JOURNAL OF ECONOMICS AND BEHAVIORAL STUDIES

Vol. 16 No. 3 ISSN 2220-6140

Editorial

Journal of Economics and Behavioral Studies (JEBS) provides distinct avenue for quality research in the everchanging fields of economics & behavioral studies and related disciplines. Research work submitted for publication consideration should not merely limited to conceptualization of economics and behavioral developments but comprise interdisciplinary and multi-facet approaches to economics and behavioral theories and practices as well as general transformations in the fields. Scope of the JEBS includes: subjects of managerial economics, financial economics, development economics, finance, economics, financial psychology, strategic management, organizational behavior, human behavior, marketing, human resource management and behavioral finance. Author(s) should declare that work submitted to the journal is original, not under consideration for publication by another journal and that all listed authors approve its submission to JEBS. Author (s) can submit: Research Paper, Conceptual Paper, Case Studies and Book Review. Journal received research submissions related to all aspects of major themes and tracks. All submitted papers were first assessed by the editorial team for relevance and originality of the work and blindly peer-reviewed by the external reviewers depending on the subject matter of the paper. After the rigorous peer-review process, the submitted papers were selected based on originality, significance and clarity of the purpose. The current issue of JEBS comprises papers of scholars from Nigeria, Malaysia, USA and China. Determinants of Women's Empowerment, Impact of Knowledge Management Process on Employee Performance, Role of Behavioral Factors in Climate Change Donations, Strategic Flexibility and Employee Creativity and Role of Remote Work in Enhancing Employee Productivity were some of the major practices and concepts examined in these studies. The current issue will therefore be a unique offer where scholars will be able to appreciate the latest results in their field of expertise and to acquire additional knowledge in other relevant fields.

Editor In Chief

Ijaz Ur Rehman Ph.D

Editorial Board

- Saqib Muneer PhD, University of Hail, Saudi Arabia
- Mehmed Muric PhD, Global Network for Socioeconomic Research & Development, Serbia
- Ravinder Rena PhD, Monarch University, Switzerland
- Apostu Iulian PhD, University of Bucharest, Romania
- Sisira R N Colombage PhD, Monash University, Australia
- Hai-Chin YU PhD, Chung Yuan University, Chungli, Taiwan
- Mohamad Firdaus Bin Ahmad PhD, Universiti Teknologi MARA, Malaysia
- Elena Garcia Ruiz PhD, Universidad de Cantabria, Spain
- Fuhmei Wang PhD, National Cheng Kung University, Taiwan
- Johan de Jager PhD, Tshwane University of Technology, South Africa
- Mamta B Chowdhury PhD, University of Western Sydney, Australia
- Muhammad Hariz bin Hamid PhD, Universiti Teknologi MARA, Malaysia

TABLE OF CONTENTS

Description	Pages
Title	I
Editorial	II
Editorial Board	III
Table of Contents	IV
Papers	V
Determinants of Women's Empowerment in Nigeria Olumuyiwa L. Makinde, Rukayat A. Olaoye, Olubunmi O. Alawode	1
Impact of Knowledge Management Process on Employee Performance: Employee Creativity as Mediator Faiz Mayah Alshammary, Dhakir Abbas Ali	14
The Role of Behavioral Factors in Climate Change Donations Everett Jin, Ariya Shah, Hanyang Xia	26
Strategic Flexibility and Employee Creativity: A Moderating Role of Leader's Education Waleed Mansi Alshammari, Dhakir Abbas Ali	40
The Role of Remote Work in Enhancing Employee Productivity: Evidence from the US-Based Tech Industry During the COVID-19 Pandemic Eric Strandt	53

PAPERS

Journal of Economics and Behavioral Studies (JEBS)
Vol. 16, No. 3, 2024 (ISSN 2220-6140)

Determinants of Women's Empowerment in Nigeria

Olumuyiwa L. Makinde[1], *Rukayat A. Olaoye[2], Olubunmi O. Alawode[2]
[1]Department of Management and Accounting, Lead City University Ibadan, Nigeria
[2]Department of Agricultural Economics, University of Ibadan, Nigeria
olumuyiwamakinde@gmail.com, *rukayatolaoye1803@gmail.com, oo.alawode@ui.edu.ng
Corresponding Author: Rukayat A. Olaoye

Abstract: Empowering women entails fortifying women to make crucial choices across various issues in an economy. This study investigated the socioeconomic determinants of women's empowerment status in Nigeria. Secondary data from 17,677 respondents were sourced from the National Health Demographic Survey (NDHS) 2018 and were analyzed using descriptive statistics to describe women's socioeconomic characteristics and the women empowerment indicators, Women Empowerment Index (WEI) to determine the level of women empowerment and probit regression to identify and examine the determinants of women empowerment in Nigeria. Results showed an average age of 33 years for Nigerian women, many were Muslims, had a household size of 1-5 persons, had no formal education, belonged to the richest group of the wealth quintile, resided in the rural area, and the majority were married. Also, the majority were employed and earned in cash, but more than half were poorly empowered. Furthermore, at $p<0.05$, being employed, educated, an urban resident, a service provider, earning more than husband, and respondent's age positively influence women empowerment, while household size, being a farmer, married woman, traditionalist, and residing in the Northeast, Southeast, South-south, and Southwest negatively influence women empowerment status in Nigeria. Thus, the study recommends the organization of awareness programs about the importance of women's participation in decision-making at the household level and the society at large, and that governments and NGOs should strive more for gender equality and empower women to reach their full potential.

Keywords: *Empowerment, Women, Decision-making, Households.*

1. Introduction

Individual or social empowerment presupposes the existence of a social oppression state that disempowered individual groups by denying them the opportunities or resources that have defined them as inferior humans; thus, lowering their self-esteem. Moubarak (2021) thus, viewed empowerment as a political and economic set of procedures aimed at increasing individual and group power, self-reliance, and strength. Empowerment fosters power in people for use in their own lives, their communities, and their society by acting on important issues (Charity, 2021). Women empowerment engross the legal recognition of women's rights and the endorsement of their rights to speak, to take part in public affairs, and to defend their beliefs in society. Similarly, women's empowerment means the ability of women to strategically make life choices where they are previously been denied. Women's empowerment is of great importance in maintaining and improving women's contribution at individual, household, community, and economic levels. It encompasses various activities that literarily boost women's status via education, training, and awareness (Charity, 2021). Henceforth, women's empowerment is all-encompassing as it enables and fortifies women to make crucial choices across various issues in an economy. For centuries, women's rights have been developing slowly and continuously. From ancient civilizations to the present day, women have fought for their rights and equal treatment in different aspects of life, including the political, economic, and social spheres. Women were viewed as inferior to men in ancient societies like Greece and Rome and lacked political and social influence and were only allowed to work in the home in these societies, and participation in public life was prohibited.

However, over time, women began to challenge these limitations and push for greater rights (Smith, 2021). The 19th century was a turning point for women's rights as the suffragette movement took hold. Women, including Elizabeth Cady Stanton, Susan B. Anthony, and Sojourner Truth, fought for the right to vote and for greater political representation. This eventually led to the 19th Amendment to the U.S. Constitution, which granted women the right to vote in 1920. The 20th century saw further progress for women's rights, as women were given greater access to education and employment opportunities (Johnson, 2018). Also, the 1960s and 1970s were particularly important, as the feminist movement gained momentum and challenged traditional gender roles. This led to important legislation such as the Equal Pay Act of 1963, which aimed to eliminate gender-

based pay discrimination in the workplace, and the Family and Medical Leave Act of 1993, which provided job-protected leave for employees for specific family and medical reasons. In recent times, women's rights have continued to be an important issue, as women face ongoing challenges such as the gender pay gap and workplace discrimination. However, the progress made over the years has provided a foundation for continued advocacy and activism as women work toward a future in which they have equal rights and opportunities (Johnson, 2018). The notion of women's empowerment has recently become a central focus of global development efforts. The United Nations Sustainable Development Goals (SDGs) explicitly recognize the need to encourage gender equality and empower women and girls in all aspects of life.

Nigeria is the most populous country in Africa, with more than 200 million people. The country is also one of the most diverse in the world, with over 250 ethnic groups and a wide range of cultural practices (Ogunleye, 2020). According to Charity (2021), Nigeria still has an untapped potential for sustainable development and has not yet grasped the importance of empowering women in ensuring successful outcomes. Nigerian women encounter a wide range of restrictions to their empowerment, including discrimination in the workplace, limited access to education and healthcare, and gender-based violence (Ogunleye, 2020). Amaechi (2019) contributed that despite the availability of limited opportunities, the roles played by many Nigerian women have demonstrated that granting them more opportunities will help Nigeria attain sustainable development. The disparities between men and women arise from the training, not innate abilities. If women were given the same training as men, they would excel similarly. A just and equitable society without gender discrimination is all that is needed for women to demonstrate their capacity to drive development in many fields. Since independence in 1960, several Nigerian women have risen to prominence in the political arena, advocating for women's rights and urging that decisions affecting everyone should be made by everyone, and have made progress in promoting gender balance and women's empowerment in recent times (Charity, 2021). The country has ratified several international agreements, such as the Convention on the Elimination of All Forms of Discrimination against Women (CEDAW) and the Beijing Declaration and Platform for Action.

In addition, Nigeria has developed several initiatives and policies to promote gender equality, such as the National Gender Policy and the Violence Against Persons (Prohibition) Act (Ogunleye, 2020). However, Tripathy (2018) contributed that the process of empowerment must start with a woman's mindset because most women were raised to view their primary role as pleasing men and fulfilling their desires, and male children are seen as more important than female children. Thus, women have internalized beliefs that they are weak and inferior to men. To achieve women's empowerment, these false beliefs must be replaced with the truth, and women need to be educated about their inherent value and potential. Women must be liberated from the self-imposed constraints placed by society. Nigeria has encountered a multitude of significant development obstacles, impeding the nation's ability to achieve sustainable progress. One of these major obstacles is gender inequality (Joseph, 2022). According to the World Bank (2019), women make up 50% of the population in Nigeria and account for 70% of the country's poor. Gender-based violence is another significant challenge to women's empowerment in Nigeria. Women and girls in Nigeria are at high risk of violence, including domestic violence, rape, and sexual harassment. This can have significant physical and psychological consequences for women and can limit their ability to participate in public life and access economic opportunities. These highlight the need to focus on strategies that can help women access economic opportunities and improve their livelihoods.

The Nigerian government has taken steps to reduce these issues, but progress has been slow as women remain underrepresented in leadership and decision-making tasks, and most times debarred from economic opportunities (Eni *et al.*, 2022). Despite the efforts of the government, non-governmental organizations, and international contributions to achieve women's empowerment in Nigeria, women still face significant barriers to their empowerment. For example, cultural practices such as child marriage and female genital mutilation (FGM) remain widespread in some parts of the country. Women also face limited access to credit and other financial resources, which can make it difficult for them to start businesses and support themselves and their families. Moreover, there is a paucity of data and research on women's empowerment in Nigeria, which makes it difficult to develop evidence-based policies and initiatives (Chioma, 2021). This study provides insights into the socioeconomic determinants of women's empowerment. By identifying the determinants, this study also aims to provide a basis for developing effective strategies to promote women's empowerment in Nigeria and

will be useful for policymakers and development practitioners in designing programs and policies that address these factors and promote gender equality.

Objectives of the Study

This study broadly assessed the socioeconomic determinant of women's empowerment in Nigeria. It specifically;

- described women empowerment indicators
- assessed the level of women empowerment
- examined the socio-economic factors influencing women's empowerment in Nigeria

2. Literature Review

Theoretical Review

The theories underpinning this study are Feminist Theory, Gender and Development Theory, Human Capital Theory, and Human Rights Theory.

Feminist Theory

Feminist theory emerged in 1794 by Mary Wollstonecraft. The theory proposes that, naturally, women are not inferior to other sex but seem to be inferior mainly because of their inaccessibility to education. The theory posited further that women who have the same right to education as men will surely be exceptional mothers and capable workers in many professions. It also recognizes the importance of understanding how gender intersects with other forms of inequality, such as race, class, and sexuality (Hill, 1990). It therefore suggested that women's status could be improved through radical reformation of the national education system. Feminist theory contributes to promoting women's empowerment by advocating equal access to education by men and women, promoting women's agency, and recognizing the diversity of women's experiences.

Gender and Development Theory

The Gender and Development (GAD) approach was influenced by Oakley (1972) (Rathgeber, 1990). This theory argues that gender relations influence development outcomes by systematically subordinating women, especially in developing nations such as Nigeria. According to this theory, gender inequality is the root cause of underdevelopment, and promoting gender equality, especially about access to resources is essential for sustainable development in any economy. It therefore emphasized the importance of addressing the root causes of gender inequality, such as patriarchal norms and discriminatory laws and policies. It also recognizes the need to recognize the distinctive nature of women's knowledge and responsibilities, especially in decision-making processes to promote their leadership and participation in all spheres of life. This recognition is particularly important in Nigeria, where women face multiple and intersecting forms of discrimination.

Human Capital Theory

The Human Capital Theory (HCT) was formulated by Gary Becker and Theodore Schultz in the 1960s and it posited that individuals' education and skills training are essential components of their capital; therefore, investing in the education and training of individuals, especially women, increases their productivity, which leads to economic growth. In the context of women's empowerment, HCT suggests that investing in women's education and skills increases women's human capital, which, in turn, leads to economic growth, this is significant because education and skills development can improve women's economic prospects, labor force participation, and enable essential contributions to families' and communities' well-being. Education and skills development can also lead to increased social mobility, self-confidence, and decision-making power, which are essential components of women's empowerment (Uzor, 2019).

Human Rights Theory

John Locke developed human rights theory in 1689 based on the perception that every human is by nature, entitled to a certain right. This theory is a framework for understanding the importance of protecting the rights and dignity of all individuals, including women. It stated that the promotion and protection of these rights and dignity are essential for achieving sustainable development. Human rights theory emphasizes the need to protect women's rights to life, liberty, and security, rights to education, healthcare, and economic opportunities (Merry, 2006). It also recognizes the essence of protecting women's rights to participate in decision-making

and to be free from gender-based violence and discrimination (United Nations, 1979). According to this theory, women's empowerment requires interventions that promote and protect their human rights, which could involve strengthening laws and policies that protect women's rights, promoting women's access to justice, and providing support for women who have experienced violence or discrimination (Chinkin, 2000).

Empirical Review

Laurent et al. (2022) evaluated the variables impacting the empowerment of women small-scale entrepreneurs in Dodoma City Council using the Women's Development Fund (WDF). Cross-sectional data were collected from 75 small-scale women entrepreneurs using purposive sampling techniques. The collected data were subjected to quantitative (descriptive statistics) and qualitative (content analysis) analytical techniques. This was ascribed to several factors, including a 4% decrease in the loans allocated by local government authorities (LGAs), delayed loan disbursement, inadequate training provided to beneficiary groups, and insufficient supportive supervision provided to credit beneficiaries. Reduced capacity for entrepreneurship and disregard for WDF norms also had an impact on the profitability of the company.

Njoku and Mbah (2021) examined the factors affecting female empowerment and its advantages for community development in Imo State, Nigeria. To choose 120 respondents for the study, a multistage random selection procedure was used. Statistical techniques for inferential and descriptive analysis were used to examine the data. The findings showed that, on average, 51.3 percent of the respondents strongly agreed with the statement that female empowerment had a positive impact on community development. Additionally, it was discovered that the main determinants of female empowerment in Imo State were age, income, and education and the major barriers to female empowerment included limited access to opportunities, low-quality education, and underrepresentation in politics; major strategies for empowering women included training (3.25), opportunities, mentoring, and positions of decision-making.

The factors impacting women's empowerment among a tribe of ex-criminals in West Bengal, India, were studied by Jana and Midya (2023). Cross-sectional data from 110 Lodha tribal women who had ever been married were the main source of data for the study. Qualitative content analysis along with descriptive and inferential statistics were used to analyze the data that were gathered. The findings showed that, from a variety of household viewpoints, women's participation in decision-making was far from satisfactory. Most participants did not have the opportunity to base their choices on family matters. The results also demonstrate that women's involvement in paid labor and/or self-help group activities are important mechanisms that support women's decision-making abilities in the home. Age, education, family structure, and income potential were also discovered to significantly influence the level of women's participation in the decision-making process.

Oboqua and Odenigbo (2022) explored the factors influencing rural women's engagement in community development projects in the Biase Local Government Area of Cross River State, Nigeria. A descriptive survey research design was used for the study, and 394 respondents were chosen proportionately from 11 political wards. At a 5% level of significance, the obtained data were analyzed using a t-test statistic to test the hypotheses. The study's conclusions showed that rural women's involvement in community development initiatives was highly influenced by their occupation and educational attainment.

Factors influencing women's engagement in leadership positions in Nigeria were explored by Okeke and Onyishi (2020) using multilevel modeling. The study adopted the survey-solving method of data collection. The study used both primary and secondary data of a qualitative and quantitative nature. It was found that both individual-level and organizational-level factors were significant predictors of women's participation in leadership positions in Nigeria. Specifically, education, income, and leadership experience were positively associated with women's participation in leadership at the individual level. Gender-based discrimination was negatively correlated with women's participation in leadership at the organizational level, but a positive organizational culture was positively associated with it. The multilevel model also showed that organizational culture, as opposed to individual-level characteristics, had a greater impact on women's leadership engagement. This implies that improving organizational culture is a critical first step in boosting the representation of women in leadership roles.

Yemenu (2020) investigated the variables that affect the inclusion of women in leadership positions. The study was descriptive, and the survey-solving method was used in data gathering. Primary and secondary data were used for this research. The data collected were analyzed using descriptive statistics. The study showed a low level of women's participation in city administration, which was attributed to societal, institutional (organizational), and individual factors. Women's career advancements were affected by a combination of different factors. Women's participation in leadership positions is low due to improper implementation of women's policies, unequal treatment of women when assigning leadership positions, and a lack of supportive work environments. These factors also make it difficult for women to make decisions and limit their ability to do so.

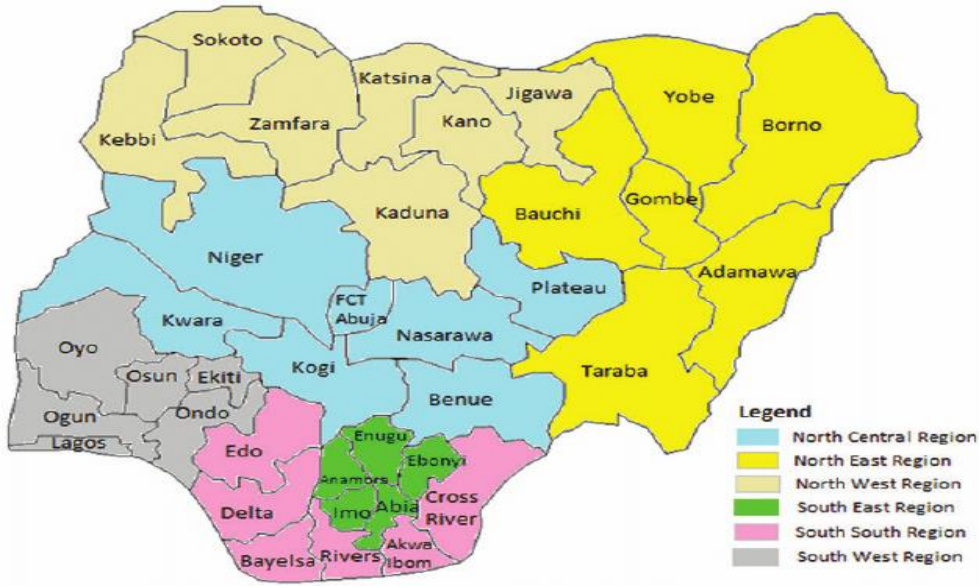
Ayetigbo (2022) examined Nigerian women's political involvement in the democratic process from 1999 and 2019. For the study, secondary data were employed. The representation of women in politics from 1999 to 2019 was examined using descriptive data, with particular attention paid to the National Assembly, which is made up of the House of Representatives and the Senate. The findings indicate that there was variability in women's political representation and participation during the 1999–2003 transition period to a new democratically elected government. In addition, from 2007 to 2015, there was a rise in the number of women participating in politics in the National Assembly. Nevertheless, in the 2019 general election, women's membership in the House of Representatives and Senate decreased significantly.

3. Research Methodology

Research Area

The study location is the Federal Republic of Nigeria. Nigeria is situated between the Greenwich meridian's 30°E and 150°E longitude and the equator's 40°N to 140°N latitude. Nigeria lies in the center of Africa, or West Africa. Its borders are the Atlantic Ocean to the south, the Benin Republic to the west, the Niger Republic to the north, the Cameroon Republic to the east, the Chad Republic to the northeast, and the West African Republic to the east. Nigeria has a total land area of about 923,768 km^2. The largest distance is roughly 1,300 km from east to west and 1,100 km from North to South. Nigeria's female population increased significantly over the previous 50 years, from 30.6 million to 110 million people, rising at an increasing annual rate that reached a maximum of 3.09% in 1980 and then reduced to 2.39% in 2023. The total live population in Nigeria is 229,561,527, of which females hold about 49.4% (113,316,719) as of July 24, 2024 (countrymeter.info. 2024). Nigeria has a long record of gender inequality and discrimination against women. Figure 1 is the map of Nigeria showing the six geopolitical zones.

Figure1: Map of Nigeria Showing the Six Geopolitical Zones



Source: National Population Commission (NPC) and International Classification of Functioning, Disability and Health (ICF), 2019

Methods of Data Collection and Analysis

The study used secondary data sourced from the Nigeria Demographic and Health Survey (NDHS) 2018. The NDHS (2018) adopted a two-stage stratified sampling technique to select 42,000 representative households. The data were cleaned up to a total of 17,677 households, with the complete required data on the socioeconomic characteristics of the respondents, women empowerment indicators, and factors influencing women empowerment. The data used were descriptively analyzed, the women empowerment index (WEI), and the Probit regression model. Descriptive statistics were used to describe the socio-demographics of the households; the women empowerment index was generated to determine the level of women empowerment in Nigeria; and the Probit model was adopted to identify and examine the factors influencing the level of women empowerment in Nigeria.

The women's empowerment index was generated using four domains, which consist of 10 indicators as utilized by Kuma and Godana (2023). The domains are; education level (primary, secondary, tertiary), type of earnings (cash or otherwise), autonomy (decision on earnings, decision on health care, decision on visits to friends and family), and ownership of assets (own land, own house). Each indicator was given a score of 1. The number of scores by each respondent was given over 10 where the minimum is 0/10 and the maximum is 10/10. The women's empowerment index was coded 0-1.0 and the values were used to distribute respondents to empowerment categories:
Where: WEI = 0; Not empowered
WEI = 0.1-0.3; Poorly empowered
WEI = 0.4-0.6; Moderately empowered
WEI = 0.7 - 0.9; Highly empowered
WEI = 1.0; Perfectly empowered

The probit model was adopted because it is the kind of model used to estimate the probability relationship between dichotomous dependent variables. For the Probit regression model, (women empowerment) equals 0 when the women empowerment index ranges between 0- 0.49, and it equals 1 when the women empowerment index is 0.5 or higher. The models can be expressed as:

$$P_i(Y_i = 1|X_i) = \Phi(\beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \beta_5 X_5 + \beta_6 X_6 + \beta_7 X_7 + \beta_8 X_8 + \beta_9 X_9 + \beta_{10} X_{10} + \in_i)$$

Where,
Y_i= Women empowerment (0= unempowered, 1 = empowered)
P_i= Probability, $P_i(Y_i = 1|X_i)$= probability that Y_i equals 1 given the explanatory variables
Φ = Function of Probit model based on normal distribution Z
β_0= Intercept, β_1= Estimation parameters
Y_i= women empowerment (0= unempowered, 1 = empowered)
X_1 = occupation (professional, clerical, sales, services, skilled, unskilled, and agriculture)
X_2= Employment status (1=employed, 0=unemployed)
X_3= Residence (1= urban, 0=rural)
X_4=Educational level (no formal education, primary, secondary, and higher education)
X_5= Geopolitical zone (Northcentral, Northeast, Northwest, Southeast, Southwest, and South-south)
X_6= Marital status (married=1, otherwise=0)
X_7= Religion (Christian religion, Islam religion, and Traditional religion)
X_8= Household size (number)
X_9= Age (years)
X_{10}= Earning more than husband (1= yes, otherwise= 0)

4. Results

Socioeconomic Characteristics of Respondents

Table 1 illustrates the socioeconomic characteristics of Nigerian women

Table 1: Socioeconomic Characteristics of the Respondents

Variables	Frequency (n=17,677)	Percentage
Age (years)		
15-24	2,554	14.45
25-34	6,979	39.48
35-44	5,884	33.29
≥45	2,260	12.78
33.42 (±8.25)		
Religion		
Christianity	8,469	47.91
Islam	9,073	51.33
Traditional	135	0.76
Wealth status		
Poorest	3,167	17.92
Poorer	3,268	18.49
Middle	3,422	19.36
Richer	3,693	20.89
Richest	4,127	23.35
Household size		
1-5	8,460	47.86
6-10	6,951	39.32
11-15	1,697	9.60
>15	569	3.22
6.53 (±3.68)		
Marital status		
Unmarried	638	3.86
Married	16,994	96.14
Geopolitical zones		
Northcentral	2,744	15.52
Northeast	2,771	15.68
Northwest	4,445	25.15
Southeast	2,454	13.88
South-south	2,216	12.54
Southwest	3,047	17.24
Educational level		
No formal education	6,442	36.44
Primary education	3,243	18.35
Secondary education	5,945	33.63
Higher education	2,047	11.58
Type of residency		
Rural	10,222	57.83
Urban	7,455	42.17
Employment status		
Unemployed	758	4.29
Employed	16,919	95.71

Source: Author's Computation from NDHS, 2018

Results showed that more than half (53.93%) of the respondents were in the 15-34years age group with a mean of 33(±8.25); this implies that most of the women are still in their active age, which may facilitate their empowerment. Over half (51.33%) of the respondents practiced Islamic religion, while very few (0.76%) of

them are traditional worshipers or traditionalists. Most (63.6%) fell within the middle of the richest group of wealth quintiles. Results showed further that the majority (96.14%) were married, and almost half (47.86%) had household sizes of 1–5. This result is by the findings of Alinsato *et al.* (2022) that more than half of the married women in farming households in Abeokuta had household sizes of 1-6. The study also showed that the highest proportion (36.44%) of the women had no formal education, 18.35% had primary education, 33.63% had secondary education, and only 11.58% had higher education. Over half (57.83%) of the women reside in rural areas, and the majority (95.71%) were employed. This implies that Nigerian women are barely unemployed even though most of them live in rural areas.

Indicators of Women's Empowerment

The indicators of women's empowerment are described in Table 2

Table 2: Indicators of Women's Empowerment

Variable	Frequency (n=17,677)	Percentage
Educational level		
No formal education	6,442	36.44
Formal education	11,235	63.56
Type of earnings (cash earnings) Yes	14,920	84.40
House ownership (own house alone) Yes	611	3.46
Who decides on health care (Respondents)? Yes	2,178	12.32
Who decides on visits (Respondents)? Yes	2,809	15.89
Who decides on household purchase decisions (Respondents)? Yes	1,245	7.04

Source: Author's Computation from NDHS, 2018

Results in Table 2 describe the women empowerment indicators and it was found that a high proportion (36.44%) of Nigerian women had no formal education, however, the majority (84.40%) earned in cash. Also, the majority could not make decisions on healthcare (87.68%) and visits to relatives (84.11%). Almost all of them did not own a house alone (96.54%) or could not make decisions on large household purchases (92.96%). Although, the majority of Nigerian women earned in cash, they do not possess most of the empowerment indicators.

Level of Women Empowerment in Nigeria

The levels of women empowerment in Nigeria are presented in Table 2.

Table 3: Level of Women Empowerment in Nigeria

Variable	Frequency (n=17,677)	Percentage
Women empowerment category		
Not empowered	245	1.39
Poorly empowered	10,388	58.77
Moderately empowered	6,466	36.58
Highly empowered	576	3.26
Perfectly empowered	2	0.01

Source: Author's Computation from NDHS, 2018

Results further show in Table 4.3 that despite women's employment (95.71% in Table 1), most (60.16%) of Nigerian women were either not empowered or poorly empowered while only 3.27% were either highly empowered or perfectly empowered. On the average, Nigerian women are poorly empowered.

Level of women empowerment by socioeconomic characteristics

The results of the chi-square analysis, which shows the relationship between the levels of women empowerment and their socioeconomic characteristics, are presented in Table 3.

Table 4: Level of Women Empowerment by Socioeconomic Variables

Socioeconomic variables	X^2	df	P-value	Decision
Wealth status	2.1e+03	16	0.000	significant
Age	142.2777	12	0.000	significant
Religion	1.8e+03	8	0.000	significant
Household size	921.7545	12	0.000	Significant
Marital status	68.5153	4	0.000	significant
Geopolitical zones	2.4e+03	20	0.000	significant
Employment status	64.2640	4	0.000	Significant
Earning more than husband	147.4224	4	0.000	Significant

Source: Data analysis, 2024

Women's socio-economic characteristics are significantly related to women's empowerment level in Nigeria at a 1% (p<0.01) level. The women's empowerment level in Nigeria was influenced by factors such as their wealth status (2.1e+03, df=16), age (142.2777, df=12), religion (1.8e+03, df=8), household size (=921.7545, df=12), marital status (=68.5153, df=4), geopolitical zones (=2.4e+03, df=20), employment status (=64.2640, df=4), and a woman earning more than their husbands (=147.4224, df=4) at p=0.01. These show that the socioeconomic characteristics of women are very important in their empowerment.

Socioeconomic Determinants of Women's Empowerment in Nigeria

Table 5 presents the probit regression results on the direction and size of the influence of socioeconomic factors on women's empowerment in Nigeria.

Table 4: Socioeconomic Determinants of Women Empowerment

Independent Variables	Coefficient	Marginal Effect	Standard Error	P-Value
Occupation (b: professional)				
Clerical	0.0288	0.026	0.118	0.807
Sales	-0.016	-0.003	0.052	0.757
Services	0.257	0.056***	0.062	0.000
Skilled	0.013	0.002	0.072	0.856
Unskilled	-0.388	-0.859	0.304	0.202
Agriculture	-0.193	-0.042***	0.059	0.001
Employment Status (b: unemployed)				
Employed	0.180	0.039***	0.066	0.006
Residence (b: rural)				
Urban	0.065	0.014**	0.026	0.015
Educational Level (b: no formal education)				
Primary education	0.783	0.173***	0.038	0.000
Secondary education	1.995	0.441***	0.039	0.000
Higher education	3.454	0.764***	0.073	0.000
Geopolitical Zone (b: north central)				
Northeast	-0.349	-0.077***	0.049	0.000
Northwest	-0.430	-0.009	0.045	0.341
Southeast	-0.585	-0.129***	0.045	0.000
South-south	-0.240	-0.053***	0.045	0.000
Southwest	-0.974	-0.021**	0.042	0.022
Marital Status (b: unmarried)				
Married	-0.141	-0.0313**	0.056	0.012

Religion (b: Christian)				
Islam	-0.348	-0.007	0.036	0.341
Traditional	-0.840	-0.186***	0.154	0.000
Household Size (years)	-0.014	-0.003***	0.003	0.000
Age	0.016	0.003***	0.001	0.000
More Earnings	0.027	0.006**	0.011	0.021
Constant	-1.916		0.122	0.000
Number of observations = 17,677				
LR $chi^2(22)$ = 9755.12				
Prob > chi^2 = 0.0000				
Log likelihood = -7008.3137				
Pseudo R^2 = 0.4104				

Source: Data Analysis, 2024.

Occupation and Women's Empowerment

Services were positively related to women empowerment at p<0.01, rendering services of different forms (being a service provider) increases the probability of women being empowered by 5.6%. However, being into agriculture as a profession was negatively related to women empowerment at 1%, implying that being a farmer hinders the probability of women being empowered by 4.2%. Therefore, women who render services have a higher probability of being empowered while those who farm have a lower probability of being empowered than women in professional lines.

Employment Status and Women's Empowerment

Employment status was positive and significant at p<0.01. Being employed was positively associated with women's empowerment by 3.9%. Meaning that employed women possessed a higher probability of being empowered than the unemployed.

Residence and Women's Empowerment

Furthermore, the sector where women reside was positively associated with women's empowerment at a 5% (p<0.05) level of significance. Therefore, women in the urban sector have a higher probability (1.4%) of being empowered than those in the rural sector.

Educational Level and Women's Empowerment

Concerning education, women's education of various levels significantly (p<0.01) contributed to women's empowerment at 1%. Attaining primary, secondary and a higher level of education increased the probability of women being empowered by 17.3%, 44.1%, and 76.4% points. This depicted that educated women, especially those who had a higher education, have a higher probability of being more empowered than those who had no formal education.

Geopolitical Zone and Women's Empowerment

The region where Nigerian women belong was significant and negatively influenced women's empowerment. Northeast, Southeast, and South-south were associated with 7.7%, 12.9%, and 5.3% reductions in the probabilities of women being empowered respectively, at p<0.01, while the Southwest geopolitical zone was associated with a 2.1% reduction in the probability of women being empowered at p<0.05. These results depict that women in the Northeast, Southeast, South-south, and Southwest of Nigeria have a lower probability of being empowered than Northcentral women. Women in all geopolitical zones of Nigeria have a lower probability of being empowered.

Marital Status and Women's Empowerment

Results indicate further that being married was negatively associated with women's empowerment by 3.1% at p<0.05; married women have lower chances of being empowered when compared with unmarried women. This could be due to the inability of married Nigerian women to make decisions autonomously (Table 2).

Religion and Women's Empowerment

It was found that religion does not encourage women's empowerment in Nigeria. Traditional religion significantly ($p<0.01$) reduced the probability of women's empowerment by 18.6%. Thus, traditional women possess a lower probability of being empowered when compared with Christian women. This may be because most traditionalists in Nigeria strongly believe in Nigeria's culture of patriarchy which makes women less privileged in some cases.

Household Size and Women's Empowerment

Household size negatively influenced the probability of women empowerment by 0.3%, at $p<0.01$. This indicates that, for every unit increase in household size, the chances of women being empowered are reduced by 0.3 percent. This could be due to an increase in the load of care of the women as the number of persons, especially dependents, in the household increases. Therefore, the probability of women's empowerment decreases as household size increases.

Age and Women's Empowerment

Women's age positively impacted women's empowerment at $p<0.01$. Age increases the probability of women's empowerment by 0.3 percent point. The more Nigerian women age, the higher their chances of being empowered. This could be due to the possibility that the woman may be able to embark on empowerment activities as she goes beyond the childbearing age and the number of dependents decreases.

Earning More Than Husband and Women's Empowerment

Results also indicate that earning more than husband was associated with a 0.6% increase in the probability of women's empowerment at $p<0.05$. Therefore, women who earn more than their husbands stand a higher chance of being empowered than those who do not. This may be attributed to the fact that the majority (84.40%) of the women earn in cash rather than in kind as described in Table 2. Also, earning more than the husband can confer a degree of autonomy in decision-making on issues concerning the household such as purchases and health care as stated in Table 2

Summary of the Findings

This study investigated the socioeconomic determinants of women's empowerment status in Nigeria. The findings indicate that most of the women are in the active stage of life, Muslims/Christians, moderately rich, have a normal household size, married, educated, employed, and reside in the rural sector in all the geopolitical zones in Nigeria, especially the Northwest. Although Nigerian women are employed, they are poorly empowered as the majority do not actively take part in household decision-making or own assets alone. The findings show further that the socioeconomic characteristics of the women highly influence their level of empowerment. Providing services (occupation), being employed, residence (urban), education (especially tertiary), age, and earning more than husband were found to be significantly related to (improves) women empowerment, while being into agriculture business, geopolitical zone, marital status (married), and household size were inversely related to (reduces) women empowerment in Nigeria.

This study is in line with previous research on women's empowerment. Jana and Midya (2023) found a dissatisfying level of women's engagement in decision-making activities at the household level. It was also found that women's age, education, and earning opportunities were correlated with the level of women's involvement in the process of decision-making. Similarly, Okeke and Onyishi (2020) found that both the individual-level and organizational-level factors, specifically, education, income, organizational culture, and leadership experience contributed to women's involvement in a leadership setting at the individual level. Also, a study by Yemenu (2020) depicted a low level of women's engagement in leadership positions which was attributed to societal, institutional, and individual factors that hinder women's decision-making abilities.

5. Contributions, Conclusion and Recommendations

The Study's Contributions

Recently, women's empowerment has been a topic of several debates across the globe as it is directly related to gender-based issues, which various agencies have been addressing so far. This study aims to contribute effectively to the ongoing conversation and add to the existing body of knowledge. The study aligns with the

United Nations Sustainable Development Goal 5, which is to adopt and strengthen sound policies and enforceable legislation to promote gender equality and empower women and girls at all levels. Also, policymakers, organizations, and advocates can utilize the findings to design targeted interventions and policies aimed at promoting women's empowerment.

Conclusion

Concerning the results of this study, it can be deduced that Nigerian women are educated, not very poor, but are poorly empowered, which is attributed to their inability to make household decisions that could elevate their level of empowerment.

Recommendations

Based on the findings of the study, the following recommendations are made:

- Awareness programs should be organized about the importance of women's involvement in decision-making both at the household level and in society.
- Government and NGOs should strive more for gender equality and empower women to reach their full potential.
- The Government should focus more on investing more resources in entrepreneurship programs for women, especially in rural areas.
- To ensure judicious resource utilization, any women's empowerment program should be monitored and followed up.

Suggestions for Further Research

Using secondary data, this study investigated socioeconomic factors influencing women's empowerment in Nigeria. Further research could explore the organizational factors that influence women's empowerment through a case study, utilizing primary data to provide greater flexibility in gathering essential information. Further research could also assess the impact of various empowerment programs on women's empowerment status.

References

Alinsato, A., Calixe A. & Nassibou, B. (2022). Women's Empowerment, Modern Energy, and Demand for Maternal Health Services in Benin. DHS Working Paper No. 185. Rockville, Maryland, USA: ICF, 1-32.

Amaechi, I. (2019). Women Empowerment in Nigeria: A Panacea for Sustainable Development. *International Journal of Academic Research in Business and Social Science* 24(2), 5-8.

Ayetigbo O.A. (2022) Women and Political Participation in Nigeria: A Case Study of Women's Participation in National Assembly from 1999-2019. *Journal of Social Sciences,* 6(1), 1-63. Available online: https://www.researchgate.net/publication/368477269

Charity, A. (2021). Women empowerment and sustainable development in Nigeria. *International Journal of Scientific and Technology Research,* 10(2), 1-9.

Chinkin, C. (2000). Gender, human rights, and the international humanitarian system. *International Affairs,* 76(1), 23-34.

Chioma, O. (2021). Women Empowerment in Nigeria: Challenges and Prospects. *Journal of Gender Studies.* 26(1), 5-16.

Eni, O.I., Nnam, M.U. & Udu, E.A. (2022). The Right to Participate in Political and Decision-Making Process under the Maputo Protocol: Normative Masculinity and Nigerian Women*. The Age of Human Rights Journal,* 18, 397–423.

Hill, C. (1990). *Black feminist thought: Knowledge,* consciousness, and the politics of empowerment. Routledge.

Jana, S. & Midya, D.K. (2023). Socio-cultural factors influencing women empowerment: A cross-sectional study among an ex-criminal tribe in West Bengal, India. *Open Peer Review on Qeios,* 1-16. https://doi.org/10.32388/SOJ30I 1/16

Johnson, K. (2018). Women's rights and the suffragette movement. *Journal of Women's History,* 30(2), 1-15.

Joseph, V. (2022). Women Empowerment and Political Participation in Nigeria: Challenges and Prospects. *Journal of African Elections.* 16(1), 24-43.

Kuma, B. & Godana, A. (2023). Factors affecting rural women's economic empowerment in Wolaita Ethiopia. *Cogent Economics and Finance,* 11, 1-18.

Laurent, R.N., Elisei, E.L. & Furaha, L. (2022). Factors influencing sustainable economic empowerment of small-scale women entrepreneurs using a local government women's development fund in Tanzania. *Local Administration Journal,* 16(2), 177 – 194.

Merry, S. E. (2006). *Human Rights and Gender Violence: Translating International Law into Local Justice*. (Chicago series in law and society). University of Chicago Press.

Moubarak, M. (2021). Empowerment in social work practice: A systematic literature review. *Journal of Social Work Education,* 57(2), 1-17.

National Population Commission (NPC) and International Classification of Functioning, Disability and Health ICF. 2019. Nigeria Demographic and Health Survey, 2018. Abuja, Nigeria, and Rockville, Maryland, USA: NOC and ICF

Njoku, J.K. & Mbah, G.O. (2021). Factors Influencing Female Empowerment and its Benefits in Community Development in Imo State, Nigeria. *Cross Current International Journal of Agriculture and Veterinary Science,* 3(4), 40-46. doi:10.36344/ccijavs.2021.v03i04.002

Oboqua, E.D. & Odenigbo, V.N. (2022). Factors Influencing Rural Women Participation in Community Development Projects in Biase Local Government Area of Cross River State, Nigeria. *Rivers State University Journal of Education (RSUJOE)*, 25(1), 201-209.

Ogunleye, O. (2020). Women empowerment and gender equality in Nigeria: Challenges and prospects. *Journal of Gender Studies,* 29(1): 1-12.

Okeke, E. N. & Onyishi, I. E. (2020). Factors influencing women participation in leadership positions in Nigeria: A multilevel modeling approach. *Journal of Gender Studies*, 29(2), 199-215.

Oakley, A. (1972). Sex, Gender and Society. London: Temple Smith.

Rathgeber, E.V. (1990). WID, WAD, GAD: Trends in Research and Practices. *The Journal of Developing Areas*, 24(4), 289-502.

Smith, L. (2021). Women's rights in ancient societies. *Journal of Ancient History,* 45(3): 1-10.

Tripathy, J. P. (2018). Women Empowerment: A Key to Sustainable Development. *Indian Journal of Public Health Research & Development,* 9(12), 166-170.

Uzor, C. C. (2019). Women empowerment in Nigeria: A review of the literature. *Journal of Gender and Social Issues*, 18(2), 1-12.

World Bank. (2019). *Poverty and shared prosperity 2018: Piecing together the poverty puzzle*. Washington, DC: World Bank Group.

Yemenu, G.B. (2020). Factors affecting women participation in a leadership position: The case study of Debre Markos City administration. *Asian of Journal Humanity, Art and Literature,* 7(1), 9-20.

Journal of Economics and Behavioral Studies (JEBS)
Vol. 16, No. 3, 2024 (ISSN 2220-6140)

Impact of Knowledge Management Process on Employee Performance: Employee Creativity as Mediator

*Faiz Mayah Alshammary, Dhakir Abbas Ali
Faculty of Business and Accountancy, Lincoln University College, Petaling Jaya 47301, Malaysia
*faiz7378@hotmail.com, drdhakir@lincoln.edu.my
Corresponding Author: Faiz Mayah Alshammary

Abstract: This study investigates the impact of the knowledge management process on employee performance. This study's objective is to examine the knowledge management processes under investigation, including knowledge sharing, knowledge utilization, and knowledge discovery, to find out the mediating role of employee creativity in the context of a healthcare center in the Hail health cluster. The study is conducted among full-time healthcare professionals (HCPs) working in the Hail Health Cluster in Saudi Arabia. 218 participants were surveyed with a well-structured questionnaire based on a previous study. The data was collected in July and August 2024 and Structural Equation Modeling (SEM) was applied to analyze the data. The findings reveal that all proposed hypotheses are supported, indicating a significant positive relationship between knowledge management processes and employee creativity. Furthermore, employee creativity was found to mediate the relationship between knowledge management processes and employee performance, demonstrating that the enhancement of creativity through knowledge sharing, utilization, and discovery positively influences performance outcomes. These results highlight the importance of fostering effective knowledge management strategies within healthcare settings to boost both creativity and performance among employees. The implications of this study suggest that healthcare organizations, particularly in the Hail Health Cluster, should prioritize knowledge management as a core strategy to drive employee performance through increased creativity.

Keywords: *Knowledge management, employee performance, employee creativity, health cluster*

1. Introduction

Knowledge management (KM) processes are essential for boosting organizational effectiveness, especially in the current time and competitive modern work environment. These processes involve the organized management of information creation, sharing, utilization, and retention. It enables organizations to fully leverage their intellectual resources (Alrashidi et al., 2024). There are different dimensions of KMP such as Knowledge accessibility, knowledge utilization, knowledge sharing, knowledge storage, etc. Each dimension has its significance (Idrees et al., 2024; Klaus-Rosińska et al., 2024; Shehzad et al., 2024). Knowledge Discovery involves identifying and extracting valuable information from various sources, which allows healthcare professionals to stay informed about best practices and innovative treatments (Huang & Yuan, 2024). Knowledge Utilization refers to applying this information in real-world scenarios, enabling employees to make informed decisions that enhance patient care. Knowledge Sharing emphasizes the collaborative exchange of insights and experiences among staff, fostering a culture of continuous learning and improvement (Sarfraz et al., 2022, 2023).

Employee creativity plays a pivotal role in this framework, as it acts as a bridge between KM processes and employee performance. Creative employees are better equipped to leverage discovered knowledge, effectively utilize it in their work, and share innovative ideas with colleagues. As such, understanding how KD, KU, and KS independently influence employee creativity and subsequently, performance is essential for optimizing the potential of the workforce within the Hail Health Cluster (Alrashidi et al., 2024).

Despite the growing recognition of knowledge management (KM) as a vital component in enhancing organizational performance, there remains a significant gap in the literature regarding the specific mechanisms through which KM processes affect employee performance in healthcare settings (Mohsin et al., 2021, Muhammad et al., 2019). There are many studies previously elaborated on the KMP, but with the knowledge of the author's research there is no study that has elaborated the KMP with KD, KU, and KS for employee creativity. Further, did not link this framework with the leader's education as moderator. Existing literature on this concept often overlooks the unique context of the healthcare sector and most importantly regions such as

the Hail health cluster. There are studies mostly focused on the general organization and neglected the complexities and challenges related to the healthcare industry with frequent changes in technology and innovation as well as expectations of patients (Naiwen et al., 2021; Naseem et al., 2020; Naseem et al., 2023). This fissure creates an opportunity for research to clarify these KM processes' interactions and influence each other, and this interaction translates into enhanced employee performance through creativity.

Addressing this gap will not only contribute to the theoretical understanding of KM in healthcare but also provide practical insights for healthcare leaders seeking to implement effective KM strategies to boost employee engagement, creativity, and overall performance (Mohsin et al., 2024). Therefore, This study aims to investigate the impact of three key KM processes, Knowledge Discovery (KD), Knowledge Utilization (KU), and Knowledge Sharing (KS) on employee performance, with employee creativity serving as a critical mediator.

By exploring these relationships, this research highlights the significance of KM processes in enhancing employee creativity, thereby contributing to improved performance outcomes in healthcare settings. The findings will provide valuable insights for healthcare leaders seeking to cultivate an environment that fosters innovation and excellence in patient care.

2. Literature Review

This section consists of the literature review of previous studies. In this section, the dependent and independent variables are explained in detail. The study has used TQM (total quality management) theory as the foundation of the theoretical background of the model. This theory plays an important role in management and administrative purposes.

Knowledge Discovery

Knowledge discovery is a process that includes mining valuable, unidentified, and large datasets. This versatile attitude is a combination of techniques from machine learning and AI to recognize outlines and tendencies (Usai et al., 2018). Knowledge discovery converts raw info into significant knowledge by analyzing data systematically or helping organizations make well-informed decisions, guess tendencies, and improve working productivity (Al-Janabi & Al-Mado, 2023). In the healthcare sector economics and marketing knowledge discovery allows the complexities of data structure, customer understanding, and tactical planning. It empowers researchers to harness the impending of their data for production and development (Grover et al., 2018).

Knowledge Utilization

Knowledge utilization is known for fostering innovation and creativity. Organizations can inspire workers to relate knowledge in innovative ways, create new ideas, or make good solutions to problems (Khan & Khan, 2019). By establishing an atmosphere that rewards knowledge utilization for innovation, sectors can inspire continuous learning improvements and pace with dynamic needs and tendencies (Abd Awang et al., 2019). Knowledge utilization promotes the learning and development of workers. By applying knowledge utilization in their work workers get practical experience, and improve their skills and expertise. Feedback loops and knowledge-sharing instruments can improve learning and growth among organizations (Hrdy, 2019).

Knowledge sharing

Knowledge sharing is the combination of information, skills, and capabilities of workers within an organization. Knowledge sharing is important in today's interconnected community, where completion is at its highest peak (Ganguly et al., 2019). Knowledge sharing can be defined in different ways, as it includes official training meetings, internship programs, and joint instruments. Organizations inspire knowledge creativity, and better decision-making and continue the learning process. When workers of any organization feel free and share their experiences they help each other not repeat mistakes and also improve overall productivity and development (Bligh et al., 2018).

Knowledge sharing not only creates a culture of trust and progress but also gives power to individuals with newly learned abilities and fosters professional growth and development (Ouakouak & Ouedraogo, 2019). Moreover, knowledge sharing is important for knowledge maintenance, it makes an adaptable team that can

rejoin to change. Knowledge sharing promotes an environment of better decision-making, innovation, and strong links within sectors and professional broader networks (Ganguly et al., 2019). Organizations create a continuous learning atmosphere by the acceptance of knowledge sharing that increases their long-term success (Al-Kurdi et al., 2018).

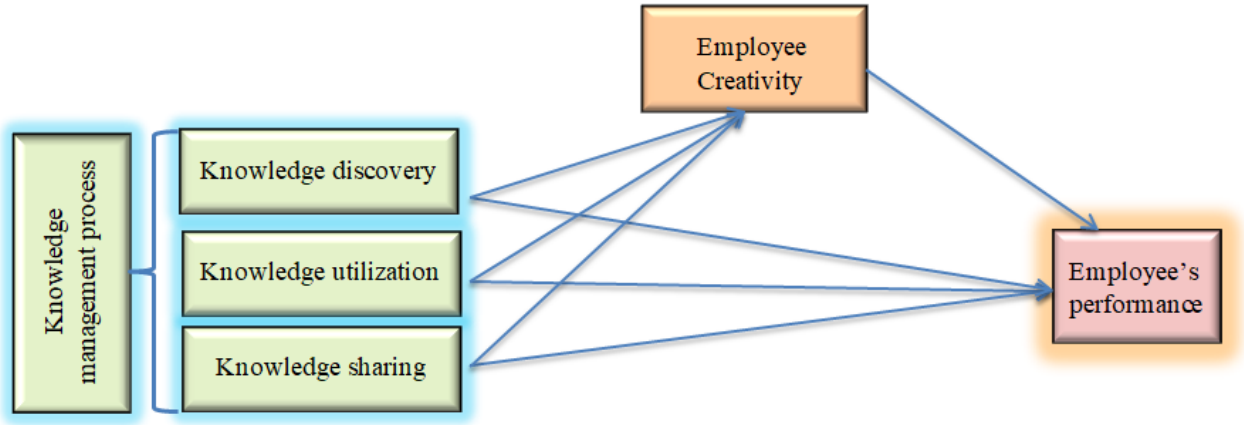
Employee creativity

Employee creativity is an important feature for organizations, when all workers are inspired to think broadly, they can make unique solutions and identify more opportunities for the betterment that go unnoticed. (Lee et al., 2018). Employee creativity within an organization fosters a more unique adaptable working environment, where all workers feel free and empowered to find new ideas. This power not only improves individual retention but also promotes a joint progressive culture where all new ideas are valuable. (Graham et al., 2022). Organizations can encourage employee creativity by giving a helpful atmosphere and giving resources like time, instruments, and feedback. Open communication that abides by practical risks is important for creativity to display (Calic et al., 2022). Leaders play an important role in the process of listening and motivating workers to pay significantly. Creativity helps organizations differentiate themselves in fluctuating markets. New ideas of all employees can lead the progress of new items or tactics to customer service, providing organizations with a diverse power (Nasifoglu Elidemir et al., 2020).

Hypothesis Development and Conceptual Framework

This section explains the hypothesis development and conceptual framework. The following figure explains that the model explores the relationship between the component of KMP and employee performance. The components of KMP are Knowledge discovery (KD), Knowledge utilization (KU), and Knowledge sharing (KS). Employee creativity is the mediator between the components of KMP and employee performance in the context of the health cluster.

Figure 1: Conceptual framework



Source: Developed by author

Knowledge discovery and employee performance

Knowledge discovery has a positive link with employee performance because it allows workers to reach relevant insights and information that improve their decision-making skills and experiences. When workers are empowered with knowledge they can solve their problems, and issues more efficiently and adapt to changes in their working atmosphere (Abubakar et al., 2019). This improves the knowledge of tasks, leading to enhanced output and value. Moreover, knowledge discovery encourages collaboration and sharing of practices among workers, it can lead to continued learning and overall improvement among team members (Ahmad & Karim, 2019). Furthermore, when workers are prepared with the right knowledge and skill learning, they are more likely to gain organizational goals or excel in their roles (Akdere & Egan, 2020).

In the context of the health sector, knowledge discovery allows the staff of the sector to make decisions, leading to managing consequences and more effective healthcare delivery (Ayatollahi & Zeraatkar, 2020). Knowledge

discovery improves the ability of workers to provide a better quality of care and helps the workers to stay with advancements and improvements in medical technology, treatment, and healthcare rules and regulations (Singh et al., 2018). Based on the above discussion following hypothesis can be developed as
H1: *Knowledge discovery has a positive and significant relation with employee performance*

Knowledge utilization and employee performance
Knowledge utilization has a positive link with employee performance. Knowledge utilization includes the practical implementation of knowledge in the working environment. When workers use the knowledge that they have gained through training, experience, or shared resources and then they are better prepared to do their tasks effectively and more perfectly (Iqbal et al., 2019). This ability can lead to enhanced the better problem-solving capabilities, quick decision-making, and can give high-quality production. On the other hand, workers who use their knowledge perfectly and utilize it effectively can adapt to innovative problem-solving decisions and contribute more expressively to organizational goals (AlMazrouei et al., 2023). Not only Culture of continuous improvement can be improved but also employees can enhance their performance by applying knowledge in real-world scenarios (Khan et al., 2019).

In the healthcare sector knowledge utilization allows the workers to implement knowledge in real-life patient care. When all the team members use their knowledge, research findings and much more then they can make better decisions and improve patient consequences (Abd Awang et al., 2019). Knowledge utilization can improve their ability to come to know the conditions, implement treatment, and follow the healthcare protocols. (Correa et al., 2020). Based on the above discussion following hypothesis can be developed as
H2: *Knowledge utilization has a positive and significant relation with employee performance*

Knowledge sharing and employee performance
Knowledge sharing has a positive relationship with employee performance because it includes the exchange of knowledge and experiences among the employees which helps them increase awareness and enhance task performance (Sa'adah & Rijanti, 2022). It is an important element of the progress process and economic production as encouraged by followers of knowledge-based views. In any sector there are new fresh employees and experienced employees and improving the collaboration and workforce between them contributes to the profitability and success of an organization (Ghani et al., 2022). Knowledge sharing enables better decision-making skills policy implementation and the generation of successful ideas. The value of individuals and organizations depends on advanced working policies that can be attained by knowledge-sharing (Sonmez Cakir & Adiguzel, 2020).

Knowledge sharing gives healthcare professionals with the entrance to a wide range of info and views. Knowledge sharing helps in making more informative decisions, healthcare workers contribute to joint decision-making, progress care coordination, and improve patient consequences. (Amir et al., 2021). Knowledge sharing gives healthcare professionals with the entrance to a high range of info and views. Knowledge sharing helps in making more informative decisions, healthcare workers contribute to joint decision-making, progress care coordination, and improve patient consequences (Nyame-Asiamah, 2020). Well-informed decisions determined by knowledge sharing positively impact employee performance. Knowledge sharing can lead to process improvement in the healthcare sector (Kim & Park, 2020).
H3: *Knowledge sharing has a positive and significant relation with employee performance*

Employee creativity as a mediator
Employee creativity works as a mediator link between knowledge discovery and employee performance. When all the workers have knowledge or are involved in knowledge discovery then they can use new information and ideas that increase their creativity (Joo et al., 2023). Knowledge sharing increases innovative thinking behavior and allows all workers to complete tasks and challenges in better progressive ways, improving creative problem-solving solutions. Employee creativity as a mediator, creativity associates the link between knowledge discovery and improved performance, since the implementation of creative and informative ideas increases more efficient processes, enhanced problem-solving (Sokół & Figurska, 2021). This relationship suggests that knowledge discovery has a positive link with employee performance and employee creativity apply the knowledge they discover, healthcare sector staff can see important improvements in progress, innovation, and overall job performance (Abdullah et al., 2021).

Knowledge utilization has a positive impact on employee performance and employee creativity is working as a mediator. Employee creativity mediates the link in these dynamics (El-Kassar et al., 2022). When workers use the knowledge they acquire in their daily tasks, it not only improves their problem-solving ability but also increases the employee's creative thinking. Workers are inspired to think outside of the specific atmosphere and find innovative problem-solving solutions to challenges which increases employee creativity (Ye et al., 2022). Knowledge creativity mediates the impact of knowledge utilization on employee performance like workers can improve approaches that enhance the processes and consequences. Moreover, employee creativity works as a connection, connecting knowledge utilization to improve knowledge performance by promoting an atmosphere where applied knowledge grows innovative decision-making, high-quality work, and results (Chen et al., 2022).

Employee creativity plays an important mediating role in the link between knowledge sharing and employee performance. When organizations promote knowledge sharing, workers are more likely to show new innovative ideas and best practices, which inspire creative thinking and innovative ideas (Imran et al., 2018). This joint working atmosphere inspires individuals to influence knowledge sharing to grow solutions or methodologies, ultimately improving their performance ability efficiently (Charband & Jafari Navimipour, 2018). As workers are involved in problem-solving and methodologies, they not only enhance their employee performance but also add to the value of their workers and organization. Therefore organizations can achieve vital improvements in employee performance by promoting employee creativity through knowledge sharing and also explaining the importance of promoting a joint knowledge-sharing atmosphere (Zeb et al., 2020).
Based on the above discussion following hypothesis can be developed
H4a: *Employee creativity has positive and significant mediation between Knowledge discovery and employee performance*
H4b: *Employee creativity has positive and significant mediation between Knowledge utilization and employee performance*
H4c: *Employee creativity has positive and significant mediation between Knowledge sharing and employee performance*

3. Methodology

This research focused on full-time healthcare professionals (HCPs) working in selected hospitals in the Hail region. For the sample, this study included medical as well as non-medical staff. The use of both medical and non-medical staff gives a well-rounded study and covers all types of staff in healthcare. The study used cross-sectional methods and data was collected with the help of a well-designed questionnaire. The questionnaire was distributed after getting permission from the department. The questionnaires were distributed to interested participants to directly increase the likelihood of participant engagement. After screening, 218 completed questionnaires were gathered and used for analysis. The high response rate provided a solid foundation for in-depth analysis, reflecting the willingness of healthcare professionals to engage in research that aims to improve healthcare practices and organizational performance.

Table 1: **Demographic characteristics of respondents**

Demographic variable	Category	Percentage (%)
Gender	Male	45%
	Female	55%
Age group	Under 25	12%
	25- 34	35%
	35-44	28%
	45-54	18%
	55-above	7%
Position	Nurses	50%
	Medical staff	30%
	Non-medical staff	20%

Years of experience	Less than year	8%
	1-5 years	27%
	6-7 years	18%
	6-10 years	22%
	More than 10	25%

In terms of gender distribution, the study shows that 55% of the participants are female, while 45% are male. This relatively balanced gender ratio, with a slight female majority, reflects the common demographic trend in healthcare, where women often make up a larger portion of the workforce, particularly in professions such as nursing.

Regarding the age groups, the majority of participants are in the 25-34 age brackets, making up 35% of the total sample. This is followed by 28% in the 35-44 age groups, indicating that most of the healthcare professionals are in the early to mid stages of their careers. Only 7% of the participants are aged 55 and above, suggesting that a smaller proportion of the workforce is nearing retirement age.

In terms of professional positions, nurses represent the largest group in the sample, accounting for 50% of the participants. Medical staff, such as physicians and specialists, make up 30%, while non-medical staff, including administrative and support roles, represent 20%. This distribution highlights the critical role nurses play in the healthcare system, which is often reflected in studies focused on healthcare professionals.

For the years of experience, the data shows that 25% of the participants have over 10 years of professional experience, demonstrating a significant level of expertise within the sample. Meanwhile, 27% have 1-5 years of experience, indicating a strong presence of early-career professionals. The remaining participants are spread across different experience levels, with 8% having less than a year, 18% with 6-7 years, and 22% with 8-10 years of experience, suggesting a well-rounded workforce with a variety of experience levels contributing to the healthcare environment.

Measurement scales of variable

In this study, three components of the KMP have been used, such as knowledge sharing, knowledge discovery and knowledge utilization. The dependent variable of this study is employee performance, whereas the mediator is employee creativity in the context of the Hail health cluster. The measurement scale for components of KMP is selected from the study by (Kun, 2022). There are 3 items of KS, 3 items of KU are used, and knowledge discovery 11 items which is a sub-process of a combination of 7 items and socialization 4 items (Sensuse et al., 2015). Further, for employee creativity, there are 4 items used from the study (Sahibzada et al., 2020).

Instruments used for data analysis

This study has used SEM-PLS to explain the data and used Smart PLS for data analysis. Therefore, this study as used followed the steps such as this study has applied measurement model and structural model.

4. Data Analysis and Findings

Measurement model

The finding of the measurement scale is used based on the value of the outer loading of all variables used in the research. The result of the current analysis shows the indicators have range from 0.71 to 0.84. The table of factor loading indicates that all the indicators have more than 0.5 value of outer loading which explains that the entire variable is significant (Karimah et al., 2024).

Table 2: Factor loading

Variable	Code	Factor loading
Knowledge sharing (KS)	KS1	0.78
	KS2	0.81
	KS3	0.84
Knowledge utilization (KU)	KU1	0.84

	KU2	0.79
	KU3	0.82
Knowledge Discovery (KD)	KD1	0.75
	KD2	0.72
	KD3	0.81
	KD4	0.73
	KD5	0.77
	KD6	0.80
	KD7	0.74
Employee's performance (EP)	EP1	0.79
	EP2	0.81
	EP4	0.75
	EP5	0.77
	EP6	0.80
	EP8	0.78
	EP9	0.82
	EP10	0.76
Employee creativity (EC)	EC1	0.83
	EC2	0.86
	EC3	0.79
	EC4	0.82

Table 3: Composite reliability (CR), Cronbach's Alpha (CA) and Average variance extracted (AVE)

Variable	CR	CA	AVE
KD	0.84	0.89	0.66
KS	0.86	0.88	0.64
KU	0.83	0.90	0.62
EC	0.88	0.91	0.67
EP	0.85	0.82	0.63

Note: Knowledge Sharing (KS), Knowledge Utilization (KU), Knowledge Discovery (KD), Employee Performance (EP), Employee Creativity (EC), Cronbach's Alpha (CA), Composite Reliability (CR), Average Variance Extracted (AVE)

The results of the reliability and validity analysis show that all constructs of Knowledge Sharing (KS), Knowledge Utilization (KU), Knowledge Discovery (KD), Employee Performance (EP), and Employee Creativity (EC) have high internal consistency, as indicated by their Cronbach's Alpha (CA) values, all of which are above 0.80. These values indicate the strong reliability of each variable. The CR values constructs are also higher than the threshold level which explains the consistency.

Table 4: Discriminant validity (Fornell and Lacker Criterion)

Construct	KS	KU	KD	EP	EC
KS	0.81				
KU	0.53	0.80			
KD	0.49	0.55	0.79		
EP	0.46	0.50	0.47	0.82	
EC	0.41	0.44	0.43	0.55	0.84

Table 4 explains the discriminant validity of the constructs with Fornell-Lacker criteria. The values represent that the square root value is greater than the correlation value. These values confirmed that there is strong discriminant validity (Chaudhuri et al., 2024, Hussain, Kampoowale, et al., 2022; Hussain, Yousufi, et al., 2022).

Table 5: Saturated results

Variable	R^2 value	Q^2 value	SRMR
EP	0.65	0.41	0.057
EC	0.50	0.32	

The table mentioned above explains that Employee Creativity has an R^2 value of 0.50, indicating that 50% of its variance is explained by the knowledge-related independent variables. The Q^2 values for both EP (0.41) and EC (0.32) confirm the model's predictive relevance, as both values are above zero, signifying that the model reliably predicts these outcomes. The SRMR value of 0.057 is well below the threshold of 0.08, indicating a good model fit to the observed data. These values collectively confirm that the model explains a substantial portion of the variance in both EP and EC, has predictive strength and accurately represents the relationships among the variables.

Structural model

The structural (or inner) model reveals a causal relationship between exogenous and endogenous constructs, as suggested by Hair et al. (2016). This model was evaluated based on its explanatory power (R^2), predictive relevance (Q^2), and path coefficient (β-values). This assessment of the model also explains the results of hypothesis development.

Table 6: Results of Hypothesis testing

Hypothesis	Path	Beta value	t-value	p-value	Decision
H1	KD->EP	0.28	4.15	0.000	Supported
H2	KU->EP	0.35	3.85	0.001	Supported
H3	KS->EP	0.20	3.65	0.009	Supported
H4a	KD->EC->EP	0.19	3.25	0.000	Supported
H4b	KU->EC->EP	0.24	3.09	0.007	Supported
H4c	KS->EC->EP	0.67	4.10	0.010	Supported

Note: Knowledge Sharing (KS), Knowledge Utilization (KU), Knowledge Discovery (KD), Employee Performance (EP), and Employee Creativity (EC),

The hypothesis testing results confirm the significant positive effects of knowledge processes on Employee Performance (EP) and highlight the mediating role of Employee Creativity (EC). Knowledge Discovery (KD) positively influences EP (β = 0.28, t = 4.15, p = 0.000), as does Knowledge Utilization (KU) (β = 0.35, t = 3.85, p = 0.001) and Knowledge Sharing (KS) (β = 0.20, t = 3.65, p = 0.009), supporting the direct hypotheses (H1, H2, and H3). Additionally, EC effectively mediates the relationship between knowledge processes and performance. Specifically, the mediating effect of EC is significant for KD (β = 0.19, t = 3.25, p = 0.000), KU (β = 0.24, t = 3.09, p = 0.007), and KS (β = 0.67, t = 4.10, p = 0.010), supporting hypotheses H4a, H4b, and H4c. This indicates that while knowledge processes directly enhance employee performance, creativity plays a critical role in amplifying these effects.

Discussion

This study aims to investigate the impact of knowledge management process with its dimension on the employee performance in the context of Hail health cluster. Further, this study also found the relationship between employee creativity as a mediator to make a strong conceptual framework. After the analysis this study has extracted the following results:-

This study has accepted the H1 which explains that Knowledge discovery positively impacts employee performance by providing insights that enhance decision-making and problem-solving skills. When employees are empowered with knowledge, they can adapt to changes in their work environment, leading to improved task efficiency and output (Abubakar et al., 2019).

The results also suggested that H2 is also accepted. This hypothesis elaborates that KU has a positive and significant relationship with employee performance. The worker with the best utilization of the resource has more capability to solve the problem and a high capacity for the best decision-making, which leads to the best quality performance. Further, the results also elaborate that the hypothesis related to KS and employee

performance is accepted. Knowledge sharing plays an important role in the provision of mutual sharing of ideas and experience which increases the know-how about the task (Nyame-Asiamah, 2020). This activity of KS promotes collaboration among the new employees and organizational success. Especially, in healthcare where timely decision-making is crucial, knowledge sharing helps to make the appropriate decision at the appropriate time (Chen et al., 2022).

Furthermore, the analysis of this study explains that employee creativity is important as a mediator between KMP and employee performance. The creativity application of the KU, KS and KD leads to the improved ability of problem-solving and management of tasks within in remaining in the resources (AlMazrouei et al., 2023). Further, in the Healthcare sector employee creativity in medical and non-medical fields enhances performance and active patient satisfaction (Sonmez Cakir & Adiguzel, 2020).. The results of these hypotheses are a line with previous studies to make these results more accurate.

5. Implications and Limitations of the Study

Practical Implications

This study has practical implications not for one sector but the other. Mainly this study provides the main practical pathway to the Hail health cluster regarding this framework. The results of this study emphasize the strategic importance of KS, KD and KU within healthcare. The environment in which the activity of knowledge sharing and collaboration is performed is the employee performance used to enhance employee creative work. Further, this performance improvement is a direct result of effective knowledge management and creativity. The framework suggests that by prioritizing knowledge sharing, utilization, and discovery, the Hail Health Cluster can achieve higher productivity, more innovative approaches to care, and overall improved healthcare delivery. This not only boosts employee performance but also aligns with the strategic goals of enhancing patient outcomes and healthcare services.

Theoretical Implications

This study is very important from a theoretical perspective. This study has used three components of the KMP which have great importance in enhancing the performance of employees working in any sector. This study has used KS, KU and KD as components of the KMP. Further, this study also used employee creativity as the mediator. Employee creativity is an important aspect of any organization as well as the production sector to make it long-term sustainable. This study along with TQM theory explains the importance of employee creativity in the healthcare cluster in Hail Saudi Arabia.

Limitations of Study

This study has several limitations that should be noted. First, the sample is restricted to healthcare professionals (HCPs) within the Hail Health Cluster in Saudi Arabia, which limits the generalizability of the findings to other sectors or regions. The specific context of healthcare may not fully represent the dynamics in other industries, and results could vary in different organizational cultures or geographic areas. Additionally, The cross-sectional nature of the data also limits the ability to establish causality between variables. A longitudinal approach would provide more robust insights into the temporal effects of knowledge management on creativity and performance.

Another limitation is the study's focus on only three knowledge management processes, knowledge sharing, utilization, and discover without considering other relevant processes like knowledge retention or organizational learning. There could be additional factors influencing employee creativity and performance that were not included. Moreover, the study does not account for contextual factors, such as leadership style or organizational support, which may also play a significant role in the relationships examined. Addressing these limitations in future research could offer a more comprehensive understanding of the impact of knowledge management on employee creativity and performance across diverse settings.

References

Abd Awang, H., Mohd Sapie, N., Yusof Hussain, M., Ishak, S., & Md Yusof, R. (2019). Nurturing innovative employees: Effects of organizational learning and work environment. *Economic research-Ekonomska istraživanja*, *32*(1), 1152-1168.

Abdullah, M. I., Huang, D., Sarfraz, M., Ivascu, L., & Riaz, A. (2021). Effects of internal service quality on nurses' job satisfaction, commitment and performance: Mediating role of employee well-being. *Nursing Open*, *8*(2), 607-619.

Abubakar, A. M., Elrehail, H., Alatailat, M. A., & Elçi, A. (2019). Knowledge management, decision-making style and organizational performance. *Journal of Innovation & Knowledge*, *4*(2), 104-114.

Ahmad, F., & Karim, M. (2019). Impacts of knowledge sharing: a review and directions for future research. *Journal of Workplace Learning*, *31*(3), 207-230.

Akdere, M., & Egan, T. (2020). Transformational leadership and human resource development: Linking employee learning, job satisfaction, and organizational performance. *Human Resource Development Quarterly*, *31*(4), 393-421.

Al-Janabi, A. S. H., & Al-Mado, A. A. G. (2023). Knowledge Management in Integration with Business Intelligence Systems: A Descriptive Analytical Research1. *International Journal of Research in Social Sciences and Humanities*, *13*(01), 18-33.

Al-Kurdi, O., El-Haddadeh, R., & Eldabi, T. (2018). Knowledge sharing in higher education institutions: a systematic review. *Journal of Enterprise Information Management*, *31*(2), 226-246.

AlMazrouei, H., Zacca, R., & Mustafa, G. (2023). Mediating-moderating effect of employee creativity and team potency on expatriate innovative work behavior. *International Journal of Organizational Analysis*, *31*(5), 1669-1693.

Alrashidi, S., Alenezi, W., Alrimali, A., & Alshammari, M. (2024). Exploring the leadership styles of nurse managers in Hail, Saudi Arabia: A cross-sectional analysis. *Journal of Hospital Administration*, *13*(1).

Amir, N., McCarthy, H. J., & Tong, A. (2021). A working partnership: a review of shared decision-making in nephrology. *Nephrology*, *26*(11), 851-857.

Ayatollahi, H., & Zeraatkar, K. (2020). Factors influencing the success of knowledge management process in health care organizations: a literature review. *Health Information & Libraries Journal*, *37*(2), 98-117.

Bligh, M. C., Kohles, J. C., & Yan, Q. (2018). Leading and learning to change: the role of leadership style and mindset in error learning and organizational change. *Journal of Change Management*, *18*(2), 116-141.

Calic, G., Mosakowski, E., Bontis, N., & Helie, S. (2022). Is maximizing creativity good? The importance of elaboration and internal confidence in producing creative ideas. *Knowledge Management Research & Practice*, *20*(5), 776-791.

Charband, Y., & Jafari Navimipour, N. (2018). Knowledge sharing mechanisms in the education: A systematic review of the state of the art literature and recommendations for future research. *Kybernetes*, *47*(7), 1456-1490.

Chaudhuri, R., Chatterjee, S., & Vrontis, D. (2024). Adoption of blockchain technology in hospitality and tourism industry and sustainability performance: impact of technological turbulence and senior leadership support. *EuroMed Journal of Business*, *19*(1), 62-83.

Chen, M., Zada, M., Khan, J., & Saba, N. U. (2022). How does servant leadership influence creativity? Enhancing employee creativity via creative process engagement and knowledge sharing. *Frontiers in Psychology*, *13*, 947092.

Correa, V. C., Lugo-Agudelo, L. H., Aguirre-Acevedo, D. C., Contreras, J. A. P., Borrero, A. M. P., Patiño-Lugo, D. F., & Valencia, D. A. C. (2020). Individual, health system, and contextual barriers and facilitators for the implementation of clinical practice guidelines: a systematic metareview. *Health research policy and systems*, *18*, 1-11.

El-Kassar, A.-N., Dagher, G. K., Lythreatis, S., & Azakir, M. (2022). Antecedents and consequences of knowledge hiding: The roles of HR practices, organizational support for creativity, creativity, innovative work behavior, and task performance. *Journal of Business Research*, *140*, 1-10.

Ganguly, A., Talukdar, A., & Chatterjee, D. (2019). Evaluating the role of social capital, tacit knowledge sharing, knowledge quality and reciprocity in determining the innovation capability of an organization. *Journal of Knowledge Management*, *23*(6), 1105-1135.

Ghani, B., Zada, M., Memon, K. R., Ullah, R., Khattak, A., Han, H., Ariza-Montes, A., & Araya-Castillo, L. (2022). Challenges and strategies for employee retention in the hospitality industry: A review. *Sustainability*, *14*(5), 2885.

Graham, J. R., Grennan, J., Harvey, C. R., & Rajgopal, S. (2022). Corporate culture: Evidence from the field. *Journal of financial economics*, *146*(2), 552-593.

Grover, V., Chiang, R. H., Liang, T.-P., & Zhang, D. (2018). Creating strategic business value from big data analytics: A research framework. *Journal of Management Information Systems*, *35*(2), 388-423.

Hair Jr., J. F., Hult, G. T. M., Ringle, C., & Sarstedt, M. (2016). A Primer on Partial Least Squares Structural Equation Modeling (PLS-SEM). Thousand Oaks, CA: Sage Publications.

Hayat., R., S. Hussain S., Iqbal S.,. (2024). Impact of Socio-Economic Factors on Women's Entrepreneurial Intention: The Moderating Role of Skill Development. *International Journal of Contemporary Social Science*, *3*(3).

Hardy, C. A. (2019). The General Knowledge, Skill, and Experience Paradox. *BCL Rev.*, *60*, 2409.

Huang, Z., & Yuan, L. (2024). Enhancing learning and exploratory search with concept semantics in online healthcare knowledge management systems: An interactive knowledge visualization approach. *Expert Systems with Applications*, *237*, 121558.

Hussain, S., Kampoowale, I., Sadia, H., & Hall, S. (2022). Linking organizational climate with Psychological capital: Organizational Innovative culture as moderator. *J. Hum. Univ. Nat. Sci*, *4*, 18-30.

Hussain, S., Yousufi, M., & Iftikhar, H. (2022). China-Pakistan Economic Corridor: Geopolitical Dynamic in the US and South Asian Print Media. *Dialogue (Pakistan)*, *17*(4).

Idrees, H., Xu, J., & Haider, S. A. (2024). Impact of knowledge management infrastructure and processes on automobile manufacturing firm innovative performance through the mediating role of agile project management practice. *Journal of Knowledge Management*.

Imran, M. K., Ilyas, M., Aslam, U., & Fatima, T. (2018). Knowledge processes and firm performance: the mediating effect of employee creativity. *Journal of Organizational Change Management*, *31*(3), 512-531.

Iqbal, A., Latif, F., Marimon, F., Sahibzada, U. F., & Hussain, S. (2019). From knowledge management to organizational performance: Modelling the mediating role of innovation and intellectual capital in higher education. *Journal of Enterprise Information Management*, *32*(1), 36-59.

Joo, B.-K., Yim, J.-H., Jin, Y. S., & Han, S. J. (2023). Empowering leadership and employee creativity: the mediating roles of work engagement and knowledge sharing. *European journal of training and development*, *47*(9), 881-899.

Karimah, R. N., Kusnanto, H., Lazuardi, L., Pertiwi, A. A., Istiono, W., Lusiantoro, L., & Idris, H. (2024). Information quality measurement model of diabetes management in primary healthcare: Confirmatory factor analysis. *International Journal of Healthcare Management*, 1-7.

Khan, N. A., & Khan, A. N. (2019). What followers are saying about transformational leaders fostering employee innovation via organizational learning, knowledge sharing and social media use in public organizations? *Government Information Quarterly*, *36*(4), 101391.

Khan, S. A., Kaviani, M. A., J. Galli, B., & Ishtiaq, P. (2019). Application of continuous improvement techniques to improve organization performance: A case study. *International Journal of Lean Six Sigma*, *10*(2), 542-565.

Kim, E.-J., & Park, S. (2020). Transformational leadership, knowledge sharing, organizational climate and learning: an empirical study. *Leadership & Organization Development Journal*, *41*(6), 761-775.

Klaus-Rosińska, A., Walecka-Jankowska, K., & Zgrzywa-Ziemak, A. (2024). The significance of knowledge management processes for business sustainability: the role of sustainability-oriented projects. *Humanities and Social Sciences*, *31*(1), 65-75.

Kun, M. (2022). Linkages between Knowledge Management Process and Corporate Sustainable Performance of Chinese SMEs: Mediating role of Frugal Innovation. *Frontiers in Psychology*, 1172.

Lee, Y., Mazzei, A., & Kim, J.-N. (2018). Looking for motivational routes for employee-generated innovation: Employees' scouting behavior. *Journal of Business Research*, *91*, 286-294.

Mohsin, M., Shamsudin, M. N., Jaffri, N. R., Idrees, M., & Jamil, K. (2024). Unveiling the contextual effects of total quality management to enhance sustainable performance. *The TQM Journal*.

Mohsin, M., Zhu, Q., Wang, X., Naseem, S., & Nazam, M. (2021). The empirical investigation between ethical leadership and knowledge-hiding behavior in the financial service sector: a moderated-mediated model. *Frontiers in Psychology*, *12*, 798631.

Muhammad, M., Muhammad, A. S., Li, N.-W., & Muhammad, M. K. (2019). Investigation of various factors affecting the coefficient of friction of yarn by using the Taguchi method. *Industria Textila*, *70*(3), 211-215.

Muhammad, N., Robinson, D., & Nisar, M. (2019). The influence of Muslim marriages on entrepreneurial intentions of women entrepreneurs: Evidence from Pakistan. *International Journal of Entrepreneurial Behavior & Research*, *25*(7), 1389-1409.

Naiwen, L., Wenju, Z., Mohsin, M., Rehman, M. Z. U., Naseem, S., & Afzal, A. (2021). The role of financial literacy and risk tolerance: an analysis of gender differences in the textile sector of Pakistan. *Industria Textila*, *72*(3), 300-308.

Naseem, S., Fu, G. L., Mohsin, M., Aunjam, M. S., Rafiq, M. Z., Jamil, K., & Salamat, S. (2020). Development of an inexpensive functional textile product by applying accounting cost-benefit analysis. *Industria Textila*, *71*(1), 17-22.

Naseem, S., Hu, X., Shi, J., Mohsin, M., & Jamil, K. (2023). Exploring the optical impact of information communication technology and economic growth on CO2 emission in BRICS countries. *Optik*, *273*, 170339.

Nasifoglu Elidemir, S., Ozturen, A., & Bayighomog, S. W. (2020). Innovative behaviors, employee creativity, and sustainable competitive advantage: A moderated mediation. *Sustainability*, *12*(8), 3295.

Nyame-Asiamah, F. (2020). Improving the 'manager-clinician ' collaboration for effective healthcare ICT and telemedicine adoption processes–a cohered emergent perspective. *Information technology for development*, *26*(3), 525-550.

Ouakouak, M. L., & Ouedraogo, N. (2019). Fostering knowledge sharing and knowledge utilization: The impact of organizational commitment and trust. *Business Process Management Journal*, *25*(4), 757-779.

Sa'adah, N., & Rijanti, T. (2022). The role of knowledge sharing, leader-member exchange (LMX) on organizational citizenship behavior and employee performance: an empirical study on public health center of pati 1, pati 2 and trangkil in central java. *International Journal of Social and Management Studies*, *3*(1), 112-131.

Sahibzada, U. F., Latif, K. F., Xu, Y., & Khalid, R. (2020). Catalyzing knowledge management processes towards knowledge worker satisfaction: fuzzy-set qualitative comparative analysis. *Journal of Knowledge Management*, *24*(10), 2373-2400.

Sarfraz, M., Naseem, S., & Mohsin, M. (2022). Adoption of renewable energy, natural resources with conversion information communication technologies and environmental mitigation: Evidence from G-7 countries. *Energy Reports*, *8*, 11101-11111.

Sarfraz, M., Naseem, S., & Mohsin, M. (2023). Assessing the nexus of gross national expenditure, energy consumption, and information & communications technology toward the sustainable environment: Evidence from advanced economies. *Sustainable Development*, *31*(4), 2826-2835.

Sensuse, D. I., Cahyaningsih, E., & Wibowo, W. C. (2015). Identifying knowledge management process of Indonesian government human capital management using analytical hierarchy process and Pearson correlation analysis. *Procedia Computer Science*, *72*, 233-243.

Shehzad, M. U., Zhang, J., Dost, M., Ahmad, M. S., & Alam, S. (2024). Knowledge management enablers and knowledge management processes: a direct and configurational approach to stimulate green innovation. *European Journal of Innovation Management*, *27*(1), 123-152.

Singh, J. B., Chandwani, R., & Kumar, M. (2018). Factors affecting Web 2.0 adoption: exploring the knowledge sharing and knowledge seeking aspects in health care professionals. *Journal of Knowledge Management*, *22*(1), 21-43.

Sokół, A., & Figurska, I. (2021). The importance of creative knowledge workers in a creative organization. *Energies*, *14*(20), 6751.

Sonmez Cakir, F., & Adiguzel, Z. (2020). Analysis of leader effectiveness in organization and knowledge sharing behavior on employees and organization. *Sage Open*, *10*(1), 2158244020914634.

Usai, A., Pironti, M., Mital, M., & Aouina Mejri, C. (2018). Knowledge discovery out of text data: a systematic review via text mining. *Journal of knowledge management*, *22*(7), 1471-1488.

Ye, P., Liu, L., & Tan, J. (2022). Creative leadership, innovation climate and innovation behavior: the moderating role of knowledge sharing in management. *European Journal of Innovation Management*, *25*(4), 1092-1114.

Zeb, A., Abdullah, N. H., Hussain, A., & Safi, A. (2020). Authentic leadership, knowledge sharing, and employees' creativity. *Management Research Review*, *43*(6), 669-690.

Journal of Economics and Behavioral Studies (JEBS)
Vol. 16, No. 3, 2024 (ISSN 2220-6140)

The Role of Behavioral Factors in Climate Change Donations

*Everett Jin[1], Ariya Shah[2], and Hanyang Xia[3]
[1]St. Mark's School of Texas, USA
[2]Dougherty Valley High School, USA
[3]Shenzhen College of International Education, China
*orimasterlin@gmail.com, ariyajshah@gmail.com, hanyang.xia.sz@gmail.com
Corresponding Author: Everett Jin

Abstract: Environmental non-profit organizations play a crucial role in fighting climate change. Most of them rely on donations from small donors whose donation decisions tend to be affected by personal factors. We examine the effects of behavioral factors on donations to climate change charities through a survey conducted among a group of participants with relatively homogenous demographic characteristics such as family wealth and educational background. We find that a potential donor's donation amount is strongly affected by his or her perception of the effectiveness of environmental charities in fighting climate change. Among participants who pay more attention when filling out the survey, the persuasion tactic featuring factual information related to climate change appears to be most effective. Lastly, participants who feel good about having given to climate change charities are associated with larger donations, highlighting the effect of the psychological benefits of giving. Our study contributes to the behavioral economics literature by focusing on donors' perspectives when examining the drivers behind charitable giving to climate change mitigation charities. Our findings suggest that climate charities should account for the effects of behavioral factors that best influence potential donors to improve fundraising success.

Keywords: *Behavioral Factors, Donations, Climate Change, Climate Charity, Methods of Persuasion*

1. Introduction

Climate change, driven by human industrial activities, poses an existential threat to life on Earth and calls for immediate mitigation measures. However, many of the efforts and measures for fighting climate change come with a hefty price tag and require financing from various sources. According to the International Energy Agency, only 30 percent of necessary finance directed towards climate change comes from the public sector, with the remaining 70 percent having to come from the private sector.[1] This reality highlights the urgent need for successful climate change-related fundraising through non-governmental organizations.

In contrast to typical charitable causes examined in prior studies on philanthropy, such as medical research, poverty reduction, or disaster relief, climate change is a relatively controversial issue that is often associated with highly polarized views among individuals across the political spectrum. As a result, institutional funding for climate change research and advocacy is somewhat limited. It is, therefore, important to have a good understanding of the various behavioral factors that tend to have a greater influence on small donors, if climate change charities aim to cultivate loyal donors and maximize donations.

In this study, we examine the effects of behavioral factors on climate change-related charitable contributions by analyzing the results from a climate change mitigation donation survey. Specifically, our survey is designed to gauge the effects of donor perceptions, persuasion modes, and the psychological benefits of giving. We focus on these factors because donors to climate charities are often small donors who have diverse views about both climate change and climate change mitigation efforts. They are thus more susceptible to the influences of personal factors.

Our climate change mitigation donation survey was conducted via Qualtrics among 100 students and staff members who were participating in a summer research program at the University of California, Santa Barbara

[1] See https://foreignpolicy.com/2024/06/03/climate-finance-small-island-states-taxes-adaptation/#:~:text=According %20to%20the%20International%20Energy,coming%20from%20the%20private%20sector and https://www.iea.org/reports/reducing-the-cost-of-capital.

in 2024. Participants were told that ten of them would be randomly selected to receive award money and would donate some or all of it, according to their donation decisions as indicated on their survey, to a charity dedicated to fighting climate change, *Clean Air Task Force* (CATF), one of the most prominent climate change charities in the U.S. in 2003 and 2004.[2]

During the survey, participants were first asked a question eliciting their view on the effectiveness of charitable giving on climate change mitigation. Participants are instructed to answer the question using a five-point Likert scale, ranging from 'Strongly Disagree' to 'Strongly Agree.' Next, to examine the effect of persuasion on charitable donations, 71 participants were randomly selected to be shown an article related to climate change appealing to logos, pathos, or ethos, while the rest of them were not shown any articles. Among the 71 participants shown a persuasion article, 24 of them were shown an article appealing to the ethos that primarily focused on major endorsements and statements from well-known, science-related organizations like NASA. 21 participants were shown an article appealing to logos that primarily featured statistics on the threat of climate change and the accomplishments of the charity. Finally, 26 participants were shown a pathos article that used strong words like 'tragedy' and 'heartbreaking' to appeal to the audience's emotions. The three articles followed the same three-paragraph format and were carefully designed to control for the effect of length and structure. To ensure that participants read the articles carefully, we made the articles a reasonable length and imposed a 20-second delay on the 'next' button leading to the next step. In addition, we had a bolded message at the top of the article reminding participants to read the article carefully.

All participants were then asked how much award money they would like to donate to a climate change charity and were told that ten randomly selected participants' donation decisions would be implemented. After participants completed their surveys, they were asked a set of five post-donation questions, which included questions concerning their feelings about their donations and demographic information of survey respondents.

To understand the effects of behavioral factors on donations to climate change charities, we perform three sets of analyses. First, we examine the effect of participants' prior attitudes towards charitable donations to environmental causes. Specifically, we regress individual participants' donation amounts on their ratings of the effectiveness of climate charities in combatting climate change. To control for participants' demographic information, we include a dummy variable indicating the participant's gender (Veldhuizen et. al, 2009). Since a significant portion of the survey participants are from California, a "blue" state that has been a strong advocate for environmentally friendly policies and regulations, we also control for a dummy variable indicating whether the participant is from California or not.

Our analyses indicate that participants' pre-existing views on the efficacy of climate change mitigation efforts by charitable organizations strongly influence their donation decisions. Specifically, participants tended to donate more money if they believed that donating to climate charities was an effective way to combat climate change. This finding corroborates previous findings on the efficacy of donations in helping solve the underlying issues. Thus, to maximize the donations received, charities combating climate change must maintain a positive image; the best way they can do this, as suggested in our findings, is by using donor donations effectively.

Second, we find that although persuasion is an effective way to increase donations, consistent with Wu et al., (2022) and Lindauer et al., (2020), persuasion matters only if participants are adequately stimulated by reading the articles carefully. This result is likely driven by the fact that the majority of our survey respondents are high school students who tend to have short attention spans. Among the three modes of persuasion, the logos article (appealing to logic, with statistics) is the most effective one. This finding deviates from Masnovi (2013) who shows that pathos was reported as the most effective persuasion mode by 79% of the respondents while logos was reported as most effective by only 19% of participants. The significant effect of logos is consistent with the fact that our survey respondents are from a select group of high-achieving high school students who tend to be more sensitive to numbers and statistics. Overall, our findings concerning the effectiveness of persuasion on

[2] According to Vox, *Clean Air Task Force* is considered as the No. 1 high-impact, cost-effective, and evidence-based organization dedicated to fighting climate change. See https://www.vox.com/future-perfect/2019/12/2/20976180/climate-change-best-charities-effective-philanthropy.

people's willingness to donate suggest that catering to potential donors' demographic characteristics could significantly increase charitable contributions.

Lastly, our analyses provide suggestive evidence that participants who feel good about having given to climate change charities turn out to be those who choose to donate more money, highlighting the effect of psychological benefits of donation. Moreover, regardless of their donation amount, participants who were shown the pathos article felt significantly better about their donations. This finding is intuitive, as the pathos article painted a particularly depressing picture of the future of climate change, most likely eliciting feelings of compassion and empathy from the participants and thus making them feel better and more rewarded about their donations. The significant role of psychological benefits suggests that charities should customize fundraising materials for their mood effects. In addition, they could potentially increase donation amounts by eliciting rewarding feelings among potential donors through means such as a heartwarming message or a physical reward.

One limitation of our study is that the majority of our survey participants are financially stable pre-college students. They have also met the admission standards for the summer program organized by UC Santa Barbara and are likely well-educated about the issue of climate change. On the other hand, since our survey was conducted among this relatively homogenous group of people with similar family backgrounds, our research design effectively controls for the effect of wealth on donation—one of the leading factors that determines charitable contributions. This allows us to conduct statistical analyses focusing on the influences of behavioral factors. In addition, since most of the participants were likely well informed about the issue of climate change underlying the persuasion articles before reading them, we can focus on the effects of persuasion modes associated with the articles, as opposed to those of their actual contents.

Although prior studies (see, e.g., Parsons, 2007 and Trussell & Parsons, 2007) have studied the effects of the perceived efficacy of charitable activities on donation amount, to the extent that climate change has been a controversial issue, climate change charities represent a more powerful setting where individual donors' perceptions become essential. Furthermore, while perception could be influenced by factors such as income, educational background, and financial wellness, our survey is conducted among a group of respondents with relatively homogenous demographic characteristics. Our findings are therefore less susceptible to the effects of confounding factors. Our analyses on persuasion modes are closely related to Masnovi (2013) who researches the relative effectiveness of logos, ethos, and pathos when applied to donations to a children's cancer organization. However, the findings of Masnovi (2013) are more subject to alternative explanations as their experiment did not control for the topic, length, or message of the logos, ethos, and pathos stimulants. In addition, the survey only sampled 44 people and did not provide any incentives for respondents to give honest answers.

In summary, using climate change-related donation decisions as the laboratory, we find that donations are strongly influenced by behavioral factors including potential donors' perception of the effectiveness of charities in promoting the underlying cause, specific persuasion methods employed when soliciting donations, and the psychological benefits of donating. Since climate change charities often must target small donors who are more susceptible to the influences of behavioral factors, our study provides insights into the effects of various behavioral factors and has distinct implications for environmental organizations aiming to combat climate change with resources funded by charitable contributions. Particularly, these organizations can improve the effectiveness of donation appeals by strategically targeting different donor groups with different mixes of rational and emotional persuasion tactics according to their educational backgrounds and knowledge of the underlying charitable cause. In addition, charitable organizations should strive to maintain a positive public image and demonstrate the real effects of their work to promote donor perception about climate change charity.

Section 2 provides a review of related literature. Section 3 discusses our survey design and empirical methodology. Section 4 discusses our analyses of the effects of perceived efficacy, persuasion methods, and psychological benefits. Lastly, Section 5 provides concluding remarks.

2. Literature Review

The psychology behind charitable donations has been extensively studied (Bekkers and Wiepking, 2011; Zagefka & James, 2015; Dietz, Shwom, & Whitley, 2020; Kovolskyi et al., 2020). Specifically, behavioral factors such as the perceived efficacy of a donation, solicitation methods, and the psychological benefits of donating are often identified as among the most important forces driving charitable giving in philanthropic studies, economics, and psychology, respectively. First, prior research indicates that when people believe that their contribution to charity will not be used effectively to make a difference to the cause that they are supporting, they are less likely to give to the charity. For example, several studies have tested the effects of providing donors with information about the effectiveness of their contributions and the organizational efficiency of the receiving charity and found positive effects on philanthropy (Warren & Walker, 1991; Parsons, 2007; and Trussell & Parsons, 2007). In addition, there is evidence that perceived efficacy influences an individual's donation behavior more than factors such as scope and awareness of the underlying issues (Snipes & Oswald, 2010).

Research in charities has also studied solicitation/persuasion methods. Specifically, prior studies have developed a framework to analyze Aristotle's three modes of persuasion: ethos, logos, and pathos (Alkhirbash, 2016). Ethos refers to an appeal to the credibility and character of the speaker. Logos refers to an appeal to the reason and logic contained within the message itself. Pathos refers to an appeal to the emotions of the audience. By evoking emotions like pity or anger, the audience adopts a different 'state of mind' that encourages them to agree with the speaker. While all three modes positively affect charity donations, several studies report that individuals believe that they respond best to pathos (Masnovi, 2013; Auger, 2014; Wu et al., 2022). Specifically, both negative and positive emotions are highly effective in encouraging charitable contributions (see, e.g., Goenka and Osselaer, 2019; Moran and Bagchi, 2019; Septianto and Tjiptono, 2019; Paxton et al., 2020; Yousef et al, 2022). On the other hand, Lindauer et al., (2020) find that well-designed philosophical arguments, a form of logos, are as effective as emotional appeals in boosting charitable donations.

Compared to the perceived efficacy of charitable contributions and persuasion methods, a more direct psychological factor influencing donation is the "joy of giving." Many studies find that charitable donations not only produce social benefits but also generate psychological benefits for donors by producing a positive mood, satisfying their desire to conform to certain social norms, or alleviating guilt about morally unjust behavior. Evidence from neuropsychological studies suggests that charitable contributions "elicit neural activity in areas linked to reward processing" (Harbaugh, Mayr, & Burghart, 2007). Consistent with this neuropsychological evidence, Kim and Childs (2021) show that consumers reveal greater donation intentions toward other-benefit appeals than self-benefit appeals in the context of clothing donations.

Although prior studies have considered behavioral factors as one of the forces driving charitable giving, we believe it is important to revisit some of the existing findings in the context of climate change donations. First, given that climate change has been a rather controversial issue, prior attitudes towards climate change and the perceived efficacy of climate charities stand of particular importance in this context. Furthermore, unlike causes related to poverty or disaster relief, which many potential donors might have never been exposed to, climate change has impacted everyone's life in a relatively direct fashion, whether it be the more frequent tropical storms or the rising temperatures. What this means is that potential donors of climate change charities might not be sensitive to previous persuasion methods that appeal to compassion or altruism, as their personal experience might have already shaped their views on climate change.

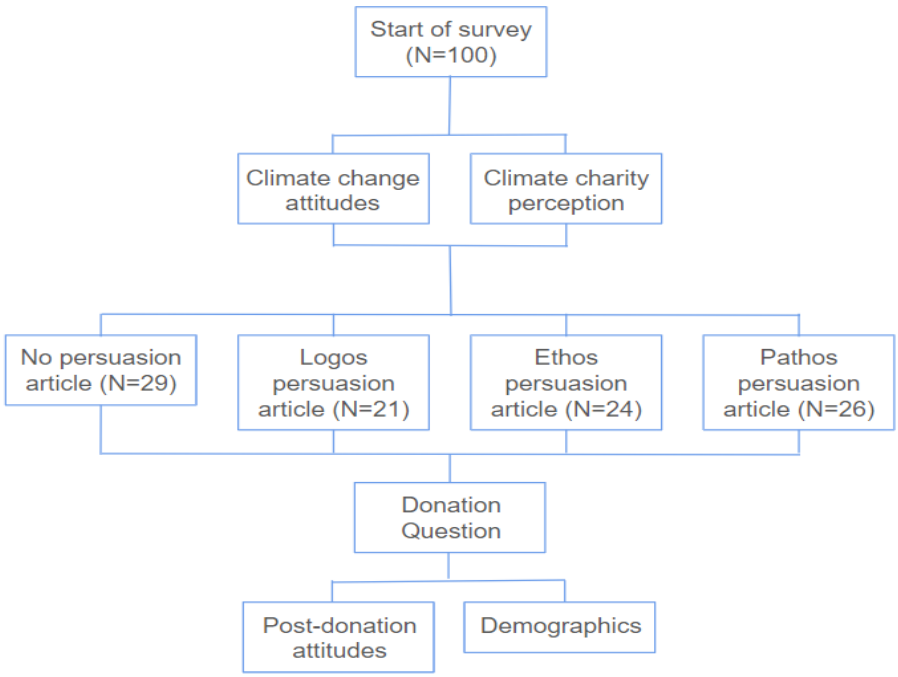
3. Experimental Design

The main objective of our experiment is to gauge how various behavioral factors, including perception towards climate charity, persuasion method, and the psychological benefit of giving, influence the amount people donate to climate change charities. This experiment was conducted by surveying one hundred participants in a summer research program organized by the University of California at Santa Barbara during the summer of 2024. Out of the 100 survey participants, 98 are students in the summer programs and two are on-campus staff.

Given the budget constraint, participants of the survey were informed beforehand that 10 of them would be randomly selected to win $20 out of the total award money of $200. That is, a lottery system was employed to ensure that each participant had a 10% chance to win $20. During the survey, participants were asked how they would split the $20 between themselves and the *Clean Air Task Force*, a charity dedicated to fighting climate change. Afterward, the donation decisions of 10 lottery-winning participants as specified in their survey responses were carried out in real life (i.e. the money respondents chose to donate was donated to the charity, and the rest was left for them to spend). This research design provides a real monetary incentive and motivates truthful responses to survey questions.

Figure 1: Flow chart of the survey

Participants were first asked a set of four questions eliciting their attitudes towards climate change. A portion of the participants were then presented with persuasion articles featuring logos, ethos, and pathos persuasion modes, respectively. All participants, whether presented with persuasion articles or not, were then asked to decide how much money they were willing to donate to a charity, Clean Air Task Force. Following their donation decisions, participants were asked how much they felt about their donations along with demographic information.



As shown in Figure 1, our survey is divided into three sections: (i) questions concerning existing attitudes towards donations to climate charities and perceptions about the efficacy of climate charities; (ii) persuasion articles presented to seventy-one randomly selected participants, aiming to elicit donations through logos, pathos, and ethos; and (iii) post-donation questions about respondents' feelings on their donations and demographic characteristics. The survey was made on Qualtrics and shared through its generated link and QR code. The survey was distributed to the one hundred participants through mass email.

First, to gauge participants' attitudes towards climate change mitigation efforts, they were asked three questions that assess whether they support combating climate change and whether they have donated to climate charities in the past.[3] Answers to these questions were collected to ensure that whether a participant

[3] Specifically, participants were asked the following questions: I support policies and regulations that can reduce carbon emissions, even if it results in higher taxation from me; I make an effort to buy products that are environmentally friendly or sustainably produced; I actively participate in activities that aim to protect the environment; I have donated to environmental or climate-related causes in the past.

was presented with a persuasion article was not a function of their prior attitudes toward climate change mitigation.

Second, participants were asked whether they agreed with a statement concerning their perceptions of the efficacy of climate charity: "I think that donating to environmental causes is an effective way to combat climate change," using a five-point Likert scale, ranging from 'Strongly Disagree' to 'Strongly Agree.' Third, the one hundred participants were divided into four groups as depicted in Figure 1: one group of 29 participants was not shown any climate change-related articles and three groups were each presented with one of the three types of persuasion articles aiming to persuade participants via logos, ethos, and pathos, respectively. When assigning participants to different groups, we control their attitude toward fighting climate change so that we can focus on the effect of persuasion. For participants presented with persuasion articles, each article appeared on the screen for at least 20 seconds before the participants were provided the option to move to the next step to ensure that they had read the article carefully.

Since all donations went to *Clean Air Task Force*, a charity dedicated to fighting climate change, the three articles were written using factual information concerning climate change from the official websites of *Clean Air Task Force* and NASA. They were intended to persuade readers that (1) climate change is a serious problem, (2) the *Clean Air Task Force* is effective in fighting climate change, and (3) the donation of the reader will be valuable to the *Clean Air Task Force* in fighting climate change. The three articles are similar in terms of content and length, with the only difference being the rhetorical techniques, i.e., logos, pathos, and ethos, respectively, utilized to present the information.

Fourth, whether presented with persuasion articles or not, all survey participants were then asked to split the twenty-dollar reward they might receive from participating in this study between themselves and the charity, *Clean Air Task Force*. After submitting the donation amount, all participants were asked a post-donation question on how good they felt about themselves for the amount they donated. In addition, they were asked to provide answers to demographic questions including their residence location and gender.

Table 1 provides summary statistics for the survey. As shown in Table 1, there exists significant dispersion in respondents' donation amounts. The median donation amount is $10 while the interquartile range is $12.50. Interestingly, only a small portion of the survey respondents, ex-ante, believe that donating to a climate charity would be an effective way to combat climate change. 72% of survey respondents are female while 68% come from California.

Table 1: Summary Statistics

This table presents summary statistics of key variables. Donation Amount is the respondents' indicated donation amount in $. Perception is a discrete variable indicating a participant's perception of a charity's effectiveness. It follows a 5-point Likert scale, ranging from -2 to 2. *Persuasion* is equal to 1 if a respondent is shown a persuasion article and 0 otherwise. *Logos* is equal to 1 if a respondent is shown a persuasion article appealing to logos, and 0 otherwise. *Ethos* is equal to 1 if a respondent is shown a persuasion article appealing to ethos, and 0 otherwise. *Pathos* is equal to 1 if a respondent is shown a persuasion article appealing to pathos, and 0 otherwise. *FeelGood* is a discrete variable indicating how good a participant feels about their donation. It follows a 10-point Likert scale, ranging from 1 to 10. *Gender* is equal to 1 for female respondents, and 0 otherwise. *CA Residents* is equal to 1 for respondents who are residents of California, and 0 otherwise.

	Mean	Stdev	P25	Median	P75
Donation Amount	11.71	6.17	7.50	10.00	20.00
Perception	0.36	0.92	0.00	0.00	1.00
Persuasion	0.71	0.46	0.00	1.00	1.00
Logos	0.21	0.41	0.00	0.00	0.00
Ethos	0.24	0.43	0.00	0.00	0.00
Pathos	0.26	0.44	0.00	0.00	1.00

FeelGood	6.72	2.21	5.00	7.00	8.00
Gender	0.72	0.49	0.00	1.00	1.00
CA Residents	0.68	0.47	0.00	1.00	1.00

4. Empirical Findings

The effects of perception on climate charity

According to Bekkers and Wiepking (2011), perceived efficacy refers to the perception of donors that their contribution makes a difference. Positive perceptions reflect donors' confidence in charitable organizations' abilities to advocate the underlying cause and are expected to increase the likelihood of charitable contributions. We therefore examine survey responses to the question "I think that donating to environmental causes is an effective way to combat climate change" as it is most relevant to respondents' perception of the efficacy of climate charities.

Specifically, we run a regression of the dollar amount of a donation on the discreet variable, *Perception*, corresponding to survey responses to the question concerning their belief about the effectiveness of climate charitable activities in combating climate change. For ease of interpretation, we rescale participants' survey responses to -2 to 2 with 2 (-2) corresponding to 'Strongly Agree' ('Strongly Disagree'). To control for the effects of gender and residency on donation amount, we include two dummy variables, *Gender* and *CA Residents*, in the regression. *Gender* is equal to one if a respondent is a female, and 0 if otherwise. *CA Residents* is equal to one if a respondent is from California, and 0 if otherwise.

Table 2: The Effect of Perception of Climate Charity

This table regresses the dollar amount of donations on variables capturing respondents' perceptions about the efficacy of climate charity. *Perception* is a discrete variable corresponding to survey responses to the question concerning the respondent's belief about the effectiveness of climate charitable activities in combating climate change. It follows a 5-point Likert scale ranging from -2 to 2 with 2 (-2) corresponding to 'Strongly Agree' ('Strongly Disagree'). *Perception +* takes the value of 1 if the survey response is "Agree" or "Strongly Agree," and 0 otherwise. *Persuasion* is equal to 1 if a respondent is shown a persuasion article and 0 otherwise. *Gender* is equal to 1 for female respondents, and 0 otherwise. *CA Residents* is equal to 1 for respondents who are residents of California, and 0 otherwise. The number of observations and R-Square are reported at the bottom of the table. ***, ** and * indicate significance at 1%, 5%, and 10% levels, respectively.

	(1)	(2)	(3)	(4)
Perception	1.2074*		1.2224*	
	(1.77)		(1.78)	
Perception +		3.4432***		3.4535***
		(2.86)		(2.86)
Persuasion			0.7470	0.7093
			(0.54)	(0.53)
Gender	0.4463	0.6865	0.5128	0.7526
	(0.35)	(0.56)	(0.40)	(0.61)
CA Residents	-0.1702	-0.3811	-0.2643	-0.4729
	(-0.13)	(-0.30)	(-0.20)	(-0.36)
Intercept	11.0650***	9.8515***	10.5450***	9.3580***
	(7.88)	(6.73)	(6.18)	(5.37)
N	100	100	100	100
R-square	0.0052	0.0536	-0.0022	0.0464

Column 1 of Table 2 shows the result of this analysis. Consistent with our expectation, more positive perceptions about the effectiveness of climate charity in fighting climate change are associated with larger donations. Specifically, a one-notch increase in respondents' perception of climate charities in general leads to an increase of $1.20 in donation amount, which is economically significant considering the median donation amount of $10. In column 2, we replace perceived efficacy measured in a five-point Likert scale with a dummy variable indicating positive perceptions (i.e., "Agree" or "Strongly Agree"), *Perception +*. The result indicates an even stronger effect of perception in terms of both economic and statistical significance. In columns 3 and 4 of Table 2, we further control for the effect of being presented with a persuasion article. The coefficients of *Perception* and *Perception +* remain qualitative and quantitatively the same. This result validates our approach of randomizing the treatment of persuasion articles so that whether a participant is shown with a persuasion article or not is not correlated with their prior attitude towards climate charities.

The effect of persuasion methods

Since our survey participants have relatively homogeneous backgrounds in terms of age, education, and family wealth, we are endowed with a sample of participants that is suitable for studying the effects of behavioral factors such as persuasion methods. Dellavigna & Gentzkow (2010) define persuasion in economics as a message provided by one person intended to change the behavior of another, without using monetary incentives or outright coercion, i.e., manipulation. We therefore examine whether persuasion can influence donations to climate charities. If so, we further examine whether certain particular modes of persuasion are more effective than others, in the context of donations related to combating climate change.

Ex-ante, it is unclear whether prior findings on the effect of persuasion modes necessarily apply to climate change-related donations. One unique aspect of climate change is that it has always been a highly controversial issue. While some people are convinced by scientific evidence on the long-term effect of climate change, others brand the issue as a hoax that aims to promote certain industries. Therefore, persuasion tactics appealing to the emotions of the audience that are highly effective for soliciting donations related to medical research or animal welfare may not work well for climate charities. On the other hand, the effects of climate change are often more tangible to most people as many have more or less experienced extreme weather conditions or have heard related stories from friends or relatives. It is possible that persuasion backed with certain concrete facts would help the audience see the connection between their personal experience and climate change. We thus also try to contrast the effects of different persuasion methods on donations to climate charities.

Specifically, we present survey participants with articles that are designed to capture Aristotle's three modes of persuasion: ethos, pathos, and logos, respectively. Ethos refers to an appeal to the credibility and character of the speaker, who can use good morals and goodwill to persuade the audience to confidently accept his ideas as true. Pathos refers to an appeal to the emotions of the audience. By evoking emotions like pity or anger, the audience adopts a different 'state of mind' that encourages them to agree with the speaker. Logos refers to an appeal to the reason and logic contained within the message itself. By using concrete and rigorous reasoning, one can formulate a logical 'proof' of their argument, which therefore should convince the audience of the validity of the speaker's position. Alkhirbash (2016) describes these three modes of persuasion as indispensable to formulating a strong argument.

In Table 3, we analyze the effects of persuasion on donation amount. Similar to Table 2, we again control for the effects of gender differences and residency. *Persuasion* is a dummy variable indicating participants presented with any one of the three articles. The result indicates that although the coefficient of *Persuasion* is positive, it is not statistically significant. Prior studies find that the effect of appeals for donation improves with the attention of potential audiences. For example, Bennett and Kottasz (2000) survey study finds that donations in response to relief appeals aired on TV positively related to the amount of time potential donors spend watching TV. Given that most survey respondents are high school students with relatively short attention spans, it is important to account for the effect of attention. We therefore further zoom in on the subgroup of survey respondents who appeared to spend more time filling out the survey. In column 2, we interact *Persuasion* with a dummy variable, *Attention*, which indicates high attention level as proxied by above-median survey time (median time is 212 seconds). As expected, the effect of the interaction term is significantly positive at a 5% significance level. More interesting, it's highly economically significant as well. Specifically, relative to those respondents who were not presented with any persuasion article or spent little time on the survey, those

who read a persuasion article and spent a longer time going through the survey, on average, tended to donate by $6 more.

Table 3: The Effect of Persuasion

This table regresses the dollar amount of donations on the dummy variable indicating viewing of a persuasion article and its interaction term with a dummy variable indicating high attention. *Persuasion* is equal to 1 if a respondent is shown a persuasion article and 0 otherwise. *Attention* is equal to 1 if a respondent's survey time is above the sample median, and 0 otherwise. *Gender* is equal to 1 for female respondents, and 0 otherwise. *CA Residents* is equal to 1 for respondents who are residents of California, and 0 otherwise. The number of observations and R-Square are reported at the bottom of the table. ***, ** and * indicate significance at 1%, 5%, and 10% levels, respectively.

	(1)	(2)
Persuasion	0.6472	-1.8903
	(0.46)	(-1.04)
Persuasion*Attention		6.1276**
		(2.04)
Attention		-3.6510
		(-1.41)
Gender	0.7695	0.1956
	(0.60)	(0.15)
CA Residents	-0.4596	-0.4125
	(-0.34)	(-0.31)
Intercept	11.0040***	12.4390***
	(6.45)	(6.79)
N	100	100
R-square	-0.0249	0.0020

In Table 4, we separately examine the effect of each persuasion mode by splitting the *Persuasion* dummy into dummy variables indicating ethos, logos, and pathos persuasion tactics, respectively. Consistent with the result in column 1 of Table 2, neither of the three persuasion methods has a significant effect on donation amount across all respondents who were shown a persuasion article. In column 2 of the table, we separately interact *Ethos*, *Logos,* and *Pathos* with *Attention*. Compared to the results in column 2 of Table 3, the interaction term between *Logos* and *Attention* is most pronounced in terms of statistical and economic significance. This finding is in stark contrast to those of prior studies comparing the three modes of persuasion in other contexts (see, e.g. Wu et al., 2022 and Masnovi, 2013). Although many of these studies have provided supporting evidence for the general effect of persuasion on donation, they often point out pathos as the most effective persuasion method. As discussed (Passyn & Sujan, 2006), pathos evokes empathy and compassion, creating an intention to act. Emotions such as guilt, regret, and challenge trigger a sense of personal accountability, transforming intention into action. Besides differences in the underlying charitable causes, one potentially important reason behind our different findings is likely to be differences in respondent demographics. Since our survey respondents are mostly well-performing high school students meeting the admission criteria of the highly competitive UC Santa Barbara summer research program, they are likely to be more sensitive to factual, statistical information that helps them understand the severity of climate changes and their detrimental long-term effects. On the other hand, information appealing to their emotions could be less effective as they are likely to be already well aware of the issue of climate change. This new insight from our study suggests that the effectiveness of different persuasion methods is likely to depend on the characteristics of the audience.

Table 4: The Effects of Different Persuasion Modes

This table examines the effect of different persuasion modes on donation amounts. *Logos* is equal to 1 if a respondent is shown a persuasion article appealing to logos, and 0 otherwise. *Ethos* is equal to 1 if a respondent is shown a persuasion article appealing to ethos, and 0 otherwise. *Pathos* is equal to 1 if a respondent is shown a persuasion article appealing to pathos, and 0 otherwise. *Attention* is equal to 1 if a respondent's survey time is above the sample median, and 0 otherwise. *Gender* is equal to 1 for female respondents, and 0 otherwise. *CA Residents* is equal to 1 for respondents who are residents of California, and 0 otherwise. The number of observations and R-Square are reported at the bottom of the table. ***, ** and * indicate significance at 1%, 5%, and 10% levels, respectively.

	(1)	(2)
Logos*Attention		8.1046**
		(2.03)
Ethos*Attention		5.5525
		(1.53)
Pathos*Attention		4.6417
		(1.26)
Logos	1.3167	-2.9692
	(0.72)	(-1.01)
Ethos	-0.8748	-2.8859
	(-0.51)	(-1.28)
Pathos	1.5683	-0.0758
	(0.92)	(-0.03)
Attention		-3.6394
		(-1.40)
Gender	0.8156	0.3754
	(0.64)	(0.28)
CA Residents	-0.5814	-0.4164
	(-0.43)	(-0.30)
Intercept	11.0390***	12.2950***
	(6.48)	(6.62)
N	100	100
R-square	-0.0225	-0.0138

The effects and determinants of positive feelings

In the last part of the paper, we take advantage of our post-donation survey to study the effects and determinants of positive feelings towards one's climate change donation. We first examine whether there exists any association between donation amount and positive feelings about one's donation as revealed from the post-donation survey question, "On a scale of 0-10, how good do you feel about yourself for the amount you chose to donate?"

Prior studies find that a good mood in general may motivate giving. For example, Wunderink (2000) shows that donors self-report "feeling good" as a motive for donating to charities. Strahilevitz and Myers (1998) find that people are more likely to choose a charity donation over a discount when buying pleasurable things (e.g., ice cream) rather than purely functional (e.g., a refrigerator). We hypothesize that those participants who feel good about their donation ex-post tend to have a positive self-assessment of their action and are likely to have donated more. We, therefore, regress the dollar donation amount on the discrete variable *FeelGood*, which

captures respondents' answers to the post-donation question on a scale of 0-10. We again control for the effects of gender and residency of the respondents.

As expected, the result presented in column 1 of Table 5 shows that those respondents who feel good about their donations tend to be the ones who have donated larger amounts. This finding remains robust after we further control for the effects of respondents' perceptions on the efficacy of climate charity and the treatment of persuasion articles. On the other hand, we caution that the result in Table 5 does not necessarily indicate a causal effect of *FeelGood* on donation. It is possible that donations simply produce positive psychological experiences for the donors as giving may make them feel that they are behaving according to certain social norms and are socially agreeable.

Table 5: The Effect of Feeling Good on Dollar Amount

This table regresses the dollar amount of donations on the extent to which respondents feel good about their donation amount. *FeelGood* is a discrete variable indicating how good a participant feels about their donation. It follows a 10-point Likert scale, ranging from 1 to 10. *Perception* is a discrete variable corresponding to survey responses to the question concerning the respondent's belief about the effectiveness of climate charitable activities in combating climate change. It follows a 5-point Likert scale ranging from -2 to 2 with 2 (-2) corresponding to 'Strongly Agree' ('Strongly Disagree'). *Persuasion* is equal to 1 if a respondent is shown a persuasion article and 0 otherwise. *Gender* is equal to 1 for female respondents, and 0 otherwise. *CA Residents* is equal to 1 for respondents who are residents of California, and 0 otherwise. The number of observations and R-Square are reported at the bottom of the table. ***, ** and * indicate significance at 1%, 5%, and 10% levels, respectively.

	(1)	**(2)**	**(3)**
FeelGood	1.3143***	1.3124***	1.3077***
	(5.00)	(5.07)	(5.02)
Perception		1.1958*	1.2021*
		(1.97)	(1.96)
Persuasion			0.3152
			(0.26)
Gender	1.9696*	1.7076	1.7312
	(1.70)	(1.48)	(1.49)
CA Residents	0.4675	0.6700	0.6273
	(0.39)	(0.56)	(0.52)
Intercept	1.1370	0.7704	0.5875
	(0.47)	(0.75)	(0.81)
N	100	100	100
R-square	0.1850	0.2090	0.2010

Lastly, we examine whether the three persuasion articles indeed serve the purpose of persuasion by making respondents feel good about their donation decisions, regardless of the specific donation amounts. We regress *FeelGood* on *Persuasion*, along with *Gender* and *CA Residents* in column 1 of Table 6. In column 2, we adopt a similar specification but replace *Persuasion* with *Ethos*, *Logos,* and *Pathos*. Interestingly, among all three types of persuasion articles, only the pathos article significantly affects whether respondents feel good about their donation decisions. As discussed in (Passyn and Sujan, 2006), pathos refers to an appeal to the emotions of the audience. By evoking emotions like pity or anger, the audience adopts a different 'state of mind' that encourages them to agree with the speaker and act accordingly. It is thus intuitive to find that our survey respondents feel good about their donations after viewing the pathos article. Table 6 also indicates that female respondents tend to feel good about their donations.

Table 6: Factors Affecting Respondents' Satisfaction with Their Donation
This table examines factors that determine how much respondents feel good about their donations. *FeelGood* is a discrete variable indicating how good a participant feels about their donation. It follows a 10-point Likert scale, ranging from 1 to 10. *Logos* is equal to 1 if a respondent is shown a persuasion article appealing to logos, and 0 otherwise. *Ethos* is equal to 1 if a respondent is shown a persuasion article appealing to ethos, and 0 otherwise. *Pathos* is equal to 1 if a respondent is shown a persuasion article appealing to pathos, and 0 otherwise. *Gender* is equal to 1 for female respondents, and 0 otherwise. *CA Residents* is equal to 1 for respondents who are residents of California, and 0 otherwise. The number of observations and R-Square are reported at the bottom of the table. ***, ** and * indicate significance at 1%, 5%, and 10% levels, respectively.

	(1)	(2)
Persuasion	0.3289	
	(0.68)	
Logos		0.1239
		(0.20)
Ethos		-0.3396
		(-0.58)
Pathos		1.1118*
		(1.93)
Gender	-0.9284**	-0.9225**
	(-2.10)	(-2.13)
CA Residents	-0.6842	-0.6802
	(-1.46)	(-1.48)
Intercept	7.6202***	7.6132***
	(12.93)	(13.18)
N	100	100
R-square	0.0428	0.0826

Our finding on the relation between *FeelGood* and donations suggests that climate charities could invoke measures that make people feel good about donations to elicit larger donation amounts. For example, small measures aiming to improve the mood of the audience such as upbeat music, public praising, encouraging statements, or personal phone calls from staff members could potentially lead to larger donations.

5. Conclusion

In this study, we examine the effects of behavioral factors on donations to climate charities. Unlike causes such as medical research or natural disaster relief, climate change mitigation relies heavily on charitable contributions due to the lack of long-term institutional funding sources. Since charitable contributions are purely voluntary, they tend to heavily depend on personal factors such as experience, wealth, belief, and psychological impacts. In particular, given that climate change is a relatively controversial issue, behavioral factors are likely to play an important role.

By surveying a group of participants with relatively homogeneous demographic characteristics, we examine how participants' perceptions about the effectiveness of climate charity, different persuasion modes, and the psychological benefit of giving affect their donations to climate charities. Our analyses discover that respondents' positive perceptions of climate change mitigation efforts significantly affect their donation amount. In addition, unlike prior studies that find pathos (i.e., appealing to one's emotions) to be the most effective persuasion mode, we find that among our group of survey respondents with relatively homogeneous demographic characteristics, logos that features factual information related to climate change turns out to be

the most effective persuasion mode when respondents pay more attention to the stimulants. Lastly, we find that respondents who feel good about their donations tend to be associated with larger donation amounts.

Although prior studies have examined various driving forces behind people's donations to charities and compared the effectiveness of different persuasion modes, our study highlights the role of behavior factors given that climate change is a relatively controversial issue and donations towards climate change mitigation thus depend critically on small donors whose donations are more affected by personal factors. Our study thus not only contributes to the behavioral economics literature but also adds to the burgeoning stream of literature examining factors influencing donor behaviors. Our findings on donor perception, persuasion tactics, and the psychological benefits of giving have important implications for climate change mitigation efforts that rely crucially on charitable contributions. By revealing the factors that best influence potential climate charity donors, we better inform the strategic design of effective fundraising messages utilized by climate charities.

References

Alkhirbash, A. (2016). A Proposed Framework for Analyzing Aristotle's Three Modes of Persuasion. *International Journal of English and Education*, 5(5), 111-117. https://ijee.org/assets/docs/10.28103809.pdf

Auger, G. A. (2014). Rhetorical framing: examining the message structure of nonprofit organizations on Twitter. *International Journal of Nonprofit and Voluntary Sector Marketing*, 19(4), 239–249. https://doi.org/10.1002/nvsm.1499

Bennett, R., & Kottasz, R. (2000). Emergency fund-raising for disaster relief. *Disaster Prevention and Management, 9,* 352-359.

Bekkers, R. and Wiepking, P. (2011) A literature review of empirical studies of philanthropy: Eight mechanisms that drive charitable giving. *Nonprofit and Voluntary Sector Quarterly*, 40(5), 924-973. https://doi.org/10.1177/0899764010380927

DellaVigna, S., & Gentzkow, M. (2010). Persuasion: Empirical Evidence. *Annual Review of Economics*, 2(1), 643–669. https://doi.org/10.1146/annurev.economics.102308.124309

Dietz, T., Shwom, R. L., & Whitley, C. T. (2020). Climate change and society. *Annual Review of Sociology*, 46(1), 135–158. https://doi.org/10.1146/annurev-soc-121919-054614

Goenka, S., & van Osselaer, S. M. J. (2019). Charities Can Increase the Effectiveness of Donation Appeals by Using a Morally Congruent Positive Emotion. *Journal of Consumer Research*, *46*(4), 774–790. https://doi.org/10.1093/jcr/ucz012

Harbaugh, W. T., Mayr, U., & Burghart, D. R. (2007). Neural responses to taxation and voluntary giving reveal motives for charitable donations. *Science, 316,* 1622-1624. https://doi.org/10.1126/science.1140738

Kim, S., & Childs, M. L. (2021). Passion for the past: Effect of charity appeals and nostalgia on clothing donation intentions. *Journal of Consumer Behaviour*, *20*(5). https://doi.org/10.1002/cb.1924

Kovolskyi, B., Holubnyk, T; Dubnevych, M., Pysanchyn, N., Selmenska, Z. (2020). Optimization of the Process of Determining the Effectiveness of Advertising Communication,
Data-Centric Business and Applications, Volume 42

Lindauer, M., Mayorga, M., Greene, J., Slovic, P., Västfjäll, D., & Singer, P. (2020). Comparing the effect of rational and emotional appeals on donation behavior. *Judgment and Decision Making*, *15*(3), 413–420. https://doi.org/10.1017/S1930297500007208

Masnovi, J. (2013). Persuasive Strategies and Hats Off for Cancer Donations. *Pepperdine Journal of Communication Research*, 1(1), 1-16. https://digitalcommons.pepperdine.edu/pjcr/vol1/iss1/3/

Moran, N., & Bagchi, R. (2019). The Power of Emotional Benefits: Examining the Role of Benefit Focus on Donation Behavior. *Journal of Advertising*, *48*(3), 284–291. https://doi.org/10.1080/00913367.2019.1602857

Parsons, L. M. (2007). The impact of financial information and voluntary disclosures on contributions to not-for-profit organizations. *Behavioral Research in Accounting, 19,* 179-196.

Passyn, K., & Sujan, M. (2006). Self-Accountability Emotions and Fear Appeals: Motivating Behavior. *Journal of Consumer Research*, 32(4), 583–589. https://doi.org/10.1086/500488

Paxton, P., Velasco, K., & Ressler, R. W. (2020). Does the Use of Emotion Increase Donations and Volunteers for Nonprofits? *American Sociological Review*, *85*(6), 1051-1083. https://doi.org/10.1177/0003122420960104

Septianto, F., & Tjiptono, F. (2019). The interactive effect of emotional appeals and past performance of a charity on the effectiveness of charitable advertising. *Journal of Retailing and Consumer Services*, *50*, 189–198. https://doi.org/10.1016/j.jretconser.2019.05.013

Snipes, R. L., & Oswald, S. L. (2010). Charitable Giving to Not-for-Profit Organizations: Factors Affecting Donations to Non-Profit Organizations. *Innovative Marketing (Hybrid)*, 6, 1-9. https://businessperspectives.org/images/pdf/applications/publishing/templates/article/assets/3066/im_en_2010_01_Snipes.pdf

Strahilevitz, M., & Myers, J. G. (1998, March). Donations to charity as purchase incentives: How well they work may depend on what you are trying to sell. *Journal of Consumer Research, 24,* 434-446. https://doi.org/10.1086/209519

Trussell, J. M., & Parsons, L. M. (2007). Financial factors affecting donations to charitable organizations. *Advances in Accounting, 23,* 265-287. https://doi.org/10.1016/S0882-6110(07)23010-X

Veldhuizen, I. J. T., Doggen, C. J. M., Atsma, F., & De Kort, W. L. A. M. (2009). Donor profiles: demographic factors and their influence on the donor career. *Vox Sanguinis*, 97(2), 129–138. https://doi.org/10.1111/j.1423-0410.2009.01201.x

Warren, P. E., and Walker, I. (1991). Empathy, effectiveness and donations to charity Social- psychology contribution. *British Journal of Social Psychology, 30,* 325-337. https://doi.org/10.1111/j.2044-8309.1991.tb00949.x

Wu, Y., Zhang, X., & Xiao, Q. (2022). Appeal to the head and heart: The persuasive effects of medical crowdfunding charitable appeals on willingness to donate. *Information Processing & Management*, 59(1), 102792. https://doi.org/10.1016/j.ipm.2021.102792

Wunderink, S.R. (2000). The economics of consumers' gifts and legacies to charitable organizations. *International Journal of Nonprofit and Voluntary Sector Marketing*, 5(3), 268-287. https://onlinelibrary.wiley.com/doi/abs/10.1002/nvsm.119

Yousef, M., Dietrich, T., Rundle-Thiele, S., & Alhabash, S. (2022). Emotional appeals are effective in enhancing charity digital advertisements. *Journal of Philanthropy and Marketing*, *27*(4). https://doi.org/10.1002/nvsm.1763

Zagefka, H., & James, T. (2015). The psychology of charitable donations to disaster victims and beyond. *Social Issues and Policy Review*, 9(1), 155–192. https://doi.org/10.1111/sipr.12013

Journal of Economics and Behavioral Studies (JEBS)
Vol. 16, No. 3, 2024 (ISSN 2220-6140)

Strategic flexibility and employee creativity: a moderating role of leader's education

*Waleed Mansi Alshammari, Dhakir Abbas Ali
Faculty of Business and Accountancy, Lincoln University College, Petaling Jaya, Malaysia
*waleed55222@hotmail.com, drdhakir@lincoln.edu.my
Corresponding Author: Waleed Mansi Alshammari

Abstract: This study aims to explore the relationship between strategic flexibility and employee creativity in the context of Hail Health Cluster Saudi Arabia. This study has used two dimensions of strategic flexibility such as coordination flexibility and resource flexibility. Furthermore, this study also aims to investigate the role of a leader's education as a moderator. For the data analysis, this study has collected data from 184 participants consisting of nurses, medical staff, and non-medical staff over three months July to August 2024. Further, on the data SEM-PLS technique is used to test the validity and decision-making about the hypothesis. The finding suggests that both coordination flexibility and resource flexibility significantly relate to employee creativity in healthcare clusters. Moreover, the education of the leader plays a moderating role among the variables. These findings are based on the Hail health cluster and offer valuable insights not only for the healthcare sector but for production sectors as well.

Keywords: *Strategic flexibility, Employee creativity, Leader's education, SEM-PLS*

1. Introduction

In the current period of novelty and the competitive environment the organization the increasingly recognizing the importance of employee creativity which further drives innovation and sustainable growth (Awan et al., 2019). Employee creativity is not only important in the manufacturing sector but it is also very crucial in the health sector (Nasir et al., 2022). The health sector also facing technological advancement as well as patient expectations to tackle the ever-growing disease, therefore it requires a workforce that is flexible and adaptable (Socha-Dietrich, 2021). This strategic flexibility enhances the ability of an organization to adjust the resources and develop the ability to react back to the changes in the working environment. These strategic activities of flexibility are key factors in fostering the practice of creativity among workers (Andriopoulos, 2001).

In the context of Saudi Arabia's Vision 2030, this vision has the great objective of improving all production as well as the service sector and, most importantly the health sector (Chowdhury et al., 2021; Rahman & Al-Borie, 2021). The Hail Health cluster plays a significant role in fulfilling the objective of Vision 2030 with challenges of workforce shortages, incorporating new technologies, and increased demand for patients to use advanced methods for treatments (Rehman & Alnuzhah, 2022).

There are many studies (Jnaneswar & Ranjit, 2022; Naiwen et al., 2021; Naseem et al., 2020; Naseem et al., 2023; Nasir et al., 2022; Nguyen et al., 2023) on the employee creativity. However current research reveals several gaps in understanding the relationship between strategic flexibility, employee creativity, and leadership education. Existing studies have not fully explored how different types of strategic flexibility, such as coordination and resource flexibility (Brozovic, 2018; Ciacci et al., 2024), uniquely affect creativity, especially in multifarious sectors like healthcare. Furthermore, while leadership education is shown to play a moderating role in this relationship, there is limited research on which specific educational backgrounds or qualifications most effectively foster creativity in employees. This is particularly relevant in healthcare settings like the Hail Health Cluster, where the role of flexibility and leadership education in addressing unique challenges, such as workforce shortages and rapid technological change, remains underexplored.

Therefore, this study aims to explore the relationship between strategic flexibilities such as coordination flexibilities and resource flexibilities with employee creativity, to analyze the moderating role of a leader's education between strategic flexibilities and employee creativity in the context of the Hail health cluster. This study has great significance for the policymakers, health sectors, and administration of healthcare centers as well as researchers.

2. Literature Review

This section consists of a review of previous studies on the current topic. This section explains the literature on strategic flexibility with its elements such as coordination flexibility, and resource flexibility. Further, this study also explains the literature related to leader's education and employee's education.

Coordination Flexibility

Coordination flexibility is an important element in the development of an organization. Coordination flexibility in the skills of employees shows how much individuals with various skills can be reorganized in the value chain of an organization. Coordination flexibility allows organizations and enterprises to adjust to changes in the inner reformation of the workplace to meet the outer and inner expectations (Vem et al., 2022). Coordination flexibility involves being flexible in strategy, skills of the employee, and the behavior of the workforce. Hence, coordination flexibility indicates the ability of a company to use its existing resources. Coordination flexibility is the capacity to produce new resources combination by the use of the inner coordination process (Ejikeme & Onuoha, 2023).

Resource Flexibility

Resource flexibility is recognized as a key enabler of rejoining to fast-changing market conditions. Resource flexibility can also be a vital enabler of learning the changes in market conditions more efficiently, which could offer a valuable competitive advantage. (Makhloufi et al., 2021). Resource flexibility can help organizations learn about the underlying demand when the latter is not fully observable because of censoring (Chod et al., 2021). Resource flexibility may allow all organizations to make better-informed operational decisions in future times. Resource flexibility provides a real option to allocate flexible resources to the most profitable use. Resource flexibility can sometimes be used as an operative border to moderate profit validity (Sawhney, 2013).

Leader's Education

A leader's education is important for the development of an organization. Education not only shapes the knowledge of leaders but also increases their capability to make strong decisions and think critically (Bolden et al., 2023; Mohsin et al., 2024; Mohsin et al., 2021). Leader's education provides some informative tools which they need to understand some issues and lead effectively. Education promotes continuous learning and innovation in this rapidly changing atmosphere (Tan, 2021). Just formal education is not important for a good leader but practical experience and continuous learning are also important for a good leader. Formal education provides a basis for the principles of management and enables leaders to make strong decisions that align with the progress and effectiveness of an organization (Ruben et al., 2023).

Furthermore, an educated leader understands the importance of intelligence which has developed through learning and experience. Successful leaders always believe in continuous learning which helps the leader to make good decisions and ability to inspire. (Day et al., 2020). A leader's education is a continuous learning journey from experiences, failures successes, and ever ever-changing world around them. Additionally, educated leaders inspire confidence in their workforce, and foster a culture of learning in an organization which is important for long-term success. (Lasrado & Kassem, 2021).

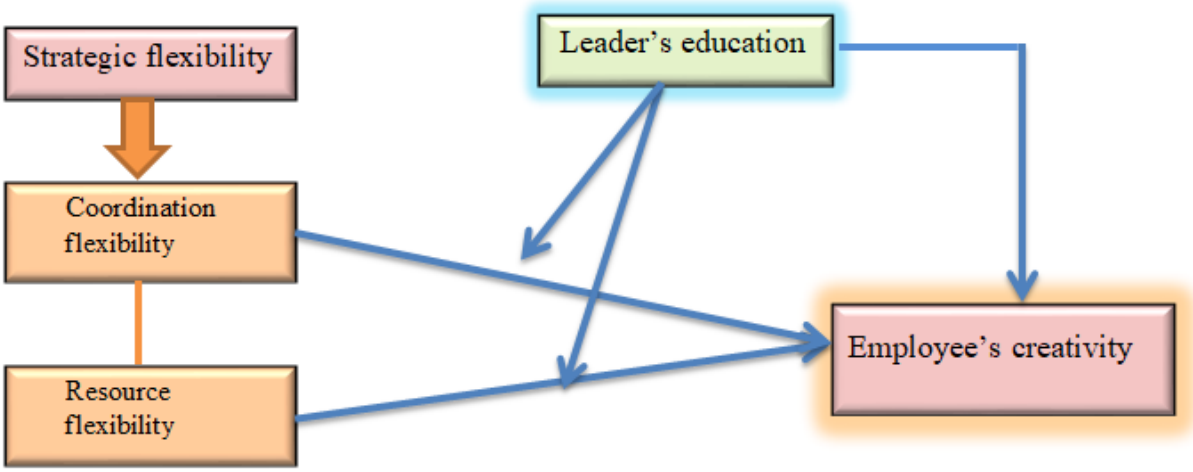
Employee's Creativity

Employee creativity plays an important role in enabling organizations to endure in a competitive business world. Employee creativity refers to the creation of ideas and solutions to problems faced by employees. (Żywiołek et al., 2022). All organizations need to recruit employees with creative behaviors to develop their business in a changing and indefinite work atmosphere. Employee creativity can be defined as constructing, hypothesizing, and emerging useful ideas processes, and measures by a group of people working together. (Arasli et al., 2020). Employee creativity is created as a sign of innovation because it associates idiosyncratic cognitive process that brings ideas creation. Employee creativity shows the ability of all employees to make new useful ideas that are of vital significance to obtain efficiency, origination, and discoveries (Khan & Mohiya, 2020).

Conceptual framework

In this research employee creativity is the dependent variable that depends on strategic flexibility which includes coordination flexibility and resource flexibility. Further to strengthen a strong and smooth relationship between dependent and independent variables leaders' education was used as a moderator. The following diagram shows the framework of this study.

Figure 1: Conceptual Framework



Source: Developed by author

Coordination flexibility and Employee's creativity

Employee creativity can be promoted with the help of coordination flexibility when the coordination flexibility facilitates adaptive collaboration within the organization and workforce (Ni et al., 2020). In the working environment team members can share their ideas, adjust their work methods and explore new approaches to solve problems, all of this is possible if the coordination is flexible. This working adaptability sparks innovation when all the individuals are permitted to break away from inflexible configuration and open interchange of ideas (Souto, 2020). Moreover, diverse perspectives can be managed with the help of coordination flexibility and it can lead to creative results and solutions (Moirano et al., 2020).

Moreover, Employee creativity enhances the healthcare sector through coordination flexibility. In the health sector, some professionals face difficulty that requires innovative solutions (Al-Alwan et al., 2022). When the working force adopts the ability of coordination, they can adapt to changing patients' wants, and integrate new innovative solutions into treatment plans. Coordination flexibility inspires the healthcare worker team to think innovatively. Furthermore, a positive link between coordination flexibility and employee creativity offers a working environment for creative thinking to succeed (Ni et al., 2020).

Resource flexibility impacts employee creativity by giving the workforce the capability to familiarize themselves with fluctuating demands in the working environment. When all the workers are allowed to use instruments and technology, and then they explore innovative solutions and think out of the ordinary (Acquah & Xing, 2021). Resource flexibility encourages experiments and allows the workers to solve problems from various methods and improve new ways of solutions. Resource flexibility improves the workplace increases employee creativity and allows workers to use their skills and knowledge in a creative way to increase the progress of an organization (Davidescu et al., 2020).

Similarly, Resource flexibility plays an important role in the development of employee creativity in the healthcare sector. Sometimes healthcare experts tackle some problems, like quickly changing conditions, technological improvements, and patients' wants. (Lalit et al., 2024). When all the employees are free to use the resources properly, like access to different medical instruments, and team collaboration, they can adopt their approaches in a better way to patient care. Resource flexibility allows the workforce to discover new treatments, and search some better ways to deliver care. Healthcare organizations improve a culture of

employee creativity that finally provides a way to develop patient care consequences and more effective health services. (Acquah & Xing, 2021; Organization, 2021). Based on the above discussion following hypothesis can be developed as

H1a: There is a positive relationship between Coordination flexibility with Employee creativity

H1b: There is a positive relationship between resource flexibility with employees' creativity

Leaders Education and Employee's Creativity

Leader's education is important in the development of employee creativity because leader's education provides leaders with experience and some extraordinary skills which are important to improving the workplace place that increases the way of innovations (Nguyen et al., 2023). The working force feels more confident with educated leaders because a well-educated leader with experience provides their team members with significant resources, liberty to use the tools and provide innovative ideas, and some support. The education of leaders improves employee creativity because employees feel free to use the resources and ideas under the guidance of a leader (Joo et al., 2023). Educated leaders can adopt critical thinking and some innovative techniques that they have learned from their education and their education leads workers in creative activities. Moreover, the education of leaders can encourage a culture of teamwork and continuous learning; and provide new perspectives that improve the creativity of the workers (Ali et al., 2020; Sarfraz et al., 2022, 2023).

Furthermore, employee creativity can be enhanced by the leaders' education by improving the working atmosphere increasing innovative ideas and flexibility (Żywiołek et al., 2022). Educated leaders often retain an understanding of healthcare tendencies, patients' wants, and difficulties of scientific processes, allowing the workforce to make some decision that increases creative results. Educated leaders are experts in identifying the significance of team collaboration; enabling healthcare experts to have diverse outlooks and new ideas (Bass et al., 2020). Educated leaders empower workers to tackle new approaches to patient care and problem-solving, by fostering a culture of continuous learning and support for creative ideas, ultimately guiding to improved outcomes and a more professional and developed healthcare atmosphere (Davis & Musolino, 2024; Tan, 2021). Based on the above discussion following hypothesis can be developed as

H2: There is a positive relationship between a leader's education and with Employee's creativity

Moderating role of leader's education

Leaders' education moderates the link between coordination flexibility and employee creativity because a leader's education provides knowledge important for managing flexible coordination between team members (Muhammad et al., 2019, Zhang et al., 2023). Educated leaders are better prepared to know about how to manage flexibility and structure while aligning the goals of an organization an educated leader allows workers to coordinate tasks in better and innovative ways. Educated leader adapts some better and more innovative ways like open communication, and collaborative problem-solving to improve employee creativity (Lenhoff et al., 2022). Educated leaders can lead coordination flexibility which shows that the workforce has the liberty to show new ideas while managing current collaboration, therefore promoting an atmosphere where employee creativity increases (Ahmed Iqbal et al., 2021).

Additionally, educated leaders improve the ability to accomplish complexities and energetic atmosphere in the healthcare sector. Leaders' education provides knowledge and understanding to improve coordination flexibility among the workforce of the healthcare sector, allowing experts to adjust the needs of patients and medical improvements (McKimm & McLean, 2020). Coordination flexibility is important for improving employee creativity problem solving and advancement in patient care. Leaders with good education lead their workforce in a joint effort, allowing them to show new ideas while maintaining excellent care. Educated leaders establish a working and supportive atmosphere by leveraging their education where flexibility in coordination higher employee creativity in the healthcare sector, improving good patient consequences and new healthcare observes (Barr & Nathenson, 2022; Osunlaja et al., 2024).

Educated leaders positively influence the link between resource flexibility and employee creativity. Leaders' education provides the working environment and knowledge to manage the allocation of resources and the solution of some problems faced by an organization (Riva et al., 2021). The good way of the allocation of resources improves the innovation and employee creativity. Education of leaders provides the knowledge about how to flexible the resources, and use of some equipment, and technology which is important for

employees to explore new creative solutions. Educated leaders distribute some resources to their team according to the requirements of their team members (He et al., 2020). This resource flexibility encourages the employee creativity to think out of the box which leads the progress and development of an organization. Leaders' education confirms that the flexibility in the resources is used properly to increase the worker's creativity, improving productivity and problem-solving within the organization (Liu et al., 2020; Yasin et al., 2022).

Moreover, educated leaders know the significance of providing healthcare experts with flexible resources which are important for improving innovative solutions for patient care (Duffy, 2022). Educated leaders know the allocation of resources properly inspires the workers to think inventively and find new treatment tactics (Akgunduz et al., 2018). The approach of leaders' education establishes a working atmosphere where the working force feels free to innovate, guiding to improve patient health consequences and more effective healthcare observes (Abed et al., 2022). Based on the above discussion following hypothesis can be developed as

H3a: There is leader's education positively moderates the relationship of Coordination flexibility with Employee's creativity

H3b: Does a leader's education positively moderate the relationship of resource flexibility with Employee creativity

3. Methodology

This study is cross-sectional and it is developed on the Hail health cluster in Saudi Arabia. The data is collected from the medical staff, non-medical and nurses working in this health cluster. The data is collected with the help of Google Forms and online applications. The well-structured questionnaire was developed on this basis. The data aimed to be collected was quantitative. After developing the questionnaire, this questionnaire was verified by the experts and removed some recommended mistakes by experts. Before the data collection, consent was taken from relevant departments with emails and phone numbers of workers and participants randomly selected from different hospitals and healthcare centers. The questionnaire was sent one by one to 300 participants. Two or three-time reminders were also sent by the researcher to participants to fill out the questionnaire on time. This study received 254 data of fill questionnaire. Further among these questionnaires, only 184 questionnaires could be used for further analysis. So, the overall response rate was 84.6 and after the screening, the response rate was 61.3 which is enough for the analysis of SEM-PLS (Purwaningsih et al., 2024; Venkatesh et al., 2024). After collecting data in an Excel sheet, it was checked manually and applied measurement model and structural model by using the Smart PLS tool. The demographic characteristics are the following

Table 1: Demographic characteristics of participants

Demographic variable	Category	Percentage (%)
Gender	Male	40%
	Female	60%
Age group	Under 25	15%
	25- 34	30%
	35-44	25%
	45-54	20%
	55-above	10%
Position	Nurses	45%
	Medical staff	35%
	Non-medical staff	20%
Years of experience	Less than year	10%
	1-5 years	25%
	6-7 years	20%
	6-10 years	15%

	More than 10	30%
Education level	Medical diploma	20%
	Bachelor's degree	50%
	Master's degree	20%
	Doctorate (MD, MBBS, etc.)	10%
Leadership role	Yes	10%
	No	25%
Leadership training	Yes	40%
	No	60%
Department	Nursing	40%
	Medical (emergency, surgery, etc.	30%
	Administration	20%
	Support services (IT, HR etc.)	10%

The participant demographics reveal several notable trends. Most participants are female, comprising 60% of the sample, while males make up 40%, reflecting a common trend in healthcare where women often occupy a larger proportion of roles, particularly in nursing. In terms of age, the largest group is between 25 and 34 years old (30%), followed by those aged 35 to 44 (25%) and 45 to 54 (20%). A smaller percentage is under 25 (15%) or over 55 (10%), indicating that the workforce predominantly consists of mid-career professionals, which may impact their approaches to flexibility and creativity in the workplace.

Position-wise, nurses represent the largest segment at 45%, followed by medical staff at 35% and non-medical staff at 20%. This aligns with the typical composition of healthcare organizations, where nurses form the majority while non-medical staff play a vital role in overall operations. Regarding years of experience, 30% of participants have more than 10 years in their field, followed by those with 1 to 5 years (25%) and 6 to 10 years (20%). A smaller group has less than 1 year (10%) or between 6 and 7 years (15%). There are 10 percent of participants have leadership roles as well as 40 percent have leadership training.

Measurement of variable

This study has used strategic flexibility with dimensions such as resource flexibility and coordination flexibility as independent variables. The measurement for this study used items form (Yang et al., 2020). The leader's education is an important moderator between strategic flexibility and employee creativity. The measurement items for the leader's education are developed from the study by Yu et al., (2022). The employee's creativity is adapted from a study by Akgunduz et al., (2018). All the items of these variables were measured at five Likert scales 1-5.

4. Results

This study has developed an SEM-PLS equation and applied a measurement model and structural model with the help of the Smart PLS tool. The measurement model estimates the factor load of variable, correlation, and Composite reliability (CR), Cronbach's Alpha (CA), and Average variance extracted (AVE)(Cheung et al., 2024; Fithri et al., 2024; Hussain et al., 2022), Whereas the structural model estimates the hypothesis testing and does the decision-making on the base of values.

Measurement model

The finding of the measurement scale is used based on the value of the outer loading of all variables used in the research. The result of the current analysis shows the indicators have range from 0.71 to 0.84. The table of factor loading indicates that all the indicators have more than 0.5 value of outer loading which explains that the entire variable is significant (Karimah et al., 2024).

Table 2: Factor loading

Variables	Items code	Factor loading
Coordination flexibility	CF1	0.78
	CF2	0.82
	CF3	0.71
	CF4	0.80
Resource flexibility	RF1	0.78
	RF2	0.83
	RF3	0.79
	RF4	0.77
Employee's creativity	EC1	0.81
	EC2	0.84
	EC3	0.79
	EC4	0.82
Leader's education	LE1	0.72
	LE2	0.76
	LE3	0.82
	LE4	0.74
	LE5	0.77
	LE6	0.78

Table 3 shows that all the constructs used in the study have strong internal consistency and reliability, as indicated by their Composite Reliability (CR) and Cronbach's Alpha (CA) values. For Coordination Flexibility, the CR value of 0.85 and the CA value of 0.80 demonstrate that the items measuring this construct are highly reliable. This table explains that all the values of variables are accepted and these values show strong consistency as well as reliability.

Table 3: Composite reliability (CR), Cronbach's Alpha (CA), and Average variance extracted (AVE)

Variable	CR	CA	AVE
Coordination flexibility	0.85	0.80	0.61
Resource flexibility	0.87	0.83	0.57
Employee's creativity	0.80	0.79	0.53
Leader's education	0.86	0.85	0.64

Table 4 presents the discriminant validity of the constructs in the study, evaluated using the Fornell-Larcker criterion. Overall, all exhibit good discriminant validity as their AVE square root (0.77) exceeds its correlations with the other constructs.

Table 4: Discriminant validity

Variable	CF	RF	EC	LE
Coordination flexibility (CF)	**0.75**			
Resource flexibility (RF)	0.65	**0.73**		
Employee's creativity (EC)	0.50	0.52	**0.80**	
Leader's education (LE)	0.60	0.55	0.65	**0.77**

Structural model

In the SEM-PLS analysis for the hypothesis testing structural model is used. This explains the beta value, p-value, t- t-value, and decision about acceptance and rejection of the hypothesis. Table 5: indicates the results of the hypothesis developed by the study. The finding indicates that the entire hypotheses are accepted. The relationship between Coordination Flexibility (CF) and Employee Creativity (EC) shows a Beta coefficient of 0.45, indicating a moderate positive effect. The T-value of 3.20 signifies statistical significance, with a P-value of 0.012, which is below the conventional threshold of 0.05. This relationship is accepted, suggesting that enhancing coordination flexibility can boost employee creativity. The interaction between Leader's Education and Resource Flexibility has a Beta coefficient of 0.71, suggesting a strong effect on employee creativity.

Furthermore, all proposed relationships in the table are accepted, demonstrating significant effects of both coordination flexibility and leader's education, both individually and in interaction with resource flexibility, on employee creativity. These findings underscore the importance of fostering an environment that enhances coordination and educational opportunities for leaders to boost creativity within the workforce.

Table 5: Results of hypothesis testing

Relationship	Beta	T-values	P- values	Decision
CF -> EC	0.45	3.20	0.012	Accepted
CF -> RF	0.51	4.10	0.001	Accepted
LE -> EC	0.38	2.80	0.005	Accepted
LE*CF -> EC	0.41	2.50	0.002	Accepted
LE*RF -> EC	0.71	2.20	0.028	Accepted

Figure 2: LE moderates the relationship between CF and EC

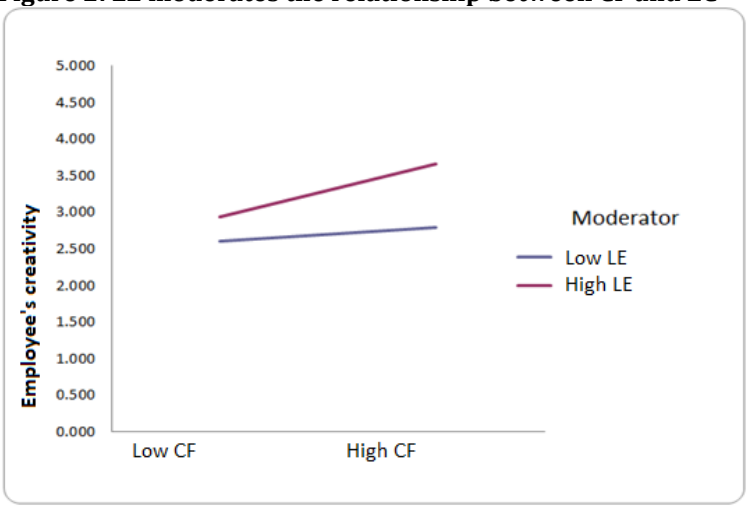
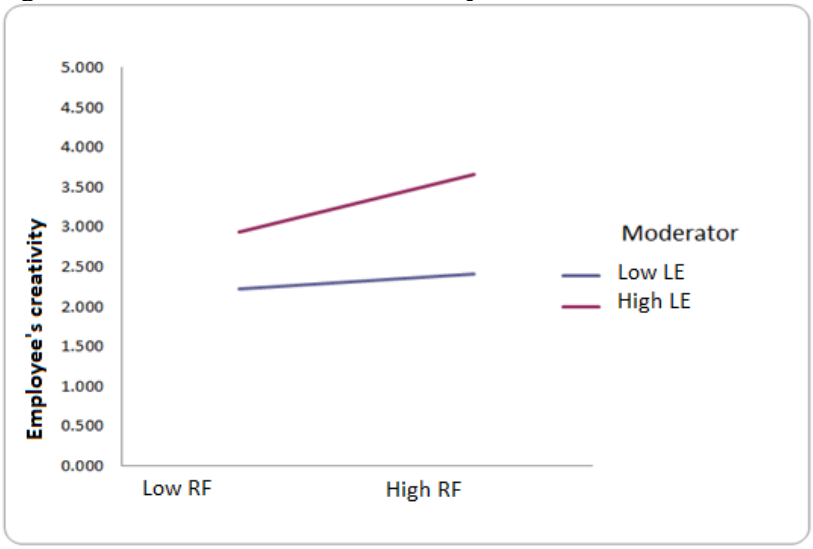


Figure 3: LE moderates the relationship between RF and EC



Discussion

This research has established the link between strategic flexibility and employee creativity. A leader's education is a moderating variable that moderates the link between strategic flexibility (coordination and

resource flexibility) and employee creativity. Based on previous literature, hypotheses are developed and analyzed on Smart PLS.

Hypothesis H1 has been accepted, H1a shows a positive relationship between coordination flexibility and employee creativity and H1b shows a positive link between resource flexibility and employee creativity. According to (Jia et al., 2022) Hypothesis H1a coordination flexibility influences the employee's creativity because when the team members coordinate tasks flexibly the employees feel free to show their ability to work professionally and feel empowered to think out of the box and innovate solutions to problems. Coordination flexibility inspires more open communication skills and collaboration. Coordination flexibility fosters a culture of employee creativity where all the workers use their abilities and bring out new innovative ideas and solutions to some problems (Gahan et al., 2021).

Moreover, hypothesis H1b highlights that the ability of an organization to allocate resources properly increases the employee's creativity. When the resources are flexible it allows the employees to use the resources in a better way and employees are more likely to explore new ideas without feeling embarrassed by limitation. These working environments allow resource flexibility which encourages the entire workforce to have the means of experiment without strict resource limitations (Al-Ghazali & Afsar, 2021).

After the data analysis this study also accepted hypothesis H2, this hypothesis shows the relationship between a leader's education and an employee's creativity. Educated leaders with their experience and knowledge provide a working atmosphere where all workers feel free and use their abilities which increases the progress of an organization. Educated leaders appreciate the benefit of coordination flexibility, further establishing a culture of creativity within the organization (Jia et al., 2022; Kezar, 2023).

Hypothesis H3a is also accepted, H3a shows that is leader's education positively moderates the relationship of Coordination flexibility with the Employee's creativity. This moderating effect defines that educated leaders are more proficient in recognizing the coordination flexibility in promoting employee creativity (Pahi et al., 2024). Leader's knowledge allows them to balance the coordination process in a way that increases the employee's creativity in an organization (Pahi et al., 2024).

Furthermore, H3b is also related to the moderating effect of a leader's education positively moderating the relationship of resource flexibility with employee creativity. Leaders' education has deep knowledge about how to flexible resources that can be tactically distributed to nurture inspired ideas (Bolden et al., 2023).

5. Theoretical implications

This study has the theoretical foundation for further studies. This study explains that strategic flexibility along with coordination flexibility and resource flexibility as important aspects of employee creativity. Employee creativity is a dependent variable in this framework and resource flexibility and coordination flexibility with the moderating role of leaders 'education give novelty in these relations. This study offers the important concept of a leader's education which is important for the utilization of limited resources and making a maximum profit.

Practical Implications

This study has empirical as well as practical importance and implications. This study highlighted the strategic flexibility in the context of the Hail health cluster. This sector is very important for providing the best health services to the patient. This study explains that flexibility in the medical area in terms of coordination and resources can make the workers more creative, after adopting this strategic flexibility healthcare professionals respond more swiftly and efficiently. Further, this study more focuses on the leader's education. The leaders with up-to-date education can handle the different medical as well as administrative situations very well. Therefore, an educated leader plays an important role to enhance the capabilities and creativity of the employees.

Limitations and suggestions for future research

This study is very significant not only for the one sector but the other sector as well. However, this study has some limitations which can be removed with future research. Such as, this study selected strategic flexibility as an independent variable which is different for various sectors. So, this study only focused on the healthcare sector. Future studies should take the same framework for the manufacturing sector as well. This study used cross-sectional data from a specific area Hail. This area has its qualities, so there is a need to check the results of this study in other cities or provinces. Further, this study has not explained the probable challenges that can be faced in strategic flexibility for employee creativity. Therefore, future studies can explore this framework in different contexts to make it more practical,

References

Abed, S. N., Abdulmuhsin, A. A., & Alkhwaldi, A. F. (2022). The factors influencing the innovative performance of leaders in nurses' professional: a developing country perspective. *Leadership in Health Services*, *35*(2), 228-245.

Acquah, T. A. A., & Xing, H. (2021). Female Leadership as a Moderator on Human Resource Flexibility Affecting Firm Performance. *Journal of Human Resource Management*, *9*(3), 94-101.

Ahmed Iqbal, Z., Abid, G., Arshad, M., Ashfaq, F., Athar, M. A., & Hassan, Q. (2021). Impact of authoritative and laissez-faire leadership on thriving at work: The moderating role of conscientiousness. *European journal of investigation in health, psychology and education*, *11*(3), 667-685.

Akgunduz, Y., Kizilcalioglu, G., & Sanli, S. C. (2018). The effects of job satisfaction and meaning of work on employee creativity: An investigation of EXPO 2016 exhibition employees. *Tourism: An International Interdisciplinary Journal*, *66*(2), 130-147.

Al-Alwan, M., Bader, D., Al-Qatawneh, M., Alneimat, S., & Al-Hawary, S. (2022). E-HRM and employee flexibility in Islamic banks in Jordan. *International Journal of Data and Network Science*, *6*(3), 703-710.

Al-Ghazali, B. M., & Afsar, B. (2021). Investigating the mechanism linking task conflict with employees' innovative work behavior. *International Journal of Conflict Management*, *32*(4), 599-625.

Ali, A., Wang, H., & Johnson, R. E. (2020). Empirical analysis of shared leadership promotion and team creativity: An adaptive leadership perspective. *Journal of Organizational Behavior*, *41*(5), 405-423.

Andriopoulos, C. (2001). Determinants of organizational creativity: a literature review. *Management decision*, *39*(10), 834-841.

Arasli, H., Arici, H. E., & Kole, E. (2020). Constructive leadership and employee innovative behaviors: a serial mediation model. *Sustainability*, *12*(7), 2592.

Awan, U., Sroufe, R., & Kraslawski, A. (2019). Creativity enables sustainable development: Supplier engagement as a boundary condition for the positive effect on green innovation. *Journal of cleaner production*, *226*, 172-185.

Barr, T. L., & Nathenson, S. L. (2022). A holistic transcendental leadership model for enhancing innovation, creativity and well-being in health care. *Journal of Holistic Nursing*, *40*(2), 157-168.

Bass, A. E., Maric, S., Milosevic, I., Uhl-Bien, M., Groves, K. S., Kim, D., Lord, J., Silvera, G., Clark, J., & Feyerherm, A. E. (2020). Future of Leadership in Healthcare: Enabling Complexity Dynamics Across Levels. Academy of Management Proceedings,

Bolden, R., Gosling, J., & Hawkins, B. (2023). *Exploring leadership: Individual, organizational, and societal perspectives*. Oxford University Press.

Brozovic, D. (2018). Strategic flexibility: A review of the literature. *International Journal of Management Reviews*, *20*(1), 3-31.

Cheung, G. W., Cooper-Thomas, H. D., Lau, R. S., & Wang, L. C. (2024). Reporting reliability, convergent and discriminant validity with structural equation modeling: A review and best-practice recommendations. *Asia Pacific Journal of Management*, *41*(2), 745-783.

Chod, J., Markakis, M. G., & Trichakis, N. (2021). On the learning benefits of resource flexibility. *Management Science*, *67*(10), 6513-6528.

Chowdhury, S., Mok, D., & Leenen, L. (2021). Transformation of health care and the new model of care in Saudi Arabia: Kingdom's Vision 2030. *Journal of Medicine and Life*, *14*(3), 347.

Ciacci, A., Balzano, M., & Marzi, G. (2024). Optimizing business models through digital alignment and strategic flexibility: Evidence from the manufacturing industry. *Journal of Management & Organization*, 1-21.

Davidescu, A. A., Apostu, S.-A., Paul, A., & Casuneanu, I. (2020). Work flexibility, job satisfaction, and job performance among Romanian employees—Implications for sustainable human resource management. *Sustainability*, *12*(15), 6086.

Davis, C. M., & Musolino, G. M. (2024). *Patient practitioner interaction: An experiential manual for developing the art of health care*. Taylor & Francis.

Day, C., Sammons, P., & Gorgen, K. (2020). Successful School Leadership. *Education development trust*.

Duffy, J. R. (2022). *Quality caring in nursing and health systems: Implications for clinicians, educators, and leaders*. Springer Publishing Company.

Ejikeme, N. J., & Onuoha, B. C. (2023). Strategic Flexibility and Environmental Dynamics of SMEs in Rivers State. *InternaΘonal Journal of Business Systems & Economics*, 14(5), 1-13.

Fithri, P., Hasan, A., Syafrizal, S., & Games, D. (2024). Validation Studies a Questionnaire Developed to Measure Incubator Business Technology Performance Using the PLS-SEM Approach. *Andalusian International Journal of Applied Science, Engineering and Technology*, *4*(1), 64-78.

Gahan, P., Theilacker, M., Adamovic, M., Choi, D., Harley, B., Healy, J., & Olsen, J. E. (2021). Between fit and flexibility? The benefits of high-performance work practices and leadership capability for innovation outcomes. *Human Resource Management Journal*, *31*(2), 414-437.

Hayat, S., A., Hussain S., and Iqbal S., . (2024). Impact of socio-economic factors on women's entrepreneurial intension: the moderating role of skill development. *International Journal of Contemporary Issues in Social Sciences*, *3*(3).

He, W., Hao, P., Huang, X., Long, L. R., Hiller, N. J., & Li, S. L. (2020). Different roles of shared and vertical leadership in promoting team creativity: Cultivating and synthesizing team members' individual creativity. *Personnel Psychology*, *73*(1), 199-225.

Hussain, S., Kampoowale, I., Sadia, H., & Hall, S. (2022). Linking organizational climate with Psychological capital: Organizational Innovative culture as moderator. *J. Hum. Univ. Nat. Sci*, *4*, 18-30.

Jia, R., Hu, W., & Li, S. (2022). Ambidextrous leadership and organizational innovation: The importance of knowledge search and strategic flexibility. *Journal of Knowledge Management*, *26*(3), 781-801.

Jnaneswar, K., & Ranjit, G. (2022). Explicating intrinsic motivation's impact on job performance: employee creativity as a mediator. *Journal of Strategy and Management*, *15*(4), 647-664.

Joo, B.-K., Yim, J.-H., Jin, Y. S., & Han, S. J. (2023). Empowering leadership and employee creativity: the mediating roles of work engagement and knowledge sharing. *European journal of training and development*, *47*(9), 881-899.

Karimah, R. N., Kusnanto, H., Lazuardi, L., Pertiwi, A. A., Istiono, W., Lusiantoro, L., & Idris, H. (2024). Information quality measurement model of diabetes management in primary healthcare: Confirmatory factor analysis. *International Journal of Healthcare Management*, 1-7.

Kezar, A. J. (2023). *Rethinking leadership in a complex, multicultural, and global environment: New concepts and models for higher education*. Taylor & Francis.

Khan, S., & Mohiya, M. (2020). Determinants of SMEs employees' creativity and their impact on innovation at the workplace. *Management Science Letters*, *10*(16), 3865-3872.

Lalit, V., Sharma, Y., Ekvitayavetchanukul, P., Majumder, J., Biswas, S., & Gangopadhyay, S. (2024). Operational Challenges in Modern Business Evolution in Healthcare Technology Startups. In *Healthcare Industry Assessment: Analyzing Risks, Security, and Reliability* (pp. 301-323). Springer.

Lasrado, F., & Kassem, R. (2021). Let's get everyone involved! The effects of transformational leadership and organizational culture on organizational excellence. *International Journal of Quality & Reliability Management*, *38*(1), 169-194.

Lenhoff, S. W., Edwards, E. B., Claiborne, J., Singer, J., & French, K. R. (2022). A collaborative problem-solving approach to improving district attendance policy. *Educational Policy*, *36*(6), 1464-1506.

Liu, X., Zhu, Z., Liu, Z., & Fu, C. (2020). The influence of leader empowerment behavior on employee creativity. *Management Decision*, *58*(12), 2681-2703.

Makhloufi, L., Azbiya Yaacob, N., Laghouag, A. A., Ali Sahli, A., & Belaid, F. (2021). Effect of IT capability and intangible IT resources on sustainable competitive advantage: Exploring moderating and mediating effect of IT flexibility and core competency. *Cogent Business & Management*, *8*(1), 1935665.

McKimm, J., & McLean, M. (2020). Rethinking health professions' education leadership: Developing 'eco-ethical ' leaders for a more sustainable world and future. *Medical Teacher*, *42*(8), 855-860.

Mohsin, M., Shamsudin, M. N., Jaffri, N. R., Idrees, M., & Jamil, K. (2024). Unveiling the contextual effects of total quality management to enhance sustainable performance. *The TQM Journal*.

Mohsin, M., Zhu, Q., Wang, X., Naseem, S., & Nazam, M. (2021). The empirical investigation between ethical leadership and knowledge-hiding behavior in the financial service sector: a moderated-mediated model. *Frontiers in Psychology*, *12*, 798631.

Moirano, R., Sánchez, M. A., & Štěpánek, L. (2020). Creative interdisciplinary collaboration: A systematic literature review. *Thinking Skills and Creativity*, *35*, 100626.

Muhammad, M., Muhammad, A. S., Li, N.-W., & Muhammad, M. K. (2019). Investigation of various factors affecting the coefficient of friction of yarn by using the Taguchi method. *Industria Textila*, *70*(3), 211-215.

Muhammad, N., Robinson, D., & Nisar, M. (2019). The influence of Muslim marriages on entrepreneurial intentions of women entrepreneurs: Evidence from Pakistan. *International Journal of Entrepreneurial Behavior & Research*, *25*(7), 1389-1409.

Naiwen, L., Wenju, Z., Mohsin, M., Rehman, M. Z. U., Naseem, S., & Afzal, A. (2021). The role of financial literacy and risk tolerance: an analysis of gender differences in the textile sector of Pakistan. *Industria Textila*, *72*(3), 300-308.

Naseem, S., Fu, G. L., Mohsin, M., Aunjam, M. S., Rafiq, M. Z., Jamil, K., & Salamat, S. (2020). Development of an inexpensive functional textile product by applying accounting cost-benefit analysis. *Industria Textila*, *71*(1), 17-22.

Naseem, S., Hu, X., Shi, J., Mohsin, M., & Jamil, K. (2023). Exploring the optical impact of information communication technology and economic growth on CO2 emission in BRICS countries. *Optik*, *273*, 170339.

Nasir, J., Ibrahim, R. M., Sarwar, M. A., Sarwar, B., Al-Rahmi, W. M., Alturise, F., Samed Al-Adwan, A., & Uddin, M. (2022). The effects of transformational leadership, organizational innovation, work stressors, and creativity on employee performance in SMEs. *Frontiers in Psychology*, *13*, 772104.

Nguyen, N. T., Hooi, L. W., & Avvari, M. V. (2023). Leadership styles and organizational innovation in Vietnam: does employee creativity matter? *International Journal of Productivity and Performance Management*, *72*(2), 331-360.

Ni, G., Xu, H., Cui, Q., Qiao, Y., Zhang, Z., Li, H., & Hickey, P. J. (2020). Influence mechanism of organizational flexibility on enterprise competitiveness: The mediating role of organizational innovation. *Sustainability*, *13*(1), 176.

Organization, W. H. (2021). *Guidance on community mental health services: promoting person-centred and rights-based approaches*. World Health Organization.

Osunlaja, O., Enahoro, A., Maha, C. C., Kolawole, T. O., & Abdul, S. (2024). Healthcare management education and training: Preparing the next generation of leaders-a review. *International Journal of Applied Research in Social Sciences*, *6*(6), 1178-1192.

Pahi, M. H., Ahmed, U., Imroz, S. M., Shah, S. M. M., & Yong, I. S.-C. (2024). The flexible HRM and firm performance nexus: can empowering leadership play any contingent role? *International Journal of Productivity and Performance Management*, *73*(2), 629-647.

Purwaningsih, P., Damayanti, N. A., Nasronudin, N., Mahmudah, M., Andarini, S., Qomarudin, B., Chalidyanto, D., Yuwono, S. R., Septanto, A. N., & Zulkarnain, H. (2024). Archive of SID. ir.

Rahman, R., & Al-Borie, H. M. (2021). Strengthening the Saudi Arabian healthcare system: role of Vision 2030. *International Journal of Healthcare Management*, *14*(4), 1483-1491.

Rehman, A., & Alnuzhah, A. (2022). Identifying travel motivations of Saudi domestic tourists: Case of Hail province in Saudi Arabia. *GeoJournal of Tourism and Geosites*, *43*(3), 1118-1128.

Riva, F., Magrizos, S., & Rubel, M. R. B. (2021). Investigating the link between managers' green knowledge and leadership style, and their firms' environmental performance: The mediation role of green creativity. *Business Strategy and the Environment*, *30*(7), 3228-3240.

Ruben, B. D., De Lisi, R., & Gigliotti, R. A. (2023). *A guide for leaders in higher education: Concepts, competencies, and tools*. Taylor & Francis.

Sarfraz, M., Naseem, S., & Mohsin, M. (2022). Adoption of renewable energy, natural resources with conversion information communication technologies and environmental mitigation: Evidence from G-7 countries. *Energy Reports*, *8*, 11101-11111.

Sarfraz, M., Naseem, S., & Mohsin, M. (2023). Assessing the nexus of gross national expenditure, energy consumption, and information & communications technology toward the sustainable environment: Evidence from advanced economies. *Sustainable Development*, *31*(4), 2826-2835.

Sawhney, R. (2013). Implementing labor flexibility: A missing link between acquired labor flexibility and plant performance. *Journal of Operations Management*, *31*(1-2), 98-108.

Schermerhorn, Jr, J. R., Bachrach, D. G., & Wright, B. (2020). *Management*. John Wiley & Sons.

Socha-Dietrich, K. (2021). Empowering the health workforce to make the most of the digital revolution.

Souto, P. C. D. N. (2020). The power of not-knowing and our experience for adaptability and innovation-in-practice. *International Journal of Technological Learning, Innovation and Development*, *12*(4), 310-351.

Tan, O.-S. (2021). *Problem-based learning innovation: Using problems to power learning in the 21st century*. Gale Cengage Learning.

Vem, L. J., Samson, N., Nkup, Y. N., & Jamoke, A. I. (2022). Does Coordination Flexibility Mediate the Relationship Between Strategic Orientation and Innovative Performance? *International Journal of Business, Management and Economics*, *3*(2), 128-148.

Venkatesh, A. T., Rajkumar, S., & Masilamani, U. S. (2024). Analyzing the factors influencing groundwater quality with different pollution indices and PLS-SEM approach in the vicinity of an open dumping yard in Saduperi, Vellore, Tamil Nadu, India. *Environmental Science and Pollution Research*, *31*(18), 27052-27068.

Yang, D., Wei, Z., Shi, H., & Zhao, J. (2020). Market orientation, strategic flexibility and business model innovation. *Journal of Business & Industrial Marketing*, *35*(4), 771-784.

Yasin, A., Hussain, S., Hali, S. M., & Iqbal, S. (2022). Digitalization and firm performance: mediating role of smart technologies. *Journal of Tianjin University Science and Technology*, *55*(4).

Yu, Q., Aslam, S., Murad, M., Jiatong, W., & Syed, N. (2022). The impact of knowledge management process and intellectual capital on entrepreneurial orientation and innovation. *Frontiers in Psychology*, *13*, 772668.

Zhang, M., Hu, E., & Lin, Y. (2023). The impact of flexibility-oriented HRM systems on innovative behavior in China: a moderated mediation model of dualistic passion and inclusive leadership. *Asia Pacific Business Review*, *29*(1), 114-135.

Zhou, D., Liu, S., & Xin, H. (2024). Servant leadership behavior: Effects on leaders' work-family relationship. *Social Behavior and Personality: an international journal*.

Żywiołek, J., Tucmeanu, E. R., Tucmeanu, A. I., Isac, N., & Yousaf, Z. (2022). Nexus of transformational leadership, employee adaptiveness, knowledge sharing, and employee creativity. *Sustainability*, *14*(18), 11607.

Journal of Economics and Behavioral Studies (JEBS)
Vol. 16, No. 3, 2024 (ISSN 2220-6140)

The Role of Remote Work in Enhancing Employee Productivity: Evidence from the US-Based Tech Industry During the COVID-19 Pandemic

Eric Strandt
Independent Researcher, United States
estrandt@gmail.com

Abstract: This study examines the impact of remote working arrangements on employee productivity within the tech industry in the United States during the COVID-19 pandemic. Utilizing an online survey of 295 tech professionals, the research compares self-reported productivity levels before and after transitioning to remote work. Findings indicate a significant increase in high productivity levels and a decrease in low productivity levels post-transition. Key factors enhancing productivity include improved work-life balance and increased flexibility in working hours, while challenges such as maintaining work-home boundaries and internet connectivity issues were identified as impediments. The study offers actionable insights for managers to optimize remote work practices and contributes to the evolving discourse on business management in the post-pandemic era.

Keywords: *Remote Work, Employee Productivity, Tech Industry, COVID-19, Work-Life Balance*

1. Introduction

The unprecedented shift to remote work due to the COVID-19 pandemic has raised significant concerns among organizations regarding maintaining employee productivity (Kniffin et al., 2021). Traditionally, productivity has been closely linked to structured office environments where supervision, collaboration, and resources are readily accessible (Waizenegger et al., 2020). The sudden transition disrupted these conventional work settings, leaving organizations uncertain about the efficiency and output of their remote workforce.

In the United States, the tech industry plays a pivotal role in the economy, employing over 12 million workers and contributing approximately $1.9 trillion to the national GDP, which accounts for about 10% of the total U.S. economy (CompTIA, 2020). This significant economic impact underscores the importance of understanding how remote work affects productivity within the tech sector. One concern is the potential decline in productivity due to challenges inherent in remote work. These challenges include communication barriers, as virtual interactions may not fully replicate the richness of face-to-face conversations (Ford et al., 2021). Employees may also experience feelings of isolation, which can negatively impact motivation and engagement (Wang et al., 2021).

Managers also face difficulties in monitoring performance and providing support remotely, which can hinder timely feedback and guidance (Carnevale & Hatak, 2020). There is also the concern that not all employees have access to adequate technological resources or a conducive workspace, potentially affecting their ability to perform tasks efficiently (Oakman et al., 2020). These issues collectively contribute to organizational apprehension about sustaining productivity levels during extended periods of remote work. The rapid transition to remote work during the COVID-19 pandemic has generated a substantial body of research exploring its implications across various industries. However, significant gaps remain in understanding the specific impact on the tech industry, particularly concerning productivity changes and effective management practices in this new context.

Limited Focus on the Tech Industry During the Pandemic

While remote work has been widely studied in the general workforce, the tech industry has not been extensively examined during the pandemic. Much of the existing literature concentrates on broad organizational perspectives or other sectors such as education, healthcare, and finance (Kniffin et al., 2021). The tech industry possesses unique characteristics, including rapid innovation cycles, reliance on collaborative software development methodologies, and a highly skilled workforce adept at using digital tools (Ford et al., 2021). These distinct features necessitate industry-specific research to understand how remote work impacts productivity and employee well-being within tech organizations.

Studies that do address the tech industry often provide only a cursory examination or are limited in scope. For example, one study discusses team collaboration during enforced remote work but does not delve deeply into productivity metrics specific to tech professionals (Waizenegger et al., 2020). Similarly, another study explores digital work during lockdowns without focusing on the nuances of the tech sector. This gap indicates a need for comprehensive studies that specifically target the tech industry's response to remote work challenges brought about by the pandemic (Richter, 2020).

Objectives of the Study

This study aims to address this gap by focusing on three specific objectives:

Investigate changes in employee productivity in the tech industry before and after shifting to remote work: This objective seeks to quantitatively assess how the transition from traditional office settings to remote work environments has affected employee productivity. By comparing productivity levels before and during remote work conditions, the study aims to identify any significant changes or trends. Understanding these changes is crucial for organizations aiming to adapt to new work models effectively (Yang et al., 2021).

Identify factors that either enhance or hinder productivity in remote work settings: The second objective involves identifying key determinants that influence productivity among remote tech workers. Factors such as technological infrastructure, communication practices, work-life balance, managerial support, and individual employee characteristics will be examined (Wang et al., 2021). Recognizing these factors will help in understanding the dynamics of remote work productivity and in developing strategies to optimize performance.

Provide managerial recommendations based on the study's findings: Based on the insights gained from the analysis, the study aims to offer practical recommendations for managers and organizations within the tech industry. These recommendations will focus on best practices for enhancing productivity, addressing challenges associated with remote work, and supporting employee well-being and engagement (Contreras et al., 2020). The goal is to equip leaders with evidence-based strategies to navigate the evolving work landscape effectively.

By addressing these objectives, the study intends to fill the existing research gap regarding the impact of remote work on productivity in the tech industry under pandemic conditions. The findings will contribute to the academic literature and provide actionable insights for practitioners, ultimately aiding organizations in making informed decisions about remote work policies and practices.

2. Literature Review

Historical Context of Remote Work

The concept of remote work, also known as telecommuting or teleworking, has evolved substantially over the past several decades. The idea emerged in the 1970s during the oil crisis, as a means to reduce commuting and conserve energy resources (Nilles, 1975).

In the 1980s and 1990s, advancements in technologies began to facilitate remote work on a broader scale. The availability of personal computers, fax machines, and early forms of the internet allowed for greater connectivity (Huws et al., 1990). However, despite technological capabilities, adoption remained limited due to organizational resistance and concerns over productivity, communication barriers, and managerial control (Olson & Primps, 1984). The early 2000s witnessed a gradual increase in remote work arrangements, driven by globalization, the rise of the knowledge economy, and improved internet infrastructure (Messenger & Gschwind, 2016). Companies began to recognize benefits such as cost savings on office space, access to a wider talent pool, and enhanced employee satisfaction (Gajendran & Harrison, 2007). Telework became a component of flexible work policies, though still not widespread.

By the 2010s, mobile technology and cloud computing further revolutionized remote work capabilities. Smartphones, high-speed internet, and collaboration tools made it feasible for teams to work asynchronously across different locations (Allen et al., 2015). Despite these advancements, many organizations maintained a

preference for in-office work, valuing face-to-face interactions and traditional management practices (Mazmanian et al., 2013).

Impact of COVID-19

The COVID-19 pandemic, declared by the World Health Organization in March 2020, served as an unprecedented catalyst for remote work adoption worldwide (World Health Organization, 2020). Government-imposed lockdowns and social distancing necessitated a rapid transition to remote operations for many non-essential businesses (Kniffin et al., 2021).

This abrupt shift challenged existing organizational structures and exposed gaps in digital readiness. Many companies had to quickly implement technological infrastructure to support remote connectivity, often without established policies or training. (Waizenegger et al., 2020). Employees faced the dual challenges of adapting to new work environments and simultaneously managing personal stressors related to the pandemic (Carnevale & Hatak, 2020).

Despite initial hurdles, many organizations observed that remote work did not significantly hinder productivity. Some organizations reported improvements due to factors like reduced commuting time and increased schedule flexibility (Ozimek, 2020). The prolonged duration of the pandemic led to a reevaluation of work practices, with a growing acceptance of remote work as a viable long-term arrangement (Savić, 2020).

Relevance to the Tech Industry

The tech industry stands at the forefront of remote work adoption, given its foundational alignment with digital innovation and virtual collaboration. Before the pandemic, tech companies were among the early adopters of flexible work arrangements, leveraging technology to support distributed teams (Messenger, 2019). The industry's workforce is often proficient with digital tools and agile methodologies that facilitate remote collaboration (Ford et al., 2021).

During the COVID-19 crisis, the tech industry demonstrated resilience and adaptability in transitioning to fully remote operations. Many prominent tech companies announced permanent shifts to remote or hybrid work models, reflecting confidence in maintaining productivity outside of traditional office settings (Kelly, 2020). Additionally, the industry's familiarity with cloud services, project management software, and virtual communication platforms enabled a smoother transition compared to other sectors (Spataro, 2020).

Theoretical Frameworks

Understanding the impact of remote work on employee productivity necessitates an examination of underlying theoretical frameworks. This examination also includes remote work frameworks that explain the dynamics between remote working conditions and productivity outcomes.

Job Characteristics Model

The Job Characteristics Model (JCM) identifies five core job dimensions that influence critical psychological states and, subsequently, work outcomes like motivation and productivity: skill variety, task identity, task significance, autonomy, and feedback (Hackman & Oldham, 1976). Remote work can enhance autonomy by giving employees more control over how and when they complete their tasks (Gajendran & Harrison, 2007). However, it may impede timely feedback due to communication delays, potentially affecting employees' ability to assess their performance accurately (Staples, 2001). Adjusting job design to accommodate remote work can mitigate these challenges by ensuring that employees continue to experience meaningfulness, responsibility, and knowledge of results in their roles.

Media Richness Theory

Media Richness Theory posits that communication effectiveness depends on the richness of the media used, which is determined by its capacity to convey information and facilitate understanding (Daft & Lengel, 1986). Face-to-face communication is considered the richest medium, while emails and memos are less rich. Remote work often relies on leaner media, which can lead to misunderstandings and reduced collaboration if not managed properly (Kirkman et al., 2002).

To counteract this, organizations can employ richer media tools such as video conferencing and collaborative platforms that simulate in-person interactions (Martins et al., 2004). This approach enhances the quality of communication and supports team cohesion in a virtual environment.

Transactional Distance Theory

Originally developed in the context of distance education, Transactional Distance Theory addresses the psychological and communication space between individuals separated by physical distance (Moore, 1993). In remote work settings, increased transactional distance can lead to feelings of isolation and disengagement, adversely affecting productivity. Reducing transactional distance involves increasing dialogue and decreasing structure to enhance autonomy and engagement (Saba & Shearer, 1994). Managers can apply this theory by promoting open communication channels and flexible work practices that accommodate individual employee needs (Hartman et al., 2015).

Job Demands-Resources Model

The Job Demands-Resources Model posits that job demands, which are physical, psychological, social, or organizational aspects of a job that require sustained effort, can lead to strain. In contrast, job resources, which are aspects that help achieve work goals, reduce demands, or stimulate growth, can buffer the impact of demands on stress and burnout (Demerouti et al., 2001).

Remote work can alter both job demands and resources. For instance, remote employees might face increased demands due to blurred work-life boundaries and feelings of always being "on" (Derks et al., 2014). Conversely, resources such as flexibility and a comfortable home environment can enhance well-being and productivity (Bakker et al., 2007). Balancing demands and resources is crucial to optimizing remote work outcomes.

Adaptive Structuration Theory

Adaptive Structuration Theory (AST) examines how groups use advanced technologies and the structures that emerge from their use (DeSanctis & Poole, 1994). In remote work, technology becomes a central medium through which work is coordinated and completed. AST suggests that the way employees appropriate technology affects group outcomes. Proper training and shared norms around technology use can lead to more effective collaboration and productivity (Majchrzak et al., 2000). Misalignments, however, can cause confusion and inefficiencies.

Work-Life Boundary Management Theory

This theory explores how individuals manage the boundaries between work and personal life (Clark, 2000). Remote work often blurs these boundaries, making it challenging to disconnect from work responsibilities (Ashforth et al., 2000). Employees adopt different strategies ranging from segmentation to integration, blending work and personal life, based on personal preferences and job requirements (Kossek et al., 2012). Understanding these preferences is essential for organizations to support employees in managing boundaries effectively, thereby reducing stress and enhancing productivity (Bulger et al., 2007).

Synthesis of Theoretical Perspectives

Integrating these theories provides a multifaceted understanding of how remote work influences employee productivity. Motivation theories highlight the importance of fulfilling psychological needs and providing meaningful work. Remote work frameworks emphasize the role of technology, communication, and boundary management in shaping the remote work experience.

Organizations can leverage these insights by designing remote work policies that enhance autonomy, provide adequate resources, and promote effective communication. By addressing both individual and organizational factors, companies can create an environment conducive to high productivity in remote settings.

Empirical Studies on Remote Work and Productivity

Summary of Key Findings from Previous Studies

Empirical research on remote work and its impact on employee productivity has produced mixed results, highlighting various factors that influence outcomes. Early studies in the 1990s and 2000s provided foundational insights into how remote work arrangements affect productivity.

A meta-analysis examined 46 studies and found that telecommuting is associated with modest but beneficial effects on perceived autonomy, work-family conflict, job satisfaction, performance, turnover intent, and stress. Specifically, remote work was positively related to improved performance due to increased autonomy and reduced work-family conflict (Gajendran & Harrison, 2007).

A group of researchers conducted a randomized controlled trial with a Chinese travel agency, Ctrip, to assess the productivity impact of working from home. The study found that employees working from home exhibited a 13% performance increase compared to their office-based counterparts. This improvement was attributed to fewer breaks, fewer sick days, and a more comfortable work environment (Bloom et al., 2015).

However, other studies have pointed out potential downsides. One such study explored how the extent of telecommuting influences job satisfaction and found that moderate levels of telecommuting can enhance job satisfaction, but excessive remote work may lead to feelings of isolation, which can negatively impact productivity. (Golden & Veiga, 2005). Moreover, another study highlighted that remote workers might experience increased stress and pressure due to the blurring of work-life boundaries (Mann & Holdsworth, 2003).

Additionally, another study provided a comprehensive review of telecommuting research and concluded that while remote work can offer flexibility and reduce work-life conflict, its impact on productivity is contingent upon factors such as job type, individual preferences, and organizational support (Allen et al., 2015). Research has also considered the role of technology. A group of researchers noted that effective use of communication technologies is crucial for maintaining productivity in remote work settings. They emphasized that organizations need to invest in reliable technological infrastructure and provide training to ensure employees can collaborate effectively from remote locations (Belanger et al., 2001).

Another study investigated the environmental and productivity benefits of teleworking in a European context. They found that remote work can lead to productivity gains when employees have suitable home offices and when organizational policies support flexible work arrangements (Coenen & Kok, 2014).

Specific Studies Focusing on the Tech Industry

The tech industry, with its inherent reliance on digital tools and a workforce adept at using them, provides a unique context for examining the effects of remote work on productivity. One study analyzed data from a large software development company that implemented a remote work policy. The researchers found that remote developers were just as productive as their in-office peers, and in some cases, productivity increased due to fewer interruptions and a more flexible work schedule (Battiston et al., 2017).

Similarly, another group conducted a study on a global tech company's workforce that shifted to "work-from-anywhere" arrangements. The study found that productivity, measured through code commits and project completion rates, increased by 4.4% among remote engineers. The authors attributed this to enhanced autonomy and the ability to work during peak personal productivity times (Choudhury et al., 2021).

To provide additional context on productivity gains, another study examined the impact of remote work on software engineers during the COVID-19 pandemic. Using data from GitHub repositories, they observed an initial decrease in productivity due to the sudden transition but noted a recovery over time as employees adapted to the new work environment and organizations improved remote work practices (Yang et al., 2021). In a similar study, another group studied the effects of remote work on a tech company's productivity during the pandemic. They found that while the quantity of work output remained stable, the quality of work improved slightly. However, employees reported longer working hours and increased collaboration time, suggesting a potential risk of burnout (Gibbs et al., 2021).

Conversely, another study highlighted challenges in remote collaboration within tech teams. Their research indicated that remote workers might face difficulties in spontaneous communication and knowledge sharing, which are critical in creative and innovative tasks common in the tech industry (Bernstein et al., 2018).

Synthesis of Empirical Findings
The empirical evidence suggests that remote work can have a positive impact on productivity, particularly when supported by appropriate technological tools and organizational policies. In the tech industry, where employees are familiar with digital collaboration platforms, the transition to remote work may be smoother, potentially leading to productivity gains.

However, the studies also caution against potential pitfalls such as increased working hours, risk of burnout, and challenges in collaborative tasks that require high levels of spontaneous interaction. Organizational support, including clear communication channels, team-building activities, and resources for maintaining work-life balance, is crucial to harness the benefits of remote work in the tech sector.

Implications for the Tech Industry
The tech industry has been at the forefront of remote work adoption due to its digital nature and flexible work culture (Hern, 2020). This shift has implications for talent acquisition, as tech companies can now recruit globally, increasing competition for skilled professionals (Ozimek, 2020).

The industry faces challenges in maintaining innovation and collaboration in remote settings, as spontaneous interactions and team dynamics are harder to replicate virtually (Ford et al., 2021). Some tech companies are investing in advanced collaboration platforms and virtual reality technologies to enhance remote teamwork. (Alexander et al., 2021). The pandemic has solidified the tech industry's position as a key enabler of the modern economy and a catalyst for future workplace evolution (Richter, 2020).

3. Methodology

Research Design & Justification
This study employs a quantitative research design to examine changes in employee productivity within the tech industry following the transition to remote work. This design enables the statistical assessment of productivity levels before and after the shift to remote work among tech professionals. The quantitative method allows for objective measurement and analysis of data, facilitating the identification of trends and patterns in productivity changes. By focusing on quantitative data, the study provides empirical evidence of significant differences in productivity associated with remote work arrangements.

Alignment with Research Objectives
The quantitative design aligns with the study's objectives by:

Investigating Changes in Employee Productivity: Collecting numerical data on self-reported productivity levels before and after transitioning to remote work enables statistical comparisons to determine significant changes.
Identifying Factors that Enhance or Hinder Productivity: Gathering data through multiple-choice questions about factors influencing productivity allows for the analysis of prevalent positive and negative influences in a remote work context.
Providing Managerial Recommendations: Quantitative findings offer evidence-based insights that can inform managerial strategies to optimize remote work practices and enhance employee productivity.

Sampling Techniques
Target Population: The target population consists of full-time tech industry professionals in the United States who transitioned from in-office to remote work due to the COVID-19 pandemic. This includes individuals employed in roles such as software development, information technology support, data analysis, project management, and other technology-related positions. Focusing on this population is essential because tech professionals are well-equipped to provide insights into remote work productivity, given their familiarity with digital tools and platforms (Ford et al., 2021).

Sampling Method: A convenience sampling method was utilized, recruiting participants through Amazon Mechanical Turk (MTurk), a widely used online crowdsourcing platform for research data collection. (Buhrmester et al., 2011). MTurk enables quick access to a diverse pool of participants, making it suitable for studies requiring specific respondent criteria.

Participant Screening and Qualification
To ensure that the sample accurately reflected the target population, the following screening measures were implemented:

Inclusion Criteria:
- Reside in the United States.
- Employed full-time in the tech industry.
- Transitioned from in-office to remote work.

Sample Size
Aiming for statistical validity at a 90% confidence level with a ±5% margin of error, the minimum target sample size was set at 214 respondents. (Cochran, 1977). This adjustment balances the need for reliable data with practical considerations, such as time and resource constraints. To account for potential incomplete responses or non-compliance with screening criteria, the survey was distributed to 300 screened MTurk workers. The final sample consisted of 295 participants who met all inclusion criteria and completed the survey satisfactorily.

Limitations and Mitigation Strategies
While MTurk offers numerous advantages, certain limitations associated with convenience sampling must be acknowledged:
Generalizability: The MTurk worker population may not fully represent the broader tech industry, potentially affecting the external validity of the findings (Walter et al., 2019).
Self-Selection Bias: Participants who choose to complete MTurk tasks might differ systematically from those who do not use the platform, introducing bias (Chandler et al., 2014).

To address these limitations and enhance data quality, the following strategies were employed:
Rigorous Screening: Implemented strict inclusion criteria and attention checks to ensure participants met the study requirements.
Fair Compensation: Provided compensation at or above the recommended rate for MTurk tasks to encourage thoughtful participation and reduce dissatisfaction (Hara et al., 2018).

Data Collection
The survey was designed to be concise yet comprehensive, focusing on key aspects related to productivity changes and influencing factors in remote work settings among tech industry professionals.

Survey Structure
The survey consisted of the following sections:

Pre-Survey Screening: Confirmed participants met the inclusion criteria.
Section 1: Productivity Before Remote Work
Participants rated their overall productivity before transitioning to remote work using a five-point Likert scale ranging from "Very Low" to "Very High."

Section 2: Productivity After Remote Work
Participants rated their overall productivity after transitioning to remote work using the same five-point scale.

Section 3: Factors Influencing Productivity
Participants selected the factor that had the most significant impact on their productivity while working remotely from a list of options:
- Reduced commuting time

- Enhanced work-life balance
- Difficulty in maintaining work-home boundaries
- Internet connectivity issues
- Increased flexibility in working hours
- Other

Data Collection Procedure
The survey was made available on MTurk for one week, allowing ample time for participation.
Attention check questions were embedded within the survey to identify inattentive or random responses.
Measures were taken to prevent duplicate responses and identify fraudulent activity by monitoring IP addresses and analyzing completion times.

Ethical Considerations
The study adhered to ethical guidelines as stipulated by the American Psychological Association. (A.P.A., 2017). Informed consent was obtained electronically from all participants before beginning the survey. Participants were informed about:
The purpose of the study.
The nature of their participation.
Confidentiality and anonymity were assured by not collecting personally identifiable information and by securely storing the data on password-protected devices.

Data Handling
Coding: Responses were coded numerically for analysis, with productivity ratings assigned values from 1 ("Very Low") to 5 ("Very High").
Data Cleaning: Reviewed response patterns for inconsistencies or rapid completion times that might indicate low engagement or fraudulent activity.

Statistical Analysis
Data was analyzed using statistical software to perform:
Descriptive Statistics
Summarized the distribution of productivity ratings and frequencies of factors influencing productivity.
Inferential Statistics:
Wilcoxon Signed-Rank Test: To determine whether the observed changes in productivity levels are statistically significant, a Wilcoxon Signed-Rank Test was conducted on the productivity ratings before and after the transition.
Effect Size Calculation: To assess the magnitude of the change, after the Wilcoxon Signed-Rank Test was conducted, an effect size was calculated.
Chi-Square Tests: Used to examine associations between the categorical variables, influencing productivity and productivity levels.

4. Results

The results analyze self-reported productivity levels before and after the transition and identify key factors influencing productivity in a remote work setting.

Descriptive Statistics
Productivity Levels Before Transitioning to Remote Work
Participants rated their overall productivity before shifting to remote work using a five-point Likert scale: Very Low (1), Low (2), Moderate (3), High (4), and Very High (5). The distribution of responses is summarized in Table 1.

Table 1: Self-Reported Productivity Levels Before Transitioning to Remote Work

Productivity Level	Frequency	Percentage (%)
Very Low (1)	2	0.7
Low (2)	47	15.9
Moderate (3)	132	44.7
High (4)	84	28.5
Very High (5)	30	10.2
Total	**295**	**100**

Key Observations:
Moderate Productivity was the most common rating, reported by 44.7% of participants.
High Productivity was reported by 28.5% of respondents.
These results suggest that before the transition to remote work, the majority of tech professionals perceived their productivity to be between moderate and high.

Productivity Levels After Transitioning to Remote Work: After transitioning to remote work, participants reassessed their productivity using the same scale. The distribution of responses is shown in Table 2.

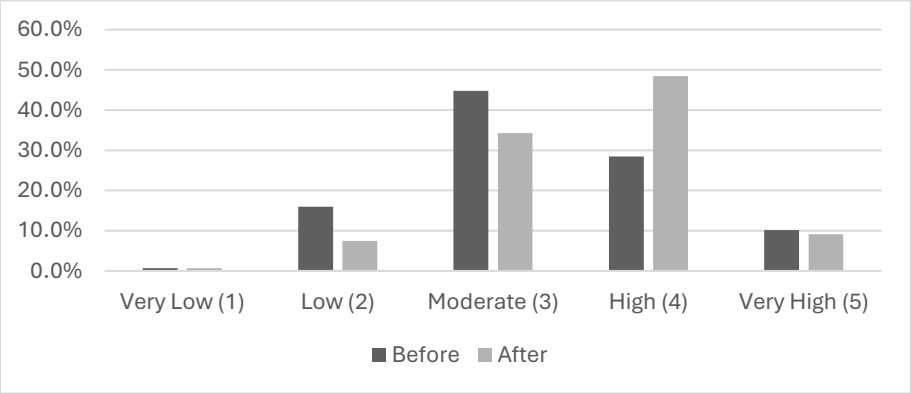
Table 2: Self-Reported Productivity Levels After Transitioning to Remote Work

Productivity Level	Frequency	Percentage (%)
Very Low (1)	2	0.7
Low (2)	22	7.5
Moderate (3)	101	34.2
High (4)	143	48.5
Very High (5)	27	9.2
Total	**295**	**100**

Key Observations:
High Productivity increased significantly to 48.5% of participants from 28.5%
Moderate Productivity decreased to 34.2% from 44.6%
Low Productivity decreased to 7.5% from 15.9%
These findings indicate an overall improvement in self-reported productivity levels following the transition to remote work.

Comparison of Productivity Levels Before and After Transition: A comparison of productivity levels before & after transitioning to remote work is illustrated in Figure 1.

Figure 1: Comparison of Productivity Levels Before and After Remote Work Transition



Interpretation:
Increase in High Productivity: The proportion of participants reporting **High Productivity** increased from 28.5% to 48.5%.
Decrease in Low Productivity: The proportion reporting **Low Productivity** decreased from 15.9% to 7.5%.
Shift from Moderate to High Productivity: There was a notable shift of participants from the **Moderate** category to the **High** category.
Stability in Extremes: The percentages for **Very Low** and **Very High Productivity** remained relatively unchanged.

Inferential Statistics
Assessing the Significance of Productivity Changes
To determine whether the observed changes in productivity levels are statistically significant, a Wilcoxon Signed-Rank Test was conducted on the productivity ratings before and after the transition.
Results of Wilcoxon Signed-Rank Test:
Number of Paired Observations (n): 295
Sum of Ranks (W): 14,325
z-score: -4.85
p-value: < 0.001

Interpretation: The test results indicate a statistically significant increase in productivity levels after transitioning to remote work ($p < 0.001$). The negative z-score reflects that the ranks of productivity after remote work are generally higher than before. This suggests that the shift to remote work is associated with a meaningful improvement in self-reported productivity.

Assessing the Magnitude of Productivity Changes
To determine whether the observed changes in productivity levels are statistically significant and to assess the magnitude of this change, after the Wilcoxon Signed-Rank Test was conducted, an effect size was calculated.
Number of Paired Observations (N): 295
Sum of Ranks (W): 14,325
Z-score: -4.85
p-value: < 0.001
Effect Size Calculation: r = -4.85 / sqrt(295) = -4.85 / 17.175 ≈ -0.282

Interpretation:
The test results indicate a statistically significant increase in productivity levels after transitioning to remote work ($p < 0.001$). The effect size ($r \approx 0.282$) suggests a moderate practical significance of the productivity increase.
While the Wilcoxon Signed-Rank Test revealed a statistically significant increase in productivity levels after transitioning to remote work, the calculation of the effect size provides insight into the practical significance of this change. Statistical significance indicates that the observed effect is unlikely due to chance alone, while practical significance assesses the real-world impact or importance of the effect. In this study, an effect size of 0.282 in magnitude suggests a moderate practical significance, meaning that the increase in productivity is meaningful and impactful in the context of tech industry professionals' work performance.

Factors Influencing Productivity
Participants identified the factor that had the most significant impact on their productivity while working remotely. The responses are summarized in Table 3.

Table 3: Factors Influencing Productivity While Working Remotely

Factor	Frequency	Percentage (%)
Reduced Commuting Time	23	7.8
Enhanced Work-Life Balance	67	22.6
Difficulty in Maintaining Work-Home Boundaries	69	23.3

Internet Connectivity Issues	64	21.6
Increased Flexibility in Working Hours	64	21.6
Other	8	2.7
Total	**295**	**100**

Key Observations:
Positive Influences:
Enhanced Work-Life Balance: Reported by 22.6% of participants.
Increased Flexibility in Working Hours: Reported by 21.6%.
Reduced Commuting Time: Cited by 7.8%.

Negative Influences:
Difficulty in Maintaining Work-Home Boundaries: Reported by 23.3%.
Internet Connectivity Issues: Reported by 21.6%.

Interpretation:
The positive factors are significantly associated with higher productivity levels. **Enhanced Work-Life Balance** and **Increased Flexibility** are significant positive factors that contribute to higher productivity.
The negative factors are associated with lower productivity levels. **Difficulty in Maintaining Work-Home Boundaries** and **Internet Connectivity Issues** are significant challenges that can hinder productivity.
The impact of **Reduced Commuting Time** is positive but less influential compared to other factors.

Relationship Between Factors and Productivity Levels
A Chi-Square Test of Independence was used to examine the relationship between the factors influencing productivity and the productivity levels reported by participants. This test is appropriate for determining if there is a significant association between two categorical variables.

Chi-Square Test Results:
Chi-Square Statistic (χ^2): 46.12
Degrees of Freedom (df): 20
p-value: < 0.001

Interpretation: There is a significant association between the factors influencing productivity and self-reported productivity levels ($p < 0.001$). Participants who reported positive factors were more likely to have higher productivity ratings. Participants who reported negative factors were more likely to have lower productivity ratings. This underscores the impact of these factors on productivity in a remote work setting.

Summary of Findings

- The Wilcoxon Signed-Rank Test confirmed a statistically significant increase in productivity after transitioning to remote work.
- The effect size indicates a moderate improvement in productivity levels, underscoring the practical significance of the findings.
- The Chi-Square Test confirmed the relationship between the factors influencing productivity and self-reported productivity levels. Participants who reported positive factors were more likely to have higher productivity ratings. Participants who reported negative factors were more likely to have lower productivity ratings.

These results suggest that remote work arrangements positively and meaningfully affect productivity among US-based tech industry professionals.

Discussion

Interpretation of Results in Context

The findings of this study indicate a statistically significant and moderately impactful increase in self-reported productivity levels among tech industry professionals after transitioning to remote work. This aligns with prior research suggesting that remote work can enhance productivity due to factors such as flexible scheduling and reduced commuting time (Allen et al., 2015; Bloom et al., 2015). Specifically, the significant increase from 28.5% to 48.5% of participants reporting High Productivity mirrors studies that have found remote work arrangements contribute to higher job performance and satisfaction (Gajendran & Harrison, 2007).

The identified positive factors—Enhanced Work-Life Balance and Increased Flexibility in Working Hours—are consistent with the literature emphasizing the benefits of remote work in improving employees' work-life integration and autonomy (Kossek et al., 2012).

Implications for Practice

The results suggest that organizations in the tech industry could harness the benefits of remote work to improve employee productivity. By promoting policies that enhance work-life balance and provide flexibility, employers can capitalize on the positive aspects of remote work. Additionally, addressing the identified challenges—such as establishing clear work-home boundaries and ensuring employees have access to reliable internet connectivity—can mitigate factors that hinder productivity.

Limitations of the Study

Sample Size: While the study achieved a sample size of 295 participants, which is adequate for analysis, a larger sample could provide more robust and generalizable results. Future studies might aim for a more extensive sample to enhance the reliability of the findings.
Response Bias: As the data were collected through self-reported surveys, there is a possibility of response bias. Participants may have overestimated their productivity levels due to social desirability or underreported challenges, potentially skewing the results.
Focus on Tech Industry: The study exclusively targeted professionals within the tech industry. As a result, the findings may not apply to other sectors with different work dynamics and productivity drivers.
Timeframe of Study: The survey was conducted at a point in time after the COVID-19 pandemic, which may have influenced participants' experiences and perceptions of remote work. Longitudinal studies are necessary to assess whether these findings hold over time and as remote work becomes a more established norm.

5. Conclusion

The findings of this study indicate that remote work has a generally positive effect on productivity among US-based tech industry professionals. Enhanced work-life balance and increased flexibility in working hours are key factors contributing to this improvement. However, challenges such as difficulty in maintaining work-home boundaries and internet connectivity issues can hinder productivity. Organizations should focus on strategies that amplify the positive aspects of remote work while mitigating the negative ones to sustain and further enhance employee productivity.

Organizations should consider offering or continuing to offer remote work to enhance employee productivity for tech industry professionals. Providing guidance on establishing work-home boundaries may help employees maintain focus and reduce stress. Addressing technical challenges such as internet connectivity may mitigate productivity losses.

The adoption of remote work is likely to persist beyond the temporary necessity brought about by the COVID-19 pandemic. The positive impact on productivity observed in this study suggests that remote work can be a viable long-term arrangement for tech professionals, provided that organizations address the accompanying challenges effectively. Embracing flexibility and supporting work-life balance can lead to sustained productivity gains, while proactive measures to maintain clear work-home boundaries and ensure reliable technology infrastructure are essential to overcoming potential obstacles. As remote work becomes embedded in organizational practices, ongoing research will be vital to understanding its long-term effects and guiding best practices for its future.

Recommendations

Implications for Organizations and Future Research: The lack of focused research hampers organizations in the tech industry from making informed decisions regarding remote work policies and practices. Without a clear understanding of how remote work affects productivity and which management approaches are most effective, companies may face decreased performance, employee dissatisfaction, and competitive disadvantages (Olson & Olson, 2014).

Future research should aim to fill these gaps by conducting in-depth studies that:

- Consider longitudinal studies to track productivity changes over an extended period. This approach would provide insights into whether the initial productivity gains observed in this study are sustained, increased, or diminished over time as employees and organizations adapt to remote work arrangements.
- Explore a broader range of factors that may influence productivity in remote work settings. Factors such as team collaboration tools, organizational culture, individual personality traits, and the role of leadership could provide a more comprehensive picture of what drives productivity in remote environments.
- Examine Productivity Metrics: Develop and utilize metrics that accurately reflect productivity in remote tech work, considering both quantitative output and qualitative factors such as innovation and collaboration effectiveness.
- Identify Effective Management Practices: Investigate management strategies that successfully address the challenges of remote work in tech, including communication methods, team building, performance evaluation, and employee well-being initiatives.
- Assess Long-Term Effects: Conduct longitudinal studies to understand the enduring impacts of remote work on productivity, job satisfaction, and organizational culture in the tech sector.
- By addressing these research gaps, scholars can provide valuable insights that help tech organizations optimize remote work arrangements, enhance employee experiences, and maintain high levels of productivity in a post-pandemic world.

References

Alexander, A., Smet, A., Langstaff, M., & Ravid, D. (2021). *What employees are saying about the future of remote work*? McKinsey & Company. https://www.mckinsey.com/business-functions/organization/our-insights/what-employees-are-saying-about-the-future-of-remote-work

Allen, T. D., Golden, T. D., & Shockley, K. M. (2015). How effective is telecommuting? Assessing the status of our scientific findings. *Psychological Science in the Public Interest*, *16*(2), 40–68. https://doi.org/10.1177/1529100615593273

A.P.A. (2017). *Ethical Principles of Psychologists and Code of Conduct*. American Psychological Association. https://www.apa.org/ethics/code/

Ashforth, B. E., Kreiner, G. E., & Fugate, M. (2000). All in a day's work: Boundaries and micro role transitions. *Academy of Management Review*, *25*(3), 472–491. https://doi.org/10.5465/amr.2000.3363315

Bakker, A. B., Demerouti, E., & Verbeke, W. (2007). Using the job demands-resources model to predict burnout and performance. *Human Resource Management*, *43*(1), 83–104. https://doi.org/10.1002/hrm.20004

Battiston, D., Vidal, J., & Kirchmaier, T. (2017). Is distance dead? Face-to-face communication and productivity in teams. *Centre for Economic Performance Discussion Paper*, *1465*. https://cep.lse.ac.uk/pubs/download/dp1465.pdf

Belanger, F., Collins, R. W., & Cheney, P. H. (2001). Technology requirements and work group communication for telecommuters. *Information Systems Research*, *12*(2), 155–176. https://doi.org/10.1287/isre.12.2.155.9699

Bernstein, E., Shore, J., & Lazer, D. (2018). How intermittent breaks in interaction improve collective intelligence. *Proceedings of the National Academy of Sciences*, *115*(35), 8734–8739. https://doi.org/10.1073/pnas.1802407115

Bloom, N., Liang, J., Roberts, J., & Ying, Z. J. (2015). Does working from home work? Evidence from a Chinese experiment. *The Quarterly Journal of Economics*, *130*(1), 165–218. https://doi.org/10.1093/qje/qju032

Buhrmester, M., Kwang, T., & Gosling, S. D. (2011). Amazon's Mechanical Turk: A New Source of Inexpensive, Yet High-Quality, Data? *Perspectives on Psychological Science*, *6*(1), 3–5. https://doi.org/10.1177/1745691610393980

Bulger, C. A., Matthews, R. A., & Hoffman, M. E. (2007). Work and personal life boundary management: Boundary strength, work/personal life balance, and the segmentation-integration continuum. *Journal of Occupational Health Psychology*, *12*(4), 365–375. https://doi.org/10.1037/1076-8998.12.4.365

Carnevale, J. B., & Hatak, I. (2020). Employee adjustment and well-being in the era of COVID-19: Implications for human resource management. *Journal of Business Research*, *116*, 183–187. https://doi.org/10.1016/j.jbusres.2020.05.037

Chandler, J., Mueller, P., & Paolacci, G. (2014). Nonnaïveté among Amazon Mechanical Turk workers: Consequences and solutions for behavioral researchers. *Behavior Research Methods*, *46*(1), 112–130. https://doi.org/10.3758/s13428-013-0365-7

Choudhury, P., Foroughi, C., & Larson, B. (2021). Work-from-anywhere: The productivity effects of geographic flexibility. *Strategic Management Journal*, *42*(4), 655–683. https://doi.org/10.1002/smj.3251

Clark, S. C. (2000). Work/family border theory: A new theory of work/family balance. *Human Relations*, *53*(6), 747–770. https://doi.org/10.1177/0018726700536001

Cochran, W. G. (1977). *Sampling techniques* (3rd ed.). Wiley.

Coenen, M., & Kok, R. A. W. (2014). Workplace flexibility and new product development performance: The role of telework and flexible work schedules. *European Management Journal*, *32*(4), 564–576. https://doi.org/10.1016/j.emj.2013.12.003

CompTIA. (2020). *Cyberstates 2020* [Research Report]. https://connect.comptia.org/content/research/cyberstates-2020

Contreras, F., Baykal, E., & Abid, G. (2020). E-leadership and teleworking in times of COVID-19 and beyond: What we know and where do we go. *Frontiers in Psychology*, *11*. https://doi.org/10.3389/fpsyg.2020.590271

Daft, R. L., & Lengel, R. H. (1986). Organizational information requirements, media richness and structural design. *Management Science*, *32*(5), 554–571. https://doi.org/10.1287/mnsc.32.5.554

Demerouti, E., Bakker, A. B., Nachreiner, F., & Schaufeli, W. B. (2001). The job demands-resources model of burnout. *Journal of Applied Psychology*, *86*(3), 499–512. https://doi.org/10.1037/0021-9010.86.3.499

Derks, D., Mierlo, H., & Schmitz, E. B. (2014). A diary study on work-related smartphone use, psychological detachment and exhaustion: Examining the role of the perceived segmentation norm. *Journal of Occupational Health Psychology*, *19*(1), 74–84. https://doi.org/10.1037/a0035076

DeSanctis, G., & Poole, M. S. (1994). Capturing the complexity in advanced technology use: Adaptive structuration theory. *Organization Science*, *5*(2), 121–147. https://doi.org/10.1287/orsc.5.2.121

Ford, D., Storey, M. A., Zimmermann, T., Bird, C., Jaffe, S., Maddila, C., & Butler, J. (2021). A tale of two cities: Software developers working from home during the COVID-19 pandemic. *ACM Transactions on Software Engineering and Methodology*, *31*(2), 1–37. https://doi.org/10.1145/3487567

Gajendran, R. S., & Harrison, D. A. (2007). The good, the bad, and the unknown about telecommuting: Meta-analysis of psychological mediators and individual consequences. *Journal of Applied Psychology*, *92*(6), 1524–1541. https://doi.org/10.1037/0021-9010.92.6.1524

Gibbs, M., Mengel, F., & Siemroth, C. (2021). *Work from home & productivity: Evidence from personnel & analytics data on IT professionals*. University of Chicago, Becker Friedman Institute for Economics Working Paper No. https://doi.org/10.2139/ssrn.3846680

Golden, T. D., & Veiga, J. F. (2005). The impact of extent of telecommuting on job satisfaction: Resolving inconsistent findings. *Journal of Management*, *31*(2), 301–318. https://doi.org/10.1177/0149206304271768

Hackman, J. R., & Oldham, G. R. (1976). Motivation through the design of work: Test of a theory. *Organizational Behavior and Human Performance*, *16*(2), 250–279. https://doi.org/10.1016/0030-5073(76)90016-7

Hara, K., Adams, A., Milland, K., Savage, S., Callison-Burch, C., & Bigham, J. P. (2018). A data-driven analysis of workers' earnings on Amazon Mechanical Turk. *Proceedings of the 2018 CHI Conference on Human Factors in Computing Systems*, *449*, 1–14. https://doi.org/10.1145/3173574.3174023

Hartman, R. I., Stoner, C. R., & Arora, R. (2015). Developing successful organizational telecommuting arrangements: Worker perceptions and managerial prescriptions. *SAM Advanced Management Journal*, *80*(3), 38–50.

Hern, A. (2020). Twitter announces employees will be allowed to work from home "forever." *The Guardian*. https://www.theguardian.com/technology/2020/may/12/twitter-announces-employees-can-work-from-home-forever

Huws, U., Korte, W. B., & Robinson, S. (1990). *Telework: Towards the elusive office*. John Wiley & Sons.

Kelly, J. (2020). Facebook and Twitter employees will work from home for the rest of the year. *Forbes*. https://www.forbes.com/sites/jackkelly/2020/05/08/facebook-and-twitter-employees-will-work-from-home-for-the-rest-of-the-year

Kirkman, B. L., Rosen, B., Gibson, C. B., Tesluk, P. E., & McPherson, S. O. (2002). Five challenges to virtual team success: Lessons from Sabre, Inc. *Academy of Management Executive*, *16*(3), 67–79. https://doi.org/10.5465/ame.2002.8540322

Kniffin, K. M., Narayanan, J., Anseel, F., Antonakis, J., Ashford, S. P., Bakker, A. B., & Vugt, M. V. (2021). COVID-19 and the workplace: Implications, issues, and insights for future research and action. *American Psychologist*, *76*(1), 63–77. https://doi.org/10.1037/amp0000716

Kossek, E. E., Lautsch, B. A., & Eaton, S. C. (2012). Telecommuting, control, and boundary management: Correlates of policy use and practice, job control, and work-family effectiveness. *Journal of Vocational Behavior*, *80*(2), 347–358. https://doi.org/10.1016/j.jvb.2011.08.011

Majchrzak, A., Rice, R. E., Malhotra, A., King, N., & Ba, S. (2000). Technology adaptation: The case of a computer-supported inter-organizational virtual team. *MIS Quarterly*, *24*(4), 569–600. https://doi.org/10.2307/3250948

Mann, S., & Holdsworth, L. (2003). The psychological impact of teleworking: Stress, emotions and health. *New Technology, Work and Employment*, *18*(3), 196–211. https://doi.org/10.1111/1468-005X.00121

Martins, L. L., Gilson, L. L., & Maynard, M. T. (2004). Virtual teams: What do we know and where do we go from here? *Journal of Management*, *30*(6), 805–835. https://doi.org/10.1016/j.jm.2004.05.002

Mazmanian, M., Orlikowski, W. J., & Yates, J. (2013). The autonomy paradox: The implications of mobile email devices for knowledge professionals. *Organization Science*, *24*(5), 1337–1357. https://doi.org/10.1287/orsc.1120.0806

Messenger, J. C. (2019). *Telework in the 21st century: An evolutionary perspective*. Edward Elgar Publishing.

Messenger, J. C., & Gschwind, L. (2016). Three generations of telework: New ICTs and the (r)evolution from home office to virtual office. *New Technology, Work and Employment*, *31*(3), 195–208. https://doi.org/10.1111/ntwe.12073

Moore, M. G. (1993). Theory of transactional distance. In D. Keegan (Ed.), *Theoretical principles of distance education* (pp. 22–38). Routledge.

Nilles, J. M. (1975). Telecommunications and organizational decentralization. *IEEE Transactions on Communications*, *23*(10), 1142–1147. https://doi.org/10.1109/TCOM.1975.1092687

Oakman, J., Kinsman, N., Stuckey, R., Graham, M., & Weale, V. (2020). A rapid review of mental and physical health effects of working at home: How do we optimize health? *BMC Public Health*, *20*(1). https://doi.org/10.1186/s12889-020-09875-z

Olson, G. M., & Olson, J. S. (2014). How to make distance work work. *Interactions*, *21*(2), 28–35. https://doi.org/10.1145/2567788

Olson, M. H., & Primps, S. B. (1984). Working at home with computers: Work and nonwork issues. *Journal of Social Issues*, *40*(3), 97–112. https://doi.org/10.1111/j.1540-4560.1984.tb00194.x

Ozimek, A. (2020). *The future of remote work*. Economics Working Paper. https://doi.org/10.2139/ssrn.3638597

Richter, A. (2020). Locked-down digital work. *International Journal of Information Management*, *55*, 102157. https://doi.org/10.1016/j.ijinfomgt.2020.102157

Saba, F., & Shearer, R. L. (1994). Verifying key theoretical concepts in a dynamic model of distance education. *The American Journal of Distance Education*, *8*(1), 36–59. https://doi.org/10.1080/08923649409526844

Savić, D. (2020). COVID-19 and work from home: Digital transformation of the workforce. *Grey Journal*, *16*(2), 101–104.

Spataro, J. (2020). *2 years of digital transformation in 2 months. Microsoft 365 Blog* [Blog]. Microsoft 365. https://www.microsoft.com/en-us/microsoft-365/blog/2020/04/30/2-years-digital-transformation-2-months/

Staples, D. S. (2001). A study of remote workers and their differences from non-remote workers. *Journal of End User Computing*, *13*(2), 3–14. https://doi.org/10.4018/joeuc.2001040101

Waizenegger, L., McKenna, B., Cai, W., & Bendz, T. (2020). An affordance perspective of team collaboration and enforced working from home during COVID-19. *European Journal of Information Systems*, *29*(4), 429–442. https://doi.org/10.1080/0960085X.2020.1800417

Walter, S. L., Seibert, S. E., Goering, D., & O'Boyle, E. H. (2019). A tale of two sample sources: Do results from online panel data and conventional data converge? *Journal of Business and Psychology*, *34*(4), 425–452. https://doi.org/10.1007/s10869-018-9552-y

Wang, B., Liu, Y., Qian, J., & Parker, S. K. (2021). Achieving effective remote working during the COVID-19 pandemic: A work design perspective. *Applied Psychology*, *70*(1), 16–59. https://doi.org/10.1111/apps.12290

World Health Organization. (2020). *WHO Director-General's opening remarks at the Mission briefing on COVID-19—12 March 2020*. https://www.who.int/director-general/speeches/detail/who-director-general-s-opening-remarks-at-the-mission-briefing-on-covid-19---12-march-2020

Yang, L., Holtz, D., Jaffe, S., Suri, S., Sinha, S., Weston, J., & Teevan, J. (2021). The effects of remote work on collaboration among information workers. *Nature Human Behaviour*, *6*(1), 43–54. https://doi.org/10.1038/s41562-021-01196-4