Glass, Singer and Friedman (1969) mentioned that results from the post experimental questionnaire revealed that on two of the three items the loud unpredictable noise was rated as less aversive by Button subjects than by No Button subjects.

Glass, Reim and Singer (1971) also investigated the effect of perceived control (in this experiment the belief that the subject could signal someone who could terminate the noise) over
an unpredictable noise upon performance on a proof-reading task with male undergraduates. Glass, Reim and Singer (1971) found that subjects in all experimental conditions evidenced adaptation to the noise. With regard to performance on the proof-reading task (the measure of the post-adaptive consequences of the loud noise) they found that subjects in the non perceived control condition exhibited poorer performance than subjects in the other conditions.

Geer, Davison and Gatchel (1970) involved male undergraduate students in a study to investigate the effect of creating "...the perception of effective control in human subjects where there really is none." (p.731) upon reaction time to press a lever when electric shock was presented and upon ratings of the shock with regard to painfulness. In part two of the experiment shock duration was halved and perceived control subjects were presented with instructions that implied that they could shorten the duration of the shock they received if their reaction times were fast enough, whereas non perceived control subjects were told the shock would be reduced.

Geer, Davison and Gatchel (1970) predicted that perceived control subjects would rate the shocks as less painful, would show less autonomic arousal to the shocks, and would find the shock situation less stressful than non perceived control subjects. They supported the latter two predictions, however, the first prediction regarding differences in painfulness ratings was not supported although there was a tendency for perceived control
subjects to rate the shocks as slightly less irritating than the non perceived control subjects. As well as this Geer, Davison and Gatchel (1970) found that there was a reduction in reaction times for subjects in the preceived control condition during this part of the experiment, while reaction times increased for subjects in the non perceived control conditions. They concluded that,

...human beings tend to find less stressful those aversive situations over which they at least believe they have some degree of control. (p.737)

Glass, Singer, Leonard, Krantz, Cohen, and Cummings (1972) conducted a study with the above findings of Geer, Davison and Gatchel (1970) in mind to investigate the effect of both belief about control and actual reduction of the duration of the electric shock presented to the subjects upon stress (as measured by autonomic responses, reaction times, performance after effects, and subjective ratings of the painfulness of the electric shock employed).

In session one of the study subjects were required to press a reaction time button at the onset of a six second shock. In session two half the subjects were given instructions which led them to believe that they could halve the duration of the shock if they pressed the reaction time button faster. The remaining subjects were not given these instructions. Instead of simply halving the six second duration of the shock for all subjects as Geer, Davison and Gatchel (1970) had done, Glass, Singer, Leonard, Krantz, Cohen and Cummings (1972) halved the duration for half of the subjects in the above two groups and left it the same for the
remaining subjects. With regard to perceived control, Glass Singer, Leonard, Krantz, Cohen and Cummings (1972) found that subjects in the Perceived Control groups believed that they could control the shocks although there was a reduction in this effect for subjects in the No Reduction condition. They also found that reaction times were faster for subjects in the Perceived Control conditions. Performance on the post shock task (the Stroop Colour Word Test) revealed that subjects in the Perceived Control conditions experienced "...less adverse behavioural after effects." (p.587) as measured by length of reading time than No Perceived Control conditions. Actual reduction of shock duration also influenced the after effects for the Perceived Control condition subjects.

On the basis of this these researchers suggested that, "It would appear that the belief that one is reducing shock ameliorates negative after effects of shock-induced stress." (p.587), although the belief alone is not enough to achieve this. Finally, with regard to the shock Glass, Singer, Leonard, Krantz, Cohen and Cummings (1972) suggested that tentatively their results indicated that if the individual believes he has control over the duration of a shock, the shock itself is experienced as less painful.

Kanfer and Seidner (1973) investigated ice water tolerance with undergraduate students as a function of the subject being able to control a response (viewing travel slides) designed to increase tolerance. They found that subject control of
presentation rate of the travel slides led to longer ice water tolerance than experimenter control (automatic presentation) of the slides.

Siegel (1973) investigated the effect of perceived control and actual control on subjects flipping a switch to avoid an unpleasant picture. In her study two groups of subjects had no control over the pictures while two groups were given perceived control via instructions implying that increased speed would lead to avoidance of the slides. Half of the subjects in these four groups actually could control the slides via increased reaction times while half had no actual control over the slides. Siegel (1973) found that subjects in the perceived control conditions showed greater increase in speed than those in the no perceived control condition and also that those in the actual control conditions showed greater increase in speed than those in the no actual control conditions.

Corah and Boffa (1970) investigated the effect of choice (which they equated with a sense of control) of avoiding or not avoiding a loud noise upon GSR and discomfort ratings made by male and female undergraduate students. An escape condition and a no escape condition were employed. In the escape condition, half the subjects were told they should press the button to escape the noise, while half of the subjects were told they did not have to do this if they chose not to. In the no escape condition half of the subjects were told they were not to press the button and turn off the sound while the
other half of the subjects were told they could do so if it was absolutely necessary.

Corah and Boffa's (1970) analysis of the discomfort ratings revealed that women rated the sounds as more discomforting than men, that the no escape trials were rated as more discomforting than escape trials, and that there was a significant EscapexChoice interaction. Particularly relevant to perceived control was their findings that in the choice condition subjects rated the no escape trials as less discomforting than subjects in the no choice condition. Their analysis of the GSR data for choice and no choice groups on the no escape trials revealed that the mean change in skin conductance for choice subjects was significantly lower than for the no choice subjects.

Corah and Boffa (1970) commented that these two latter findings,

...suggested that the choice variable operates to reduce the aversive quality of the stimulus and the resultant physiological arousal. (p.4).

Finally, the findings of their experiment would indicate (as they suggest) that giving the individual the choice of avoiding or not avoiding aversive stimulation is the same as giving him/her control over that stimulation.

Sherrod, Hage, Halpern and More (1977) manipulated control over the initiation and termination of a loud noise. In this experiment undergraduate males were placed in one of five groups: no control over initiation or termination; control over
initiation; control over termination; control over
initiation and termination; and non-aversive noise (a control
group). Sherrod, Hage, Halpern and More (1977) found with
regard to the subjects' perceptions of the experiment that
those with control over initiation felt they had more control
over the initiation of the stimulus than subjects with no
control over initiation. Subjects with control over termina-
tion felt they had more control over the termination of the
stimulus than those who could not control the termination of
the noise.

Sherrod, Hage, Halpern and More (1977) found with regard
to performance of a task whilst exposed to the noise that a
combination of initiation and termination control had the
most positive effect; termination control alone had an
intermediate positive effect; and that initiation control
alone had the least positive effect. This was also found
with regard to performance on a task following exposure to
the noise. Sherrod, Hage, Halpern and More (1977, p.24)
concluded,

The results of the present experiment demonstrate
that a perception of personal control can
ameliorate the effects of aversive environments
on behaviour. Moreover, increased perception of
control appears to reduce performance degradations
still further.

Finally, Seligman's (1975) research into the phenomenon he
calls "learned helplessness" demonstrates the severe problems
that can eventuate as a result of continued exposure to
unpredictable and uncontrollable aversive events.
The above studies suggest that a sense of perceived control over an aversive stimulus does have an effect on the way in which the subject reacts to that stimulus. Specifically, a sense of perceived control has been found to: first, lessen the debilitating behavioural consequences of such stimuli (for example, Bowers, 1969; Glass, Singer and Friedman, 1969; Corah and Boffa, 1970; Glass, Reim and Singer, 1971; Geer, Davison and Gatchel, 1970; Glass, Singer, Leonard, Krantz, Cohen and Cummings, 1972; Kanfer and Seidner, 1973; Seigel 1973; and Sherrod, Hage, Halpern and More, 1977); and second, reduce the stressful nature of the perceived unpleasantness associated with aversive stimuli (for example, Weiss, 1968; Geer, Davison and Gatchel, 1970; Glass, Singer, Leonard, Krantz, Cohen and Cummings, 1972; and Corah and Boffa, 1970).

Before concluding this section one final aspect of the control issue needs to be considered. Geer and Maisel (1972) attempted to investigate what they called the "prediction-control confound" since they believed that control over the termination of an aversive stimulus involves prediction of its duration and as a result it may be possible to conclude that,

...results of studies in which perceived or actual control serves as an independent variable may be primarily due to prediction rather than any special attribute of control. (p.314).

Geer and Maisel (1972) included three groups in their study: one in which subjects had control over the termination of the
aversive stimulus (viewing slides of dead bodies); one in which subjects could predict but not control the stimulus; and one in which subjects had neither control or prediction with regard to the aversive stimulus. They found, on the basis of skin responses, that subjects in the prediction group were more affected than the control or no control groups by the onset of the warning tone. In response to the photographs themselves (the aversive stimulus) they found that the response of subjects in the predictable group and in the no control group were similar (a high level of responding that declined over trials) whereas the group which had control over the termination of the aversive stimulus reacted with rapid habituation and lower skin conductance responses. They suggested that,

...the effects of control are not simply the effects of control and prediction being confounded. Rather there is something about being able to terminate aversive stimuli that reduces the impact of those stimuli. (p.39).

The findings of Greer and Maisel (1972) with regard to predictability support those of Paré (1964), however, they do not agree with those of other researchers (for example, Seligman, 1968; Glass, Singer and Friedman, 1969; Staub, Tursky and Schwartz, 1970 and Finkleman and Glass, 1970) who have demonstrated that being able to predict an aversive stimulus lessens its debilitating effects. The discrepancy in the findings could be the result of differing measures being employed to evaluate the effect of predictability. Furthermore, their suggestion (based on the
different findings obtained for the predictable and control group) that the effect that control has upon behaviour is not simply the result of control and prediction being confounded should be viewed with caution. Although the findings with regard to these two groups are different it is not possible to conclude from this that predictability does not influence a subject's response when it is combined with control. It is possible that part of the "something" about control that they refer to is being able to predict the occurrence and duration of aversive stimulus in combination with being able to terminate the stimulus at will.

4.3. **Concluding Remarks**

Studies investigating the effect of perceived control and also those examining the effect of predictability with regard to aversive stimulation, have demonstrated that these variables may help to lessen the adverse effects (behavioural and subjective) of such aversive stimulation. The research has not, however, been concerned with investigating the effects of these variables, especially perceived control, in the punishment procedure, especially with regard to the recipient's subjective perceptions of the punishment procedure. It would be interesting to discover whether perceived control over the punishing stimulus would influence how the recipient would perceive the punishing stimulus within the punishment procedure.
It was suggested earlier that the punishment situation is one in which the individual recipient has control over the aversive consequences. It is possible that in the punishment situation the individual recipient may perceive the stimulus used as the punishing stimulus as less discomforting, unpleasant, annoying or painful than if the same stimulus was presented to them in the same situation but where the recipient was unable to control the onset or termination or the stimulus. This would imply that perhaps the punishment situation is not as unpleasant and debilitating a situation as some researchers (for example, Maier, 1949) suggest.
5.1. Aim and Hypotheses

It was pointed out in the first chapter that the purpose of the present experiment is to "...make clearer the relationship between subjective perceptions (perceptions of the severity of the punishing stimulus, perceived locus of control and perceived control of the punishing stimulus) and responding in the punishment situation." (p.6) The review of the studies in the area of punishment demonstrated that the majority of the research has concentrated upon investigating the effect of various punishers and aspects of the punishment situation. Some studies (those mentioning emotional reactions on the part of the recipient and those employing the withdrawal of positive reinforcement) have provided some support for the suggestion that the subjective perceptions of the recipient could be influential in the effect the punishing stimulus will have upon the response being punished.

No known studies, in the area of punishment, however, have set out specifically to investigate the relationship between the recipient's perceptions of the punishment situation and their overt behaviour in the punishment situation. Investigation of this relationship would not only clarify the importance of subjective perceptions in the punishment situation, but would also be useful in empirically establishing the validity of the definition of punishment proposed by Maitland and Clarke (1980).
The research in the area of resistance to influence and compliance in relationship to perceived locus of control would suggest that perceived locus of control may be influential in determining how individual recipients will respond in a punishment situation. Studies investigating resistance to influence and compliance have revealed that individuals identified as internally oriented on measures of perceived locus of control react differently in influence situations from individuals identified as externally oriented. Specifically, externals have been shown to be reasonably compliant to influence from an outside source whereas internals have been shown to either resist the influence attempts or be unresponsive to them.

With regard to the punishment situation it has been suggested that individuals identified as internally oriented may resist the influence of the experiment via the punishing stimulus. Individuals identified as externals, in contrast, may readily comply with the experimenter's influence in the punishment situation. This proposed relationship between perceived locus of control and the responses in the punishment situation, which could be considered to form part of the recipient's overall subjective perception of the punishment situation, has so far not been investigated.

It was also suggested that perceived control over the punishing stimulus may also be influential in determining how an individual recipient will perceive the punishing stimulus.
This would form part of the individual's overall subjective perception of the punishment situation. Although the literature reveals that perceived control over aversive stimulation can lessen the debilitating effects of such stimulation, the research has not been concerned with looking at this specifically in the punishment situation in relation to how the recipient subjectively perceives the severity of the punishing stimulus. Specifically, the perceived control inherent in the punishment situation may result in the recipient perceiving the punishing stimulus as less severe or unpleasant than they would if the stimulus was presented in a similar situation with no opportunity for the recipient to control its onset or termination.

Finally, several studies have suggested (and obtained) differences between males and females with regard to perceived locus of control and also with regard to ratings of aversive stimuli. In the area of perceived locus of control females have been found to obtain more external scores than males. However, this has not been the case in all studies. With regard to rating of aversive stimuli a study conducted by Corah and Boffa (1970) revealed that females rated aversive stimuli as more discomforting than males. It is possible that females may respond differently from males in the punishment situation as a result of these differences.

There is, therefore, a need for further research, in the area of punishment concerned with the relationship between
the subjective perceptions of the recipient (perceptions of the severity of the punishing stimulus, perceived locus of control and perceived control of the punishing stimulus) and responding in the punishing situation. It also would suggest the need to include sex as a variable in any such investigation.

The present experiment was designed to test the following hypotheses.

1) Internally oriented individuals will exhibit more trials to criterion on a button pressing task than externally oriented individuals in the acquisition phases of the study.

2) Internally oriented individuals will exhibit more trials to cessation on a button pressing task than externally oriented individuals in the punishment phases of the study.

3) Individuals who rate the punishing stimuli severely will exhibit fewer trials to cessation in the two punishment phases of the study than those individuals who rate the punishing stimuli less severely.

4) Ratings of the visual (light) stimulus employed for some subjects in the first punishment phase, in which the subject is able to control the onset and termination of the stimulus, will be less severe than ratings of the light made by the same subjects prior to punishment when the experimenter controlled the onset and offset of the stimulus (the cross-modality matching phase of the study).
As well as these specific hypotheses the performance of male and female subjects on the I-E Scale (Rotter, 1966) and in the learning and punishment phases of the study will be investigated to see if there is any difference in their performance, as previous research has suggested. Furthermore, individuals who score in the middle percentiles of scores on the I-E Scale (Rotter, 1966) (ambivalent scorers) will not be excluded from the investigation. However, no specific hypotheses about how they will react in the punishment and learning phases of the study in comparison with internals and externals have been formulated.

5.2. A Brief Overview of the Study

Before describing in detail the experiment which was designed to test the hypotheses and predictions stated above, some preliminary comments need to be presented to clarify why the experiment was conducted in the manner described in the next chapter.

First, a task was selected which could be conducted in a laboratory so that as many extraneous variables as possible could be eliminated in the controlled environment.

Second, in order to punish a particular response in a laboratory setting it was necessary to design the study in such a way that subjects would be able to first learn a specific response which could later be punished. The response chosen
was button pressing because of the ease with which subjects would be able to learn the response in a relatively short period of time. Another reason for selecting this response was that it has been used successfully with human recipients in previous research (Vogel-Sprott, 1967).

Third, the study was designed in such a way that it would be possible to compare the effects of two punishing stimuli upon responding with each recipient. This was to see whether two stimuli which were equated by each recipient would suppress responding in a similar manner. The cross modality matching phase of the study was designed to obtain two subjectively equated stimuli for each recipient in order to compare their suppression.

Fourth, the two punishing stimuli were chosen for the following reason. Many studies have employed electric shock and time out successfully as punishers. Subjects, however, are reluctant to participate in a study if electric shock is to be employed. It was decided, therefore, to examine whether other physical stimuli could be employed with similar success. Auditory and photic stimulation were chosen since these appear to have been less thoroughly investigated.

Finally, rating scales were developed to enable each recipient to assess subjectively how unpleasant the punishing stimuli employed appeared to be to him. Five separate scales were employed to obtain a more comprehensive picture of the
subject's perceptions of the stimuli. The rating scales were designed so that it would be possible to relate each recipient's performance in the punishment phases of the study to how unpleasant they felt the stimuli to be. This procedure would also enable a comparison to be made between the rating of the visual stimuli following its presentation during the cross modality matching phase (experimenter controlled) and following punishment (subject controlled).

The experiment was, therefore, designed in such a way that both situational and person variables could be investigated. That is, both overt behaviour and covert perceptions (represented by overt behaviour) in a punishment situation were examined.
CHAPTER 6
THE EXPERIMENT: METHOD

6.1. **Subjects**

The subjects who participated in the study were students enrolled in the first year Psychology subject at the University of Wollongong (Australia). There were forty-nine females whose ages ranged from eighteen years to forty-four years, with a median age of 18.55 years. There were fifty-two males whose ages ranged from eighteen years to fifty-two years, with a median age of 20.4 years.

All subjects were volunteers although they were entitled to receive credit toward their overall marks for such experimental participation. There was one restriction with regard to the students who could participate in the study as a result of one of the stimuli to be employed.

Since photic stimulation would be presented to the subjects during the study, any student who had experienced epileptic seizures or who came from a family with a history of epilepsy, were asked not to volunteer. The reason for this was that it has been found that such stimulation at particular frequencies (especially, fifteen to eighteen flashes per second) may induce epileptic seizures (see Giménez-Roldan, Peraita, López Agreda and Abad, 1971; Tsukahara and Takahashi, 1973; Reilly and Peters, 1973; Doose and Gerkin, 1973; Sollo-Lavizzari and Sollo-Lavizzari, 1974; and Hess, Harding and Drasdo, 1974). This selection restriction was merely precautionary since the
frequency employed in the study was kept below the critical frequency.

6.2. **Apparatus**

6.2.1. **Experimental Setting**

The study was conducted in two experimental cubicles in the Department of Psychology at the University of Wollongong. The cubicles were 2280 mm wide x 1930 mm deep x 2230 high. The cubicles had Faraday cage earth shielding and carpet on the floor, walls, ceiling and doors. They also had sound deadening material on the floor, walls and ceiling. They were air conditioned (22°C) and had no windows, being illuminated by fluorescent lights.

The cubicles had a doorway 1970 mm x 895 mm which was closed by an inner wooden door and an outer wooden door. There was a 265 mm cavity between the inner and outer doors, and between the 130 mm thick wall of the cubicle and the 130 mm thick wall of the corridor containing the outer door. Both doors contained a small viewing window 200 mm x 200 mm. The window in the outer door could be closed by sliding a wooden panel across it.

The cubicles adjoined each other. The adjoining wall was 130 mm wide and consisted of (going from one cubicle to the next): carpet tiles (on masonite) facing into the cubicle; 50 mm of sound deadening material; Faraday cage earth shielding: a 60 mm plaster wall; a 90 mm cavity; a 60 mm plaster wall;
Faraday cage earth shielding; 50 mm of sound deadening material; and carpet tiles (on masonite) facing into the adjoining cubicle.

The adjoining wall contained a channel 40 mm in diameter through the wall near ground level. One 19 pin connector and one 11 pin connector contained within a screened cable passed through this channel to connect the experimenter's panel to the subject's panel.

Each cubicle contained a table 750 mm square and a chair. The table in the subject's cubicle was placed against the rear wall of the cubicle. The subject's response panel was placed on top of the table 260 mm from the front and back of the table and 210 mm from either side of the table facing the experimenter's cubicle. The chair was placed in front of the table facing the subject's response panel.

In each corner of the room against the wall adjoining the experimenter's cubicle behind the chair was a speaker mounted on a stand. The speakers were 1550 mm above the ground. One speaker was 300 mm behind and 320 mm to the right hand side of the centre of the chair. The other speaker was 300 mm behind and 1060 mm to the left of the centre of the chair. It was necessary to locate the chair further away from the left hand speaker than from the right to allow easy access into the subject's cubicle and around the table.
The table in the experimenter's cubicle contained the experimenter's panel. The table was placed in the corner against the wall adjoining the subject's cubicle and against the rear wall of the cubicle. The chair was placed in front of the table facing the experimenter's panel.

6.2.2. The Experimenter's panel

The experimenter's panel (see Figures 1 and 2) was rectangular and constructed of aluminium with a painted finish. The front of the experimenter's panel facing the experimenter (see Figures 1 and 2) consisted of nine individual panels (plug-in modules with a brushed aluminium finish).

The first panel from the left contained a knob to control the illumination level of the push buttons on the subject's response panel. Below this was a light indicating the level of the illumination.

The second panel from the left contained the switches necessary to operate the auditory and visual stimuli. This included: a volume control knob for the auditory stimulus which varied from 0 to 10; a knob to adjust the frequency of the auditory stimulus which varied from .25 Khz to 1.25 Khz; a switch which activated the auditory stimulus when pushed down; a knob to adjust the frequency of the visual stimulus which varied from 2 Hz to 10 Hz; a switch which activated the visual stimulus when pushed down; and a knob to control the duration
Figure 1. Front elevation of the experimenter's panel.
Figure 2. Detailed representation of the panel second from the left on the experimenter's panel.
of both the auditory and visual stimuli which varied from 1 second to 15 seconds.

The third panel from the left contained a four digit register (H.P. 5082 - 7300 BCD l.e.d. displays). This recorded the sequence of button pressing exhibited by the subject on each trial.

The fourth panel from the left contained a two digit counter (H.P. 5082 - 7300 BCD l.e.d. displays) designed to represent the numbers of trials each subject required for each phase of the study. Beneath this was the dial designed to select the number of practice trials required which could vary from 0 to 99. The dial was a two digit BCD thumbwheel.

The fifth panel from the left contained a two digit counter (H.P. 5082 - 7300 BCD l.e.d. displays) to register the number of reinforcements the subject received during the study. Beneath this was the dial (two digit BCD thumbwheel) designed to select the number of consecutive reinforcements necessary for the subject to reach criterion on the learning trials (this could vary from 0 to 99).

The sixth panel from the left contained the switch designed to interrupt the allocation of reinforcement on the subject's response panel. Beneath this was the inter-trial time selector dial (two digit BCD thumbwheel) which varied from 0 to 99.

The seventh panel from the left contained the "Set Up" switch which made possible the operation of the auditory and visual
stimuli without operating any of the other controls on the experimenter's panel except the power (on/off) switch. Beneath this was the reset switch designed to reset the apparatus, that is, to clear any information recorded on both the experimenter's panel and the subject's Response Panel.

The eighth panel from the left contained the on/off switch. Finally, the ninth panel from the left contained the equipment necessary to operate the intercom: the switch to activate the intercom (Press to Talk); and the volume control for the intercom. There was also provision for a cassette recorder to be connected to the intercom. The "Pull to Unlock" lever above the last panel was designed to unlock the experimenter's panel to enable access to the circuitry. Appendix 1 presents a more technical description.

6.2.3. Subject's response panel

The subject's response panel (see Figure 3) was constructed of aluminium with a painted finish. The dimensions were as illustrated in Figure 3. On top of the subject's response panel was a light. The light consisted of a 130 mm diameter dished reflector and two xenon flash tubes (type FC 100 5 S). The subject's response panel also contained: a two digit HP 5082 - 7300 BCD I/P l.e.d. display (reward counter); four illuminated momentary action D.P.D.T. push buttons located on the sloping front panel of the subject's response panel; and a 55 mm round 8 ohm speaker (part of the intercom) located behind and to the
Figure 3. Subject's response panel.
right of the sloping front panel.

6.2.4. Speakers

Two speakers placed on tripods were employed in the study. They were 127 mm diameter "Pilot" weather proofed horn speakers (model PA 5). They were 8 Ohm speakers with an impedance of 5 watts.

6.2.5. Other materials

The I-E Scale (Rotter, 1966) was employed in the study. Attached to the instruction sheet on the I-E Scale (Rotter, 1966) was provision for the subject to record their name, age and sex.

Rating sheets containing five rating scales each were developed to obtain a measure of the subjects perceptions of the punishing stimuli employed (see Appendix 2). Each rating sheet contained the same five ten - point rating scales. These were bipolar scales with provision for subjects to rate from one to ten the following dimensions:

(i) the unpleasantness of the stimulus;
(ii) how annoying the stimulus appeared to be;
(iii) how discomforting the stimulus appeared to be;
(iv) how intrusive the stimulus appeared to be; and
(v) how painful the stimulus appeared to be.
6.3. **Procedure**

Each subject was dealt with individually for the entire experimental session. Upon arriving at the experimental location, the subject was greeted by the experimenter and shown into the subject's cubicle. The subject was asked to sit in the chair immediately in front of the subject's response panel. This meant that the subject was seated 55 mm in front of the light mounting on the response panel. The seating arrangement also meant that the subject was between the two speakers through which the tone was to be delivered.

The experimenter handed the subject a copy of the I-E Scale (Rotter, 1966). The subject was instructed to complete the Scale and to write his/her name, age and sex on the instruction sheet (in the spaces provided) preceding the scale items. The experimenter left the room whilst the subject completed the scale, returning to collect it as soon as the subject had finished.

After the experimenter collected the I-E Scale (Rotter, 1966) from the subject she presented the following instructions introducing the dark adaptation period:

I am going into the adjoining room, all instructions will be presented to you via the intercom located in the equipment on the table in front of you. I will close the doors to this cubicle so that you will not be distracted from your tasks.
There is a small amount of illumination coming from the four buttons located on the equipment in front of you. To enable you to become accustomed to this reduced illumination level you will not be required to perform any tasks for the next ten minutes.

Toward the end of this ten minute period I will present instructions to you, through the intercom, relating to the first task you will be required to perform.

Are there any questions?

Having answered any questions the subject raised, the experimenter left the subject's cubicle closing both the inner and outer doors to the cubicle and turning off the light switch. The experimenter went into the experimenter's cubicle, sat down in front of the experimenter's panel and timed the subject for ten minutes.

Toward the end of the ten minute period the experimenter activated the intercom and presented the following instructions, relating to the cross-modality matching task the subject was to perform:

On the table in front of you is a panel containing four buttons, a counter and a light. On either side of you there are speakers through which a tone will be presented. For this phase of the experiment you will need only to concentrate on the light in front of you and on listening to the tones you will hear.

You will be presented with a light flash and a burst of tone, together, five times. Listen and watch carefully, and at the conclusion of the five pairs of light and tone say "match" or "no match". "Match" means that the light and tone seemed equal in stimulus strength to you. "No match" means that the light and tone did not seem equal in stimulus strength to you.
Following this you will be presented with another five pairs of light and tone and your task will be the same as for the first five pairs. The procedure will continue until you are asked to cease work.

Are there any questions?

The experimenter answered any questions the subject raised and if necessary read the instructions a second time. The cross-modality matching task was then commenced.

Two ascending trial blocks and two descending trial blocks were included for the cross-modality matching task. On each of these trial blocks only one level of light intensity was employed (4 Hz), that is, the light intensity was held constant. However, on each of these four trial blocks ten volume settings for the tone were available if required (.1 to 1.0 on the volume control). The frequency of the tone was held constant at .8 KHz. The duration of both the tone and the light was 3 seconds.

Each of the ascending and the descending trial blocks varied in the number of trials presented to the subject depending on how many attempts the subject required to equate subjectively the tones and light with which he was presented. The maximum number of presentations of tone - light pairs possible per trial block was fifty, that is, five pairings of light and tone for the ten volume settings available. The minimum number of presentations of tone - light pairs possible was fifteen, that is, five pairings of light and tone for three of the volume settings available. For a subject to receive the
minimum number of presentations he would need to equate the first five tone-light pairs presented and then indicate a "no match" (not equal) for the following two sets of five tone-light pairs.

Following the instructions the experimenter ensured that the switch activating the tone and the switch activating the light were down (that is, on). The experimenter then pressed the button labeled "Set Up", which activated the light and tone simultaneously, five separate times and waited for the subject's response. If the subject made no response the experimenter prompted the subject by asking whether the pairs of tone and light just received represented a "match" or a "no match". The subject's response was recorded.

The order of presentation of the four trial blocks was: ascending; descending; ascending; and descending. The first ascending trial block (trial block one) commenced on the lowest volume setting available. This trial block continued until the subject responded with "match" followed by two consecutive "no match" responses or until the subject had been presented with all ten volume settings available. The first descending trial block (trial block two) commenced at the volume setting one above the subject's final "no match" on the preceding ascending trial block. The descending trial block continued until the subject responded with "match" followed by two consecutive "no match" responses or until the subject had been presented with all the remaining volume settings down to the lowest volume setting available. The second ascending trial
block (trial block three) commenced at the tone volume setting one below the subject's final "no match" response on the preceding trial block. The remaining procedure for trial block three was the same as for trial block one. The procedure for the second descending trial block (trial block four) was identical to trial block two.

On completing the fourth trial block on the cross-modality matching task the experimenter went into the subject's cubicle, opening the doors and turning on the fluorescent light. The experimenter handed the subject a pen and two rating sheets containing five rating scales (see Appendix 2). On one rating sheet the subject was instructed to rate the tones, he had experienced. On the second rating sheet the subject was instructed to rate the light he had experienced. The experimenter returned to her cubicle whilst the subject completed the ratings.

While waiting for the subject to complete the rating sheets the experimenter obtained a mean tone volume from the subject's matching responses over the four cross-modality matching trial blocks. This was obtained by calculating the mean of all the volume settings on which the subject had responded with "match". This produced a tone volume setting supposedly equated with the light the subject had received during the cross-modality matching task which was to be used in the second phase of the experiment.
The experimenter returned to the subject's cubicle and collected the two completed rating sheets. She also informed the subject that he was about to commence another phase of the experiment and that it would be necessary to switch off the light and to close both the doors to the cubicle to prevent distraction, as before. Having done this the experimenter left the subject's cubicle, switching off the light and closing the doors, and returned to her own cubicle.

Whilst the subject was briefly dark adapting for a second time, the experimenter adjusted the settings on the experimenter's panel in the following manner: the volume setting was adjusted to correspond to the subject's mean tone volume; the number of practice trials were set at 24; the reward selector was set at eight; the inter-trial time selector (time delay) was set at 5 seconds; the score interrupt switch was in the up position (off); and either the light or tone activating switches were down (on) depending on whether the subject was to receive light or tone as the first punishing stimulus (which stimulus each subject was to receive as the first punishing stimulus was determined prior to the commencement of the study by means of a table of random digits).

Following this the experimenter activated the intercom and presented the following instructions:

For the second phase of this experiment you will need to know more about the panel on the table in front of you. As I mentioned before, it contains
four buttons and a counter. Your task is to press the four buttons on the panel, one at a time, in any order you wish, as soon as all four buttons are illuminated. Do not press the buttons before they are illuminated. Once you press a button its light will go out and you will not be able to press it again until the next trial, that is, when all four buttons are illuminated again.

There is a particular sequence of button pressing that is to be rewarded. Each time you press this sequence the counter on the panel will increase by one digit. Try and obtain as high a score as you can.

At times while you are performing the task you may be presented with a flashing light or a loud tone, similar to the ones you have already experienced.

To familiarize you with button pressing you will begin by pressing the buttons for a number of trials, none of which will be rewarded. Each time you press the buttons check the counter so that you will know when reward has begun.

Are there any questions?

The experimenter answered any questions the subject asked without giving any more information about the task and, if necessary, repeated the instructions a second time. Following this the subject was instructed to commence the task.

Each time the subject pressed the four buttons the order in which these buttons had been pressed appeared on the "Register" on the experimenter's panel. The experimenter recorded the sequences of button pressing.

Immediately the subject pressed the first sequence of four buttons the twenty four practice trials commenced. No reward was possible during these trials. The learning trials (which were rewarded) commenced following the twenty fourth practice trial. The twenty fifth combination pressed was immediately
rewards by an increase of one digit on the subject's reward counter (located on the subject's response panel) and became the combination that was to be rewarded each time it was pressed during the learning trials. Each time this combination was pressed the counter on the subject's response panel increased by one digit. The learning trials continued in this manner until the subject had pressed the rewarded combination eight consecutive times or until forty-eight (trials) had been made. Any subjects who failed to reach the learning criterion of eight consecutive correct responses were asked to cease work and were thanked for participating in the experiment. The subject was also asked before leaving not to tell any other students about the experiment they had just participated in.

Subjects who did reach the learning criterion participated in the punishment trials. As soon as the subject reached the learning criterion of eight consecutive correct responses, punishment of that previously rewarded combination commenced. The experimenter immediately activated the "Score interrupt" switch so that reward would no longer be delivered for the previously rewarded response. Each time the subject pressed this combination following the commencement of the punishment trials he received either a three-second presentation of the strobe light or a three-second presentation of the broken tone (at the volume selected by the experimenter on the basis of the cross-modality matching task). The punishment trials continued until the subject ceased to press the previously
rewarded combination eight consecutive times (trials) or until twenty four presses elapsed.

As soon as the punishment criterion was reached or twenty four presses had elapsed the subject was asked by the experimenter (via the intercom) to cease work. Following this, the experimenter adjusted the experimenter's panel for the third phase of the experiment, by changing the practice trials to five, pressing "reset", altering the punishing stimulus the subject was to receive (if light had been employed during the previous phase, the light switch was pressed up to "off" and the tone switch was pressed down to "on") and switching the "score interrupt" up to the "off" position.

The experimenter then presented the following instructions to the subject:

The final phase of this experiment is very similar to the previous phase, however, some changes have been made. Only several practice trials have been included and the rewarded combination may not be the same as before. Your task will be the same as before.

Are there any questions?

The experimenter clarified any confusion with regard to the task on the part of the subject and then instructed him to commence the task.

The procedure was essentially the same as for the previous phase (Punishment 1). The following alterations, however, were made: only five practice trials were included; and the punishing stimulus was changed so that subjects who had received tone
as the punishing stimulus in Punishment 1 received light as
the punishing stimulus in Punishment 2 and vice versa.

When the third phase (Punishment 2) was completed the
experimenter went to the subject's cubicle, opening the doors
and turning on the fluorescent light. She handed the subject
two rating sheets containing five rating scales each (the same
as the subject received following the cross-modality matching
task). The subject was asked to rate the tone he had received
during phase 1 or 2 of the study and to rate the light he had
received during phase 1 or 2 of the study. The tone was rated
on one sheet and the light was rated on the other.

The experimenter left the subject's cubicle while the subject
completed this task. When both sheets of ratings were completed
the experimenter collected them from the subject and thanked the
subject for participating in the study. Subjects were not told
what the study had been designed to investigate, however, they
were told they could find this out later in the year. This was
to prevent the information being inadvertently passed on to other
potential subjects.
CHAPTER 7

RESULTS

7.1. Preliminary Analyses

Before testing the hypotheses several preliminary analyses were carried out.

7.1.1. Division of subjects into internal, ambivalent and external scorers on the I-E Scale (Rotter, 1966)

The first preliminary analysis involved the division of subjects into internal scorers, ambivalent scorers and external scorers on the I-E Scale (Rotter, 1966). The intention was not to look only at the extreme internal and external subjects and so subjects were divided into the three groups on the basis of their scores on the I-E Scale (Rotter, 1966) by dividing the distribution into thirds (approximately). Internal scorers were those subjects whose scores fell within the lower third of the distribution (less than or equal to a score of seven), external scorers were those subjects whose scores fell within the upper third of the distribution (scores greater than or equal to 13), and ambivalent scorers were those subjects whose scores fell within the middle third of the distribution (scores between 8 and 12).

7.1.2. Division of subjects into groups on the basis of their subjective ratings of the punishing stimuli

This involved the division of subjects into two groups: those whose subjective ratings of the punishing stimuli could be considered severe (high); and those whose subjective ratings
could be considered less severe (low). This required the calculation of two subjective rating scores for each subject based on the two sets of five ten-point rating scales they completed during the two punishment segments of the study. This was done by obtaining the mean of the scores on the five rating scales for the stimuli employed in the first and second punishment segments separately. A median split was carried out to divide subjects into severe and less severe raters for the first and second punishment segments separately.

7.1.3. Transformation of scores

Since analysis of variance and t-tests were to be employed to examine performance in both the two learning phases and the two punishment phases of the study, the raw scores obtained during these segments were inspected to see if they were normally distributed. The distributions were found to be slightly positively skewed as a result of some subjects obtaining extremely high scores on trials to criterion in the learning segments of the study and/or trials to cessation in the punishment segments of the study in comparison to other subjects.

Furthermore, Cochrans C tests conducted after grouping the scores for the various analyses of variance revealed that the variances were not homogeneous. On the basis of these findings it was decided to use logarithmic transformations of the raw scores for all analyses of variance and t-tests involving trials to criterion in the learning phases and/or trials to cessation.
in the punishment phases of the study to render the variances homogeneous.

7.1.4. The effectiveness of the two punishing stimuli

Inspection of the scores in the first punishment phase indicate that all but eight subjects reached the punishment criterion (ceased pressing the punished response button) before the limit of twenty-four possible presses were reached. All but five subjects reached the punishment criterion before the limit of twenty-four possible presses was reached in the second punishment segment. This would suggest that the punishing stimuli were effective in suppressing the punished response for the majority of subjects.

Since two different punishing stimuli were employed in the first punishment phase and also in the second punishment phase of the study, it was necessary to see whether there was any difference in the effect of tone on trials to cessation in comparison with light for the first and second punishment phases. This was to ensure that any differences obtained between different groups of subjects in subsequent analyses were not the result of differential effects of the two punishing stimuli employed.

A Student's t-test for independent samples for trials to cessation in the first punishment phase between subjects who received tone and those who received light as the punishing stimulus was not found to be significant ($t = -0.11$, $df = 94$, $p = 0.910$ for a two-tailed test). The Student's t-test for
independent samples for trials to cessation in the second
punishment phase between subjects who received tone and those
who received light as the punishing stimulus was also not
significant (t = -1.61, df = 94, p = 0.11 for a two-tailed
test).

Of the eight subjects who did not reach the punishment
criterion in the first punishment phase four had received tone
while four had received light as the punishing stimulus. In
the second punishment phase, three of the five subjects who
did not reach the punishment criterion had received tone
while two had received light as the punishing stimulus.

These results demonstrate that the two punishing stimuli
had a similar effect upon responding in the two punishment
phases of the study.

7.2. Investigations Of The Hypotheses And Predictions

7.2.1. The influence of perceived locus of control upon
responding in the two learning segments of the study

Hypothesis 1 was tested by examining the number of trials
to criterion in both learning phases of the study for male and
female subjects who were grouped as internal, ambivalent or
externals on the basis of the I-E Scale (Rotter, 1966). Two
analyses of variance using trials to criterion as the dependent
variable and sex and perceived locus of control as the two in-
dependent variables were carried out.
<table>
<thead>
<tr>
<th>Source of Variation</th>
<th>Sum of Squares</th>
<th>df</th>
<th>Mean Square</th>
<th>F</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Main Effects</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sex</td>
<td>.080</td>
<td>1</td>
<td>.080</td>
<td>.235</td>
<td>.629</td>
</tr>
<tr>
<td>Locus of Control</td>
<td>1.764</td>
<td>2</td>
<td>.882</td>
<td>2.601</td>
<td>.08</td>
</tr>
<tr>
<td><strong>Interactions</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sex X Locus of Control</td>
<td>.095</td>
<td>2</td>
<td>.047</td>
<td>.139</td>
<td>.870</td>
</tr>
</tbody>
</table>
## TABLE 2
MEANS AND STANDARD DEVIATIONS FOR TRIALS TO CRITERION
FOR MALE, FEMALE, INTERNAL, AMBIVALENT AND EXTERNAL
SUBJECTS IN THE FIRST LEARNING PHASE OF THE STUDY

<table>
<thead>
<tr>
<th>Group</th>
<th>Mean</th>
<th>Standard Deviation</th>
<th>N</th>
</tr>
</thead>
<tbody>
<tr>
<td>Males</td>
<td>.631</td>
<td>.596</td>
<td>43</td>
</tr>
<tr>
<td>Females</td>
<td>.535</td>
<td>.578</td>
<td>44</td>
</tr>
<tr>
<td>Internals</td>
<td>.760</td>
<td>.618</td>
<td>24</td>
</tr>
<tr>
<td>Ambivalent Scorers</td>
<td>.411</td>
<td>.534</td>
<td>35</td>
</tr>
<tr>
<td>Externals</td>
<td>.644</td>
<td>.582</td>
<td>28</td>
</tr>
<tr>
<td>Source of Variation</td>
<td>Sum of Squares</td>
<td>df</td>
<td>Mean Square</td>
</tr>
<tr>
<td>-----------------------------</td>
<td>----------------</td>
<td>----</td>
<td>-------------</td>
</tr>
<tr>
<td><strong>Main Effects</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sex</td>
<td>.264</td>
<td>1</td>
<td>.264</td>
</tr>
<tr>
<td>Locus of Control</td>
<td>.018</td>
<td>2</td>
<td>.009</td>
</tr>
<tr>
<td><strong>Interactions</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sex x Locus of Control</td>
<td>.467</td>
<td>2</td>
<td>.238</td>
</tr>
</tbody>
</table>

TABLE 3
RESULTS OF THE ANOVA ON TRIALS TO CRITERION SCORES FOR THE SECOND LEARNING PHASE OF THE STUDY
TABLE 4
MEANS AND STANDARD DEVIATIONS FOR TRIALS TO CRITERION
FOR MALE, FEMALE, INTERNAL, AMBITALENT AND EXTERNAL
SUBJECTS IN THE SECOND LEARNING PHASE OF THE STUDY

<table>
<thead>
<tr>
<th>Group</th>
<th>Mean</th>
<th>Standard Deviation</th>
<th>N</th>
</tr>
</thead>
<tbody>
<tr>
<td>Males</td>
<td>.317</td>
<td>.523</td>
<td>43</td>
</tr>
<tr>
<td>Females</td>
<td>.205</td>
<td>.430</td>
<td>44</td>
</tr>
<tr>
<td>Internals</td>
<td>.263</td>
<td>.471</td>
<td>24</td>
</tr>
<tr>
<td>Ambivalent scorers</td>
<td>.242</td>
<td>.490</td>
<td>35</td>
</tr>
<tr>
<td>Externals</td>
<td>.282</td>
<td>.488</td>
<td>28</td>
</tr>
</tbody>
</table>
The results of the two analyses of variance are presented in Tables 1 and 3. The means and standard deviations for males, females, internals, ambivalent scorers and externals are presented in Tables 2 and 4.

Table 1 and Table 3 reveal that neither of the main effects (sex and locus of control) nor any of the interactions were significant. Hypothesis 1 was, therefore, not supported although the results for perceived locus of control (see Table 2) in the first learning phase were in the direction predicted.

To see whether subjects reached criterion in the second learning phase of the study in fewer trials than in the first learning phase a $t$-test for related samples was calculated. The value was found to be significant ($t = 5.35, df = 97, p = .0001$ for a two-tailed test). This result indicates that subjects took fewer trials to criterion in the second learning phase of the study than they did in the first.

7.2.2. The influence of perceived locus of control and subjective rating of the punishing stimulus upon responding in the two punishment phases of the study

Hypotheses 2 and 3 were investigated by examining the trials to cessation of responding in the two punishment phases of the study for male and female subjects who were grouped according to perceived locus of control and their subjective ratings of the punishing stimulus for each punishing phase. Two analyses of variance, using trials to cessation of responding as the dependent
variable and sex, perceived locus of control and subjective rating as the three independent variables, were carried out.

The results of the two analyses of variance are presented in Tables 5 and 7. The means and standard deviations for males, females, internals, ambivalent scorers, low subjective raters and high subjective raters are presented in Tables 6 and 8.

Table 5 shows a significant main effect on trials to cessation scores for perceived locus of control in the first punishment phase of the study. No other main effects nor interactions were significant. Table 6 reveals that the internal and external subjects performed in the hypothesised way. An orthogonal contrast looking at the difference between the trials to cessation of internals and externals was significant in the hypothesised direction ($t = 3.324$, $df = 84$, $p = .001$ with a one-tailed test). Since no hypothesised differences were postulated with regard to the performance of the ambivalent group in comparison to either of the other two locus of control groups, Scheffe tests were conducted to discover whether ambivalent subjects performed significantly differently from internals or externals. The results of these tests were not significant.

Table 7 reveals a significant main effect on trials to cessation scores for perceived locus of control for the second punishment phase of the study. All other main effects and
<table>
<thead>
<tr>
<th>Source of Variation</th>
<th>Sum of Squares</th>
<th>df</th>
<th>Mean Square</th>
<th>F</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Main Effects</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sex</td>
<td>.001</td>
<td>1</td>
<td>.001</td>
<td>.009</td>
<td>.923</td>
</tr>
<tr>
<td>Subjective rating</td>
<td>.188</td>
<td>1</td>
<td>.189</td>
<td>1.631</td>
<td>.206</td>
</tr>
<tr>
<td>Locus of Control</td>
<td>1.309</td>
<td>2</td>
<td>.655</td>
<td>5.683</td>
<td>.005</td>
</tr>
<tr>
<td><strong>Interactions</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sex x Subjective rating</td>
<td>.001</td>
<td>1</td>
<td>.001</td>
<td>.006</td>
<td>.937</td>
</tr>
<tr>
<td>Sex x Locus of Control</td>
<td>.129</td>
<td>2</td>
<td>.064</td>
<td>.559</td>
<td>.574</td>
</tr>
<tr>
<td>Subjective rating x Locus of Control</td>
<td>.047</td>
<td>2</td>
<td>.023</td>
<td>.204</td>
<td>.816</td>
</tr>
<tr>
<td>Sex x subjective rating x Locus of Control</td>
<td>.213</td>
<td>2</td>
<td>.107</td>
<td>.926</td>
<td>.401</td>
</tr>
</tbody>
</table>
**TABLE 6**

MEANS AND STANDARD DEVIATIONS FOR MALES, FEMALES, INTERNALS, AMBIVALENT SCORERS, EXTERNALS, LOW RATERS AND HIGH RATERS ON TRIALS TO CESSATION SCORES IN THE FIRST PUNISHMENT PHASE OF THE STUDY

<table>
<thead>
<tr>
<th>Group</th>
<th>Mean</th>
<th>Standard Deviation</th>
<th>N</th>
</tr>
</thead>
<tbody>
<tr>
<td>Males</td>
<td>.867</td>
<td>.331</td>
<td>43</td>
</tr>
<tr>
<td>Females</td>
<td>.852</td>
<td>.370</td>
<td>44</td>
</tr>
<tr>
<td>Internals</td>
<td>1.000</td>
<td>.294</td>
<td>24</td>
</tr>
<tr>
<td>Ambivalent scorers</td>
<td>.896</td>
<td>.372</td>
<td>35</td>
</tr>
<tr>
<td>Externals</td>
<td>.694</td>
<td>.303</td>
<td>28</td>
</tr>
<tr>
<td>Low Raters</td>
<td>.815</td>
<td>.336</td>
<td>43</td>
</tr>
<tr>
<td>High Raters</td>
<td>.902</td>
<td>.360</td>
<td>44</td>
</tr>
</tbody>
</table>
TABLE 7

RESULTS OF THE ANOVA ON TRIALS TO CRITERION SCORES FOR THE SECOND PUNISHMENT PHASE OF THE STUDY

<table>
<thead>
<tr>
<th>Source of Variation</th>
<th>Sum of Square</th>
<th>df</th>
<th>Mean Square</th>
<th>F</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td>Main Effects</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sex</td>
<td>.115</td>
<td>1</td>
<td>.115</td>
<td>.964</td>
<td>.329</td>
</tr>
<tr>
<td>Subjective rating</td>
<td>.063</td>
<td>1</td>
<td>.063</td>
<td>.523</td>
<td>.472</td>
</tr>
<tr>
<td>Locus of Control</td>
<td>.963</td>
<td>2</td>
<td>.481</td>
<td>4.021</td>
<td>.022</td>
</tr>
<tr>
<td>Interactions</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sex x Subjective rating</td>
<td>.167</td>
<td>1</td>
<td>.167</td>
<td>1.398</td>
<td>.241</td>
</tr>
<tr>
<td>Sex x Locus of Control</td>
<td>.285</td>
<td>2</td>
<td>.142</td>
<td>1.191</td>
<td>.310</td>
</tr>
<tr>
<td>Subjective rating x Locus of Control</td>
<td>.075</td>
<td>2</td>
<td>.037</td>
<td>.313</td>
<td>.732</td>
</tr>
<tr>
<td>Rating x Locus of Control</td>
<td>.115</td>
<td>2</td>
<td>.057</td>
<td>.480</td>
<td>.621</td>
</tr>
</tbody>
</table>
TABLE 8
MEANS AND STANDARD DEVIATIONS FOR MALES, FEMALES, INTERNALS, AMBIVALENT SCORERS, EXTERNALS, LOW RATERS AND HIGH RATERS FOR TRIALS TO CESSATION SCORES IN THE SECOND PUNISHMENT PHASE OF THE STUDY

<table>
<thead>
<tr>
<th>Group</th>
<th>Means</th>
<th>Standard Deviation</th>
<th>N</th>
</tr>
</thead>
<tbody>
<tr>
<td>Males</td>
<td>.710</td>
<td>.360</td>
<td>43</td>
</tr>
<tr>
<td>Females</td>
<td>.618</td>
<td>.350</td>
<td>44</td>
</tr>
<tr>
<td>Internals</td>
<td>.841</td>
<td>.341</td>
<td>24</td>
</tr>
<tr>
<td>Ambivalent scorers</td>
<td>.602</td>
<td>.371</td>
<td>35</td>
</tr>
<tr>
<td>Externals</td>
<td>.589</td>
<td>.304</td>
<td>28</td>
</tr>
<tr>
<td>Low Raters</td>
<td>.639</td>
<td>.389</td>
<td>43</td>
</tr>
<tr>
<td>High Raters</td>
<td>.687</td>
<td>.323</td>
<td>44</td>
</tr>
</tbody>
</table>
interactions were not significant. Table 7 shows that the mean score for trials to cessation for internals and externals were in the hypothesised direction. An orthogonal contrast looking at the difference between the means of these two groups was significant in the hypothesised direction ($t = 2.646$, $df = 84$, $p = .01$). Scheffé tests revealed no differences between the trials to cessation scores of the ambivalent group compared with the scores of either the internal or external group.

The result of the two analyses of variance and the orthogonal constraints support hypothesis 2. They do not, however, support hypothesis 3 since in both punishment phases of the study, the main effects for subjective rating were not significant. It was therefore decided to look further into the relationship of subjective rating and trials to cessation scores in the two punishment phases of the study.

The subjective rating score for each subject was obtained (as mentioned earlier) by combining scores on five individual scales. This approach may have overlooked any relationships between individual scale ratings and responding in the two punishment phases. The relationship between each of the five separate scales and responding in the two punishment phases was therefore examined (using non transformed scores) by means of Pearson product-moment correlations. The results are presented in Table 9.
TABLE 9
PEARSON PRODUCT MOMENT CORRELATIONS BETWEEN SCORES OF THE FIVE SUBJECTIVE RATING SCALES AND TRIALS TO CESSATION SCORES IN PUNISHMENT 1 AND PUNISHMENT 2

<table>
<thead>
<tr>
<th>Scale</th>
<th>Punishment 1</th>
<th>Punishment 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Unpleasant</td>
<td>0.109</td>
<td>-0.020</td>
</tr>
<tr>
<td>Annoying</td>
<td>0.148</td>
<td>-0.039</td>
</tr>
<tr>
<td>Uncomfortable</td>
<td>0.107</td>
<td>-0.005</td>
</tr>
<tr>
<td>Intrusive</td>
<td>0.152</td>
<td>-0.022</td>
</tr>
<tr>
<td>Painful</td>
<td>0.111</td>
<td>-0.011</td>
</tr>
</tbody>
</table>
TABLE 10
PEARSON PRODUCT-MOMENT CORRELATIONS
BETWEEN SCORES ON THE FIVE SUBJECTIVE
RATING SCALES AND TRIALS TO CESSATION SCORES
IN PUNISHMENT 1 AND PUNISHMENT 2
FOR INTERNALS, AMBIVALENT SCORERS AND EXTERNALS

<table>
<thead>
<tr>
<th>Punishment</th>
<th>Scale</th>
<th>Internals</th>
<th>Ambivalent Scorers</th>
<th>Externals</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Unpleasant</td>
<td>-.074</td>
<td>.176</td>
<td>.366</td>
<td>.02</td>
</tr>
<tr>
<td>1</td>
<td>Annoying</td>
<td>.010</td>
<td>.185</td>
<td>.351</td>
<td>.03</td>
</tr>
<tr>
<td>1</td>
<td>Uncomfortable</td>
<td>.064</td>
<td>.028</td>
<td>.410</td>
<td>.015</td>
</tr>
<tr>
<td>1</td>
<td>Intrusive</td>
<td>.115</td>
<td>.174</td>
<td>.191</td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>Painful</td>
<td>.089</td>
<td>-.040</td>
<td>.467</td>
<td>.006</td>
</tr>
<tr>
<td>2</td>
<td>Unpleasant</td>
<td>-.007</td>
<td>-.023</td>
<td>-.037</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Annoying</td>
<td>-.040</td>
<td>.040</td>
<td>-.112</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Uncomfortable</td>
<td>-.003</td>
<td>.104</td>
<td>-.119</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Intrusive</td>
<td>.092</td>
<td>.018</td>
<td>-.161</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Painful</td>
<td>-.087</td>
<td>.068</td>
<td>-.118</td>
<td></td>
</tr>
</tbody>
</table>
Table 9 reveals that all the correlations were very small and not significant. Since perceived locus of control had been found to affect performance in the two punishment phases (as shown in the analysis of variance results) it was decided to test whether these correlations could have been affected by this variable. Correlations between perceived locus of control scores and scores on the five rating scales (for both punishment 1 and punishment 2) were found to be low and not significant. These revealed that overall subjective ratings were similar across all subjects regardless of locus of control.

Pearson-Product Moment Correlations were calculated between subjective ratings on the five scales and trials to cessation scores in the first and second punishment phases separately (see Table 10) for subjects classified as internals, ambivalent scorers and externals.

Table 10 reveals that none of the correlations were significant for internals or ambivalent scorers for either punishment phases. Subjective rating as measured by scales tapping the extent to which the stimulus was rated as unpleasant, annoying, uncomfortable and painful, however was moderately positively correlated with trials to cessation scores (and significantly so) for external subjects in the first punishment phase. These relationships were not found in the second punishment phase for these subjects.
Overall, the results (analysis of variance and product-moment correlations) relating to subjective rating and responding in the punishment phases of the study lend partial support for hypothesis 3 but only with regard to external subjects.

Finally, to see whether subjects ceased responding in fewer trials in the second punishment phase, a t-test for related samples using the transformed scores was calculated. The t value was found to be significant ($t = 4.46$, $df = 97$, $p = .0001$ for a one-tailed test).

Since perceived locus of control affected responding in both punishment phases of the study it was decided to investigate this difference between trials to cessation in punishment 1 and in punishment 2 for internals, ambivalent scorers and externals. The results of t-tests for related samples revealed that there was a significant difference between cessation in the two punishment phases for internals ($t = 1.94$, $df = 29$, $p < .05$ for a one-tailed test) and for ambivalent scorers ($t = 3.97$, $df = 37$, $p < .005$ for a one-tailed test) but not for externals ($t = 1.56$, $df = 29$, $p > .05$ for a one-tailed test), although the difference just failed to reach significance for this group.

7.2.3. **Sex differences**

Looking at the performance of males and females in the two learning phases and in the two punishment phases of the study, the analysis of variance (Tables 2, 4, 5 and 7) revealed no
significant main effects or interactions as a result of sex. To see whether there was any difference between the means for males and females on the I-E Scale (Rotter, 1966), a t-test for independent samples was carried out. The value obtained was not significant ($t = 1.05$, $df = 96$, $p = .296$ for a two-tailed test).

7.2.4. **The influence of control of the punishing stimuli upon the rating of the stimuli used during the study**

To investigate hypothesis 4, the five subjective ratings made by each subject who received the light as the punishing stimulus in the first punishment phase of the study following its use as a punishment were compared to the five subjective ratings of the same stimulus following the cross modality matching phase of the study. Only the ratings of the light stimulus were used for the comparisons since the intensity and duration of the light remained constant throughout the entire study whereas the tone intensity varied during the cross modality matching phase of the study.

The ratings of the light employed in the first punishment phase and not in the second punishment phase were used for the comparisons to avoid any influence that experience of and rating of the first punishment stimulus might have had upon the rating of the second punishing stimulus.

Table 11 presents a breakdown for each scale of the number of subjects who did not change their rating after the first
TABLE 11

NUMBER OF SUBJECTS WHO DID NOT CHANGE, WHO INCREASED SEVERITY AND WHO DECREASED SEVERITY OF EACH RATING FOLLOWING THE FIRST PUNISHMENT PHASE OF THE STUDY

<table>
<thead>
<tr>
<th>Change</th>
<th>Scale 1</th>
<th>Scale 2</th>
<th>Scale 3</th>
<th>Scale 4</th>
<th>Scale 5</th>
</tr>
</thead>
<tbody>
<tr>
<td>No change</td>
<td>14</td>
<td>12</td>
<td>11</td>
<td>14</td>
<td>14</td>
</tr>
<tr>
<td>Increased severity</td>
<td>4</td>
<td>8</td>
<td>8</td>
<td>9</td>
<td>10</td>
</tr>
<tr>
<td>Decreased severity</td>
<td>27</td>
<td>25</td>
<td>26</td>
<td>22</td>
<td>27</td>
</tr>
</tbody>
</table>
punishment phase, who increased the severity of their rating and who decreased the severity of their rating, after the first punishment phase in comparison with their rating of the light prior to the first punishment phase of the study.

The figures in Table 11 were converted to percentages to enable a clearer comparison of the type of change (if any) exhibited by subjects in their before and after ratings of the light stimulus employed as the first punishment. Looking at Scale 1 (unpleasant) 31% of subjects did not change their ratings, 9% of subjects increased the severity of their ratings while 60% decreased the severity of their ratings. The figures for Scale 2 (annoying) show that 27% of subjects did not change their rating, 18% increased the severity of their rating, while 55% of subjects decreased the severity of their rating. The figures for Scale 3 (uncomfortable) revealed that 24% of subjects did not change their rating, 18% of subjects increased the severity of their rating, while 58% of subjects decreased the severity of their ratings. The figures for Scale 4 (intrusive) revealed that 31% of subjects did not change their rating, 20% of subjects increased the severity of their rating, while 49% of subjects decreased the severity of their ratings. Finally, for Scale 5 (painful) 31% of subjects did not change their rating, 22% of subjects increased the severity of their rating while 47% of subjects decreased the severity of their ratings following punishment.
TABLE 12

MEANS AND STANDARD DEVIATIONS FOR RATINGS MADE ON THE FIVE RATING SCALES PRIOR TO (FOLLOWING THE CROSS-MODALITY MATCHING PHASE) AND FOLLOWING THE FIRST PUNISHMENT PHASE OF THE STUDY

<table>
<thead>
<tr>
<th>Scale</th>
<th>Prior to the first punishment segment</th>
<th>Following the first punishment segment</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>Mean</td>
<td>6.53</td>
<td>6.58</td>
</tr>
<tr>
<td>Standard Deviation</td>
<td>2.16</td>
<td>2.38</td>
</tr>
</tbody>
</table>

N = 45
To see if the differences between before and after punishment ratings were significant the five rating scales (before and after punishment) were compared individually employing t-tests for dependent samples. Means and standard deviations for each scale before the first punishment phase and after the first punishment phase are presented in Table 12.

Table 12 indicates that for all five rating scales, the rating prior to the first punishment phase was higher than the mean rating following the punishment phase. The t-tests revealed significant differences between the before and after ratings of the light for Scale 1 (t = 5.32, df = 44, p < .01 for a one-tailed test), Scale 2 (t = 3.722, df = 44, p < .01 for a one-tailed test), Scale 3 (t = 4.322, df = 44, p < .01 for a one-tailed test), Scale 4 (t = 2.6055, df = 44, p < .01 for a one-tailed test) and Scale 5 (t = 2.8013, df = 44, p < .01 for a one-tailed test).

These results indicate that subjects rated the light stimulation prior to the first punishment phase as more severe than they did the light stimulation following the first punishment phase of the study. The results, therefore, support hypothesis 4.
In the earlier chapters it was shown that the majority of researchers investigating the effectiveness of various punishments have been concerned primarily with the effect the punishing stimulus will have upon the recipient's overt behaviour. Their research has emphasised the effect that situational variables will have upon such behaviour without considering the influence of person or subject variables. The introductory chapters highlighted the need to investigate the influence that subject variables, specifically those that contributed to the recipient's subjective perceptions of the punishment situation, may have upon responding in the punishment situation.

It was suggested that three variables may influence overt responding in the punishment situation: first, perceived locus of control; second, the recipient's subjective perceptions of the severity of the punishing stimulus; and third, perceived control of the punishing stimulus. Generally, the results of the present investigation indicate that this is the case, although they suggest that the influence of subjective perceptions of the severity of the punishing stimulus is more complex than was originally postulated.

The results obtained for the punishment phases of the study, and, to a limited extent, for the first learning phase (see
hypotheses 1 and 2) indicate that internally oriented individuals exhibited resistance to the influence of the experimenter in a similar way to the subjects in verbal conditioning studies mentioned in Chapter 3. Furthermore, the findings for the two punishment phases confirm the prediction made earlier, on the basis of Biondo and MacDonald's (1970) research, that internal individuals will resist overt, as well as, covert attempts to influence their behaviour. The punishment situation is one in which the influence exerted by the experimenter is more obvious than the subtle influence exerted in the verbal conditioning studies. It is possible that the obvious nature of the influence in this study encouraged the more internally oriented individuals to persist with the punished response until they considered it no longer to their advantage to do so.

The findings for externally oriented individuals for the two punishment phases of the study confirmed the prediction that they would be more responsive to the punishing stimulus in terms of suppression of responding than internally oriented individuals. This finding is consistent with that of Holmes and Jackson (1975) who found externals more sensitive to the punishing stimulus employed in their study.

It would appear from the results for the punishment phases of the study that the structure of the experimental session did not adversely effect the study as previous researchers (such as Rotter, 1966; Feather, 1967; Du Cette and Wolk, 1972)
have suggested it may. In this investigation, structuring the task presented to the individual and obtaining data from repeated measures with the same task did not mask the relationship between perceived locus of control and responding in the punishment situation. This is clearly demonstrated by the finding that internally oriented recipients were resistant in the second punishment phase even though the second punishment phase was identical to the first except for the punishing stimulus employed. These findings confirm the second of the two possible effects of structure within the punishment situation mentioned in Chapter 3, namely that it would make it easier for the "external" individual to perceive the connection between the punishing stimulus and their responses, thus assisting them in complying with the experimenter's demands, while reinforcing the "internal" individual's view that the experimenter was attempting to manipulate their behaviour and thus encouraging their resistance to such manipulation.

These findings with regard to perceived locus of control and responding in the punishment situation demonstrate that the effectiveness of a punishing stimulus will vary from individual to individual depending on their position in the perceived locus of control dimension. This suggests that knowledge of the individual's perceived locus of control may be helpful when selecting punishments that will be the most effective in suppressing particular behaviours for individual recipients. For example,
since recipients with an external perceived locus of control appear to be more responsive to the punishing stimulus than "internals", they may not require as severe a punishment as internally oriented individuals to effectively modify their behaviour.

The nature, as well as the intensity, of the punishing stimulus may also be effected by the influence of perceived locus of control. Internals have been shown in this investigation to resist the punishing stimulus despite their having rated it as unpleasant to some degree. This would suggest that some punishments may be more appropriate to employ with internally oriented individuals than others. It has been noted that "internals" may not resist attempts to influence them if they see it to their advantage to comply. This would indicate that punishments which may be seen to their advantage to comply with, may be the most effective to employ with these "internal" individuals for the rapid elimination of their undesired behaviour. Some form of time out or response cost may be more appropriate than "physical" punishments for "internal" individuals, since these punishments (unlike "physical" punishment) can be made to result in the recipient giving up something they value. In this situation internally oriented individuals may see it is to their advantage to comply with rather than resist, the punishment.

There is a need for more research to investigate whether
individuals vary in their response to different punishments as a function of their perceived locus of control.

Before leaving the topic of the demonstrated relationship of perceived locus of control and responding in the punishment situation it would seem appropriate to comment on the effectiveness of the I-E Scale (Rotter, 1966) in differentiating "internals" and "externals" in the present investigation. The results of the present investigation indicate that the scale was a suitable measure to use despite its weaknesses outlined in Chapter 3. This confirms the suggestion that the I-E Scale (Rotter, 1966) is still a suitable tool to use despite the finding that perceived locus of control is probably a multidimensional construct.

It would still seem appropriate, however, for future research to attempt to determine whether or not a more specific measure, other than the general scale, may differentiate even more satisfactorily, the performance of "internals", "externals" and ambivalent scorers in the punishment and other situations. One possible avenue of research would be to compare the effectiveness of various measures of perceived locus of control in predicting behaviour in the punishment situation. For example, a measure based on a specific factor on the I-E Scale (Rotter, 1966) which related to control in the punishment situation could be compared with the measure based on the I-E Scale (Rotter, 1966) generally. Another possibility would be to develop a measure
of perceived locus of control which would relate specifically
to the punishment situation for use in research of this nature.

Looking at the second "subject" variable, the recipient's
subjective perception of the punishing stimulus, the results
at first sight (see hypothesis 3) did not confirm the prediction
that the more severe the punishment is perceived to be, the more
effective it will be in suppressing punished behaviour. Further
examination of these data, however, revealed that the method of
dividing subjects into severe and less severe raters was some-
what insensitive to the effect of subjective perceptions of the
stimulus upon performance in the two punishment phases of the
study.

Subsequent analyses revealed that for externally oriented
recipients, their subjective perceptions of the punishing stimulus
were influential in determining how they responded to the punishing
stimulus in the first punishment phase of the study, although this
possibly was related to their willingness to comply with the
demands of the experiment. Responding of the internally oriented
recipients appeared to be independent of their subjective percep-
tions of the stimulus. It is possible that the internally
oriented recipients may have allowed their determination to resist
the experimenter's influence, via the punishing stimulus to override
the unpleasantness of the punishing stimulus. These findings
suggest that the relationship between subjective perceptions of the
punishing stimulus and overt responding in the punishment situation
is not as simple as has been postulated. It would appear that
this relationship is mediated to some extent by the individual recipient's perceived locus of control.

The attempt to investigate this relationship employing a more objective measure of subjective perceptions was not successful. It was thought that if two stimuli were equated they should suppress responding equally. This, however, was not the case. The results suggest that this finding may be partly attributable to the effect of perceived locus of control since the significant decrease in trials to cessation from punishment 1 to punishment 2 was primarily a result of the internally oriented individuals.

These results indicate the difficulty for an experimenter involved in trying to estimate the recipients subjective perceptions of the punishing stimulus in the punishment situation. It may be worthwhile for future research to investigate whether clearer results could be obtained by employing physiological measures of subjective perceptions such as measuring responses of the autonomic nervous system to the punishing stimulus (for example, heart rate, galvanic skin responses).

With regard to the third variable studied, the perceptions of control over the punishing stimulus inherent in the punishment situation, the results demonstrate that the light stimulus was rated less severely following its use as a punishment than when it had been presented previously by the experimenter. This confirmed the prediction that perceived control over the punishing
stimulus would result in it being viewed as less discomforting, unpleasant, annoying, intrusive or painful following its use as a punishment than when it was presented in the same punishment situation but with no provision for the recipient to control the onset or termination of the stimulus. These findings agree with those of other researchers who have found that perceived control over an aversive stimulus can alleviate the debilitating effects such a stimulus may produce (for example, Weiss, 1968; Bowers, 1968; Glass, Singer and Friedman, 1969; Glass, Reim and Singer, 1971; Geer and Maisel, 1972; Sherrod, Hage, Halpern and More, 1977). This would need to be investigated further, however, to ensure that the reduction in rating severity was due to the control inherent in the punishment situation and not to the fact that in the cross modality matching situation, the light was paired with a tone which may have enhanced its unpleasantness whereas in the punishment situation it was presented alone. The results tend to suggest that this probably was not a factor influencing the ratings since there were subjects who did not alter their ratings or who increased the severity of their ratings following the punishment situation. Further research could also investigate whether control within the punishment situation produces a similar enhancing effect as control over aversive stimuli in other situations.

The investigation was primarily concerned with the three "subject" variables making up the recipient's overall subjective
perceptions of the punishment situation. However, the effect of sex differences were also investigated in the punishment situation and on the I-E dimension. The results indicate that there were no differences as a result of sex on either of these measures.

The findings with regard to sex differences in relation to perceived locus of control do not confirm the findings of some researchers (such as Feather, 1967; McGuinnies et al, 1974; and Zerega Jr. et al, 1976) who found females to be more externally oriented than males. The findings, however, support those of other researchers (for example, Rotter, 1966; Chandler and Dugovics, 1977) who found no difference between males and females of various samples.

One possible explanation for these equivocal findings may be as follows. Feather (1967) has postulated that differences between males and females on measures of perceived locus of control may be dependent on the age of the subjects being investigated. Specifically, the younger the age of the females in the sample the more likely there is to be a sex difference in favour of greater externality for females. It is quite possible that the inclusion of more mature age students (who have chosen to undertake tertiary education) in a sample, may account for this result. Such students may have a more internal locus of control than younger students who come straight to university from secondary education often without any clear idea of what
they intend to do. The present study which found no evidence of a difference between males and females on the I-E Scale (Rotter, 1966) employed a mixture of younger and more mature age students (30% of females and 40% of males were mature age) even though they were all first year students. It is possible that the inclusion of older students in the sample may account for the lack of sex differences found in this study.

To see if this was the case, percentages were calculated for the number of subjects whose I-E scores fell within the internal third, external third and middle third of the I-E distribution of this study. This revealed that for the mature age students, 45% of males and 46% of females were internally oriented, 41% of males and 31% of females were ambivalent, and 14% of males and 23% of females were externally oriented. In contrast, for the younger students 26% of males and 15% of females were internally oriented, 26% of males and 50% of females were ambivalent and 48% of males and 35% of females were externally oriented. This indicates that for both male and female subjects there were more older students scoring in the internal direction of the I-E Scale (Rotter, 1966) than younger students. It would appear that further investigations including age as a variable would be useful to help clarify these findings with regard to sex differences in relation to perceived locus of control.
Concluding Remarks

The results of the present investigation suggest that there is some relationship between recipient's subjective perceptions of the punishment situation and the effect the punishing stimulus has upon recipient's overt behaviour. Variations in subjective perceptions of the punishment situation, especially subjects perceived locus of control, resulted in different responses to the punishing stimulus. These findings confirm Bower's (1973) recommendation that person variables should be taken into consideration, as well as situational variables, in psychological research of this kind.

The results of this investigation also lend support to the definition of punishment presented by Maitland and Clarke (1980). However, these results suggest that it is more likely recipient's subjective perceptions of the punishment situation (as a whole) rather than of the unpleasantness created by the punishing stimulus alone which influences recipient's overt behaviour.
APPENDIX 1

A TECHNICAL DESCRIPTION OF THE WAY IN WHICH
THE EXPERIMENTER'S AND SUBJECT'S PANEL OPERATED

(Written by the Senior Technical Officer who
maintained the apparatus)
When the buttons are selected the Data is stored in memories 1 and 2, when the next selection occurs memory 1 is updated. Comparator 3 looks at memories 1 and 2 and if equal enables rewards ("Score"). "Register Display" shows current selection of numbers and is updated each trial. Pushbutton data is encoded to binary for transmission to memory. Each flip flop register extinguishes the pushbutton illumination as depressed.

A signal is fed to the $\div 4$ counter which increments the decade counter driving "number of trials display". Comparator 1 looks at the setting of trials, selection thumbwheels and the decade counter output to "number of trials display". When these are equal address enable is signalled which allows memory 2 to be addressed.

Comparator 2 looks at the setting of the rewards, thumbwheels and the decade counter output monitoring the "Score". When these are equal a signal appears on "punishment initiate" from the comparator. The punishment section can be either auditory or visual. The signal on "punishment initiate" enables a monostable, adjustable by a potentiometer ("Duration") 1-10 second, this triggers an astable running at 3 Hz., which controls the "on" time of the astable running at a frequency varied by the tone control between 50 Hz - 10 KHz for auditory stimulus. The signal is then fed to an audio amplifier to drive 2 horn speakers.
The signal from the 1 - 10 second monostable ("Duration") also enables an astable running at 2 Hz - 20 Hz which drives the strobe light circuit for visual stimulus presentation, a potentiometer allows variation of the flash rate with a L.E.D. indicating operation. The trigger signal is fed to an opto-isolator which allows a gate signal to appear at the S.C.R. which triggers a pulse through the transformer TR6KN firing the xenon flash tubes. A "set up" button initiates the 1 - 10 second ("Duration") monostable to test the strobe and audio output functions.

The "reset" button, resets all registers, displays, counters and flip flops. The "score interrupt" switch inhibits the decade counter driving the two score displays. The time delay selection thumbwheels allow presetting of delay before new entries of data can be accepted from 0.1 - 9.9 seconds. This is accomplished by a downcounter driven by a clock counting down from the preset delay.

When the count is zero, an output is fed back to enable the input to accept new data. A 2 - way intercom is provided using an audio amplifier with switching of speakers on each panel to enable speech or listening using the speakers, it is possible to use an external microphone.

The push button illumination was controlled by a potentiometer on the panel controlling a voltage regulator supplying the pushbutton lamps. A telltale is provided to indicate level.
APPENDIX 2

Rating sheet containing five ten-point rating scales

NAME

STIMULUS: Tone

Rate the stimulus on each of the following scales:

Not at all unpleasant  | Extremely unpleasant
1 2 3 4 5 6 7 8 9 10

Not at all annoying  | Extremely annoying
1 2 3 4 5 6 7 8 9 10

Not at all uncomfortable  | Extremely uncomfortable
1 2 3 4 5 6 7 8 9 10

Not at all intrusive  | Extremely intrusive
1 2 3 4 5 6 7 8 9 10

Not at all painful  | Extremely painful
1 2 3 4 5 6 7 8 9 10
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Pendergrass, V. Effects of length of time-out from positive reinforcement and schedule of application in suppression of aggressive behaviour. The Psychological Record, 1971, 21, 75-80.


Rotter, J.B. Generalized expectancies for internal versus external control of reinforcement. *Psychological Monographs, 1966, 80, (Whole No. 609).*


ERRATA

Page 2 para 1 line 7 cumulative
Page 5 4th last line affect
Page 6 line 1 affects
Page 29 line 9 conditioning
   line 11 if → of
Page 35 and elsewhere counselling
   persistence
Page 43 line 3 expectancies
   line 10 determining
Page 51 line 6 affect
Page 52 line 7 devices
Page 60 last line subsidiary
Page 63 para 2 line 8 electric
Page 72 line 5 switch
Page 94 line 6 eighth
Page 123 para 3 line 1 none .... was
Page 133 para 2 line 2 affected
Page 135 line 5 override
Page 140 line 4 'perceptions.... which influence.'
Page 147 Brecker..... 'serendipitous.'
Page 149 Doleys et al. Underline 'Journal.'
Page 151 Second last references 'Psystiological Optico' should read Physiological Optics.
Page 151 Last reference 'Counselling'
Page 156 Second reference 'psychosomatic.'