

The Effectiveness of Various Training Programmes on Lie Detection Ability and the
Role of Sex in the Process

Abstract

This paper explores the area of lie detection and the respective ability of cognitive, emotional and attempted-control training techniques at teaching the ability to detect lies. In addition the role of gender in the ability to detect lies is also explored.

60 participants, divided into three separate groups of 20 (10 male, 10 female), were trained by one of the three respective training approaches and were then tested to see how efficiently they were able to detect lies.

Results from two-way between-subjects analysis of variance (ANOVA) indicate that the training programmes have a statistically significant effect on scores of lie detection, $F(2, 54) = 9.432, p < .001$, and that sex does not significantly influence the ability to detect lies $F(1, 54) = 1.926, p < .171$. However, a significant interaction effect between sex and the training approaches was identified $F(2, 54) = 100.65, p < .001$ and the data was split to facilitate separate one way ANOVA's on the data to discern the different effectiveness of the training programmes for male and female participants.

Introduction

Lying, or deception, may be defined as an act or state designed to conceal or distort the truth for the purpose of misleading others (Podlesny & Rashin, 1977). The ability to be able to tell if someone is lying is a valuable attribute to obtain and can be regarded as a very significant asset in many fields of work or study. For example, the ability that is lie detection is quite important in areas such criminal justice and studies in abnormal psychology. As a consequence of the significance of the ability to detect lies in many areas of work and study, research on the nature of deception and of the ability of people to successfully detect it is of paramount interest to many psychologists. More efficient means of teaching lie detection could possibly enhance the efficacy of professionals who deal with criminals and treat patients with abnormal conditions. Consequently, further research on the area of deception and lie detection is important and welcomed.

These issues in relation to lie detection and the teaching of various lie detection methods facilitate an environment where many important and interesting research questions can be explored. For example, what is the impact of different lie detection training approaches on the ability to detect lies? As a specific extension of this query, one could explore the relative effectiveness of the following three training approaches at teaching people to detect lies; emotional, cognitive and attempted-control. Another significant and equally intriguing question that one could pose is that in relation to sexual orientation. Does sex actually play a significant role in the ability to detect lies? As a relevant extension of this, one could ask does sex moderate the relationship between the respective training programmes and the ability to detect lies. The identification of a potential interaction effect between the variables would certainly be an intriguing issue to delve further into in future research.

The purpose of this experiment is to give some tentative answers to questions about the respective abilities of the training methods to teach lie detection and to explore the role that gender plays in the ability to detect lies and the effectiveness of the respective training programmes. Consequently, the following predictions will be utilised in order to give the utilisation of data and statistical analyses a definite purpose.

- 1) As a unified predictor variable group, the three respective training approaches will have significant effect on the ability to detect lies.
- 2) Sex does not play a significant role in the ability to detect lies.
- 3) There is no significant interaction effect between sex and the training methods employed to attempt to teach individuals to detect lies.

Due to the requirement establishing the potential differences between the abilities of the three respective training methods at teaching lie detection and to determine the role that gender plays in the issue, the application of two-way between-subjects ANOVA will be utilised on the data. It is hoped that viable results can be attained and that a clearer perspective on the dynamics of lie detection can be established.

Method

Materials

16 videotape presentations. Each tape consisted of a different college-aged woman in an interview. Half of the tapes presented different women lying while the other half of the tapes presented women telling the truth.

Participants

The total number of participants was 60. They were drawn from a population of students where 50 per cent male and 50 per cent female. There were 20 participants (10 male, 10 female) for each of the three conditions, i.e. emotional approach, cognitive approach and attempted control approach.

Design

The design of this report is an independent subjects design. The independent variables were the sex of the participants and the group of training methods (consisting of a cognitive, emotional and attempted control approach). The dependent variable was the training scores of the participants after undergoing the training programmes. A two-way between-subjects ANOVA was utilised on the data.

Procedure

60 participants, divided into three separate groups of 20 (10 male, 10 female), were trained by one of the three respective training approaches and were then tested to see how efficiently they were able to detect lies. The tests consisted of 16 videotape presentations. Each tape consisted of a different college-aged woman in an interview.

Half of the tapes presented different women lying while the other half of the tapes presented women telling the truth. Each of the participants had to judge if each of the women was lying or telling the truth. The data from the results from the participants was then compiled in preparation for relevant statistical analyses.

Results

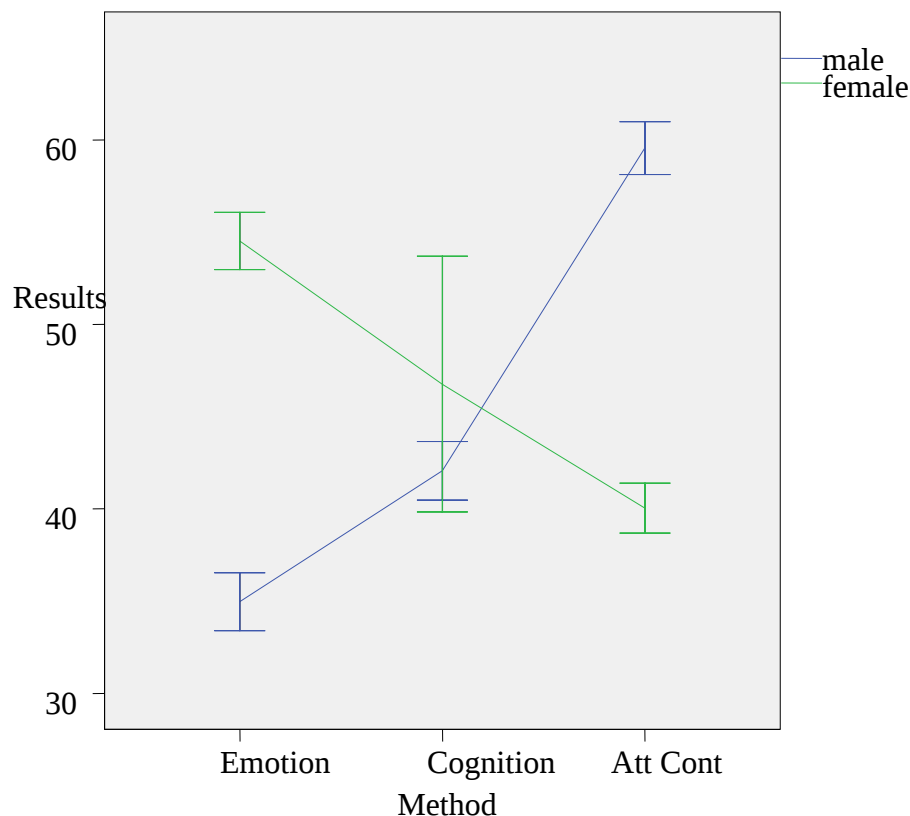
A two-way between groups analysis of variance was conducted in order to explore the impact of sex and different training approaches on the ability to detect lies. Subjects were divided into three groups according to which training programme they undertook (cognitive, approach, emotional approach, attempted-control approach). The following table summarises the scores obtained by the participants in the post training tests.

Table of means

Lie detecting approach	Male			Female		
	n	M(SD)	95% CI	n	M(SD)	95% CI
Emotional	10	34.97(2.20)	(32.19, 37.761)	10	54.52(2.17)	(51.31, 57.31)
Cognitive	10	42.07(2.22)	(39.28, 44.86)	10	46.76(9.69)	(43.97, 49.55)
Attempted Control	10	59.56(2.01)	(56.77, 62.35)	10	40.04(1.90)	3(7.26, 42.83)

Preliminary analyses were conducted to ensure no violation of the assumption of homogeneity of variances. A Levene's test for homogeneity of variances returned a Sig. value of .072. As this value is greater than .05, the assumption has not been violated.

The interaction effect between sex and the respective training groups was statistically significant, $F(2, 54) = 100.65$, $p < .001$. The interaction effect is identified in a clear and simplistic manner through the fulcrum of a means graph. From the graph it can be noted, through utilisation of error bars, that the male and female scores in the cognitive approach condition were not statistically different. However, significant differences between males and females can be noted in the remaining two conditions.

Plot graph: marginal means of lie detection

There was a statistically significant main effect for the groups variable (the three respective training approaches collapsed); $F(2, 54) = 9.432, p < .001$. However this effect size was quite small (partial eta squared = .259), as suggested by Pallant (2007).

Post-hoc comparisons using the Tukey HSD test indicate that the mean score for attempted control ($M = 49.8010, S.D. = 10.18946$) is different to the other two training approaches. There was no significant difference between the emotional approach ($M = 44.7475, S.D. = 10.25050$) and the cognitive approach ($M = 44.4140, S.D. = 7.24995$). The main effect for sex, $F(1, 54) = 1.926, p < .171$, did not reach statistical significance.

Although there was statistically significant main effect present, this result must be viewed in the context of the additional presence of a statistically significant

interaction effect. Pallant (2007) suggests that if one finds a significant interaction effect, one cannot easily and simply interpret and report the main effects because, in order to describe the influence of one of the independent variables, one needs to specify the level of the other independent variable. As a consequence of this, the data file was split by sex and a repeat one-way analysis of variance for each group was performed in order to analyse effectively the effect of the training programmes on lie detection separately for males and females.

A one-way between groups analysis of variance was conducted to explore the impact of the different training approaches on lie detection solely for males. Preliminary analysis were conducted to ensure no violation of the assumptions of homogeneity of variances. There was a statistically significant difference at the $p < .05$ level in post training scores for all of the three training approaches; $F(1, 27) = 348.826$, $p < .001$. The effect size, calculated using eta squared, was .9627 which according to Cohen (1988) is of high statistical significance. Post-hoc comparisons using the Tukey HSD test indicated that the mean score for all three groups were significantly different to each other.

The female participants' data was also analysed through one-way analysis of variance to explore the impact of the different training approaches on lie detection solely from their sexually orientated perspective. There was a statistically significant difference at $p < .05$ level in post training scores for all of the three training approaches; $F(1, 27) = 15.415$, $p < .001$. The effect size, calculated using eta squared, was .5331 which, according to Cohen (1988), is of high statistical significance. Post-hoc comparisons using the Tukey HSD test indicated that the mean score for all three groups were significantly different to each other.

Discussion

The results of the ANOVA contain very valid and interesting information.

In relation to the first prediction, which stated that as a unified predictor variable group, the three respective training approaches will have significant effect on the ability to detect lies, results indicate that the groups variable, consisting of the three respective training approaches, have a statistically significant effect on scores in the lie detection tests. Essentially this result suggests that the respective training approaches are capable of producing significantly different results in lie detection tests and, therefore, can affect an individual's ability to detect lies.

In relation to the second prediction, which states that sex does not play a significant role in the ability to detect lies, results from the analyses suggest that the effect of sex on scores in the lie detection test did not reach statistical significance. Essentially, this suggests that sex does not have a significant influence on an individual's ability to detect lies, and consequently supports the second prediction.

However, and rather crucially in the context of the exploratory nature of this report, results from the analysis also indicate that there is a statistically significant interaction effect between sex and the groups variable (emotional, cognitive and attempted control approach). The consequences that are implied by this result suggest that, although sex does not have any significant effect on the participants' ability to detect lies, it does have a significant influence on the relative effectiveness of the respective training approaches at teaching them to detect lies. Interpretation from the Plot graph-including error bars- indicate that, although post scores for males and females in the cognitive approach were not significantly different from a statistical viewpoint, i.e. they were very similar, males attained significantly higher post scores through the fulcrum of the attempted control approach whereas females significantly

exceeded their males counterparts in post scores via the emotional approach. These results are completely unsupportive of the third prediction which states that there is no significant interaction effect between sex and the training methods employed to attempt to teach individuals to detect lies.

Two-way between –subjects ANOVA was effective because it facilitated the exploration of the effectiveness of the training approaches whilst simultaneously creating scope to assess the role that sex plays in the process. The identification of a significant interaction effect serves as justification of the choice of this statistical test as an analytic tool.

The final results were statistically significant yet, certainly in the case of the main effects, must maintain a certain degree of caution due to the presence of a significant interaction effect between sex and the respective training approaches. The identification of attempted-control as being significantly different from the other two training approaches in relation to post scores, as well as being the most effective approach with the highest mean scores, is, from a practical perspective, somewhat misleading. This is due to interaction effect present in the data. When segregating the male and female scores via the utilisation of one-way between-subjects ANOVA's, it becomes apparent that this statistically significant result is masking the true complication of the situation. The results of the one-way ANOVA's portray the effect of the training programmes from both a male and female perspective and aide in qualifying the rather misleading results attained previously due to the interaction effect.

In conclusion, the various training approaches have statistically significant yet ultimately weak effect on the ability to detect lies. However the identification of an interaction effect between sex and the various training approaches is a very important

development and possess noteworthy implications for future research in this area as sex will need to be accounted for when creating experimental design and interpreting the subsequent results.

References

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