



# THE STRUCTURAL BASIS OF DIFFERENCES BETWEEN INDIVIDUALS IN CONSERVATION AND HUMAN BEHAVIOUR: AN IN-DEPTH STUDY



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Original Article

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## Abstract

Despite increased efforts by non-governmental organizations, universities, and governments to save species in recent decades, several hazards persist, continuing to diminish their populations and even driving them to extinction. The escalating human utilisation of natural resources is primarily responsible for the depletion of biodiversity. Consequently, conservation specialists must investigate the underlying factors that drive human behavior in order to effectively address this issue. Social psychologists studying decision-making recognize the use of mathematical theories to explain human decision-making processes. However, they also acknowledge that individuals do not consistently exhibit financially rational behavior. Instead, personal factors such as attitudes and perceived social pressure can significantly influence decision-making. The researchers are exploring the application of the social-psychological theory of behavior in the contexts of ecological sustainability and natural resource management. Numerous studies mostly focus on general attitudes towards conservation rather than specific attitudes towards conservation-related activities, hence limiting their applicability in formulating interventions aimed at modifying these behavioural patterns. Adopting a narrower definition of the behavior under investigation and examining attitudes within the framework of other social-psychological indications of behavior can lead to a more comprehensive understanding of conservation-relevant behaviours and the development of more effective interventions to influence them. These indicators may include consumer attitudes, the presence of supporting factors, and moral obligation.

**Keywords:** *Attitude; Decision-Making; Ecological Sustainability; Human Behavior; Management of Natural Resources; Social Norms*

## Introduction

The limited sample sizes in this study heighten the potential for misinterpretation of the findings. The disciplines of psychology and cognitive neuroscience are involved. Moreover, a considerable body of research in the fields of both neuroscience and psychology focuses on recruiting undergraduate participants from prestigious educational institutions in wealthy Western countries. However, it is plausible that different kinds of personalities might provide insight on the cognitive processes behind such actions. Many human actions, such as overexploitation of natural resources, habitat loss, and anthropogenic climate change, can contribute to the detrimental impact on ecosystems and the extinction of species. "Conservation" encompasses a wide range of actions aimed at mitigating the ongoing degradation of ecological systems and the loss of biodiversity. Given the anthropogenic nature of these issues, which require the implementation

of measures to alter human behaviour and social structures, a comprehensive understanding of ecology is necessary for the successful implementation of conservation efforts. For the proper functioning of these systems, a wide range of scales and time spans are necessary, including global markets and governments down to individual smallholder farmers. In the absence of a thorough understanding of the intricacies inherent in social systems, conservation initiatives run the risk of being too simplistic and misguided. In order to maximize the impact of conservation efforts, it is essential to have a comprehensive and forward-looking understanding of the socioeconomic processes that underlie ecological change. There is a growing need for the use of prescriptive methodologies in the field of ecology, with the aim of enhancing its practical relevance and applicability. Numerous academic disciplines scrutinize human conduct, each with distinct epistemological and methodological underpinnings. The discipline of conservation research has always depended on financial and psychological ideas pertaining to human conduct [1].

Sociology and behavioural researchers extensively employ the Theories of Planned Behaviour, a widely used framework in the field of social psychology, to gain insights into individuals' motivations and guide the development of impactful interventions. Furthermore, even though the conservation community has not widely adopted the concept of "bounded rationality" from the field of economics, it still holds significant relevance. Economic theories pertaining to rational hunters have offered a theoretical framework for understanding the behavioural patterns demonstrated by human hunters. When applying models from the field of behavioural ecology to human conduct, the primary goal is to optimize adaptation, not utility, unlike the rationality-maximizing models commonly used in economics. In order to enhance comprehension of environments that have undergone human-induced modifications and the efficacy of conservation endeavors, scientists are persistently and laboriously striving to amalgamate a wide range of information pertaining to behavior among people with ecological data. One approach to integrating social as well as ecological information is the use of a model, which enables the establishment of causal links between the many components of the system's ecology and society. This enables researchers to anticipate the environmental and social ramifications of various prospective adjustments to social systems [2].

### **Background of Study**

In the realm of neuroscience, which investigates behaviours and cognition, it is customary to aggregate data from multiple participants. This practice serves to minimize the impact of individual variations. Many studies conducted in the fields of neuroscience and psychology specifically target college freshman and sophomore students attending educational institutions in Western countries. Although standardized tests tend to focus on a limited spectrum of human diversity, findings derived from research with a limited sample size are often regarded as representative of the whole community. However, by leveraging individual variations, it may be possible to understand the cognitive mechanisms underlying these actions. The conventional research methodology entails investigating the effects of a single experimental alteration or action on the mean response. In the presence of noise measurement, it becomes imperative to use data averaging techniques over several patients in order to discern the genuine effects. We are subjecting the replies, which exhibit considerable variation, to an averaging process. The answers of two individuals, shown by the pink lines, exhibit a contrary trend to the overall dataset, going in the other direction. Conversely, responses from two additional individuals, represented by the green lines, demonstrate much higher values compared to the remaining data points [3].

People often disregard these anomalies as idiosyncrasies or measurement errors. In studies pertaining to cognitive processes involved in perception, thinking, and action, the process of averaging data gathered from a group of individuals serves to diminish the presence of inter-individual variation, sometimes referred to as "noise". However, if tests demonstrate reliability, it is possible to associate individual differences in microvariability with cerebral functioning. New developments in magnetic resonance imaging (MRI) research have shown that voxel-based morphometry and neuroimaging techniques can accurately predict how different people will be in a wide range of basic cognitive abilities, such as consciousness, introspection, motor control, perception, and memories. These findings are based on comprehensive investigations of the human brain. The researchers think that multivariate data, which is usually thrown out of studies that look at the neural circuitry behind thinking, seeing, and acting, could help us understand how cognitive processes are connected to physical brain structures [4].

## Problem Statement

*“In recent years there has been a growing recognition of the potential importance of the structural basis of inter-individual differences in conservation and human behavior with relation to social psychology and cognition. It's difficult to get an accurate count of the number of people who lack from inter-individual differences in conservation and human behavior with relation to social psychology and cognition, but little is known about the structural basis.”*

This study examined by Gulland scientific investigations pertaining to human behavior. Inter-individual variability, often viewed as a source of 'noise', typically affects the brain processes that underline perception, thought, and action. Consequently, we sometimes disregard the outcomes derived from individual variations in favor of the group average. The brain's human behaviour, on the other hand, reveals that the regional composition of greyish and white matter, when assessed using voxel-based morphology or diffuse tensor imaging, has the potential to anticipate differences across individuals in a wide range of basic and advanced cognitive functions. The authors claim that the analysis of individual differences may provide valuable insights into the influence of brain shape on human behaviour and cognition [5].

## Research Objectives

- To find out the characteristics of individual differences in conservation and human behaviour with relation.
- To understand individual differences in cognitive development in conservation and human behaviour.
- To explain, it is important to study individual differences in human behaviour with relation in social psychology.
- To find out the role of interindividual differences in conservation and human behaviour.
- To evaluate the so-called interindividual difference in conservation and human behaviour.

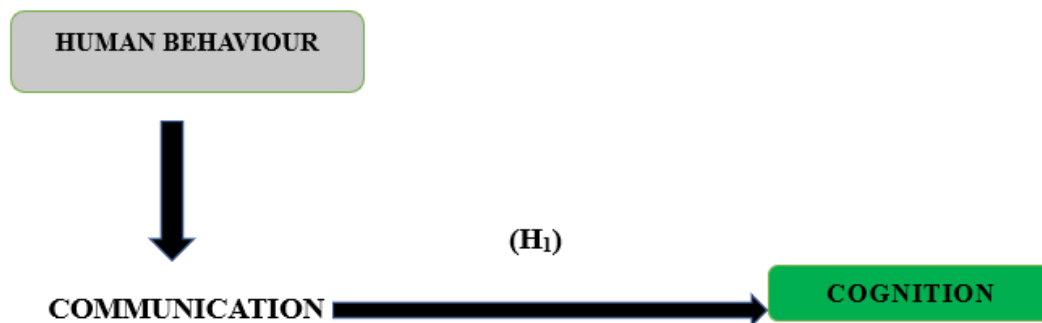
## Literature Review

Studies using non-intrusive MRI (structural magnetic resonance imaging) techniques have shown the existence of extensive information storage within the neural architecture of the human brain, which is associated with variances in human behavior. In recent years, there has been a significant rise in the volume of research investigating the correlation between fundamental personality traits and brain shape [6]. There are links between the architecture of white and grey matter and conduct in several aspects of higher-order cognition, such as sensory domains. This has enabled them to identify the most urgent issues that require prompt resolution. Although cross-sectional research can provide information on the longitudinal development of the brain, the causal relationship between these alterations and changes in behavior remains uncertain. To enhance comprehension of the intricate relationship between brain shape and behavior, it is necessary to conduct prospective or interventional research. The consideration of the structure's potential to undergo timely changes and adaptations is also of significance. Examining the extent of flexibility in other cognitive skills, such as reasoning and problem-solving in addition to vision, might provide intriguing insights. Finally, additional research is required to validate the reliability of the brain's structure as a predictive instrument for identifying the structural factors associated with individual differences. In the domains of autism spectrum disorders (ASD) and Alzheimer's disease (AD), scholars have lately initiated investigations into the potential use of aberrations in brain architecture as a predictive factor for clinical phenotype [7].

In order to devise strategies that safeguard biodiversity while minimizing potential risks to human lives, it is imperative to enhance their understanding of the intricate dynamics between human societies and the natural environment. Scientists are currently investigating the extent to which human activities have influenced the natural environment, considering both anthropogenic alterations and reciprocal impacts. This observation highlights their little understanding of the complex dynamics that exist between human societies and ecological systems [8]. If the organization fails to initiate the development of process-based models and consistently evaluate them within an adaptable framework, the situation will only deteriorate further. Those working in the field of natural resource management could benefit from incorporating insights from social sciences, which encompass a wide range of knowledge related to behavioural sciences and analytical frameworks. There exists a considerable body of research that supports the notion that comprehending

human intentions is a crucial factor in the development of efficacious approaches aimed at mitigating the decline in biodiversity. There exists an extensive catalogue of instances wherein conservation efforts have fallen short, thereby substantiating this assertion [9]. One of these is the opposition to using the Integrated Conservation and Development Program (ICDP) as a strategic approach; another is the difficulty in creating long-lasting and stable payment systems; and a third is the lacklustre results seen in alternative livelihood projects and the bad effects of buffer zone projects around protected areas. In spite of the varied outcomes seen in conservation projects, researchers have made notable advancements in applying control and counterfactuals to assess the effectiveness of diverse programmers [10].

### Conceptual Framework



### Methodology

**Sampling:** The subjects of this study were 890 people, sampled from the total population of China.

**Data and Measurement:** The data were collected during the first half of the annual year 2022. Human behaviour was required. A questionnaire was distributed, and quantitative analysis was implemented.

**Statistical Software:** MS-Excel and SPSS 25 were used for statistical analysis.

**Statistical Tools:** Descriptive analysis was applied to understand the basic nature of the data. Validity and reliability of the data were tested through Cronbach alpha and ANOVA.

### Results & Discussion

#### Factor Analysis

Factor analysis is often used to validate the latent component structure of a collection of measurement items. People believe that latent factors explain the observed scores. Modelling is fundamental to accuracy analysis (FA) [11]. It emphasizes simulating the interaction between observed events, unknown factors, and measurement inaccuracies. The Kaiser-Meyer-Olkin (KMO) Test assesses the appropriateness of data for factor analysis. Both individual model variables and the whole model are evaluated to guarantee adequate sampling. [12]. Data analysis indicates the degree to which several variables may have similar variation. A lower percentage typically signifies that the data is more appropriate for factor analysis purposes. KMO yields values ranging from zero to one. The sample size is sufficient only if the KMO value falls between 0.8 and 1.0. A KMO below 0.6 indicates insufficient sampling and necessitates modification. Certain writers use the value of 0.5 for this objective; they must exercise their judgement within the range of 0.5 to 0.6. [13].

If the Kaiser-Meyer-Olkin (KMO) value is close to 0, it signifies that the total correlations are insignificant in comparison to the magnitude of the partial correlations. In summary, extensive correlations provide a considerable challenge to component analysis. Kaiser's minimal and maximum criteria are as follows: The minimum and maximum criteria set by Kaiser are as follows: Oscillating between 0.050 and 0.059. The middle school level is below average

(0.60-0.69), frequently exhibiting a quality point score between 0.80 and 0.89. Remarkable variety occurs between 0.90 and 1.00.

**Table 1: KMP and Bartlett's Test**

KMP and Bartlett's Test	
Kaiser-Meyer Olkin Measure of Sampling Adequacy	
	0.980
Approx. Chi-Square	3252.968
df	190
Sig.	0.000

*Source: Collected by Author*

Determining whether or not the data is suitable for factor analysis is the first phase of exploratory factor analysis (EFA). In this regard, Kaiser proposed that the KMO (Kaiser-Meyer-Olkin) measure of sampling adequacy coefficient value should be greater than 0.5 as a basic minimum requirement for conducting factor analysis. This is because KMO stands for the Kaiser-Meyer-Olkin measure of sampling adequacy. The study produced a KMO value of 0.980 for the used data. Additionally, Bartlett's test of sphericity determined the significance level to be 0.00 (refer to table 1).

### Test for Hypothesis

Scientists refer to the act of proposing a hypothesis as putting out a conjecture or assumption for the purpose of debate and later empirical testing to assess its validity. The first stage of the scientific process involves formulating a viable hypothesis, followed by conducting a comprehensive literature study. The hypothesis successfully predicted the results. A hypothesis refers to any suggested answer to the core topic of research. Depending on the scope of the inquiry, it could be necessary to formulate several assumptions, each of which would then undergo testing.

### Dependent Variable

- **Cognition**

Cognition refers to the mental activity involved in gaining information and comprehension via thinking, personal encounters, and sensory perception. Cambridge Cognition concentrates on the cognitive processes that involve the reception and storage of information, and the subsequent application of this knowledge to shape an individual's behaviour.

### Independent Variable

- **Human Behavior**

Human behavior refers to the inherent and demonstrated ability of people or groups to react to both internal and external stimuli, including mental, physical, and social aspects, throughout their lifespan. Both hereditary and environmental variables influence an individual's behavior.

### Factor

- **Communication**

Communication is the act of transmitting and receiving messages using both spoken and non-spoken ways. Communication is a bilateral method of exchanging information, such as thoughts, views, and ideas, among two or more people with the aim of fostering comprehension.

Gestures are essential elements of language that provide significant and distinct information to a spoken word, mirroring the speaker's underlying knowledge and experiences. Theoretical frameworks suggest that speech and gesture originate from the same conceptual source, have a close connection, and overlap in timing, meaning, and purpose to enhance the communication environment. They examine extensive psychology research showing the benefits of gestures in communication for both speakers and listeners. Additionally, they explore the significant cognitive roles that gestures

play in organizing spoken language, as well as their ability to enhance problem solving, learning, and remembering. However, there has been a lack of research on the topic of gesture in individuals with neurogenic communication impairments, despite the available data.

On the basis of the above discussion, the researcher formulated the following hypothesis: to analyze the relationship between communication and cognition (refer to table 2).

**H<sub>01</sub>: “There is no significant relationship between communication and cognition.”**

**H<sub>1</sub>: “There is a significant relationship between communication and cognition.”**

**Table 2: Significant Relationship Between Communication and Cognition**

		Sum	H1_Mean
<b>Pearson Correlation</b>	Sum	1.000	0.995
	H1_Mean	0.995	1.000
<b>Sig. (1_tailed)</b>	Sum	-	-
	H1_Mean	0.000	-
<b>N</b>	Sum	100	100
	H1_Mean	100	100

Source: Collected by Author

**Table 3: Model Summary**

Model Summary <sup>b</sup>					
Model	R	R	Adjusted R Square	Std. Error of the Estimate	Durbin Watson
1	1.000 <sup>a</sup>	1.000	1.000	0.000	0.625
<b>a. Predictors: (Constant), H1_Mean</b>					
<b>b. Dependent Variable: Sum</b>					

Source: Collected by Author

The value of the multiplied correlation coefficient is in the "R" column. R can be used to assess the predictability of the dependent variable, in this case, disruptive innovations. An achievement of 1.0 shows a satisfactory level of prediction. The "R Square" column displays the "coefficients of determination," also known as the R<sup>2</sup> number. This diagram is utilized to deduce causal connections by illustrating the percentage of overall variability in the dependent variable that can be ascribed to the impact of the independent variables (specifically, it represents the proportion of variation explained by the regression model in addition to the mean model). The result of 1.0 indicates that the independent factors completely account for the variance in the dependent variable, which is the emergence of disruptive technologies. However, in order to present their discoveries in a satisfactory manner, they must possess a comprehensive understanding of the "adjusting R squared" (adj. R<sup>2</sup>). In an advanced course on multiple regression, researchers examine both the results and the factors that contribute to these findings (refer to table 3).

**Table: 4 ANOVA**

ANOVA <sup>a</sup>						
Model		Sum of Squares	df	Mean Square	F	Sig.
1	<b>Regression</b>	55705.310	4	13926.327	10496673816440674.000	0.000 <sup>b</sup>
	<b>Residual</b>	0.000	95	0.000		
	<b>Total</b>	55705.310	99			
		55705.310	4	13926.327	10496673816440674.000	0.000 <sup>b</sup>
<b>a. Dependent Variable: Sum</b>						
<b>b. Predictors: (Constant), H1_Mean</b>						

Source: Collected by Author

The basic equation that may be used to anticipate disruptive technology based on Social Interaction, Communication, Ethnic Background, Gender: the likelihood of including essential components, social psychology =  $1.677 + (9.343E-7 \times H1\_Mean \text{ (Communication)})$  (refer to table 4).

## Conclusion

Studies on individual behavioral variations have demonstrated that non-intrusive structural magnetic resonance imaging can systematically gather a significant amount of data on individuals. In recent years, there has been a notable increase in research endeavours aimed at investigating the potential correlation between variations in brain structure and the manifestation of diverse behavioural traits across individuals. The relationships between white and grey matter building design and behaviour extend beyond specific domains like sensory perception to various areas of higher-order cognition. Numerous concerns have been identified as requiring more examination. Furthermore, it should be noted that cross-sectional studies do not possess the capability to establish a causal relationship between a modification in brain structure and a subsequent alteration in behavior. In order to elucidate the relationship between brain structure and behavior, it was necessary to conduct either observational or interventional investigations. The examination of structural flexibility across time has significant importance. It is surprising that even a brief training period, lasting only a few weeks, can lead to long-lasting changes in the brain's structure, especially when it comes to motor functions. It would be very advantageous to assess the extent to which this model exhibits flexibility in accommodating various forms of individual variance in perception or higher cognitive functions.

## Limitation

The foundation of quantitative approaches is the application of mathematical frameworks, formulas, and other formulas, all of which rely on underlying assumptions. Therefore, it is essential not to regard them as infallible. Failing to heed this cautionary advice might potentially result in significant repercussions. Many times, using quantitative methodologies requires the involvement of specialists, which can lead to an increase in expenses. Owing to the substantial financial implications associated with implementation, even the most prominent corporations only employ quantitative approaches in a limited number of circumstances. It is fairly commonplace for managers to rely on their subjective judgements and prior experiences rather than empirical evidence when making choices. Quantitative techniques may encounter several challenges, such as insufficient data, divergent definitions, inadequate sample selection, flawed methodologies, improper comparisons, and substandard presentation. Quantitative approaches are considered inadequate for the analysis of qualitative phenomena due to their disdain for quantifiable and intangible human traits. The methodologies used do not consider intangible factors such as a manager's ability, attitude, and passion. Nevertheless, the tactics might be executed in an indirect manner via the assignment of monetary amounts to

abstract assertions. For example, the assignment of a numerical score considering a range of parameters may determine the intelligence quotient (IQ) of a manager.

## Conflict of Interest

The authors declare that they have no conflict of interests.

## Acknowledgement

The authors are thankful to the institutional authority for completion of the work.

## References

1. Dobson AD, De Lange E, Keane A, Ibbett H, Milner-Gulland EJ. Integrating models of human behaviour between the individual and population levels to inform conservation interventions. *Philosophical Transactions of the Royal Society B*. 2019 Sep 16;374(1781):20180053. <https://doi.org/10.1098/rstb.2018.0053>
2. Kareiva P, Marvier M. What is conservation science?. *BioScience*. 2012 Nov 1;62(11):962-9. <https://doi.org/10.1525/bio.2012.62.11.5>
3. Gintis H. Towards the unity of the human behavioral sciences. *Politics, Philosophy & Economics*. 2004 Feb;3(1):37-57. <https://doi.org/10.1177/1470594X04040188>
4. Du M, Basyouni R, Parkinson C. How does the brain navigate knowledge of social relations? Testing for shared neural mechanisms for shifting attention in space and social knowledge. *NeuroImage*. 2021 Jul 15;235:118019. <https://doi.org/10.1016/j.neuroimage.2021.118019>
5. Milner-Gulland EJ. Interactions between human behaviour and ecological systems. *Philosophical Transactions of the Royal Society B: Biological Sciences*. 2012 Jan 19;367(1586):270-8. <https://doi.org/10.1098/rstb.2011.0175>
6. Tandel GS, Tiwari A, Kakde OG. Performance enhancement of MRI-based brain tumor classification using suitable segmentation method and deep learning-based ensemble algorithm. *Biomedical signal processing and control*. 2022 Sep 1;78:104018. <https://doi.org/10.1016/j.bspc.2022.104018>
7. Caprara GV, Alessandri G, Di Giunta L, Panerai L, Eisenberg N. The contribution of agreeableness and self-efficacy beliefs to prosociality. *European Journal of Personality: Published for the European Association of Personality Psychology*. 2010 Feb;24(1):36-55. <https://doi.org/10.1002/per.739>
8. Comberti C, Thornton TF, De Echeverria VW, Patterson T. Ecosystem services or services to ecosystems? Valuing cultivation and reciprocal relationships between humans and ecosystems. *Global Environmental Change*. 2015 Sep 1;34:247-62. <https://doi.org/10.1016/j.gloenvcha.2015.07.007>
9. Bawa KS, Sengupta A, Chavan V, Chellam R, Ganesan R, Krishnaswamy J, Mathur VB, Nawn N, Olsson SB, Pandit N, Quader S. Securing biodiversity, securing our future: A national mission on biodiversity and human well-being for India. *Biological Conservation*. 2021 Jan 1;253:108867. <https://doi.org/10.1016/j.biocon.2020.108867>
10. Casey BJ, Cannonier T, Conley MI, Cohen AO, Barch DM, Heitzeg MM, Soules ME, Teslovich T, Dellarco DV, Garavan H, Orr CA. The adolescent brain cognitive development (ABCD) study: imaging acquisition



across 21 sites. *Developmental cognitive neuroscience*. 2018 Aug 1;32:43-54.  
<https://doi.org/10.1016/j.dcn.2018.03.001>

11. LinLin S, Agarwal N. A Study To Experiment The Communicative Abilities Of Chinese Students At Memorial University. *Educational Administration: Theory and Practice*. 2024 Apr 25;30(4):9959-64.  
<https://doi.org/10.53555/kuey.v30i4.6089>
12. Eze NM, Asogwa OC, Eze CM. Principal component factor analysis of some development factors in Southern Nigeria and its extension to regression analysis. *Journal of Advances in Mathematics and Computer Science*. 2021 Apr 24;36(3):132-60. <https://doi.org/10.9734/jamcs/2021/v36i330351>
13. Shareef TH, Rashid BN, Faraj AA. Factors affecting customer satisfaction with Internet services in Sulaimani Governorate, KRI. *Passer Journal of Basic and Applied Sciences*. 2023 Jun 1;5(1):134-43.  
<https://doi.org/10.24271/psr.2023.378420.1209>