

Research Paper

Impact of Belief in and Awareness about Heredity/Environment Mechanisms on Attributing Failure at Internality Dimension

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ABSTRACT

Present study, mainly exploratory in nature, was conducted to investigate how people's beliefs and awareness of heredity/environmental mechanisms influence the way they assign causality to failure events on internality attribution dimension. The study involved two phases: firstly, 800 participants were surveyed with measures to assess their awareness and beliefs about heredity/environment. In the second phase, a sample of 270 subjects was chosen based on their scores of awareness and beliefs about heredity/environment using a single step double criterion approach. These participants were administered a questionnaire to evaluate their casual ascriptions for success and failure events. The collected data was subjected to appropriate statistical analysis, revealing significant main and interactive effects among the variables.

Keywords: *Belief, Awareness, Survey, Dimension, Casual, Failure*

According to Fishbein & Ajzen (1975) beliefs serve as the fundamental building blocks within our conceptual structure. Bar Tal (2000) has defined beliefs as the basic units of knowledge categories such as ideology, values, norms, decisions, inferences, goals, expectations, religions, dogmas, or justifications. They are stored in individuals' minds and are also expressed in various human products such as books, newspapers, films or even paintings. One's belief in heredity or environment i.e., who believe that behavioral characteristics are determined by heredity or environmental factors, may influence his/her causal ascriptions for events of success and failure, outcomes.

Generally, there is a particular set of causal explanations that are relevant for any particular situation. It is true even if people disagree on the relative importance of various causal factors. Weiner (1974) has indicated that attributions can be characterized by two basic dimensions: Internality (Internal v/s external) and stability (stable v/s unstable). Various theorists have agreed that explanations of behaviours and events can be categorized as internal or external attributions (Jones and Davis, 1965; Kelly, 1967; Weiner, 1974). Internal attributions ascribe the causes of behaviour to personal dispositions, traits, abilities and feelings. External attributions ascribe the causes to situational demands and environmental constraints. Research in attribution theory (Eswara 1972, Weiner and Kukla 1970) suggested

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that the attributional dimension of internality directly influences the subject affective reactions to task performance. These studies support the hypothesis that if one attributes failure to an internal cause, self-depreciation and negative affect result, whereas attribution of failure to an external cause minimizes this effect. Similarly, positive affects following success are minimized by attributions to external causes.

REVIEW LITERATURE

The studies related to belief in and awareness of heredity/environment mechanisms have explored how beliefs in heredity and the environment are influenced by various factors such as age, education, political views, and knowledge of one's genetic background. Furnham, Johnson and Rawles (1985) in their study reported that males, older individuals, and those with lower education held stronger beliefs in heredity, while females, younger people, and the educated lean towards attributing human characteristics to the environment. A measure of belief in heredity/environment constructed by Meerum, Terwogt, Hoeksma and Koops (1993) using 16 human characteristic items showed that age and belief in heredity are curvilinear correlated. Middle-aged individuals held the weakest belief, around age 25. Moreover, a negative relationship was found between belief in heredity and education. Another study by Van Kampen, et. al (1990) reported that parents of adopted children and those with incomplete genetic background information tended to have stronger beliefs in heredity's influence. Foster parents and adopted children inclined more towards heredity in their beliefs in comparison to biological parents and their children. Nilsson and Ekehammer (1989) study found that the awareness of their own genetic background influences the beliefs in heredity/environment, but sex did not show any significant variation in these beliefs.

Studies related to belief in heredity/environment were also conducted in Indian context also. In 2001, Singh, Shyam, and Aruna examine various beliefs about heredity/environment among two hundred seventy (270) participants. They found that gender and knowledge level played significant roles, with males and teachers tending to hold more environment-oriented beliefs, while females and students leaned towards heredity. Building on this, Singh and Shyam (2002a) expanded their study to a large sample (N=3001), revealing a generally balanced perspective on belief in heredity/environment. The results indicated that females and individuals from rural areas were more inclined towards heredity-oriented beliefs, whereas males and educated individuals were more inclined towards environment-oriented beliefs. In a similar study by Singh, Shyam, and Kumar (2004) participants with balanced belief system had higher positive self-perception than participants having polarized beliefs. Those with balanced beliefs also rated others more positively on various aspects such as linguistic ability, emotional stability, helping behavior, leadership, humor, and body weight, while attributed lower ratings to ego-centrism and reasoning ability.

People provide various casual explanations for the outcomes of behavioral events due to several factors. For example, Jones and Nisbet (1971) noted that most of the time, individuals attribute their actions to situational factors, whereas those observing them are more inclined to attribute the same actions to stable personal traits. Studies (Eswara (1972), Weiner and Kukla (1970) indicate that attributing failure to internal factors can lead to negative emotional responses, whereas attributing failure to external factors reduces this effect. Similarly, attributing success to external causes minimizes positive affects following success. Cultural differences also play a role in how individuals attribute causes to actions. Miller (1984) observed that adult Hindus were more likely to attribute behavior to situations,

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while adult Americans attribute behavior to traits. Despite the limited number of studies in this field, the existing research (Singh and Shyam, 1997; Shyam, 2004) has reported discrepancies in the attribution made by individuals who hold various beliefs related to heredity and environment. Understanding of the heredity/environment mechanisms could potentially impact an individual's beliefs in these factors, leading to variations in how success and failure are attributed to them.

The literature review and conceptual framework underscore the scarcity of research connecting belief in and awareness of heredity/environment with causal explanations for behavioral outcomes. Despite limited studies, findings of the available research suggest the significance of investigating this area. Given the dearth of research, our exploratory study aims to examine the impact of belief in and awareness of heredity/environment on causal attributions for the events of failure. The study's central theoretical focus centers on knowledge, belief, and general cognition. It delves into understanding participants' knowledge about factors influencing behavior (i.e. heredity and environment), their beliefs in heredity/environment, and how they attribute causes to outcomes of behaviors for events of failure. Furthermore, the study incorporates knowledge of heredity/environment mechanisms to mitigate any potential confounding effect.

Objectives

- To investigate the effect of knowledge of heredity/environment on internality attribution scores for failure events.
- To investigate the effect of belief in heredity/environment on internality attribution scores for failure events.
- To investigate the interactive effect of belief in and awareness of heredity/environment mechanisms on internality attribution scores for failure events.

Hypotheses

- Knowledge/Awareness about heredity/environment mechanisms would have significant effect on the internality dimension of attribution for events of failure.
- Belief in heredity/environment would have significant effect on internality dimension of attribution for failure events.
- There is a possibility of obtaining significant interactive effect of awareness and belief in heredity/environment mechanism on internality dimension of attribution for failure events.

METHODOLOGY

Sample

For achieving the objectives, study was carried out in two phases. In first phase, for evaluating the beliefs and awareness about heredity/environment mechanism, a survey was carried out on 800 subjects (age ranges between 18 to 81 years). In the subsequent phase, 270 participants (134 males and 136 females) were selected on the basis of scores on heredity/environment belief and awareness of heredity/environment mechanisms following a single step double criteria procedure. Heredity/environment belief and awareness of heredity/environment mechanisms were taken as independent variables, both having three levels. Three belief groups i.e., heredity believers, balanced believers and environmental believers were formed taking subjects scoring more than mean +1 S.D. in the environment believers group, below mean -1 S.D. in the heredity believer group and scoring in between

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mean ± 1 S.D. in the balanced believers group. Heredity/environment awareness variable also had three levels - high, moderate and low. Three groups were formed taking subjects mean $+1$ S.D. in high awareness, mean -1 S.D. in the low awareness and subjects falling in between Mean ± 1 S.D. in moderate awareness group. Thus, in the second phase of the study a 3×3 factorial design was used. Total nine cells, with an equal number of subjects ($N=30$) in each cell, were formed. Questionnaire measuring causal ascription for events of success and failure was administered to all the subjects of second phase.

Tools Used: Following tools were used in the study:

- **Measure of the belief in heredity/environment for human characteristics:** A measure of belief in heredity/environment for human characteristics (Singh and Shyam, 2002) was used for measuring belief in heredity/ environment for human characteristics. The scale consists of connotative descriptions (in Hindi) of all the characteristics and arranged in the form of a checklist subscribed with a three point-scale. Items finally selected (i.e., 20 human characteristics) had an endorsement rate of around 0.5 (i.e., 50%) and discriminated well between heredity and environment believers. The Kuder-Richardson reliability (KR-21) coefficient of the measure is 0.68. The checklist was standardized on a sample of 3001 subjects drawn from a heterogeneous population. The respondents were required to check each characteristic as determined by heredity (1), both heredity and environment (2) and environment (3). Scores on the scale may range from 20 to 60, high scores indicating belief in the environment.
- **Checklist for Awareness of Heredity/Environment Mechanisms:** A checklist prepared by (Singh, Shyam and Kumar (2004) was used to assess the awareness of the respondents about the mechanisms of heredity and environment influencing human characteristics. In it, there are 20 items which were prepared by taking the help from the literature and discussion with subject's experts as well as keeping the common man in mind. Items were simple, clear and in easy language. Some items were of multiple-choice type, while others were of 'Yes-No' type, still others were open ended requiring the subject to give a brief description. A correct answer to a question was given a score of one and a wrong answer was scored as zero. Thus, the score ranged from 0-20, high score indicating high awareness.
- **Causal ascriptions for events of success and failure:** For measuring causal ascriptions to events of success, a questionnaire containing seven events of success and seven events for failure was prepared. The subjects were required to read each event carefully and ascribe causes for events of the success and failure. They were also required to ascribe (7-point scales, 7 being, internal, stable and global and 1 being external, unstable and specific) the causes to internal, stable and global or external, unstable and specific dimension of attribution style. The events were described in Hindi. The re-test reliability (30 days gap) of the scale was very high ranging from 0.95 to 0.99 for internality ($r=.96$), stability ($r=.96$), globality ($r=.98$) dimensions for the events of success. It was also high for composite ($r=.99$) score as well as importance ($r=.98$) attached the events. The re-test reliability for the events of failure was also very high and the co-efficient of correlations ranged from .95 to .98. The scores on various dimensions of attributions on protocols for causal ascription to events of success and failure were correlated with scores on various dimensions of attribution of BASQ (Feather and Tiggermann, 1984) which ranges from 0.71 to 0.86 for events of success and 0.56 to 0.67 for events of failure. These coefficients of correlation indicate the validity of the questionnaire which ranged from moderate to

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high for various dimensions. All 14 protocols describing events of success and failure had to be rated on 7 point scale. Thus, the score ranged from 7 to 49 each for events for success and failure.

Procedure

For evaluating the beliefs and awareness about heredity/environment mechanism, a survey was carried out on 800 participants during first phase of study. On the basis of scores on both the tasks of first phase and by adopting a single step double criterion, 270 subjects were selected for the second phase. All the subjects of second phase were administered questionnaire measuring causal ascriptions for events of success and failure. The scoring of all the measures was carried out according to the specified procedure.

RESULTS

For achieving the objectives of the study, scores of only internality dimension for events of failure are included in present article. Data was analyzed by using a 3 x 3 ANOVA along with analysis of variance for simple effects and Duncan's post-hoc test was applied wherever required. The results are presented in Table 1 to 3.

Table 1: Summary of ANOVA on ratings for internality dimension of protocols describing events of failure by groups varying in H/E belief (H, H/E & E) and awareness (high, moderate and low) categories

Source of Variance	SS	Df	MS	F
H/E belief (A)	68.47	2	34.23	1.31 ^{ns}
H/E awareness (B)	107.27	2	53.63	2.05 ^{ns}
H/E belief X H/E Awareness (AXB)	342.87	4	85.72	3.28*
Within (error)	6802.5	261	26.02	

*Significant at 0.05 level.

ns = non-significant

Table 2: ANOVA for simple effect of belief in heredity/environment on internality dimension for failure events with high (b₁), moderate (b₂) and low (b₃) awareness

Awareness	Sources of Variance	SS	Df	MS	F
b ₁ (High)	Belief in H/E	106.67	2	53.33	1.71 ^{ns}
	(Within groups)	2708.93	87	31.14	
b ₂ (Moderate)	Belief in H/E	60.20	2	30.10	1.23 ^{ns}
	(Within groups)	2133.90	87	24.53	
b ₃ (Low)	Belief in H/E	244.47	2	122.23	5.38**
	(Within groups)	1977.53	87	22.73	

** Significant at 0.01 level *ns = non-significant*

Table 3: Mean ratings for internality dimension of failure events by groups varying in H/E belief (H, H/E and E) and H/E awareness (high (H), moderate (M) and low (L))

Belief Awareness → ↓	H (a ₁)	H/E (a ₂)	E (a ₃)	Total
H (b ₁)	40.73	42.07	39.40	40.73
M (b ₂)	38.20	39.30	40.20	39.23
L (b ₃)	41.87 ^a	39.23 ^b	37.90 ^b	39.67
Total	40.26	40.20	39.17	

Subscripts a and b shows Duncan's post hoc test for significant mean comparisons.

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The main effects of belief in heredity/environment as well as that of awareness of heredity/environment mechanisms were non-significant on internality of failure events (Table 1). The interactive effect of belief in heredity/environment and awareness of heredity/environment mechanisms was significant ($F=3.28$, $p<.05$, $df=4,261$) on internality dimension for events of failure (Table 1). Analysis of simple effect revealed that the mean ratings of the heredity, balanced and environment believers were significantly ($F=5.38$, $p<.01$, $df=2,87$) different only in case of low awareness (Table 2). Post-hoc comparisons by Duncan's test (Table 3) revealed that the mean rating on internality dimension of the events of failure of the heredity believers ($\bar{X}=41.87$) was significantly higher than both the balanced ($\bar{X}=39.23$) and the environment believers ($\bar{X}=37.90$). This indicates that the heredity believers having less awareness of heredity/environment mechanisms ascribed events of failure to internal factors more than the balanced and environment believers. The heredity balanced and environment believers did not differ in case of moderate and high awareness of heredity/environment mechanisms (Table 3).

DISCUSSION

The results of the study clearly reveal that there is a lack of consistent attribution style among the three beliefs and awareness groups. However, the interaction of belief in heredity/environment and awareness of heredity/environment mechanisms was significant and analysis of simple effect revealed that the group of heredity believers having low awareness of heredity/environment mechanisms attributed events of failure to internal factors. Thus, they displayed a kind of negative bias/or error in their attributions as described by Beck (1987). 'Negative bias' is present if individuals make less internal, stable and global attributions for success than they do for events of failure. Beck noted this kind of negative bias in depressed individuals. In the present study only normal subjects were taken, but subjects having low awareness of heredity/environment mechanisms and having a particular type (heredity) of orientation have particularly seems to display negative bias as they took less credit for success than the (high and moderately awarded) heredity, balanced and environment believers rather they took the blame for failure by attributing failure events to internal factors. The presence of negative bias and concurrent absence of positive bias may have consequences for the heredity believers having less awareness of heredity/environment mechanisms. This kind of attributions may lower their self-esteem and self-image (Fishbein and Ajzan, 1975) and may perhaps lead to depression and other forms of psychopathology (Taylor and Brown, 1988).

Implications

The findings of the study highlighted that it is important to help people understand how their beliefs about heredity/environment can influence their attribution for failure. Findings further suggest helping heredity believers to develop a more accurate understanding of heredity/environment mechanisms. This may help to reduce negative bias in attribution and improve mental health outcomes.

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Conflict of Interest

The author(s) declared no conflict of interest.

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