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LOCUS OF CONTROL PREDICT ATTITUDE TOWARDS ARTIFICIAL INTELLIGENCE AND EMPLOYEE WORK PERFORMANCE IN WORKING MIDDLE AGE ADULTS

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Abstract
A person's behavior, attitude, or performance predominates from how he/she perceives things happening around them. When faced with the same scenario, various people react differently due to the effects of internal and external locus of control on their behavior. The current study was designed to identify the role of LOC in attitude towards AI and employee work performance in working middle-aged adults. This cross-sectional study selected a sample of 300 middle-aged adults through purposive sampling techniques. INTLOC and EXTLOC were measured using I-E 4 scale, attitude towards artificial intelligence was assessed using GAAI scale, and employee work performance was assessed using Individual work performance questionnaire (IWPQ). Regression analysis was conducted to predict positive and negative GAAI and work performance among working middle age adults. INTLOC ($\beta = .44$, $p = .00$), and EXTLOC ($\beta = -.16$, $p = .00$) significantly predicts positive GAAI. INTLOC ($\beta = -.52$, $p = .00$) and EXTLOC ($\beta = .08$, $p = .00$) significantly predicts negative GAAI among working middle age adults. INTLOC ($\beta = .03$, $p = .00$), and EXTLOC ($\beta = -.38$, $p = .00$) significantly predict work performance among middle age working adults. The results of this study can be used to guide the creation of targeted measures and tactics that will facilitate the integration of AI, foster innovation, and enhance middle-aged workers' productivity at work. In an increasingly AI-driven world, these efforts will help organizations succeed. It is suggested that Future studies should use both self-report measures and observer-report measures in combination to overcome the constraint of data collecting from a single source. They consider adolescents, young, and older adults as their sample and should use mixed-method or qualitative research should be conducted in addition to quantitative ones to get a detailed account.
Keywords: Working middle age adults, Locus of Control, Attitude towards AI & Employee Work Performance

INTRODUCTION

A person's behavior, attitude or performance is predominately a result of how he perceives things happening around him. When faced with the same scenario, various people would react differently due to the effects that internal and external directions have on their behavior (Rotter, 1966). One's ideas about having influence over life occurrences are referred to as locus of control. People are frequently classified as having an internal or external locus of control. People who have an internal locus of control believe their own actions are what lead to the things they experience in life. On the other hand, individuals who have an external locus of control think that other elements like fate, luck, or other people have an important bearing on life's consequences (Schultz & Schultz, 2016). According to the majority of research, those who are certain that they have control over their rewards via their own behavior typically have stronger ego functioning, fewer mental health issues, and higher stages of life satisfaction and self-esteem. Moreover, it has been discovered that a range of population traits and actions can differentiate between those who perceive things internally and externally (Rotter, 1954). Research varies on this point; some studies indicate that women have a lower internal locus of control than men (Churchill et al., 2020), while others support the opposite theory (McPherson &

Martin, 2016). According to other studies, as people age, they tend to have a greater internal locus of control (Hovenkamp-Hermelink et al., 2019).

The characteristics of locus of control were also described by Robbins and Judge (2014), who distinguished between internal and external orientations. According to them individuals who hold an internal locus of control, demonstrate a conviction in their ability to guide their own life. They function based on their own skills, judgements, and efforts; they have a tendency to work hard, take initiative, look for answers consistently, streamline thought processes, and uphold the belief that success requires sincere effort. On the other hand, people with an external locus of control think that their life is influenced by other factors. They blame other factors, luck, fate, other individuals, or other forces that are greater than they are for their acts.

As it is well established that the term "locus of control" describes a person's insight of their level of control over life events. This belief system has the power to affect the manner in which individuals view and react to the outside world, such as innovations concerning technology like artificial intelligence (Liu, 2021). The way people view and use technological innovations is interconnected with the association concerning LOC and AI. People who identify as having an internal locus of control (LOC) and who anticipate that they possess the power to shape their lives frequently view AI as a tool to improve their independence as well as their decision-making skills. They're likely to aggressively incorporate AI into their work practices and to quickly accept it, seeing it as a chance for both professional and personal development. However, those with an external locus of control (LOC), who are typically more unreceptive and sensitive to outside stimuli, can first be wary of AI. They might, however, eventually come to appreciate how useful AI is in giving jobs structure and organization and reducing the load of decision-making (Sharan & Romano, 2020). In today's world of rapid advancement, AI has emerged as a source for modifying different aspects of our lives, including our work and interactions. The imitation of human intelligence processes by machines, chiefly computer systems, is known as artificial intelligence (Laskowski & Tucci, 2023).

Research on Relation Between Locus of Control in Attitude Towards Artificial Intelligence

There is a dearth of information regarding the role of locus of control in attitudes towards AI. Although studies have been conducted to determine attitudes towards AI based on various personality traits, such as using the big five personality qualities into consideration, Kaya et al. (2022) examined the effects of personality traits, anxiety related to artificial intelligence, and demography on attitudes towards artificial intelligence, it is possible that attitudes towards this new technology are formed in large part by an individual's Locus of Control (LOC), which is a primary personality attribute. According to earlier studies, those who had internal LOC viewed computers more constructively than those who did not.

A study was led by Kaya et al (2022), on The Roles of AI Anxiety, Personality Traits, and Demographic Factors in Attitudes towards Artificial Intelligence. Hierarchical Multiple Linear Regression Analyses disclosed that the amount of computer use, degree of expertise in AI, and anxiety associated with adopting AI considerably projected positive attitude towards artificial intelligence. Significantly, negative attitudes about AI were foreseen by AI configuration anxiety, agreeableness, and AI learning anxiety. Attitude towards AI are significantly impacted by Personality traits, AI anxiety, and demographics.

A study on the impact of personality and locus of control on trust in humans versus artificial intelligence was carried out by Sharan and Romano (2020). It turned out that LOC affects related trust ratings and concordance. Particularly, LOC negatively predicted trust concordance beyond the BFI parameters. People were less inclined to heed advice from AI and humans when LOC levels rose. A study was carried out to explore the relationships among attitudes regarding AI and personality traits. A relationship between the Chinese and German samples was explored. Among other things, correlational analysis disclosed that both samples' neuroticism and fear of AI showed considerable positive correlations with similar effect sizes (Sindermann et al., 2022). A review of employees' paradoxical attitudes towards engaging with artificial intelligence (AI) was carried out by Lichtenthaler (2019). Results revealed that a lot of businesses face difficulties executing AI because of unfavorable attitudes among their staff. Lastly, another study concluded that perceived utility and perceived ease of use were both significantly affected by locus of control (Hsia et al. 2012).

Locus of Control Theory

Rotter's famous locus of control theory was the main component of his social learning theory. When Rotter communicated his social learning theory, Freud's psychoanalysis—that emphasized how people's innate, primal motivations shape their behavior—was the preeminent viewpoint in clinical psychology. People were thought to be oblivious to their unconscious urges, and therapy necessitated a thorough examination of early life experiences. Drive theory, which maintained that people are driven by biologically based impulses that press on the individual to please them, even dominated learning practices at the time. Rotter moved away from drive-based behaviorism and instinct-based psychoanalysis in the development of social learning theory. He thought that a psychological motivational principle ought to be present in any psychological theory. Rotter's driving force was the empirical law of effect. According to the law of effect, humans are driven to avoid painful stimulus and seek out rewarding stimulation, or reinforcement. Rotter did not rely on urges or physiological instincts as a driving force; instead, he integrated behaviorism and personality research. According to the theory of social learning, a reward serves to reinforce an

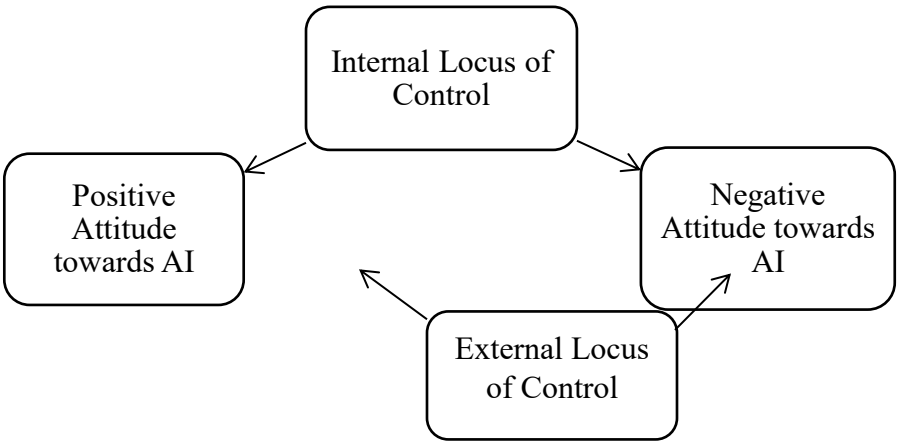
expectation that a specific behavior or event will result in that reinforcement in the future. Once an expectation for this kind of behavior reinforcement sequence is established, it will either diminish or completely disappear if the reinforcement does not occur. An infant learns to distinguish between occurrences that are causally related to earlier events and those that are not as he grows and experiences more. As a general rule, expectancies will not rise to the same extent when reinforcement is perceived as contingent on the subject's behavior as they will when it is perceived as non-contingent. The primary idea of Julian Rotter's social learning theory is that an individual's personality is a reflection of their interactions with their environment. An intrinsic personality that exists independently of one's environment cannot be analyzed. Furthermore, behaviour cannot be viewed as an automatic response to a particular combination of outside stimuli. Instead, understanding behaviour requires taking into account both the individual (i.e., life experiences and lessons learned) and the environment (i.e., stimuli the person is aware of and reacting to). According to Rotter, personality is a somewhat consistent collection of potential responses to various circumstances. According to Rotter, behavior and personality are always malleable. It is possible to change someone's behaviour by changing their thinking or the environment they are responding to. He does not think personality is fixed at a certain point in time. However, the more life experiences one has that contribute to the formation of particular belief systems, the more work and intervention need for transformation to happen. Rotter has a positive conception of human nature. Rather than just attempting to avoid punishment, He considers they are attempting to maximize their reinforcement and are driven by their goals (Rotter; 1954, 1955, 1960). Julian Rotter popularized his concept of Locus of control theory in 1966 when he published the classic locus of control scale in psychological monographs. Rotter's method divides locus of control into two distinct sources of control: internal and external (Rotter, 1966).

Based on this theory, employees' actions and reactions are fundamentally projected based on the events that obtain more attention. This means that employees possess the same information to repeat the same action when they come across the same situation, which eventually requires motivation to carry out the same action repeatedly (Rotter, J.B, 1966). This well-known theory, put out by Rotter, emphasizes reinforcement and expectations or anticipatory perceptions, which impact an employee's behavior established on whether they see an external or internal locus of control. This theory adds worth to previous studies by addressing and emphasizing the most significant question concerning human behavior—why do employees act in the way they do? The way people respond because, as a result of social learning, employees encounter novel and distinguishing behaviors when they detect them in others (Judge, T. A. & Robbins, S, 2007).

CONCEPTUAL FRAMEWORK

The fundamental ideas, factors, connections, and presumptions that direct the scholarly investigation are included in a conceptual framework. It lays up the theoretical foundation and offers a prism through which data may be interpreted and analyzed by the researchers.

Figure 4 Conceptual Framework of the Role of locus of control in attitude towards AI, Employee Creativity and employee work performance in working middle age adults



Aim of the Study

The study aimed to assess the role of locus of control in attitude toward artificial intelligence in working middle-aged adults. The results aim to address the limitations of previous studies and provide a more comprehensive understanding of the variables involved.

Hypothesis

1. Internal locus of control would be a significant negative predictor of positive GAAI in working middle-aged adults
2. Internal locus of control would be a significant positive predictor of negative GAAI in working middle-aged adults

3. External locus of control would be a significant negative predictor of negative GAAI in working middle-aged adults
4. External locus of control would be a significant positive predictor of positive GAAI in working middle-aged adults

METHOD

Procedure

This study employed a quantitative research design to understand the role of locus of control in attitudes towards artificial intelligence (AI) among working middle-aged adults. The participants were recruited via purposive sampling. It is the type of non-probability sampling technique in which the investigator deliberately selects the respondents on the basis of informer's qualities vital by the research. The researcher recognizes what is the necessity of the research and then takes the information from those that are eager to give the desired set of knowledge and experience (Bernard, 2002).

Participants who were in the age range of 30 to 65 years were included. Those working either in private or public sectors in IT department of different organizations either male or female were included in this study. Those who did not fill out the questionnaires fully were not to be included. Those who responded incorrectly to the attention check question in the GAAI scale were also not included in the study. Participants currently self-employed were not included as well.

Ethical guidelines were strictly followed, such as taking approvals. In order to guarantee that participants understand the objective, risks, and advantages of the study before voluntarily choosing to participate, informed consent were obtained. This emphasized the participants' autonomy. Participant privacy and confidentiality was ensured, data security was ensured, and debriefing sessions as outlined in the ethical considerations section were provided.

Participants

The participants covered working middle age adult employees from public and private sectors of IT Departments (mainly the software engineers, web developers, software developers), in Pakistan. In the present study the sample was recruited from the twin cities of Pakistan. The study constituted a sample of 300 working middle-aged adults, in between the ages of 30 and 65 (Wrightsman, 2002), from private and public sector of IT departments of different organizations.

Instruments

The Internal-External Locus of Control Short Scale (IE-4 Scale) was used to measure the internal and external locus of control of the individuals. The initial version of this scale was developed in German language. Later on, it has been translated in English language and validated by Nießen et al. (2022). All items are positively phrased in reference to the fundamental concepts, internal and external locus of control, just like in the German-language original instrument. The I-E Scale was intended to assess individual differences in beliefs about control of reinforcement. The measure distinguishes between beliefs in external control, which is dependent on chance or other people's actions or control, and internal control, which be contingent on an individual's actions. The scale consists a total of 4 items, 2 for external locus of control and 2 for internal locus of control. The items are responded using a 5-point rating scale that ranges from does not apply at all (1) to applies completely (5). The subscale scores for internal and external locus of control can be determined by calculating the unweighted mean score of the corresponding two items for each subscale. It is not recommended to calculate the mean score for the two subscales together.

General Attitude towards Artificial Intelligence scale (GAAI) was used to assess the individuals' attitude towards AI. It consists of 20 items that are rated on a 5-point Likert scale that ranges from strongly disagree to strongly agree. This scale consists of 2 subscales, positive subscale and negative subscale. The positive subscale includes the item number 1, 2, 4, 5, 7, 11, 12, 13. 14. 16. 17, 18, whereas the negative subscale includes the items number 3, 6, 8, 9, 10, 15, 19, 20. There is also one item for attention checking but its score is subtracted from the overall score. Negative subscale items are reverse scored. To procedure an overall score for positive subscale, a mean is taken of the positive items score and for score of a negative subscale, a mean is taken of the negative item scores. Higher score on each subscale indicates more positive attitude. An overall scale mean is not recommended. This scale has good psychometric properties, discriminant and convergent validity and good cross validation designs (Schepman & Rodway, 2020).

RESULTS

The hierarchical regression analysis was used to evaluate the predictive significance of INTLOC and EXTLOC in positive and negative GAAI among working middle adults.

Regression analysis was conducted to predict positive GAAI from INTLOC, and EXTLOC among middle age adults. As shown in table 1, INTLOC and EXTLOC significantly predicts positive GAAI.

Table 1 Frequencies and percentages of the demographic variables of the study (N=300)

Variable	f	%
Gender		
Male	159	53.0
Female	141	47.0
Education		
Graduate	116	38.7
Masters	156	52.0
PhD	28	9.3
Job Sector		
Private	214	71.3
Government	86	28.7
Marital Status		
Single	82	27.3
Married	153	51.0
Divorced	65	21.7
Family Structure		
Nuclear	174	58.0
Joint	126	42.7
Socioeconomic Status		
Lower	33	11.0
Middle	202	67.3
Upper	65	21.7
Age	Mean= 35.46	SD= 7.724

Note: f= frequency, %= Percentage

Table 2 Multiple Regression Analysis of Predictors of Positive GAAI (N=300)

Predictor						95% CI	
	B	SEB	β	T	p	LL	UL
(Constant)	2.29	.27		8.32	.00	1.75	2.83
INT LOC	.07	.009	.44	8.72	.00	.06	.09
EXT LOC	-.02	.009	-.16	-3.42	.00	-.04	-.01
R	.59						
R^2	.35						
ΔR^2	.33						
F	15.79						

Note. *p < .05, ** p < .01, ***p < .001, INTLOC= Internal Locus of Control, EXTLOC= External Locus of Control
Regression analysis was conducted to predict negative GAAI from INTLOC and EXTLOC among middle age adults. As shown in table 2, INTLOC significantly predicts negative GAAI among middle age adults.

Table 3 Multiple Regression Analysis of Predictors of Negative GAAI (N=300)

Predictor						95% CI	
	B	SEB	β	T	p	LL	UL
(Constant)	4.07	.23		17.24	.00	3.60	4.53
INT LOC	-.08	.008	-.52	-10.97	.00	-.09	-.06
EXT LOC	.01	.008	.08	1.83	.06	-.00	.02
R	.65						
R^2	.42						
ΔR^2	.04						
F	21.46						

Note. *p < .05, ** p < .01, ***p < .001, INTLOC= Internal Locus of Control, EXTLOC= External Locus of Control
Results in Table 3 indicate differences among the male and female research participants. Results documented show lower positive GAAI among female participants as compared to male participants

DISCUSSION

The current study explored the role of locus of control in attitude towards AI among working middle age adults. The study used a cross-sectional survey research design to answer the research questions. The research questions were about the role of locus of control, a personality trait, in the dependent variables of the study. A sample of 300 participants was chosen by using purposive sampling from IT departments of different private and public organizations. The participants of the age range were 30-65, worked in IT departments of either private or public sector organizations were most prevalent. Regression analysis t-test and ANOVA were used to test the hypothesis.

The first hypothesis of the study was "Internal locus of control would be a significant negative predictor of positive GAAI in working middle-aged adults". According to the results of Table 1 Regression analysis was conducted to predict positive GAAI from INTLOC, and EXTLOC among working middle age adults. INTLOC ($\beta = .44$, $p = .00$), and EXTLOC ($\beta = -.16$, $p = .00$) significantly predicts positive GAAI.

According to the second hypothesis, "Internal locus of control would be a significant positive predictor of negative GAAI in working middle-aged adults". Regression analysis was conducted to predict negative GAAI from INTLOC, and EXTLOC among middle adults. According to the results of Table 2 INTLOC ($\beta = -.52$, $p = .00$) significantly predicts negative GAAI among working middle age adults. A study done by Sharan and Romano (2020) showed that the locus of control shows a significant positive relationship in multiple linear regression analysis, but in a negative direction, indicating that as the locus of control increases, trust towards artificial intelligence decreases.

The contribution of the current study in terms of theoretical and clinical implications were also significant. Primarily, the current research study aimed to consider significant manifestations among working middle-aged adults. These significant manifestations encompassed Internal Locus of Control, External Locus of Control, Positive and Negative Attitudes toward Artificial Intelligence. The present research study emphasizes the predictive role of multiple factors including sociodemographic variables (gender, job sector, marital status, family structure, education, socioeconomic status). Data was collected using instruments that have been validated and were reliable measurements. Most significantly, the findings would be advantageous, constructive, and valid research disciplines. The results of this study can be used to guide the creation of targeted measures and tactics that will facilitate the integration of AI, foster innovation, and enhance middle-aged workers' interest at work. In an increasingly AI-driven world, these efforts will help organizations succeed.

Recommendations

- Future studies should use both self-report measures and observer-report measures in combination to overcome the constraint of data collecting from a single source.
- Future studies should consider adolescents, young, and older adults as their sample.
- Future studies should use mixed-method or qualitative research should be conducted in addition to quantitative ones to get a detailed account.
- Future studies should use a different sample for studying the impact of such variables.

CONCLUSION

The present study contributes to a growing literature of research studies evidence demonstrating attitudes towards AI in working middle-aged adults. The current research study is designed to investigate the primary factors related to the current situation in response to the excessive use and dependency on AI. Subsequently, this study's results could be considerably helpful in lessening such problems and negative consequences.

According to the findings of the hierarchical regression analysis among sociodemographic variables, age, marital status, family structure, Socio Economic Status, internal locus of control, and external locus of control significantly predicts positive General Attitude towards AI. Furthermore, among sociodemographic variables, gender, education, marital status, SES, and internal locus of control significantly predicts negative General Attitude towards AI among middle adults.

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