Remittances Review
January, 2024
Volume: 9, No: 1, pp. 2765-2776
ISSN: 2059-6588(Print) | ISSN 2059-6596(Online)

Received: 5 January 2023, Accepted: 10 February 2023

DOI: https://doi.org/10.33282/rr.vx9il.120

STATISTICAL ANALYSIS OF PSYCHOLOGICAL EMPOWERMENT, JOB SATISFACTION, ORGANIZATIONAL COMMITMENT, AND ORGANIZATIONAL INNOVATION

Dr. Elma Sibonghanoy Groenewald[1], Mehwish jaweed[2], Aisha Iqbal Shaikh[3], Saleena Akram[4], Almighty Cortezo Tabuena[5], Nida Muhammad[6], Dr. Syed Hyder Raza[7], Dr. Coenrad Adolph Groenewald[8], Tariq Rafique[9]

[1]Chief Executive Officer (CEO), SG Virtuosos International, Executive Department,1501-1502 Tran Phu Street, Loc Tho Ward, Nha Trang City, Khan Hoa Province, Vietnam, 650000
Email: elmasgroenewald@sgvirtuososinternational.com
ORCID: https://orcid.org/0000-0001-7813-2773
[2]Lecturer, Department of Management Sciences, SZABIST University, Hyderabad Capmus,
Email: mehwishkashif00@gmail.com
[3]Lecturer, Department of Management Sciences, SZABIST University, Hyderabad Capmus,
Email: aisha.iqbal.shaikh@gmail.com
[4]Lecturer, Department of Psychology, National University Of Modern Languages Islamabad, Pakistan, Email: saleenaakram@gmail.com
[5]Osias Educational Foundation, La Union, Philippines, Email: almighty.tabuena@gmail.com
[6]Lecturer, Institute of Management Sciences, University of Balochistan,
Email: nidamkhan786@gmail.com
[7]Professor, Department of Pharmacology, Niazi Medical & Dental College, Sargodha, Pakistan,
Email: hyder.raza891@gmail.com
[8]Consulting Director, SG Virtuosos International, Executive Department,
Cape Town, South Africa, Email: dolfgroenewald@sgvirtuososinternational.com,
ORCID: https://orcid.org/0000-0002-2394-6347
[9]Assistant Professor Dadabhoy Institute of Higher Education, Karachi,
Pakistan E mail: dr.tariq1106@gmail.com

ABSTRACT

Objective: This study aims to explore the influence of employee psychological empowerment, job satisfaction, and organizational commitment on organizational innovation within the context of the Habib Bank in Karachi City.
Methodology: The research adopts a descriptive-correlational approach and utilizes survey methodology. The study population consists of all employees of Habib Bank in Karachi City, with a sample size of 244 participants selected. Questionnaires assessing psychological empowerment, job satisfaction, organizational commitment, and organizational innovation are administered to collect data. Descriptive and inferential statistical analyses, including structural equation modeling, are employed to analyze the gathered data.

Findings: The findings of the study validate the conceptual model proposed. Notably, it is observed that psychological empowerment has both direct and indirect effects on organizational innovation. Furthermore, the indirect effect, mediated through employee job satisfaction and organizational commitment, is found to be significantly greater than the direct effect.
Implications: These findings provide insights for organizational leaders and policymakers regarding the factors influencing organizational innovation. Understanding the interplay between psychological empowerment, job satisfaction, and organizational commitment can inform strategies aimed at fostering a culture of innovation within the organization.
Conclusion: The study underscores the importance of employee psychological empowerment, job satisfaction, and organizational commitment in driving organizational innovation. It highlights the need for organizations to prioritize these factors in their human resource management practices to enhance innovation capabilities and maintain competitive advantage.

Keywords: Employee psychological empowerment, Job satisfaction, Organizational commitment, Organizational innovation, Descriptive-correlational research, Structural equation modeling.

Today's world is often described as a place that is constantly changing; markets are not stable, and political and legal contexts are shifting more than before. Furthermore, technological changes have increased communication speed, requiring organizations to examine and respond to the changes. Meanwhile, small and medium-sized enterprises are heavily affected by environmental changes due to limited resources and capital. Therefore, organizations must seek competitive advantage to remain in this dynamic and changing environment (Rahimnia & Sajjad, 2015). In addition, organizational innovation is the key to survival in a competitive environment and the most critical source of competitive advantage (Bas, Mothe, & Nguyen-Thi, 2015; Hill & Jones, 2012;). This is because it can lead to the production of new products and services that better meet customers' needs and improve the quality of existing products or reduce production costs (Hill & Jones, 2012; Yesil et al., 2013). Therefore, it is hard to speak about growth and competitiveness if there is no innovation in an organization (Yesil et al., 2013). Moreover, an organization's innovation ability is recognized as a determinant factor to survival and success (Aguilera-Alcala, Morales-Reyes, et al. 2020).

On the other hand, there are various approaches to achieving innovation in organizations. One of these practical approaches is the human capital approach (Alshekaili & Boerhannoeddin, 2011). The human capital of each company is one of the crucial factors influencing the innovation of companies (Pizarro et al., 2009). The tools that can help improve the quality of human capital with company managers' help are empowerment, job satisfaction, and organizational commitment to this human capital. As the theoretical evidence suggests, employees are empowered, more satisfied, more committed, and more innovative. Although the word "empowerment" may have been used in similar forms or terms, the scientific term can be ascribed to "Mary Parker Follett" (Herbert, 2009). Empowerment means granting power, participation in decision-making, receiving appropriate information, autonomy, creativity, and innovation in work, having knowledge and the necessary skills, and accepting responsibility (Petter et al., 2002). Empowerment is the personal belief that people can enhance their skills and knowledge and act according to it (Bogler & Somech, 2004). Employee empowerment gives employees the authority to make crucial decisions about their day-to-day activities (Jafari et al.,

2013). Psychological empowerment is an internal motivating factor that reflects the active role of employees in the organization (Thomas & Velthouse, 1990). Psychological empowerment includes competence, self-determination, impact, trust, and meaning (Brucks & von Bayern, 2020)

Job satisfaction is a pleasurable emotional state resulting from the appraisal of one's Job (Brief & Weiss, 2002). Lund (2003) defined job satisfaction as the amount of observed communication between what a person demands from his Job with what has been given to him by the Job and the organization. Gunlu, Aksarayli, and Sahin Perçin (2010) explained job satisfaction as a kind of reaction to a particular job or an issue related to a job. According to Antoncic and Antoncic (2011), job satisfaction refers to the Employee's satisfaction with their job and the amount of interest in job-related activities. Low job satisfaction leads to negative implications such as isolated behavior, increased cost, reduced profits, and customer dissatisfaction (Abdulla et al., 2011). Job satisfaction includes the satisfaction of pay, coworkers, work, and supervision (Vitell & Davis, 1990). Organizational commitment has become one of the most fashionable variables studied in the last three or four decades. Like every other psychological construct, it is hard to have a universally accepted definition (Suma & Lesha, 2013). Organizational commitment is the relative degree of identification with the organization and participation in it (Allen & Meyer, 1990). As Dee, Henkin, and Singleton (2006) noted, organizational commitment is the relative strength of identification with and involvement in an organization, acceptance of organizational goals, and willingness to exert effort to remain in that organization. Cichy, Cha, and Kim (2009) referred to organizational commitment as the extent to which a person internalizes values, goals, and a sense of loyalty and dutifulness to the workplace. Gunlu, Aksarayli, and Sahin Perçin (2010) described organizational commitment as an overall reaction to the entire organization. Organizational commitment includes affective, continuance, and normative commitment (Brucks & von Bayern, 2020; Ma, Khan, et al., 2021)

The concept of innovation has changed significantly over the past four decades. In the 1950s, innovation was a discontinuous event that originated from the knowledge created by researchers and inventors—still, innovation results from a wide-ranging collaboration of many factors (Landry et al., 2002). Organizational innovation is the willingness of an organization to develop new and improved products and services and deliver them to market for success (Gumusuluoglu & Ilsev, 2009). Organizational innovation can refer to either 'new-to-the-state-of-the-art' or 'new-to-the-firm' (Mol & Birkinshaw, 2009). Innovation is to conform to an idea or behavior new to the organization (Tamayo-Torres et al., 2010). Organizational innovation is defined as an organizational method in a firm's business practices, workplace organization, or external relations that are new to the firm and intended to improve the firm's performance (Steiber, 2012). Innovation is the successful implementation of valuable creative ideas within the firm. Additionally, innovation can be described as a new idea, application, or object newly accepted by an individual or another application unit (Celik et al., 2014). Organizational innovation includes product, market, process, behavior, and strategic innovation (Wang & Ahmed, 2004). Regarding the above discussion, this research investigates the effect of Employee's psychological empowerment, job satisfaction, and organizational commitment on organizational innovation (Brucks & von Bayern, 2020).

Empowerment and Organizational Innovation

Yang and Alison (2011) conducted a study that examined the interactive effects of workplace diversity and employee involvement on organizational innovation. This research demonstrated that there is a positive relationship between the level of employee involvement and corporate innovation. Ertürk (2012) concluded that the psychological empowerment of Employees is strongly and positively related to innovation capability. Singh and Sarkar (2012) found that having greater control over one's non-work domain positively influenced psychological empowerment and innovative behaviors. In addition, when people felt their work had meaning, they tended to be more involved in their Jobs, positively influencing creative behavior. Berries, Chaher, and Benyahia (2014) expressed that employee empowerment positively affects innovation. Celik, Iraz, Cakıci, and Celik (2014) concluded that there is a meaningful relationship between employee empowerment and innovativeness. Madhavan (2014) suggested a positive relationship between employee empowerment and innovation in the workplace (Bundell, 2020).

Empowerment and Job Satisfaction

Laschinger, Finegan, Shamian, and Wilk (2004) stated that workplace empowerment impacts job satisfaction. Hamed (2010) expressed a positive association between employee empowerment and job satisfaction. Mushipe (2011) found a positive relationship between employee involvement and job satisfaction. Kazlauskaite, Buciuniene, and Turauskas (2012) concluded that organizational empowerment impacts job satisfaction. Elnaga and Imran (2014) examined the relationship between employee empowerment and job satisfaction by reviewing and determining all factors affecting this relationship. They found that charges can lead to job satisfaction (Funk, 2002).

Empowerment and Organizational Commitment

Liu, Fellows, and Chiu (2006) found that perceived empowerment correlates with organizational commitment. Chen and Chen (2008) concluded that there is a positive and significant relationship between dimensions of charge and organizational commitment. Ismail, Mohamed, Sulaiman, and Yusuf (2011) noted a positive relationship between empowerment and organizational commitment. Kazlauskaite, Buciuniene, and Turauskas (2012) researched "Organizational and psychological empowerment in the HRM-performance Linkage." This research demonstrated that organizational empowerment has an impact on affective commitment. Goudarzv, Chegini, and Kheradmand (2013), in a study entitled "The Relationship between Empowerment and Organizational Commitment," concluded that there is a significant relationship between empowerment and organizational commitment (Hodges, Fealko, et al. 2020).

Job Satisfaction and Organizational Innovation

In their study, Shipton, West, Parkes, Dawson, and Patterson (2006) found a relationship between aggregate job satisfaction and innovation. Lambert and Hogan (2010) concluded that perceptions of organizational innovation had statistically significant positive associations with job satisfaction. Tien and Chao (2012) stated that job satisfaction impacts corporate innovation. Ghoochkanloo and Talebieshlaghi (2016) explained that Employee job satisfaction significantly affects the organization's creation (Holland, Kirschvink et al. 2008).

Organizational Commitment and Organizational Innovation

Ming and Ying (2010) demonstrated that affective commitment, directly and indirectly, had significant and positive effects on both technological innovation and organizational innovation; continuance commitment, directly and indirectly, had substantial and adverse

January, 2024
Volume: 9, No: 1, pp. 2765-2776
ISSN: 2059-6588(Print) | ISSN 2059-6596(Online)

impacts on both technological innovation and administrative innovation; and normative commitment, directly and indirectly, had a significant and positive effect on technological innovation. Lambert and Hogan (2010) concluded that perceptions of the organization had statistically significant positive associations with organizational commitment. Holliman (2012) found a relationship between the organizational commitment of teachers and innovation, and higher levels of adherence were associated with higher levels of innovation. Rostami, Veismoradi, and Akbari (2012) noted a significant relationship between organizational commitment and innovation (Holland, Kirschvink, et al. 2008).

Job Satisfaction and Organizational Commitment

Meyer, Stanley, Herscovitch, and Topolnytsky (2002) found that job satisfaction determines organizational commitment. Adekola (2012) posited that organizational commitment significantly impacts job satisfaction. Yucel and Bektas (2012) concluded that job satisfaction positively correlated with organizational commitment. Suma and Lesha (2013) explained that dimensions of job satisfaction as work-itself, quality of supervision, and pay significantly influence employees' organizational commitment (Ikitimur, Uysal, et al. 2021).

Conceptual Model

In this research, for the design of variables of *psychological empowerment*, job satisfaction, organizational commitment, and organizational innovation, the models by Whetten *and Cameron* (2015), *Vitell* and Davis (1990), Meyer and Herscovitch (2001), Wang and Ahmed (2004) were used respectively. The reason for using these models is that these models have the most citations. Figure 1 shows the conceptual model of research:

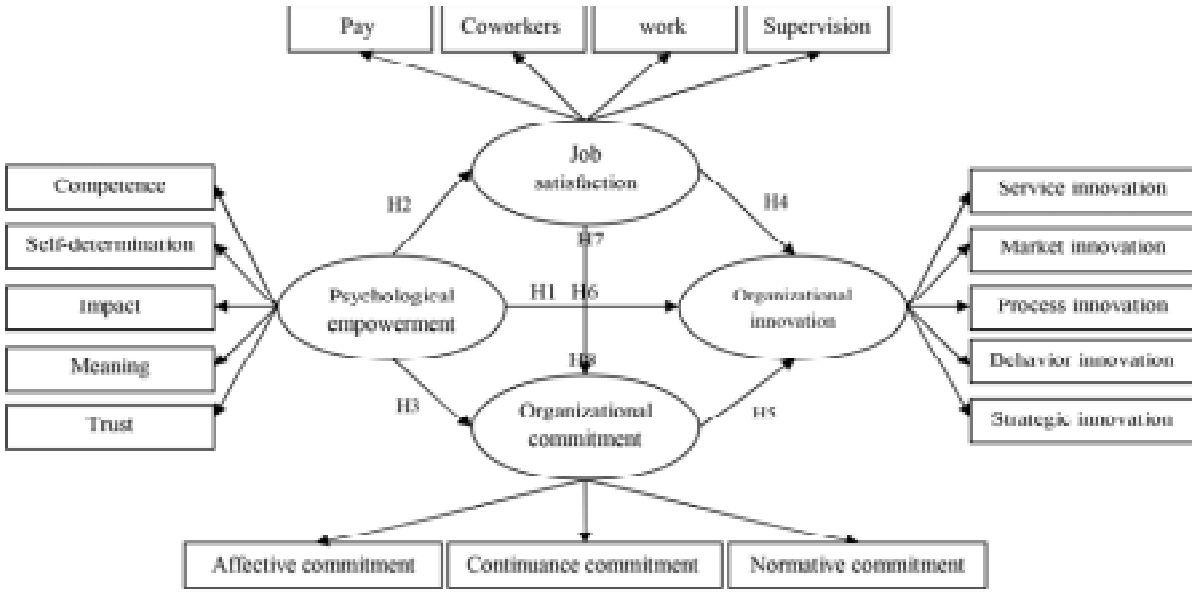

Figure 1. Conceptual model of study

Hypotheses

According to the conceptual model of the study, the study hypotheses are presented as follows:

H_1: Employee's psychological empowerment affects organizational innovation.
H_2: Employees' psychological authorization affects their job satisfaction.
H_3: Employee's psychological consent involves the Employee's organizational commitment.
H_4: Employee job satisfaction affects organizational innovation.
H_5: Employee's organizational commitment involves corporate creation.
H_6: Employee's job satisfaction affects Employee's organizational commitment.
H_7: Employee job satisfaction mediates the relationship between psychological empowerment and organizational innovation.
H_8: Employees' organizational commitment mediates the relationship between employees' psychological empowerment and corporate innovation.

Method

The present study is descriptive-correlational research conducted using a survey. Also, this study is development-applied research. The study's statistical population included all Habib Bank of Karachi city employees. The number of employees during the study was 600, and 244 were selected as the sample using Cochran's formula (because it was likely that some questionnaires would not be returned or answered thoroughly, 300 questionnaires were distributed among the statistical population). Four questionnaires were used to collect the data, which were standard and were adjusted based on the range of 5 scales of Likert (1 = strongly disagree to 5 = strongly agree). The first questionnaire includes 15 questions and evaluates the employees' psychological empowerment through its dimensions as competence (3 questions), self-determination (3 questions), impact (3 questions), meaning (3 questions), and trust (3 questions). The second questionnaire includes 11 questions and evaluates the employees' job satisfaction through its dimensions as pay (3 questions), coworkers (2 questions), work (3 questions), and supervision (3 questions). The third questionnaire includes 24 questions and evaluates the employees' organizational commitment through its dimensions as affective commitment (8 questions), continuance commitment (8 questions), and normative commitment (8 questions). The fourth questionnaire includes 20 questions and evaluates organizational innovation through its dimensions as service innovation (4 questions), market innovation (4 questions), process innovation (4 questions), behavior innovation (4 questions), and strategic innovation (4 questions) (Koepke, Gray, et al. 2015).

Regarding the validity and reliability, the psychological empowerment, job satisfaction, organizational commitment, and organizational innovation questionnaires are standard and have always been used in other studies, including Whetten and Cameron (2015), Vitell and Davis (1990), Meyer and Herscovitch (2001), Wang and Ahmed (2004), respectively.

Since the structural equation modeling (SEM) approach was used in this research, one of the prerequisites for using structural equation modeling is the fitting of measurement models. Therefore, the fitting of measurement models of the same structural validity of these questionnaires has been re-examined and addressed in the research findings section.

Descriptive and inferential statistics were used to analyze the gathered data. After entry into the computer, the data was analyzed using SPSS and Amos software. In the data analysis, initially,

all variables were tested for normality. After fulfilling the Kolmogorov-Smirnov statistical test and confirming the normality of the variables, the structural equation modeling technique was used. Structural equation modeling is a prolific multivariate analysis technique of the multivariate regression branch that allows researchers to simultaneously test a set of regression equations (Hooman, 2014). This method, in contrast to regression analysis for analyzing structural equations, is suitable because it allows the researcher to measure the relations between the latent and manifest variables and also analyzes multi-agent relationships. The present research uses the structural modeling approach to fit the measurement models, the proposed model test, and the hypotheses (Losco, Roxo, et al. 2022).

Results

The findings showed that more than 50% of respondents were male, more than 40% had bachelor's degrees, more than 50% were married, and more than 60% were over 30. All fit indexes confirmed measurement models of the employees' psychological empowerment, the employees' job satisfaction, the employees' organizational commitment, and organizational innovation. As shown in Table 2, all indexes related to the four variables of the employees' psychological empowerment, the employees' job satisfaction (except for question 2), the employees' organizational commitment, and organizational innovation benefit from the acceptable value of t-statistic (more than 1.98) and factor loading (more than 0.3), respectively. Therefore, question 2 of the job satisfaction variable is eliminated from the process (Losco, Roxo, et al. 2022).

Test of the Conceptual Model and Hypotheses

In this study, structural equation modeling was used to test the conceptual model and hypotheses of the research. The employees' psychological empowerment had a positive effect on employees' job satisfaction, employees' organizational commitment, and organizational innovation. The employees' job satisfaction and organizational commitment positively impacted corporate innovation. The employees' job satisfaction positively affected the employees' organizational commitment. According to these results, hypotheses 1 to 6 were confirmed. In addition, the results of path analysis in Table 5 showed that the employees' psychological empowerment, beyond its direct effect on organizational innovation, indirectly influenced the corporate creation through the employees' job satisfaction and organizational commitment, and that indirect impact was significantly higher than the immediate effect. Thus, the mediating role of the employee's job satisfaction and corporate loyalty on the relationship between the employees' psychological empowerment and organizational innovation was verified. Moreover, the Bootstrap method obtained a significant level based on the calculations. The mediating role of employees' job satisfaction and organizational commitment was .001 and .001, respectively (in the Bootstrap method, if the level of significance is less than .05, the role of the mediator variable is confirmed) (Lynn & Pepperberg, 2001).

January, 2024
Volume: 9, No: 1, pp. 2765-2776
ISSN: 2059-6588(Print) | ISSN 2059-6596(Online)

Discussion and Conclusion

The study's findings indicated that the employees' psychological empowerment, beyond its direct influence, exerts an indirect effect on organizational innovation through the mediations of the employees' job satisfaction and organizational commitment, in which the extent of indirect effect is significantly greater than that of a direct one. The study's findings were also analyzed and compared with the results of the different studies. The findings revealed that the employees' psychological empowerment positively and significantly affects organizational innovation in the Regional Power Company of Kerman. This finding is coordinated with the results of the research of Yang and Alison (2011), Ertürk (2012), Singh and Sarkar (2012), Berraies, Chaher and Benyahia (2014), Celik, Iraz, Cakıci and Celik (2014), and Madhavan (2014). Yang and Alison (2011) concluded that there is a positive relationship between the level of employee involvement and organizational innovation. Ertürk (2012) ended the psychological empowerment of employees is strongly and positively related to innovation capability. Singh and Sarkar (2012) found that psychological empowerment positively impacts innovative behaviors. Berries, Chaher, and Benyahia (2014) expressed that employees' empowerment positively affects innovation. Celik, Iraz, Cakıci, and Celik (2014) suggested a meaningful relationship between employees' empowerment and innovativeness. Madhavan (2014) noted a positive and significant relationship between employees' empowerment and their innovation in the work.

The results also showed that the employees' psychological empowerment has a positive and significant effect on the employees' job satisfaction in the Regional Power Company of Kerman. This finding is consistent with the results of the research of Laschinger, Finegan, Shamian, and Wilk (2004), Hamed (2010), Mushipe (2011), Kazlauskaite, Buciuniene, and Turauskas (2012), and Elnaga and Imran (2014) (Ma, Khan et al. 2021)

Laschinger et al. (2004) concluded that workplace empowerment impacts job satisfaction. Hamed (2010) found a positive association between empowerment and job satisfaction. Mushipe (2011) found a positive relationship between employee involvement and job satisfaction. Kazlauskaite, Buciuniene, and Turauskas (2012) stated that organizational empowerment impacts job satisfaction. Elnaga and Imran (2014) concluded that appointments could increase job satisfaction. Another study finding indicated that the employees' psychological empowerment has a positive and significant effect on the employees' organizational commitment to the Regional Power Company of Kerman. This finding is consistent with the results of the research of Liu, Fellows, and Chiu (2006), Chen and Chen (2008), Ismail, Mohamed, Sulaiman, Mohamad, and Yusuf (2011), Kazlauskaite, Buciuniene, and Turauskas (2012), and Goudarzv and chegini and Kheradmand (2013). Liu, Fellows, and Chiu (2006) concluded that perceived empowerment correlates with organizational commitment. Chen and Chen (2008) found a positive and significant relationship between charge dimensions and organizational commitment. Ismail et al. (2011) claimed that a positive relationship exists between empowerment and organizational commitment. Kazlauskaite et al. (2012) concluded that corporate mandate impacts affective commitment. Goudarzv, chegini, and Kheradmand (2013) stated a significant relationship between empowerment and organizational commitment(Ma, Khan et al. 2021).

Another study finding revealed that Employee job satisfaction positively and significantly affects organizational innovation in the Regional Power Company of Kerman. This finding is coordinated with the results of the research of Shipton, West, Parkes, Dawson, and Patterson (2006), Lambert and Hogan (2010), Tien and Chao (2012), and Ghoochkanloo and Talebieshlaghi (2016). Shipton et al. (2006) concluded a relationship between aggregate job satisfaction and innovation. Lambert and Hogan (2010) posited that perceptions of organizational innovation have statistically significant positive associations with job satisfaction. Tien and Chao (2012) noted that job satisfaction impacts corporate innovation. Ghoochkanloo and Talebieshlaghi (2016) found that Employee job satisfaction significantly affects the organization's creation. Another study finding showed that the employees' organizational commitment positively and substantially affects corporate innovation in the Regional Power of Habib Bank. This finding is consistent with the results of the research of Ming and Ying (2010), Lambert and Hogan (2010), Holliman (2012), and Rostami, Veismoradi and Akbari (2012). Ming and Ying (2010) concluded that affective and continuance commitments affect both technological and administrative innovation, and normative commitment affects technological innovation. Lambert and Hogan (2010) found that organizational perceptions have statistically significant positive associations with organizational commitment. Holliman (2012) claimed that there is a relationship between organizational commitment and innovation, and higher levels of commitment are associated with higher levels of innovation. Rostami et al. (2012) noted a significant relationship between organizational commitment and innovation. Another study finding indicated that the employees' job satisfaction has a positive and significant effect on Employee's organizational commitment in the Regional Power Company of Kerman. This finding is coordinated with the results of the research of Meyer, Stanley, Herscovitch, and Topolnytsky (2002), Adekola (2012), Yucel and Bektas (2012), and Suma and Lesha (2013). Meyer et al. (2002) concluded that job satisfaction determines organizational commitment. Adekola (2012) found that organizational commitment significantly impacts job satisfaction. Yucel and Bektas (2012) stated that job satisfaction positively correlated with organizational commitment. Suma and Lesha (2013) noted that dimensions of job satisfaction, such as work itself, quality of supervision, and pay, significantly influence employees' organizational commitment (Ma, Khan et al. 2021).

Aguilera-Alcala, N., et al. (2020). "Role of scavengers in providing non-material contributions to people." Ecological Indicators 117: 11.

> In today's societies, scavengers play an important role as providers of nature's contribution to people (NCP), such as disease control and carcass removal. However, very little is known about the non-material NCP (i.e., nature's effects on subjective and psychological aspects of people's well-being) that scavengers provide societies with. The first aim of this study is to determine which species of obligate and facultative scavengers provide different non-material NCP in Spain, including recreational and aesthetic experiences, learning and inspiration, and supporting identities. The second aim is to identify which ecological variables determine their capacity to provide the aforementioned non-material NCP. Data were collected from different sources, including the Internet (websites of nature photography and wildlife-watching tours, Global

Biodiversity Information Facility, and Google Trends), outreach magazines, and scientific articles to assess non-material NCP nationwide. A top predator, Canis lupus, followed by an obligate scavenger, Gyps fulvus, was among the most prominent species to provide multiple non-material NCP. Aesthetic experiences were provided mainly by common species, such as Genetta genetta, Milvus migrans, and corvids. Threatened and charismatic species, such as C. lupus, Ursus arctos, and Aquila adalberti, provided the NCP of recreation and learning by civil society. Knowledge acquired by scientists was provided mainly by meso-carnivores. Finally, the NCP of supporting identities was related to species capable of providing beneficial and detrimental contributions, such as C. lupus and Sus scrofa. Integrating data mined from different sources has allowed it to reveal the interweaving among non-material categories. Recognizing that all species of scavengers are essential for providing non-material NCP can raise society's awareness about their crucial cultural role and may contribute to their conservation.

Albantakis, L., et al. (2020). "Alexithymic and autistic traits: relevance for comorbid depression and social phobia in adults with and without autism spectrum disorder." Autism 24(8): 2046-2056.

Brucks, D. and A. M. P. von Bayern (2020). "Parrots Voluntarily Help Each Other to Obtain Food Rewards." Current Biology.

Helping others to obtain benefits, even at a cost to oneself, poses an evolutionary puzzle [1]. While kin selection explains such "selfless" acts among relatives, only reciprocity (paying back received favors) entails fitness benefits for unrelated individuals [2]. So far, experimental evidence for prosocial helping (providing voluntary assistance for achieving an action-based goal) and reciprocity has been reported in a few mammals but no avian species [3]. In order to gain insights into the evolutionary origins of these behaviors, the capacity of non-mammalian species for prosociality and reciprocity needs to be investigated. We tested two parrot species in an instrumental-helping paradigm involving "token transfer." Here, actors could provide tokens to their neighbors, who could exchange them with an experimenter for food. To verify whether the parrots understood the task's contingencies, we systematically varied the presence of a partner and the possibility for exchange. We found that African grey parrots voluntarily and spontaneously transferred tokens to conspecific partners, whereas significantly fewer transfers occurred in the control conditions. Transfers were affected by the strength of the dyads' affiliation and partially by the receivers' attention-getting behaviors. Furthermore, the birds reciprocated the help once the roles were reversed. Blue-headed macaws, in contrast, transferred hardly any tokens. Species differences in social tolerance might explain this discrepancy. These findings show that instrumental helping based on a prosocial attitude, accompanied but potentially not sustained by reciprocity, is present in parrots, suggesting that this capacity evolved convergently in this avian group and mammals.

Bundell, S. (2020). "The parrots that understand probabilities." Nature.

Funk, M. S. (2002). "Problem-solving skills in young yellow-crowned parakeets (*Cyanoramphus auriceps*)." Animal Cognition 5(3): 167–176.

> Despite birds' and mammals' long divergent evolutionary history, early avian and primate cognitive development have many convergent features. These features were investigated with tasks designed to assess human infant development. The tasks were presented to young parakeets to assess their means-end problem-solving abilities. Examples of these early skills are: attaining and playing with objects, retrieving rewards using a stick or rake, or pulling rewards on supports or the ends of strings. Twelve such tasks were presented to 11 young yellow-crowned parakeets (Cyano-ramphus auriceps) to investigate their natural abilities; there was no attempt to train them to do those tasks that they did not spontaneously perform. Six of the birds were parent-raised, and five were hand-raised. The birds completed 9 of the 12 tasks, demonstrating all the Piagetian sensorimotor circular reactions, but they failed to hand-watch ("claw-watch"), stack objects, or fill a container. Their ordinality on the tasks differed from that of human infants in that locomotion to obtain objects occurred earlier in the avian sequence of development. The two groups of avian subjects performed the mid-level tasks in a mixed order, perhaps indicating that these abilities may not emerge in any particular order for these birds as they supposedly do for human infants. The hand-raised group needed fewer sessions to complete these means-end tasks.

Hodges, H., et al. (2020). "Autism spectrum disorder: definition, epidemiology, causes, and clinical evaluation." Translational pediatrics 9(Suppl 1): S55.

Holland, R. A., et al. (2008). "Bats use magnetite to detect the earth's magnetic field." PLoS ONE 3(2): e1676.

> While magnetic cues' role in compass orientation has been confirmed in numerous animals, the detection mechanism is still debated. Two hypotheses have been proposed, one based on a light-dependent mechanism, apparently used by birds, and another based on a "compass organelle" containing the iron oxide particles magnetite (Fe(3)O(4)). Bats have recently been shown to use magnetic cues for compass orientation, but the method of detecting the Earth's magnetic field remains unknown. Here, we use the classic "Kalmijn-Blakemore" pulse re-magnetization experiment, whereby the polarity of cellular magnetite is reversed. The results demonstrate that the big brown bat Eptesicus fuscus uses single-domain magnetite to detect the Earth's magnetic field, and the response indicates a polarity-based receptor. Polarity detection is a prerequisite for using magnetite as a compass and suggests that big brown bats use magnetite to detect the magnetic field as a compass. Our results indicate the possibility that sensory cells in bats contain freely rotating magnetite particles, which appears not to be the case in birds. The ultrastructure

of the magnetite-containing magnetoreceptors must be described for our understanding of magnetoreception in animals.

Ikitimur, H., et al. (2021). "Case report: two cases of persistent hiccups complicating COVID-19." The American Journal of Tropical Medicine and Hygiene 104(5): 1713.

Koepke, A. E., et al. (2015). "Delayed Gratification: A Grey Parrot (Psittacus erithacus) Will Wait for a Better Reward." Journal of Comparative Psychology 129(4): 339-346.

Delay of gratification, the ability to forgo an immediate reward to gain either better quality or quantity, has been used as a metric for temporal discounting, self-control, and the ability to plan for the future in humans (particularly children) and nonhumans. The task involved can be parsed in several ways, such that the subjects can be required to wait, not only for a better or a larger reward but also for the rewards to either be in view or hidden during the delay interval. We have demonstrated that a Grey parrot (Psittacus erithacus) trained in the use of English speech could respond to the label "wait" for up to 15 minutes, in a task that has many similarities to those used with young children, to receive a better quality reward, whether or not the better quality reward or the experimenter was in view.

Losco, L. et al. (2022). "Helix thigh lift. A novel approach to severe deformities in massive weight loss patients." Journal of Investigative Surgery 35(3): 620–626.

Lynn, S. K. and I. M. Pepperberg (2001). "Culture: In the beak of the beholder?" Behavioral and Brain Sciences 24(2): 341-+.

We disagree with two of Rendell and Whitehead's assertions. Culture may be an ancestral characteristic of terrestrial cetacean ancestors, not derived via marine variability, modem cetacean mobility, or any living cetacean social structure. Furthermore, evidence for vocal behavior, such as culture, social stability, and cognitive ability, is richer in birds than Rendell and Whitehead portray and comparable to that of cetaceans and primates.

Ma, F., et al. (2021). "Investigating the Impact of Information Technology, Absorptive Capacity, and Dynamic Capabilities on Firm Performance: An Empirical Study." SAGE Open 11(4): 21582440211061388.