The present investigation was undertaken to study the effect of KR, on the acquisition of efficiency and extinction when withdrawn, on two tasks i.e. weight estimation and Muller Lyer illusion. The effect of certain psychological variables like personality anxiety and intelligence has also been studied in relation to the effect of KR on both acquisition and extinction.

The discussion of the results would follow the framework in which the present problem was conceptualized in the form of the hypotheses. The discussion of the results will be focussed primarily on the effect of provision-withdrawal of KR on the performance of weight estimation and Muller Lyer illusion in relation to psychological variables mentioned above.

KNOWLEDGE OF RESULTS (KR) AND PERFORMANCE

It is an established fact that KR facilitates performance (Ammons 1956, Mohan, 1977). This facilitative effect of KR was demonstrated as early as 1931 by Thorndike in a classical experiment on line drawing. He reported a significant improvement in the performance of drawing a 4" long line after the introduction of KR. In the present study too, the facilitative effect of KR is confirmed. The discrepancy curves for the performance of weight estimation and Muller Lyer illusion for the total sample (Figs. 1 and 2) show a marked drop in the discrepancies after the eleventh trial when KR is introduced.
This decrement in discrepancies is maintained up to 26th trial after which the performance stabilises (Figs. 1 and 2). These results are discussed separately for the two tasks.

(i) **Performance on Weight Estimation with KB**

The downward trend of the discrepancy curve in the acquisition series of weight estimation (Fig. 1) reveals that the performance is facilitated with the introduction of KB. In order to see the significance of improvement, t-test was used on the above stated difference. The t-ratio comes out to be highly significant (Table VI) which implies that the improvement after the introduction of KB is highly significant.

The mean acquisition rates range from 16.07% to 19.52% with an overall mean acquisition rates of 17.80% for the total sample (Table VI). Mohan and Damral (1971) and Mohan and Gupta (1972, 1984-) also reported an improvement in performance on the task of weight estimation when KB was given.

(ii) **Performance on Muller Lyer Illusion with KB**

The downward trend of the mean discrepancy curve (Fig. 2) in the acquisition series of Muller Lyer illusion implies that the performance improved with the introduction of KB. The positive difference between the discrepancies of the last four trials of the initial and the acquisition series on Muller Lyer illusion indicates the facilitative effect of KB. The t-test applied on the difference of discrepancies reveals
that the difference is highly significant which implies that the provision of KR reduces the illusion significantly.

The mean acquisition rates range from 11.05% to 14.46% with an overall acquisition rates of 12.75% for the total sample on the performance of Muller Lyer illusion. An earlier study by Sen and Belode (1971) using the same task reported significant decrease in illusion under KR condition. The authors concluded that "the variable of KR markedly reduces the extent of Muller Lyer illusion in general as well as in particular but rarely aids to minimize it totally due to certain particular characteristics of the figure." This supports our hypothesis that the extent of Muller Lyer illusion with KR would be significantly lesser than that in the initial series when no KR is provided.

This facilitative effect of KR has also been demonstrated by different investigators using different tasks such as line drawing (Thorndike 1931, McGuigan, 1959; Mohan, 1969; 1973; Gupta, 1978; and Mohan, Gupta and Sharma, 1985); time estimation (Waters, 1933; Macpherson et al., 1948; Madan and Dey, 1964; Mohan and Sekhon, 1972; Allen and Clark, 1979; Phillips et al., 1983; and Mohan & Deol, 1983); reaction time (McCormack, 1959; Church and Camp, 1965; Mohan, 1969; Mohan and Mann, 1970; and Strong, 1983); vigilence tasks (Mohan and Malhotra, 1974; Camus and Francis, 1980; and Huntermark & Witte, 1980); mental tasks (Angell, 1949; Pressey, 1950; Paige, 1956; Flock and Saggar, 1968; Mohan and Kumar, 1973; Bayti, 1979 and Mohan and Dhingra, 1984).
From the results of the present study, the facilitative effect of KR is confirmed irrespective of the task used.

**Extinction as a Function of Withdrawal of KR**

Although phenomenon of extinction as a function of withdrawal of reinforcement is well established in classical and instrumental conditioning (Pavlov, 1927; Skinner, 1938), yet there is a relative paucity of work on extinction as a function of withdrawal of KR. The performance is deteriorated to a marked extent after the withdrawal of KR. This is supported by many investigators using different tasks, e.g., line drawing (Thorndike, 1931; McGuigan, 1959; and Mohan & Vohra, 1984); pedestal sight manipulation test (Houston, 1947; and Goldstein & Mittemhouse, 1954); eyelid conditioning (Grant et al., 1950; Frank, 1956; and Hartmen & Grant, 1960); verbal conditioning (Grant et al., 1953; Lewis, 1956; and Lorain, 1970); target tracking (Macpherson et al., 1948; Bilodeau and Schumski, 1959); and with operant conditioning (Myers, 1960; and Hager Roger, 1962). In the present study too, this detrimental effect of the withdrawal of KR upon the performances of weight estimation and Muller Lyer illusion, is confirmed. The present findings are discussed below for the two tasks separately.

(i) **Extinction on Weight Estimation**

A portion of the curve (Fig. No. 1) which spans over the extinction series on the task of weight estimation for the total sample, shows a marked increase in the discrepancies after the 30th trial. This increase in mean discrepancies and the upward trend of the curve in the extinction series,
reveal an adverse effect of the withdrawal of KR on the performance of weight estimation. This implies that extinction has taken place after the cessation of KR.

The negative difference (-3.81) between the mean discrepancies of the last four trials of the acquisition and the extinction series also indicates that extinction has taken place (Table No. V). This difference reaches significance beyond .01 level (t = 42.33). The highly significant t-ratio suggests that extinction has taken place significantly after the withdrawal of KR. The extinction rates ranged from 8.49% to 10.48% with an overall mean extinction rates of 9.49% for the total sample on the task of weight estimation (Table X). This extinction effect has also been reported on various tasks mentioned earlier.

Though the performance dropped significantly after the withdrawal of KR, it has not dropped to the initial level as is evident from the curve in Fig.1. The highly significant t-ratio (27.58) on the difference between the mean discrepancies of the last 4 trials of initial and the extinction series on weight estimation (Table V) implies that the performance after the withdrawal of KR is still better and above the initial level. The results are supported by a previous study on pedestal sight manipulation test by Houston (1947) who reported a significant extinction after the withdrawal of KR. The author further reported that the performance of KR group did not drop to the level held by no KR group. Macpherson et al. (1948) also reported
Thus the present results, regarding extinction on weight estimation confirm the present hypothesis that the performance will be deteriorated after the withdrawal of KR.

Extinction on Muller Lyer Illusion

A portion of the curve (Fig. No. 2) which spans over the extinction series on Muller Lyer illusion indicates an upward trend. It suggests that the withdrawal of KR results in relative increase in Muller Lyer illusion. This deteriorative effect is further established by the negative difference between the mean discrepancies of the last 4 trials of the acquisition and the extinction series (Table V). This difference reaches significance beyond .01 level (t = 42.33) which implies that a highly significant extinction has taken place after the withdrawal of KR.

The extinction rates ranged from 4.39% to 7.43% with an overall mean extinction rates of 5.91% for the total sample on Muller Lyer illusion (Table XII) which are lower in comparison with those on weight estimation (Table X). The comparative lower mean extinction rates on Muller Lyer illusion may be explained to be due to the differences in the nature of two tasks. In case of weight estimation, the subjects being blind folded, could have become more uncertain and confused after the withdrawal of KR, while they were free to see the standard stimulus in case of Muller Lyer illusion. They might have been using certain cues in adjusting
the variable stimulus, which resulted in comparatively lesser decrement in performance after the withdrawal of KR. The extinction effect has also been reported on various tasks by Thorndike (1931), Houston (1947), Macpherson et al. (1948); Grant et al. (1953); McGuigan (1959); Lorain (1970); Sen (1976); and Mohan & Vohra (1984).

Though, the performance has dropped significantly after the withdrawal of KR on Muller Lyer illusion, it is evident from Fig. 2 that the discrepancy curve is still below the initial level and has not dropped to the initial level i.e. Muller Lyer illusion has increased after the withdrawal of KR but this increment in the illusion is not above (more than) the initial level; not even equal to the initial level (Fig.2). The difference between the mean discrepancies of the last 4 trials of the initial and the extinction series comes out to be highly significant ($t = 24.76$) (Table V). This implies that the increase in Muller Lyer illusion is significantly lower than that of initial series. The results are supported by a previous study on pedestal sight manipulation test by Houston (1947) who reported a significant extinction after the withdrawal of KR. The author further reported that the performance of KR group did not drop to the level held by no KR group. Macpherson et al. (1949) also reported the same results on target tracking. The authors reported that the performance dropped after the withdrawal of KR, but not below the initial level.
Though bulk of the studies have reported performance decrement as a function of withdrawal of KR, there do exist some studies that have reported no significant decrement after the withdrawal of KR. These studies are by Bifel et al. (1944), Tufts, Bief et al. (both reported in Ammons, 1956), and Madan and Dey (1964).

The decrement in performance after the withdrawal of KR reported in some studies and not in others, may be explained in accordance with Madan and Dey (1964), due to the difference in the control of some important factors accounting for the lack of agreement between experimental findings, e.g., the possibility that certain processes which serve as substitutes for knowledge giving events are eliminated in certain experiments and not eliminated in others after the withdrawal of KR. Thus, resulting in performance decrement in the former but not in the latter.

EFFECT OF EXPERIMENTAL AND PSYCHOLOGICAL FACTORS ON PERFORMANCE IN RELATION TO KR.

The facilitative effect of KR and deteriorative effect of withdrawal of KR on performance depends upon certain experimental and organismic factors. In the present study, some of the variables taken into account are frequency of KR; personality in terms of E/I and anxiety; intelligence and sex differences. The effect of KR on performance with regard to these variables is discussed below.
The extent of the facilitative effect of KR depends upon the proportions of trials on which the KR is given (Ammons, 1956). The improvement in performance is in proportion to the increase in the frequency of KR. The greater the number of trials on which the KR is given, the quicker and greater will be the improvement. In the present study, too, where the frequency of KR was varied in two ways, i.e., 100 % and 50 % (K₁ and K₂), the results reveal the superiority of the former group on both the tasks of weight estimation and Muller Lyer illusion which is discussed below:

**Frequency of KR and Performance on Weight Estimation**

The curves plotted for two frequencies of KR reveal that 100 % KR group is performing better than the 50 % KR group (Fig. 3). The mean discrepancies of the last 4 trials in the acquisition series also indicate the superiority of 100 % KR group (Table VI). The superiority of the 100 % KR group is further established by its higher acquisition rates i.e. 18.73 % than that of the 50 % KR group i.e. 16.86 % (Table VI). An A x B x C x D x E ANOVA (Edward, 1968) applied to the mean discrepancies on the final performance and on the acquisition rates, has statistically established the superiority of 100 % KR group over 50 % KR group in terms of acquisition rates as well as the mean discrepancies on the acquisition series of weight estimation (Table VII).
Mohan and Damral (1971) reported a trend in favour of the 100% KR group in comparison with the 66% and 33% of KR groups on the same task on adult sample. Mohan and Gupta (1972) using the same task on school children, reported a significant difference in favour of 100% KR group at .05 level, Mohan and Gupta (1984) using the same task in another study on college youth, however, reported an insignificant difference among 100%, 75%, 50% and 25% KR groups. But in a further analysis of the mean discrepancies, the authors reported a significant difference in favour of 100% KR group.

(ii) Frequency of KR and Performance on Muller Lyer Illusion

In the curves (Fig.4) plotted for two frequencies of KR, the mean discrepancies of the last four trials of the acquisition series and the mean acquisition rates (13.66%) and 11.85% respectively) calculated for the two frequencies of KR (Table VIII) reveal the superiority of the 100% KR group (K₁) in comparison with the 50% KR group (K₂). The superiority of 100% KR group is statistically significant beyond .01 level when ANOVA was applied to the acquisition rates and the mean discrepancies both (Table IX). The highly significant F-ratios imply that 100% KR group is significantly better than the 50% KR group on both the acquisition of efficiency and the final performance.

A number of studies have been reported by different investigators regarding the effects of different frequencies of KR. Two types of results have been reported.
(i) The studies which reported no significant difference between the performance of the different KR groups, i.e., Goldstein and Ritten-house (1954), Rosen (1961); McCormack, et al. (1963), Mohan and Mann (1970) and Mohan & Gupta (1984) found no significant difference in the performance of the 100% and 50% KR groups. Mohan, Gupta and Sharma (1985) also reported insignificant difference between the two frequencies of KR on a line drawing task. However, the trend was in favour of 100% KR group.

(ii) The second category of studies reported a significant effect of different frequencies of KR on various tasks. Houston (1947), Bilodeau and Bilodeau (1956) reported a significant difference among the performances of 100%, 50% and 25% KR groups on aiming and target tracking. The superiority of 100% KR group has also been reported on line drawing (McGuigan, 1959; Gupta, 1978; and Mohan and Vohra, 1984); time estimation (Madan and Dey, 1964; Mohan and Deol, 1983); vigilance tasks (Abbey and Cowman, 1960; Wiener, 1963; Johnson and Payne, 1966); pursuit rotor learning (Gerson, 1979); motor learning (Linda and John, 1979) and paired associate learning (Mohan and Dhingra, 1984).

The present results in line with the latter group of studies confirm the hypothesis that the higher the frequency of KR, the quicker and better the performance will be.
FREQUENCY OF KR AND EXTINCTION

The qualitative and quantitative drop in the performance level after the cessation of KR, depends upon many experimental and psychological factors. Among the experimental variables, one of the most important variable is the frequency of KR given in the training or acquisition series. According to Jenkins and Stanley's generalization (Madan and Dey, 1964), "All other things being equal, resistance to extinction after partial reinforcement is greater than after continuous reinforcement..." In other words, resistance to extinction is negatively related to the frequency of reinforcement or KR given in the acquisition series, i.e., the lower the frequency of KR the higher the resistance to extinction after the withdrawal of KR will be and the vice versa. The present results regarding extinction on both the tasks in relation to frequency of KR also point towards the superiority of the partial i.e. 50% KR over 100% KR group. The results for both the tasks are discussed below separately.

Frequency of KR and Extinction of Weight Estimation

A comparison of the curves on the portion of the extinction series plotted for the 100% and 50% KR groups (Fig. 3) and also of their mean discrepancies on the extinction series of weight estimation gives evidence of a slight difference between the performance of 100% and 50% KR groups, favouring the latter group (Table X). But the extinction rates calculated for the two KR groups demonstrate the superiority of the 50% KR
group (8.49 %) over 100 % KR group (10.48 %). The ANOVA performed on extinction rates reveal that the difference between the extinction rates of the two KR groups is significant beyond .01 level (Table XI). However, the ANOVA performed on the mean discrepancies of the extinction series of the same task does not reveal any significant difference between the performance of two KR groups (Table XI). The significant F-ratio on the extinction rates may be attributed to the already high performance level of the 100 % KR groups on the acquisition series in comparison with the 50 % KR group, leaving less scope for decrement after the withdrawal of KR in the extinction series.

(ii) Frequency of KR and Extinction of Muller-Lyer Illusion

A comparison of the groups on the portion of the extinction series, plotted for the two frequencies of KR, reveals the superiority of the 50 % KR group over 100 % KR group after the withdrawal of KR (Fig. 4). The superior performance of the 50 % KR group is further established by its lesser mean discrepancies on the extinction series and lower extinction rates on the task of Muller-Lyer illusion (Table XII). The difference between the two KR groups reached significance at .001 level with respect to extinction rates ($F = 210.55$) as well as mean discrepancies ($F = 10.48$) (Table XIII).

The significant F-ratio for two frequencies of KR on both the tasks imply that 50 % KR group is significantly more
resistant to extinction in comparison with the 100% KR group. A number of studies regarding the differential effect of two frequencies of KR on extinction, have been reported by different investigators. Hartman and Grant (1960) on eyelid conditioning, Myres (1960) on operant conditioning, Hogar (1962), Lorain (1970) and Mohan and Vohra (1984) reported the results in favour of partial KR group in comparison with the 100% KR group. The present results in line with these previous findings confirm the present hypothesis that extinction will be quicker and greater in magnitude under 100% KR group than under 50% KR group on both the tasks of weight estimation and Muller Lyer illusion.

II Extraversion and Performance with KR

Among organismic factors, E/I dimension, being related to the individual differences in the cortical excitement and inhibition (Eysenck 1947, 1952, 1957, 1960) is responsible for augmenting and decreasing the facilitative effect of KR. Introverts are supposed to condition/learn better because of the quicker arousal and slower accumulation of reactive inhibition (Ir) in comparison with the extraverts because of latter's faster accumulation of Ir and its slower dissipation. The present results also support the above hypothesis. The results for both the tasks are discussed below separately.
Extraversion (E/I) and Performance on Weight Estimation

A comparison between two personality groups on (a) the curves (Fig. 5) plotted for the portion of the acquisition series, (b) the mean discrepancies and (c) the acquisition rates, reveals a consistent superiority of the introverts over the extraverts in terms of all the three aspects on the performance of weight estimation (Table VI). The superiority of the introverts is statistically established on the acquisition rates ($F = 8.19$) and on the mean discrepancies of the acquisition series ($F = 34.61$) at .01 and .001 levels respectively (Table VII). The highly significant $F$-ratios for the acquisition rates as well as the mean discrepancies reveal that the introverts are significantly better than their counterparts in the acquisition of efficiency on the task of weight estimation when the performance is coupled with KR. The same trend was reported by Mohan and Gupta (1972) on the same task. However, this trend in favour of introverts failed to reach significance in Mohan and Gupta's (1972) study.

(ii) Extraversion and Performance on Muller-Lyer Illusion

A comparison between the performance of extraverts and introverts on (a) the curves (Fig. 6) plotted for the portion of acquisition series, (b) the mean discrepancies and (c) the acquisition rates (Table VIII) reveals that the introverts are superior to extraverts with respect to the decrement of Muller-Lyer illusion. The superiority of introverts is established by the lower discrepancy curve and their lesser mean discrepancies.
on the acquisition series. The superiority of introverts is further supported by their higher acquisition rates in comparison with the extraverts (Table IX).

This difference between the performance of introverts and extraverts is significant for the acquisition rates as well as the final performance on the acquisition series of Muller Lyer illusion (Table IX). Mohan and Gill (1961) also reported the significant superiority of introverts over extraverts on the same task of Muller Lyer illusion. The fact that introverts are less illusioned in the acquisition series, has its support in Eysenck's (1967) basic theory which attributes better performance of introverts to their higher cortical excitation, slower accumulation of Ir and its faster dissipation. According to Kohler and Wallach (1944) (In Mohan and Gill, 1981), this basic assumption would imply that in perceptual exposures for a considerable time fixation of a contour produces realized current flow in visual cortex. Prolonged fixation builds up resistance to further flow and this subsequent input from the same part of the visual field is displaced to relatively unsatisfied areas. Mohan and Gill (1961) assumed that in extraverts, this satiation would take place faster because of their low cortical arousal and faster accumulation of Ir, and hence the greater illusion effects. Mohan and Gill (1979) found similar better performance of introverts in perceptual estimates of kinesthetic figural after effects.
The lesser illusion effect among introverts after the provision of KR may also be explained on the basis of their greater magnitude of illusion in comparison with the extraverts in the initial series, leaving more scope for improvement after the provision of KR.

The present findings regarding the superiority of extraverts over introverts in the initial series and the former's subsequent inferiority over the latter group in the final stage of acquisition series may also be explained through the concept of inhibition. In the beginning of performance there is no building up of reactive inhibition (Ir) in the CNS of extraverts. The favourable effect of this lack of Ir would be more pronounced in the case of extraverts than introverts (Kumar, 1974). This is exactly the case in the present study. As one proceeds from initial to acquisition and to extinction series, the building up of Ir is quite apparent because the performance drop in the case of extraverts becomes more pronounced reaching its peak towards the end of extinction series (Fig. 6).

Eysenck explains the concept of inhibition in terms of Hullian concept of reactive inhibition (1943) as, "All responses leave in the physical structure ------- a state which acts directly to inhibit the evocation of activity ------- This inhibitory substance manifests through reaction potentials. This negative action is called Ir, an increment of which is assumed to be generated by every repetition of
the responses whether reinforced or not and these increments are assumed to accumulate except as they spontaneously disintegrate with the passage of time." Gray (1972), too holds the same opinion. Mohan and Mann (1970) and Mohan and Kumar (1974) also reported the superiority of extraverts in the initial stages in respect of reaction time and simpler problems respectively.

Level of arousal is the 2nd major construct in Eysenck's theory to explain better learning of introverts, who, by nature, have a weaker CNS and even a weaker stimulus is sufficient for the arousal. Eysenck (1967) and Gray (1972) agree that introverts are characterized by higher states of arousal while the E.E.G. studies have provided evidence that there is lower level of cortical arousal in extraverts (Gale et al. 1969). Coming back to the present results, it is seen that on initial trials, the introverts are performing poorer despite quicker rate of arousal. This contradiction can be explained through the level of aspiration and achievement motivation interacting with the fear of failure. Introverts have higher level of aspiration and are high on achievement motivation (Eysenck, 1957, 1960). Lynn (1962) and Broadbent (1958) report that the level of aspiration is positively related to introversion. It can be suggested in accordance with Kumar (1974) that in the face of high level of aspiration, high achievement motivation and fear of failure in introverts in the initial stage, and the absence of KR (reinforcement) might
have led them to a state of anxiety and work decrement for a temporary period. The fact that the introverts are more susceptible on punishment than extraverts, has been accepted by Eysenck (1947) and Gray (1972). The absence of reward and fear of failure in the first instance might have caused cognitive dissonance (Festinger, 1957) which in turn, produced a temporary state of anxiety and stress which impaired performance (Lazarus, Deese and Osels, 1952) by causing a temporary block in the way of already activated ARAS.

Thus, the just stated facts explain the better performance of introverts in respect of acquisition rates as well as final performance on acquisition series. The superior acquisition rates of introverts than that of extraverts, support the results obtained by Mohan and Gupta (1972), Mohan and Malhotra (1974), Mohan and Kumar (1974), Bayti (1979), Mohan and Deol (1983) and Mohan and Dhingra (1985). Thus, the better performance of introverts revealed on both the tasks of weight estimation and Muller Lyer Illusion in the present study confirms the present hypothesis that the introverts will be significantly better than the extraverts on the performance of weight estimation and Muller Lyer Illusion both.

EXTRAVERSION AND EXTINCTION

According to the second part of the Eysenck’s hypothesis (1947, 1955, 1960), introverts, being slower in accumulation of Ir and faster in its dissipation, were expected to show more resistance to extinction in comparison with the extraverts who
are characterized with faster accumulation of Ir and its slower dissipation. The present results also reveal the same trend. The introverts are performing significantly better than the extraverts on the extinction series on both the tasks.

**Extraversion and Extinction on Weight Estimation**

An inspection of the portion of the graph (Fig.5) on the extinction series plotted for the extraverts and introverts reveals that the introverts are performing better than the extraverts after the cessation of KR on weight estimation.

The superiority of introverts is further established by their lesser mean discrepancies on the extinction series and lower extinction rates (8.61/10.37) in comparison with the extraverts (Table X). The difference between the performance of the two groups reached significance at .01 level in terms of extinction rates and also on mean discrepancies of the extinction series both (Table XI).

**Extraversion and Extinction on Muller Lyer Illusion**

A look at the curves (Fig.6) on the portion of the extinction series, plotted for the extraverts and introverts on the performance of Muller Lyer illusion, suggests that the extraverts are more adversely affected by the withdrawal of KR in comparison with the introverts (as depicted in increased illusion effect). The lesser mean discrepancies of introverts on the extinction series and their lower
extinction rates in comparison with the extraverts also point towards the same trend (Table XII). The superiority of introverts is statistically significant as the F-ratio for the extinction rates as well as the mean discrepancies reaches significance beyond .01 level (Table XIII).

The highly significant F-ratios for the extinction rates as well as the mean discrepancies of the extinction series on both the tasks imply that E/I dimension is playing a highly significant role in augmenting or decreasing the deteriorative effect of the withdrawal of KR on the performance of both the tasks. The introverts, having significantly lower extinction rates in comparison with the extraverts, have come out to be significantly more resistant to extinction in comparison with the extraverts. Thus, the deteriorative effect of withdrawal of KR on their subsequent performance is augmented among the extraverts but decreased among introverts, resulting in lesser extinction rates of the latter. The present results are in line with the Eysenck's hypothesis (1947, 1952, 1955, 1960, 1965) that the introverts, being slower in accumulation of Ir and faster in its dissipation, will be more resistant to extinction after the withdrawal of reinforcement.

Thus, the present hypothesis regarding the superiority of introverts in being resistant to extinction on both the tasks of weight estimation and Muller Lyer illusion, is upheld.
Anxiety is another important variable which is considered to play a significant role in the acquisition of efficiency when the performance is coupled with KR. According to Taylor and Spence (1953), response strength (R) in a conditioning situation, is some positive function of the level of internal anxiety or emotionality of the subjects. Accordingly, Ss with greater anxiety would possess more drive strength and hence condition better than their low counterparts. Taylor (1951) and Spence et al. (1958) reported the superiority of high anxiety Ss on eyelid conditioning. Singh (1981) and Singh and Vohra (1982-83) also demonstrated the superiority of high anxious Ss on academic achievement. However, the authenticity of Taylor and Spence hypothesis (1951) could not be proved empirically for all the tasks. Rather, the results have been reported in favour of Yerkes-Dodson law (1908) which states that there exists a curvilinear relationship between drive and task complexity. It implies that performance is disrupted at very low and at very high drive levels (Sarason 1966, Sreedhar et al. 1973; Mohan and Kumar, 1979; Jain, 1981; Mookerji et al., 1982; Chadha, 1982; and Arkin et al., 1983).

Present results, regarding the performance of high and low anxious subjects on both the tasks, for initial and acquisition series are in line with Yerkes and Dodson law (1908). As apparent from the curves in Figs. 7 and 8, the performance of high anxious subjects is inferior to their low counterparts, but, the introduction of KR in the acquisition
series (from trial 11 onward) seems to have facilitated the performance of high anxious group by bringing down their level of anxiety to an optimum level where it starts facilitating learning. The provision of KR to the low anxiety group, no doubt, facilitated its performance (as apparent from the curve for low anxiety group)(Figs. 7 and 8). It also played its role in bringing down the already low level of anxiety below the optimum level where it i.e., the insufficient drive starts decreasing the facilitative effect of KR. Bethge et al. (1982) reported that the feedback reduced test anxiety and negative orientation to the testing situation and thus improved the performance of the anxiety Ss. These results are discussed separately for the two tasks.

Anxiety and Performance on Weight Estimation

A comparison on the portions of the curves (Fig. 7) plotted for the high ($A_1$) and low ($A_2$) anxiety groups on the acquisition series, reveal a small difference between the performance of high and low anxious groups favouring the latter group. The same trend is evident from the difference between the mean discrepancies of the last 4 trials on the acquisition series of the two anxiety groups on the performance of weight estimation. But a change in the trend is observed when acquisition rates are taken into account. The high anxious group comes out to be superior to low anxious group (Table VI).
This change in trend may be explained on the basis of the low initial performance of the high anxiety group than that of the low anxiety group, leaving more scope for improvement in the acquisition or training period when the performance is coupled with KR. However, this difference between the acquisition rates of the two anxiety groups is not significant (Table VII). It just missed significance at .05 level (F = 3.77). The insignificant F-ratio on the acquisition rates suggests that the introduction of KR does not have any significant differential effect on the performance of high and low anxiety groups on weight estimation. Mohan and Gupta (1972) also reported insignificant difference between the performance of neurotics (characterized with high anxiety) and stables (characterized with low anxiety).

**Anxiety and Performance on Muller Lyer Illusion**

A look at the portions of the curves (Fig.6) in the acquisition series plotted for the high and low anxiety groups on the tasks of Muller Lyer illusion reveals that the high anxious group is performing better than the low anxious group towards the end of the acquisition series. The same trend is apparent from the comparison of the mean discrepancies of the two anxiety groups on the last 4 trials of the acquisition phase (Table VIII). The superiority of the high anxious group is further supported by its higher acquisition rates in comparison with the low anxious group (Table VII). This superiority of the high anxious group is statistically proved,
as the F-ratio (77.79) on the main effect of anxiety on the acquisition rates of Muller Lyer illusion is highly significant beyond .01 level (Table IX). It implies that the high anxious group has been facilitated more in comparison with the low anxious group by the introduction of KR. The condition of anxiety is also significant at .05 level for the acquisition series of the same task.

The superiority of the high anxious group on the acquisition rates of both the tasks may be explained on the basis of:

(a) Taylor-Spence hypothesis (1951) and Eysenckian dimensional theory (1947, 1955, 1971, 1978). According to both, the high anxious Ss are faster in conditioning and slower in dissipation. It implies that the facilitative effect of KR on the learning of high anxious Ss gets augmented, while the same is decreased in case of low anxious Ss. This results in the better acquisition of high anxious Ss. This generalization is supported by Morocco (1978), Bayti (1979), Bethge et al. (1982) and Mohan & Deol (1983).

(b) On account of the nature of the task with regard to its requirement of accuracy, Eysenck and Gillan (1964) generalized that the high drive group is slower but more accurate than the low drive group. As both the tasks of weight estimation and Muller Lyer illusion are concerned with accuracy instead of speed or reaction time, the high anxious group is likely to excel the low anxious group especially after the right response
becomes dominated after the introduction of KR. Initially, when the wrong responses dominated, the performance of high anxious group was inferior to that of the low anxious group (Figs. 7 and 8) but, as soon as, right response became dominant in the acquisition series after the provision of KR, the high anxious group not only came at par with the low anxious group but also succeeded in superceding the latter (Tables VI and VIII).

(c) The reverse happened in the case of low anxiety subjects. They were performing better than the high anxiety group in the initial stage; but, later, in the acquisition series after the introduction of KR, their optimum drive level might have gone down (When they were confident that their estimation is approximately right) to such an extent that they became careless in the later phase of acquisition series. Their reduced drive level decreased the facilitative effect of KR for the low anxiety Ss. This phenomena is in accordance with Yerkes and Dodson Law (1908) which states a curvilinear relationship between the drive level and performance i.e. the performance is disrupted at very low and at very high drive levels. Corcoran (1965) (In Mohan and Kumar, 1979), while referring to the inverted-U relation between performance and level of arousal, viewed that "for any given value of performance, except the optimal, there will be two possible values of arousal, so that, although, level of performance is predictable, given level of arousal; level of arousal cannot be ascertained merely
from knowledge of performance. However, there are instances in which the latter prediction is possible — either by increasing level of arousal or by decreasing it. If arousal is lowered (as the provision of KR is assumed to reduce the anxiety level by providing direction and reducing error responses), then performance at the upper level of arousal will improve, but deteriorate at the lower level of arousal.

All the above stated facts explain the better performance of high anxiety Ss. Thus, the hypothesis that the high anxiety group will be superior to the low anxiety group when the performance is coupled with KR is confirmed.

ANXIETY AND EXTINCTION

A perusal of the portion of the curves (Figs. 7 & 8) concerned with the extinction series plotted for the high and low anxiety groups (A1 and A2) on the performance of weight estimation and Muller-Lyer Illusion, indicates the superiority of the high anxiety group over low anxiety group on both the tasks after the withdrawal of KR. The detailed discussion for both the tasks is given below:

1) Anxiety and Extinction on Weight Estimation

The lower extinction rates of the high anxious group in comparison with the low anxious group (Table X) reveal the superiority of the high anxious group in respect of resistance to extinction. The better performance of the high anxious group is also revealed by the lesser mean discrepancies of the high
anxious group on the extinction series in comparison with their low counterparts (Table X). The difference between the two anxiety groups is significant at .01 level on the task of weight estimation (Table XI). The highly significant F-ratio on the extinction rates (252.27) as well as the extinction series (26.20) imply that the high anxious group is more resistant to extinction.

(ii) Anxiety and Extinction on Muller Lyer Illusion

On comparing the curves (Fig.8) plotted for the mean discrepancies of the high and low anxiety groups for the portion of extinction series, it is clear that the performance of high anxious group is better than that of the low anxious group after the withdrawal of KR. The superiority of the high anxious group is also revealed by its lesser mean discrepancies on the extinction series and its lower extinction rates in comparison with the low anxious group (Table XII). This superiority is statistically significant, both, on the mean discrepancies and the extinction rates, on the task of Muller Lyer illusion at .01 levels (Table XIII).

This superiority of the high anxiety group on extinction was expected on the basis of Taylor-Spence hypothesis (1951) and Eysenckian dimensional theory (1947, 1955, 1967, 1978) which maintain that the high anxious group is quicker and faster in conditioning but slower in its dissipation after the withdrawal of reinforcement. Frank (1956) also maintained that the Neurotics were superior to stables on the eyelid
conditioning. The present finding regarding superiority of high anxious group on extinction reaffirms the above hypothesis.

**INTELLIGENCE AND PERFORMANCE WITH KR**

The mean discrepancy curves plotted for the high and low intelligent groups on the performance of both the tasks of weight estimation and Muller Lyer illusion reveal that the high intelligent group is consistently performing better than the low intelligent group. However, when the performance of both the intelligence groups is compared in respect of acquisition rates, the low intelligent group proves to be better because of its low initial ability, leaving more scope for improvement after the introduction of KR. The performance of both the intelligence groups is discussed below separately.

**Intelligence and Performance on Weight Estimation**

A comparison of the acquisition rates in respect of high and low intelligent groups on the task of weight estimation demonstrates the superiority of the low intelligent group (19.52%) in comparison with the high intelligent group (16.07%). The ANOVA computed on the acquisition rates reveals that the difference between the high and the low intelligent groups is highly significant beyond .01 level (Table VII).

However, when the performance of two intelligence groups is compared on the mean discrepancy curves (Fig.9) as well as the mean discrepancies of the last 4 trials of the acquisition series, the high intelligent group comes to be
consistently superior with respect to both. This superiority of the high intelligent group on the acquisition series is established statistically at .01 level (Table VII). Mohan and Gupta (1984) while using the same task, also reported the difference in favour of low intelligent group in respect of acquisition rates.

**Intelligence and Performance on Muller Lyer Illusion**

The mean discrepancy curves plotted for the high and low intelligent groups on the performance of Muller Lyer Illusion point out the consistent superiority of high intelligent group over their low counterparts (Fig. 10). But the acquisition rates for the high and low intelligence groups indicate the better performance of low intelligent group in comparison with the high intelligent group (Table VIII). This difference in the acquisition rates of the two intelligence groups is highly significant at .01 level (Table IX). A very high F-ratio implies that the low intelligent Ss are significantly better on the acquisition of efficiency on Muller Lyer illusion where superiority is measured in terms of decrement of Muller Lyer Illusion.

A number of studies, conducted to study the effect of intelligence on performance and learning, have also reported the better performance of the low intelligents and dulls in comparison with the normals and brights when the performance was coupled with KR. Cromwell (1963), Mohan and Malhotra (1974)
on tone discrimination, Gupta (1978) on line drawing and Bayti (1979) on academic achievement reported the significant superiority of the low intelligent groups on the acquisition rates. Mohan and Gupta (1984) also reported the difference in the acquisition rates of the two intelligence groups in favour of the low intelligent group. However, the difference was not reported to be significant.

The better acquisition rates of the low intelligent groups on both the tasks may be explained in accordance with Cromwell (1963), Mohan and Malhotra (1974), Gupta (1978) and Mohan and Gupta (1984) on the basis of their low initial ability as compared with brights leaving more scope for improvement under experimental conditions.

Taking into consideration, the present results on both the tasks of weight estimation and Muller Lyer illusion, and the results of previous such studies with KR, the present hypothesis that the 'low intelligent group will benefit more than the high intelligent group, when performance is coupled with KR' is confirmed.

INTELLIGENCE AND EXTINCTION

The mean discrepancy curves plotted for the high and low intelligent groups on the performance of weight estimation and Muller Lyer Illusion on the portion of extinction series (Figs. 9 and 10) point out that the high intelligent group is performing better than the low intelligent group after the
withdrawal of KR in the extinction series. The results are discussed below separately for both the tasks.

**Intelligence and Extinction on Weight Estimation**

The mean discrepancy curves (Fig. 9) on the extinction series reveal that the high intelligent group is performing consistently better than the low intelligent group except in the first few trials of the first half of the extinction series. The lower mean discrepancies on the extinction series as well as lower extinction rates of high intelligent Ss in comparison with their low counterparts suggest that the former group is more resistant to extinction than the latter (Table X). The superiority of the high intelligent group is also statistically established, as the difference between the two intelligence groups is significant beyond .01 level (Table XI).

**Intelligence and Extinction on Muller Lyer Illusion**

The supremacy of the high intelligent group in respect of extinction on Muller Lyer illusion is revealed by its consistent lower mean discrepancy curve than that of the low intelligent group on the extinction series (Fig. 10). This fact gets substantial support by the former's lesser mean discrepancies on the extinction series and lower extinction rates in comparison with the latter's (Table XII). The ANOVA used on the mean discrepancies as well as the extinction rates
indicate that the difference in the performance of high and low intelligent groups is significant at .01 level establishing the superiority of the former over the latter group.

The higher extinction rates for the low intelligent group is not a new and unnatural phenomena, Mohan and Vohra (1984) reported significant extinction of the retarded subjects on a line drawing task. The authors, assuming a strong memory deficit in the dull subjects, contended that 'the prolonged beneficial effect of KR would fail causing more extinction'. The present results confirm the present hypothesis that the low intelligent group due to its memory deficit would manifest more extinction in comparison with the high intelligent group after the withdrawal of KR.

**Sex and Performance with KR**

In the present study the variable of sex appears to have influenced the results on the task of Muller Lyer illusion alone. The curves plotted for the performance of males and females on weight estimation reveal that females are performing slightly better than the males (Fig. 11 & 12). The results are discussed below for both the tasks separately.

**Sex and Performance on Weight Estimation**

A comparison of the mean discrepancy curves (Fig. 11), the mean discrepancies, and the acquisition rates for males and females on the performance of weight estimation (Table VI) reveal that the females are performing better than the males.
However, this difference between the performance of the two sexes on both the acquisition rates and the mean discrepancies is insignificant (Table VII). This insignificant difference implies that KR has not affected the performance of males and females differentially. The present results are in line with Mohan and Gupta (1984) who reported an insignificant difference between the performance of two sexes when it was coupled with KR.

Sex and Performance on Muller Lyer Illusion

A perusal of the mean discrepancy curves plotted for the performance of males and females (Fig.12) reveals the superior performance of females to the males. The superiority of females over males is further established by the former's lesser mean discrepancies and higher acquisition rates in comparison with the latter (Table VIII). The significant F-ratios on the acquisition rates as well as on the mean discrepancies at 0.05 level on the variable of sex suggest that the females are benefitted more by the introduction of KR in comparison with the males (Table IX). The superiority of females has also been reported by Mohan and Gill (1981) on the task of Muller Lyer illusion.

The superiority of females over males has been explained by Kingsley and Garry (1962) as, "women are likely to excell in skills requiring close co-ordination of small muscles and strict attention to detail". The tasks used in the present study are such that they required close attention to detail.
and co-ordination of small muscles. As such, females were expected to perform better than the males. Similar results were obtained by Baheim (1963) on a 'function naming test', where females were reported to be superior to males on the task of replacement of missing implements. Mohan (1969) reported that the female Ss performed better on drawing a 4" long line and on estimation of 7 Sec. of time, when the performance was coupled with KR. Mohan (1969) and Mohan and Mann (1970) using choice reaction time; Mohan and Malhotra (1974) using tone discrimination and Gupta (1978) using line drawing, have also reported the superiority of females over males when the performance was coupled with KR. Vasudeva (1975) maintained that sex differences, apart from the anatomical differences, are environmentally conditioned and culturally controlled. This environmentally conditioning and cultural control assigns different roles to the different sexes. For example, the males have been assigned the role of doing better on the tasks which required muscular strength. The females are expected to do better on the domestic fronts. These types of differences are observed right from the early childhood. The girls are encouraged to play soft games while the boys to play hard games. Similarly, these differences can be observed in learning situations. Wilson and Kahn (1975) maintained that the superiority or inferiority of performance depends upon the sex linked characteristics of the tasks. Muller Lyer illusion is the task that requires close co-ordination of small muscles,
strict attention to detail and accuracy as the Ss are required to adjust the variable stimulus equal to the standard stimulus.

Thus, in the present study, too, the sex role linked tasks may have resulted in significant difference between the performance of males and females.

**Sex and Extinction on Weight Estimation**

A comparison between the mean discrepancy curves plotted for the males and females, on the extinction phase of the performance on weight estimation (Fig.11) reveals an inconsistent trend in respect of the superiority of the either sex, throughout the extinction phase. However, the females are performing slightly better than the males towards the end of the extinction phase. This trend in favour of the former is also revealed by the lower extinction rates as well as the lesser mean discrepancies on the extinction series (Table X). The difference between the performance of males and females, however, failed to reach significance with respect to the extinction rates as well as the mean discrepancies (Table XI). The insignificant F-ratio for the extinction rates (1.82) on the variable of sex implies that the withdrawal of KR does not have any differential effect on the performance of males and females on the task of weight estimation.

Thus, the hypothesis that females will be more resistant to extinction on the task of weight estimation,
A comparison of the mean discrepancy curves, on the portion of the extinction series, plotted for males and females on the tasks of Muller Lyer illusion indicates that the females are consistently performing better than the males. This superiority of females is further established by their lesser mean discrepancies on the extinction series and lower extinction rates (Table XII). The difference between the extinction rates of males and females, does not reach significance while the same is significant beyond .01 level on the mean discrepancies of the extinction series (Table XIII). The significant F-ratio on the mean discrepancies of the extinction series demonstrates that the overall performance of males and females has been differentially affected by the withdrawal of KR.

The superiority of females in terms of lesser increment of Muller Lyer illusion after the withdrawal of KR, can be explained on the ground that females being more alert and conscious, are likely to 'excell in the skills requiring close co-ordination of small muscles and strict attention to detail' (Kingsley and Garry, 1962). As such, their alertness warrants for less deterioration in performance in comparison with the males after the withdrawal of KR.

Secondly, the withdrawal of KR might have acted as a challenge for the girls keeping them nearer the goal, while
the same procedure does not seem to have acted as a challenge for the boys. This insufficient drive (motivation) in the latter's case might be responsible for more deterioration of performance among boys after the withdrawal of KR. On the basis of the present results, it can be generalized that females are, in general, more resistant to extinction in comparison with their male counterparts.

INTERACTIONS

1. BETWEEN ANXIETY x EXTRAVERSION

(A) Initial Ability and Acquisition

The interactions between anxiety x extraversion is significant at .05 level for initial ability and at .01 level for acquisition rates in respect of Muller Lyer illusion (Tables IV and IX). The contingency tables I-a and II-d and the graphs 13-a and 14-d, clearly reveal that the high anxious introverts are the poorest on the initial ability but improve the performance and emerge to be the best on the acquisition rates of Muller Lyer illusion. The poor initial ability of the high anxious introverts has been explained independently while dealing with the discussion of the results in their respective sections on the basis of Yerkes-Dodson Law (1908). The superiority of the high anxious introverts on the acquisition rates may be accounted for on the basis of
Eysenck's contention (1967) that the neurotic introverts have the highest level of drive. Their high drive level reach its optimum in the later stages of learning when the right response becomes dominant after the provision of KR. This resulted in their better performance. This contention of Eysenck's (1967) is better substantiated, when the acquisition rates for the high anxious (13.33 %) and introverts (13.68 %) are compared with that of the high anxious introverts (14.43 %). It becomes obvious that the facilitative effect of KR is augmented when high anxiety is combined with introversion. The same is decreased when low anxiety (12.18 %) and extraversion (11.83 %) are combined (11.43 %). Thus the provision of KR proves to be highly beneficial for the high anxious introverts. It confirms present hypothesis that the high anxious introverts will perform best when the performance is coupled with KR.

(B) Extinction

The interaction between anxiety x extraversion is significant at .05 level for the extinction series and at .01 level for the extinction rates of Muller Lyer illusion (Table XIII). The contingency tables V-f and V-c and graphs 16-f and 16-c reveal that the high anxious introverts are the best and the low anxious extraverts the poorest on both the extinction series and extinction rates of Muller Lyer illusion.
On comparing the extinction rates of individual components of the group with those of the combined effect of these two jointly, it becomes apparent that the deteriorative effect of withdrawal of KR is decreased for the high anxious introverts (high anxious = 4.49%; introverts = 4.39% and high anxious introverts = 3.70%) and augmented for the low anxious extraverts (low anxious = 7.33%, extraverts = 7.43% and low anxious extraverts = 9.59%). This confirms our hypothesis that the high anxious introverts will be the most resistant to extinction following withdrawal of KR in comparison to other combinations of anxiety and extraversion.

2. BETWEEN INTELLIGENCE x EXTRAVERSION

(A) For the initial ability, final ability and acquisition rates:

The significant interaction between intelligence x extraversion at .01 level in the performance of Muller Lyer illusion reveals that the high intelligent extraverts are the best in performance on the initial series (cont. table I-b and graph 13-b). On acquisition series, high intelligent introverts (cont. table II-b and graph 14-b) and on acquisition rates, low intelligent introverts (cont. table II-e and graph 14-c) are performing better than any other group. The change of trend from initial to acquisition series may be attributed to the faster accumulation of Ir and its slower dissipation among extraverts in the acquisition series. This is
also true in case of the performance on weight estimation (cont. table II-a and graph 14-b). On acquisition rates, the better performance of the low intelligent introvert group may be due to their low initial ability which might have left more scope for improvement when KR is administered.

On comparing the acquisition rates of the individual components of the group with those of the combined effect of these two jointly - it becomes apparent that the facilitative effect of KR is augmented for the low intelligent introverts (low intelligents = 14.46%; introverts = 13.68% and low intelligent-introverts = 15.58%) and decreased for the high intelligent-extraverts (high intelligents = 11.05%; extraverts = 11.83% and high intelligent-extraverts = 10.32%). This confirms our hypothesis that the low intelligent introverts will be the most benefited as a group when the performance is coupled with KR.

Another salient feature of the significant interaction as revealed through figures 14-b and 14-c is that the performance of high intelligent Ss is not as affected by their level of extraversion as that of the low intelligent Ss. The low intelligent introverts are performing significantly better than other any other group.

(B) Extinction

With respect to extinction, the interaction between extraversion x intelligence is significant at .05 and .01 levels
for final performance of the extinction series of both the tasks of weight estimation and Muller Lyer illusion (Tables XI and XIII respectively). The contingency tables for the interactions of the said interaction (V-a and V-b) reveal the superiority of the high intelligent introverts and the inferiority of low intelligent extraverts on the extinction series of both the tasks. The same trend was observed on the acquisition series of both the tasks (cont. tables II-a and II-b) and the figures 14-a and 14-b.

Secondly, the difference between the performance of extraverts and introverts at higher level of intelligence, similar to that in acquisition series, is less while the same is more at lower level of intelligence. The direction is same while there is a difference in the magnitude of the total difference between the performance of extraverts and introverts. It implies that the high intelligent group is more resistant to extinction, the level of E/I does not affect their performance as adversely as that of the low intelligent group. On the other hand, introverts are more resistant to extinction, and the level of intelligence has lesser effect on their performance than on extraverts. The superiority of high intelligent introverted group in respect of resistance to extinction has been explained on the basis of the memory deficit among low intelligents resulting in more extinction following withdrawal of KR (Mohan and Vohra, 1964) and

3. BETWEEN ANXIETY AND INTELLIGENCE

(A) Initial ability and acquisition

The interaction between anxiety x intelligence is significant beyond .01 level for the acquisition series of Muller Lyer illusion, but missed significance level at .05 for the acquisition rates of the same tasks (Table IX). The contingency table no. II-c and figures 14-c reveal the superiority of the low anxious-high intelligent group and the inferiority of the low anxious-low intelligent group for the final performance on the acquisition series. In respect of acquisition rates, the high anxious-low intelligent group is the best, while low anxious-high intelligent group the poorest (cont. table II-f and Fig.14-f). The change in trend of the quality of high and low intelligent group on the one hand and low and high anxious group on the other may be explained on the basis that the low initial ability of the low intelligent and high anxious groups left more scope for improvement after the provision of KA.

Presently, when interaction between anxiety x intelligence is concerned for the initial ability, it may be suggested that the high anxiety produced more deliterious and disorganizing effects in the beginning due to competing response tendencies thereby causing stressful situation for the high anxiety-low
intelligent group and the resultant impairment in their performance. However, when the right response got dominated after the provision of KR, their drive level got reduced and reached the optimum level, which, in turn, facilitated and improved their performance to a considerable extent.

The low anxiety-high intelligent Ss who performed well in the beginning, also improved their performance after the provision of KR, as is apparent from figures 8 and 10, but their already high level of performance left less scope for improvement.

This change in trend of performance signifies that the same treatment i.e. the provision of KR, while facilitated the performance of high anxious low intelligent Ss to a marked extent by bringing down their level of drive to the optimum level, was not as effective and beneficial to the low anxious high intelligent group as to the former. It can safely be concluded that the former group is more benefitted by the provision of KR.

Thus, it can be concluded that the low anxiety when combined with high intelligence reduces the Muller Lyer illusion, it increases the same to a marked extent when combined with low intelligence.

(B) Extinction

The interaction between anxiety x intelligence is significant at .01 level for the final performance on the
extinction series of Muller Lyer illusion (Table XIII). The contingency table V-e and figure no. 16-e reveal the superiority of the high anxious-high intelligent group and inferiority of the low anxious-low intelligent group. The latter group was the inferior-most on the acquisition series of the same task too. The greater Muller Lyer illusion of the low intelligent-low anxious group following withdrawal of KR can be explained in accordance with Mohan and Vohra (1984) that the low intelligent Ss having a strong memory deficit, would be adversely affected, after the withdrawal of KR. The low intelligence when combined with low anxiety further augmented the deteriorative effect of withdrawal of KR and thus increased their illusion to a marked extent in comparison to the high intelligent-high anxious group.

4. INTERACTION BETWEEN KR x EXTRAVERSION

Extinction

The interaction between KR x extraversion is insignificant for the acquisition series, the acquisition and extinction rates. However, it is significant beyond .05 level for the final performance of extinction series (Table XIII). The contingency table no. V-b and figure 16-b reveal that the introverts receiving 50% KR are performing best while extraverts receiving 100% KR the poorest on the extinction series. The significant interaction between KR x E/I as revealed through Fig.16-b implies that the difference between
the performance of extraverts and introverts is less among 100 % KR group and more among 50 % KR group. The superiority of introverts has already been discussed in terms of Eysenckian hypothesis of excitation and inhibition (1947, 1955, 1965). The superiority of 50 % KR group has also been discussed on the basis of Jenkin's and Stanley's generalization (In Madan 1961) that "all other things being equal, resistance to extinction after partial reinforcement is greater than after continuous reinforcement."

5. AMONG ANXIETY X INTELLIGENCE X EXTRAVERSION

(A) Initial Ability and Acquisition Rates

The interaction among anxiety x intelligence x extraversion is significant at .01 level for both the initial ability and the acquisition rates of Muller Lyer illusion. The contingency tables I-c, III-d and graphs 13-c, 15-d reveal that the high anxiety low intelligent-extraverts are the poorest on the initial ability but best on the acquisition rates. This change of trend is because of the poor initial ability of the high anxious-low intelligent introverts which leaves more scope for improvement when KR is given.

Another fact revealed through the graphs for the said interaction (Fig.15-d) is that the intelligence x extraversion interaction is dependent upon the level of anxiety. The difference between the performance of extraverts and introverts at both the levels of intelligence is less among low anxious and more among
high anxious Ss.

6. **INTERACTION AMONG KR x EXTRAVERSION x ANXIETY**

The third order interaction between the frequency of KR x extraversion x anxiety is significant at .01 level on the acquisition rates as well as on the mean discrepancies of the acquisition series in respect of Muller Lyer illusion (Table IX). 100% KR-high anxious-introverts are the best and 50% KR-low anxious-extraverts - the poorest on the mean discrepancies as well as the acquisition rates of Muller Lyer illusion (Cont. table nos. IV-b and III-a). The same trend can be observed in Fig.15-a which reveals that the interaction between anxiety x extraversion depends upon the frequency of KR. While the interaction between anxiety x extraversion is highly significant for the 100% KR group, it is not significant for the 50% KR group (as revealed by almost parallel lines). It implies that the high anxious introverts are more facilitated by the provision of 100% KR than by 50% KR.

(B) **Extinction**

The interaction among the frequency of KR x extraversion x anxiety is insignificant for the extinction rates of Muller Lyer illusion. However, it is highly significant at .01 level for the extinction series of the same task (Table XIII). Contingency table no. VI-a and graph 17-a reveal the superiority of 50% KR high anxious-introverts (0.71) and the
inferiority of 50 % KR-low anxious-extraverts (1.91). Graph 17-a reveals that the deteriorative effect of withdrawal of KR is reduced to a marked extent for the high anxious introverts with 50 % KR, but the same is augmented for the low anxious extraverts receiving the same amount of KR.

However, there is a shift in trend when extinction rates are taken into consideration. Contingency table VI-b and graph 17-b reveal the superiority of the high anxious introverts with 50 % KR and the inferiority of the low anxious extraverts with 100 % KR. The interaction between anxiety and extraversion is significant for the 100 % KR as well as for 50 % KR group i.e. it is independent of the frequency of KR provided in the acquisition phase.

7. **INTERACTION AMONG FREQUENCY OF KR x EXTRAVERSION x INTELLIGENCE**

The third order interaction among the frequency of KR x extraversion x intelligence is significant at .01 level for (i) the mean discrepancies of the acquisition series of weight estimation (Table VII); mean discrepancies and (iii) mean acquisition rates of Muller Lyer illusion (Table IX). The contingency tables IV-a and IV-c indicate the superiority of 100 % KR-high intelligent introverts and the inferiority of 50 % KR low intelligent extraverts in respect of mean discrepancies of both the tasks. However, when the acquisition rates are taken into consideration, the 100 % KR-low intelligent-introverts are the best on the acquisition rates and 50 % KR
high intelligent extraverts—the poorest (cont. table III-b).

This difference in the trend in the performance of high and low intelligent Ss may be explained on the basis of the low initial ability of low intelligent group leaving more scope for improvement in comparison with that of the high intelligent group.

The significance of KR x extraversion x intelligence interaction for the acquisition rates can also be observed from the specific nature of the graph (Fig.15-b). It reveals that the extraversion x intelligence interaction is insignificant for the 100 % KR group but highly significant for the 50 % KR group. This revelation has got great educational implication. In order to increase the proficiency of the low intelligent extraverts, 100 % KR can act as a good reinforcer.

8. THE INTERACTION BETWEEN KR X ANXIETY X INTELLIGENCE

Another three order interaction among frequency of KR x anxiety x intelligence is significant at .01 level for the final performance on acquisition series as well as the acquisition rates of Muller Lyer illusion (Table IX). Contingency table IV-d prepared in terms of mean discrepancies reveal the superiority of 100 % KR low anxious high intelligent group and inferiority of 50 %KR-low anxious-low intelligent group. When the contingency table III-c for acquisition rates is taken into consideration, the 100 % KR-high anxious-low intelligent group comes out to be the best and 50 % KR-low anxious high intelligent group—the poorest.
The shift in the trend in the performance of Ss in respect of anxiety and intelligence may be explained on the basis of the low initial performance of high anxiety group (explained on the basis of Yerkes-Dodson Law, 1908) and low intelligence group left more scope of improvement after the provision of KR. The performance of high anxious Ss might have been facilitated more by the provision of 100% KR.

The significant interaction between KR x anxiety and intelligence is also apparent from figure 15-c. It reveals that the anxiety x intelligence interaction is dependent upon the frequency of KR. It is highly significant for 50% KR group but insignificant for 100% KR group.

9. **INTERACTION AMONG KR x extraversion x anxiety x intelligence**

The 4th order interaction among frequency of KR x extraversion x anxiety x intelligence is insignificant for acquisition series of both the tasks. The same interaction is significant at .05 level for the mean discrepancies on the extinction series as well as the extinction rates in respect of Muller Lyer illusion (Table XIII) Contingency table nos. VI-c and VI-d reveal the superiority of 50% KR high anxious-high intelligent-introverts on the both - the extinction series and extinction rates. Whereas 100% KR low anxious-low intelligent extraverts are the poorest on extinction rates (having maximum extinction rates i.e., 12.88%), the 50% KR low anxious-low intelligent-extraverts are the poorest on the extinction series of Muller Lyer illusion. This difference
in trend i.e. inferiority of 100 % KR group in the extinction rates but not on the extinction series can be explained on the basis that while calculating extinction rates the performance on acquisition series is taken into consideration. As 100 % KR group is already performing significantly better than that of 50 % KR group, their already high level of performance left less scope for deterioration after the cessation of KR. On the other hand, 50 % KR group performing poorer than the 100 % KR group, though performed better after the withdrawal of KR, yet the gap could not be compensated. This resulted in ultimate superiority of 100 % KR group over 50 % KR group. This fact has already been explained under the discussion of three order interaction among KR x extraversion x anxiety.

The superiority of 50 % KR-high anxious-high intelligent-introverts in respect of resistance to extinction was expected as it has already been explained that partial KR, high anxious, high intelligent and introvert Ss are more resistant to extinction than their respective counterparts. The significant interaction as revealed through Fig.17-c reveals that KR x Intelligence x extraversion interaction is insignificant for extraverts but highly significant for introverts.

CONCLUSION

After discussing all the results, it can safely be concluded that :

(1) Since the performance of both the tasks of weight estimation and Muller Lyer illusion is facilitated by the
provision of KR and deteriorated by its subsequent withdrawal, it becomes obligatory on the part of the psychologists and educationists to introduce KR in order to make the teaching-learning process more effective.

(2) The superiority of 100% KR group with regard to acquisition and that of 50% KR group in terms of extinction has got great educational implication. The teacher is concerned not only with the maximum acquisition but also with the minimum, slower and gradual forgetting of his students. So, keeping both these aims in view, the teacher can combine the KR Schedules in such a manner that it may be given continuously in the earlier stages but decreased in percentage gradually in the later stages of acquisition. He can also increase the period of acquisition, i.e., the training period. The sufficient reinforced practice will make the memory traces stronger. This in turn, will minimize extinction or forgetting following withdrawal of KR.

(3) The present study has further revealed that the facilitative effect of KR and deteriorative effect of its withdrawal is not uniformly distributed over all types of subjects with differing levels of E/I, anxiety and intelligence. The introverts and the high anxious females are more facilitated by the provision of KR in the acquisition stage and less adversely affected by its withdrawal in the extinction phase. There is a qualitative change in the trend of high and low anxious Ss after the introduction of KR. It implies that the high anxious S is
not doomed to perpetual underachievement, that there is a hope for him in the form of KR which facilitates their performance by reducing his drive and arousal level to the optimum level.

(4) The low intelligent Ss are highly benefitted by the provision of KR in the acquisition phase. However, their higher extinction rates in comparison with that of the high intelligent Ss call for more reinforced practice trials and drill so as to strengthen the memory impression and minimise forgetting.

(5) The significant two, three and four level interactions among E/I, anxiety, intelligence and frequency of KR suggest that these variables affect the acquisition of efficiency and its subsequent extinction jointly. The facilitative effect of provision of KR is augmented for the high anxious low intelligent introverts receiving 100% KR and decreased for the low anxious-high intelligent extraverts with 50% KR. Similarly, the deteriorative effect of withdrawal of KR is augmented for the low anxious-low intelligent extraverts with 100% KR but decreased for the high-anxious-high intelligent introverts with 50% KR.