

MAN K I N D

Q U A R T E R L Y



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MAN K I N D Q U A R T E R L Y

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About Mankind Quarterly

Mankind Quarterly was founded as a quarterly journal of anthropology, in the broadest sense of “the science of man,” in 1961. This was a time when the study of man had already diversified into physical anthropology, ethnography, quantitative cross-cultural research, archaeology and other subspecialties.

These developments took place against the background of a widening gulf between the biological and social sciences. Following the leading dogma of the day, cultural and social anthropologists in academe had begun to deny the importance of biology for behavioral and cultural phenomena. Conversely, biological (physical) anthropologists aligned themselves with the “hard” sciences, many describing themselves as human biologists rather than anthropologists in an attempt to distance themselves from a social anthropology that they no longer saw as scientifically sound. In many places, these divisions persist to the present day. *Mankind Quarterly* was founded as a response to these centrifugal trends. Its founders believed in the interdependence of human biology, behavior and culture, and they understood biological and cultural diversity as the outcomes of evolutionary, ecological, and historic processes.

In short, *Mankind Quarterly* was established as a journal for those scholars who still believed in a unified “science of man” that studies the interactions between biological and cultural diversity. It was first published in Edinburgh, Scotland in 1961, and then, from 1979 to 2014, by the Council for Social and Economic Studies (chaired by Roger Pearson) in Washington, D.C. In January 2015, publication was transferred to the Ulster Institute for Social Research, a non-profit organization in London, England, and then to the US-based Mankind Publishing House in January 2025. Throughout its existence, *Mankind Quarterly* has maintained its character as a journal devoted to the interdisciplinary study of man. New developments in the field were reflected in the journal early on. When first sociobiology and then evolutionary psychology developed descriptions of human nature and explanations for cultural universals, the new developments found expression in the journal. The same happened with behavioral genetics, which like sociobiology saw major advances during the last three decades of the 20th century.

Today the editorial board includes scholars from 12 countries who represent a wide variety of disciplines including primatology, physical anthropology, archaeology, cultural anthropology, human genetics, differential psychology, sociology, and history. Despite their varied expertise and views, the editors share a common interest in the evolutionary and historical processes that generate human diversity, and in the universal features of human nature that constrain this diversity. Because history and biological evolution are ongoing processes, this includes an interest in the social, cultural, demographic and biological changes that are taking place in modern societies.

Some of the articles the journal publishes deal with the evolutionary and historic processes that have created the racial, ethnic, linguistic and cultural diversity we see today. Others describe present-day cultural diversity and ongoing trends, especially at the psychological level. During the last years, intelligence and its change over time have been especially active research areas, and a substantial part of this work has been published in *Mankind Quarterly*. The subject is important because education and intelligence are considered the key drivers of cultural change and economic growth, not only in developing countries but also in mature postindustrial societies. Other areas of special interest are the demographic changes that are taking place in countries today and that are shaping the world of the future.

Historically, *Mankind Quarterly* has earned a reputation for publishing articles in controversial areas, including behavioral race differences and the importance of mental ability for individual outcomes and group differences. During the “Bell Curve wars” of the 1990s, it became a target of attack when opponents realized that some of the work cited by Herrnstein and Murray had first been published in *Mankind Quarterly*. However, much of this science has stood the test of time. For example, the importance of genes for individual differences in intelligence is no longer controversial, and genetic effects on individual and group differences that were merely inferred in earlier research are now studied at the molecular level. There is nothing wrong with being at the embattled forefront of new scientific developments.

Most of the research that *Mankind Quarterly* publishes today is “normal” science, but the editors still welcome controversy and new ideas. They see it as part of the journal’s mission to provide a forum for the presentation and discussion of theories and empiric research that challenge entrenched beliefs. Of course, the often contradictory views that are represented in *Mankind Quarterly* are those of the individual authors, not those of the journal’s publishers or editors.

Notes for Authors

As a peer-reviewed academic journal of anthropology, *Mankind Quarterly* publishes articles on all aspects of the science of man, ranging from cultural and physical anthropology, and psychology and behavioral genetics, to demography, mythology, and the history of religion.

However, the editors are especially interested in articles relating to cultural and biological evolution, and to the interaction between biology and culture. Such topics include

- (1) the historical origins of present-day cultural and biological diversity using approaches from history, archaeology, linguistics, mythology, and population genetics;
- (2) the study of cultural and biological trends in contemporary societies including cross-cultural studies of personality, intelligence, and culturally transmitted beliefs and values, as well as the study of demographic trends and trends in physical characters and gene frequencies over time; and
- (3) the implications of current trends for future human evolution.

Included in these areas of special interest are articles dealing with the evolution of personality, its expression in varying cultural, ecological, and economic conditions, and its implications for future cultural and biological evolution. Interdisciplinary approaches that integrate findings from historically separate disciplines and subdisciplines are especially encouraged.

Mankind Quarterly publishes research reports, theoretical articles, data-driven reviews, book reviews, and short communications on new discoveries or critical comments on published papers, either in *Mankind Quarterly* or elsewhere. Because *Mankind Quarterly* is read by individuals from diverse backgrounds, the authors of highly specialized or technical articles are asked to present the background and significance of their work clearly and concisely. Book reviews should also deal with publications that will be of interest to a non-specialist audience.

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Articles in edited collections:

Rushton, J. P. (2003). Race differences in *g* and the Jensen effect. In: H. Nyborg (ed): *The Scientific Study of General Intelligence: A Tribute to Arthur R. Jensen*. Amsterdam: Pergamon.

Material published online:

Statistics New Zealand (2013). http://www.indexmundi.com/new_zealand/demographics_profile.html

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Cover picture: The image reflects the cultural and political transitions in Pakistan's tribal regions following the 2018 FATA merger, a key focus of Naseer et al. (2025)'s article on page 309. The traditional attire and setting underscore the governance challenges and community identity amidst administrative reforms. Photo credit: Javad_esmaeili from Pixabay.

The Muslim Middle East: On the Road to Peak IQ

Editorial*

Anthropologists have noticed for a long time that human societies exist at different levels of “cultural complexity” (Powell, 1888). The idea is, simply speaking, that those societies that are complex in one domain tend to be complex in other domains as well. For example, a society that has skilled craftsmen in many highly specialized trades also tends to have a complex political organization, science, and philosophy. Nations that have great achievements in one area, such as literature or theology, tend to excel also in others, such as technology, economic efficiency, and political effectiveness. It has long been recognized that the manifold trappings of civilization all correlate with each other (Murdock & Provost, 1973).

Working within a similar framework, historians have long noticed that historical civilizations have tended to rise and fall on time scales of many centuries. Culturally, Greece was the world’s leading nation in classical and Hellenistic times. Today it is a cultural backwater with scant evidence of intellectual excellence (see Table 1). During the last millennium, we have seen the dramatic rise of Christian Europe while the Muslim Middle East was declining — on all metrics including political and military might, political organization, and creativity in science and technology. In today’s world, we use a concept similar to cultural complexity when we speak of “developed” and “developing” countries, with “threshold countries” somewhere in between. These designations are founded on the experience of rising prosperity since the Industrial Revolution, an experience that created the unfounded belief that “development” is always a progression towards greater prosperity and economic efficiency — never mind that this progress is an historical anomaly for which satisfactory explanations are rarely offered.

Modern science has supported what the study of historical civilizations had already recognized at least implicitly: that the intellectual qualities of the people are a major force behind rising economic efficiency and prosperity, as well as other traits that we subsume under the term civilization. In our time, future economic growth can be predicted from two major variables: the present level of prosperity measured as per capita gross domestic product (GDP) or gross national product (GNP), and the level of “cognitive human capital”, a term describing useful skills that require intelligence (Rindermann, 2018). Whether growth regressions are run with standard methods (e.g., Weede & Kämpf, 2002) or with the most sophisticated methods (Francis & Kirkegaard, 2022), the main results are always the same: Low pre-existing per capita GDP (the “advantage of backwardness”) and high intelligence are the predictors of fast economic growth. If intelligence is a cause rather than only a consequence of economic efficiency, we can predict the future economic performance of a nation by assessing the intellectual competence of its youth. The same most likely applies to other elements of “civilization” such as innovation rate and a functioning political system.

Looking more closely at the Muslim Middle East, we see the pattern typical of less developed countries: lacklustre economies combined with low levels of scientific and intellectual productivity and innovation, and authoritarian governments with a sprinkling of “failed states” such as Libya, Yemen, and (until recently) Syria. Scores on international scholastic achievement tests such as PISA (OECD 2023, pp. 52-57) and IQ tests (www.viewoniq.org) suggest an average IQ of Arabic-speaking Middle Eastern populations in the eighties (Table 1). The important implication for these countries is that if their intelligence is rising, they are likely to get more prosperous independent of the oil price; and if the young generation’s intelligence is stagnating or declining, their economies are likely to stagnate or decline as well in the near future.

Whether the average intelligence in a country is rising, stagnating or declining is an empirical question that can be answered with international scholastic tests such as the OECD’s Programme for International Student Assessment (PISA), which conducts assessments regularly every three years, or with intelligence tests that have been developed mainly for use in the school system. The general pattern has been that in

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Table 1: Country scores on PISA 2022, average of Mathematics, Reading and Science. Countries of the MENA (Middle East and North Africa) region are compared with representative countries from other world regions. OECD mean is 500, and OECD standard deviation is 100.

Country	PISA score
<i>MENA countries</i>	
Turkey	462
United Arab Emirates	427
Qatar	422
Saudi Arabia	387
Palestine	361
Jordan	359
Morocco	356
<i>Comparison countries</i>	
Japan	533
United Kingdom	494
United States	489
Greece	436
Mexico	407
Indonesia	369

the well-studied Western countries, intelligence was rising massively during the 20th century. This is known as the Flynn effect. However, since the 1990s some of the intellectually and economically most advanced European countries (Meisenberg & Lynn, 2023) and most recently also the United States (Dworak et al., 2023, but see also Winter et al., 2024) have produced evidence for stagnating or even declining intelligence.

In this issue of Mankind Quarterly, Homoud Abdullah Saad Almoghyrah and his colleagues from King Saud University report about the Flynn effect in Riyadh, the capital of Saudi Arabia. The researchers identified an earlier study that had administered the Children's Intelligence Test (CIT) to a representative sample of more than 900 schoolchildren aged 9 to 15 years in 2004. They then administered the same test in the academic year 2017-2018 to a sample of more than 1300 schoolchildren of equivalent age and school grade. What they found were higher scores in the later sample, with the difference estimated at 6.6 IQ points. This is well within the range of IQ gains reported at the time when the Flynn effect was raging in Europe and other Western countries (Flynn, 1987). A lower standard deviation in the later sample suggested that in Riyadh, intelligence had been rising more strongly among the low-scorers than the gifted. Another observation was that the IQ gain was stronger in younger than in older children suggesting accelerated intellectual maturation. This is in line with similar observations in many other Flynn effect studies worldwide.

What does a study like this tell us about the future prospects of Saudi Arabia? One adage from the oil countries of the Persian Gulf (or is it the Arabian Gulf?) says: "My father rode a camel; I drive a car; my son flies an airplane; my grandson will ride a camel." It expresses the expectation that the country's present prosperity will evaporate once the oil resources are exhausted. The presence of a Flynn effect shows that this gloomy outlook may not be justified. It shows that it is still possible to raise the population's intelligence, at least in Saudi Arabia. Human capital based on high intelligence is the essential ingredient for the creation of a diversified, efficient, and sustainable economy that can be maintained even without oil revenue.

However, Flynn effects cannot last forever. "Peak IQ" is reached when the genetic limits of the population have been reached and the educational system has exhausted its armamentarium for raising children's intelligence even further. This appears to be the situation in the most developed countries of Europe today, where robust Flynn effects are lacking in cohorts born after the 1970s and economic growth

has slowed to a crawl in the first decades of the 21st century. It appears that like most other developing countries, Saudi Arabia has not yet reached this point. It remains to be seen whether ongoing educational reforms in the country can accelerate the path to Peak IQ. Nor can we even estimate how high Peak IQ will be in Saudi Arabia and other countries of the Muslim Middle East. The genetic potential of national populations can be estimated roughly from their average polygenic scores for educational attainment and intelligence (Piffer, 2019), but informative studies of this kind have not yet been done on representative populations in the Middle East. This is a fruitful area for future research.

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Local People's Perceptions and Expectations from Political, Legal and Administrative Transition in the Erstwhile FATA after Merger into Khyber Pakhtunkhwa Province

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Marium Fatima[†]

Muhammad Irfan Mahsud[‡]

Abstract

This paper studies the perceptions and expectations of local people in the tribal districts after the 2018 merger of erstwhile Federally Administered Tribal Areas (FATA) of Pakistan into Khyber Pakhtunkhwa (KP) Province, a transition which has promised to bring many political, legal and administrative changes. The erstwhile FATA was merged in 2018 and this research started in 2019. Therefore, it is pertinent to mention that research was conducted in the post-merger era in the milieu of various challenges, including pandemic-related lockdowns that caused restrictions imposed on access and mobility in these Newly Merged Districts. However, since 2019, through qualitative methods, data was gathered and analysed from 28 representative key informants' interviews and 14 focus group discussions. The qualitative data provided nuanced and comprehensive insights into the expectations and priority issues of the population and their concerns regarding the new administrative system after the merger. Findings suggest that due to unawareness, illiteracy, and weak coverage of electronic and print media, the new administrative system was not very popular, and people were unaware about the pros and cons of the merger. Moreover, perceptions of corruption and nepotism have increased especially in the revenue and taxation departments. It is suggested, that to change the rather negative perceptions about the merger of these tribal districts, several steps are required. One is that for protection and enforcement of legal rights, infrastructure and staff are needed for the police and judiciary. The police service was generally perceived positively; however, areas of weakness include proper training, equipment, and infrastructure. There is an urgent need for revenue, and for land records to settle tribal disputes. Strict checks and balances on the appointment of officers to these areas and an efficient governance system are needed to make the new administrative system successful.

Keywords: Newly Merged Districts, FATA, Transition, People's perceptions

1 Introduction

Under British colonial rule, erstwhile¹ was a frontier region between British India and Afghanistan governed and controlled through a special law known as Frontier Crimes Regulations (FCR). This unique law contained harsh provisions such as a collective punishment clause and no access to mainstream judicial organs in the North West Frontier Province of British India. The local Jirga system was instead upheld, and women were excluded from decision-making forums. This law strengthened indirect rule by vesting the local elders with vast powers, criticized in current legal debates for denying fundamental human rights guarantees to

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¹ Erstwhile FATA, now called Newly Merged Areas, is a mountainous region sharing a border with Afghanistan. It was divided into seven 'political agencies', Bajaur, Khyber, Kurram, Mohmand, Orakzai, North Waziristan and South Waziristan, along with six smaller zones called 'frontier regions' (FRs), governed by the President through the Governor of Khyber Pakhtunkhwa.

the tribal people (Mahsud, 2019; Mahsud et al., 2023). The tribal areas under British rule were neither politically integrated nor economically developed but served as a militarized buffer region (Spain, 2014).

Following in the footsteps of the British colonial masters, the new state of Pakistan, founded in 1947, maintained the semi-autonomous status of the FATA region rather than giving full authority to the state in these peripheral areas. In Pakistan's 1973 Constitution, erstwhile FATA was placed as a special status area under Article 247. The tribal population was ignored politically and economically. This had a profound impact on their standard of living, with 60 % of the population living below the poverty line² (Naseer, 2015b; UNDP, 2020). These present-day Newly Merged Districts had once been called 'land of rebels' by both Afghans and Mughal rulers who used these peripheral areas for furthering their vested political and economic interests (Dupree, 1997). The British Raj governed tribal areas by empowering certain local elites and tribes. This relationship between the state and regional elites of the borderland is best described by Baud and van Schendel (1997) in their work *Toward a Comparative History of Borderlands*. These writers discussed indirect and cost-effective management of different borderlands by colonial powers who relied on local elites as their managers and point of contact to control the local tribes.

The British Raj managed cost-effective governance of the peripheral areas by integrating borderland elites as important allies to control local tribal people and assist the designated officers or political agents in administration of the border areas. The designated officers (Mashraan), authorized by provisions of the FCR to serve the Raj's interests and those of the local elites, drew legitimacy from traditional practices to control local tribes. However, this unique arrangement of governance overlooked the political and economic interests of tribal people and society (Baud & van Schendel, 1997). After partition of the Indian subcontinent in 1947, a similar governance arrangement on the model of British control was adopted because the newly formed state feared that tribesmen might rebel if the local elites are not integrated in the new scheme of governance. Thus, vestiges of the colonial governance arrangements/structures were conserved in the Pakistani state with the assistance of the borderland elite, which in turn kept the local tribal population isolated and outside of state laws.

However, in the wake of the Soviet invasion of Afghanistan in 1979 and the ensuing war, the Pakistani state altered local governance dynamics by replacing the traditional tribal elites with religious clergy as new power elites to serve the state's military policies (Khan, 2024; Mahsud & Aman, 2018). These religious clergies served the state's short-term interest of supporting United States agendas in the Afghan War, but it created a leadership vacuum in tribal areas which at a later stage was filled by militants and other non-state actors (Mahsud, 2019). Consequently, with the emergence of non-state actors (Taliban) in these areas after 2001, the state's writ and machinery broke down. This further pushed the tribal people into poverty, isolation, and insecurity (Naseer, 2015a).

Hence, since 2001, erstwhile Federally Administered Tribal Areas, now Khyber Pakhtunkhwa's Merged Areas, have experienced various economic and security challenges with large-scale population displacements (Mahsud, 2019). The people residing in these militarised areas demanded a political reform process, which culminated in the 25th amendment to the 1973 Constitution on 31 May 2018, which provided for the merger of FATA into neighbouring Khyber Pakhtunkhwa (Mahsud, 2024; Yousaf, 2021). The merger, one of the most consequential political reforms in Pakistan's 70-year history, is an unprecedented extension of constitutional rights and governance structures to 5 million of the poorest people in Pakistan (Pakistan Bureau of Statistics, 2017). Interestingly, the amended constitution gave to the tribal people in the merged districts the same rights as other Pakistanis living in settled parts. This constitutional change, which included elected local governments, the extension of writ of institutions to uphold the rule of law, and an empowered legislature, fundamentally altered the historical relationship dynamics between the citizens of the merged districts and the state and with each other. It amounted to a new social contract with the state (Fayaz et al., 2021).

In the fluid environment of these Newly Merged Districts, with heightened sensitivities and insecurity

² The poverty line in Pakistan is defined as the minimum level of income required to meet basic needs of a household. A situation in which a person or household lacks the resources necessary to be able to consume a certain minimum basket of goods. The basket consists either of food, clothing, housing and other essentials (moderate poverty) or of food alone (extreme poverty).

due to militancy, where access and intervention for government and non-governmental agencies such as civil societies, humanitarian organization as well academics still poses a significant challenge, it is difficult to assess the progress of the transition process after the merger. On this background, our qualitative study based on interviews with local tribal people seeks to provide a deeper understanding of their perceptions and expectations attached to the merger process, as a means to assess the wider risks and opportunities around the transition process. In current scholarship, the FATA merger is generally supported as an extension of the prevailing political rhetoric, legal discourse, and security narrative. However, no study has been undertaken to find out the sentiments of the tribesmen, whether they support the merger or disagree with it. It is also pertinent to study the actual impact of the merger's implementation on the local administrative, political, legal or social dynamics from the perspective of the population directly affected by this constitutional amendment. Hence, for us as researchers, it is important to record perceptions of residents about the merger of erstwhile FATA into KP after its announcement in 2018 and compare them to its implementation to-date.

2 Research methodology

In these Newly Merged Districts, qualitative data were gathered through interviews with 28 representative key informants, and 14 focus group discussions (FGDs) were held separately with men and women. The participants selected for key informant interviews (KIIs) and focus group discussions (FGDs) included tribal elders, doctors, college and school teachers, journalists, lawyers, traders and youth, to gather nuanced expectations and perceptions from a range of perspectives. Thus, in each district interviews were conducted with four key informants, 2 men and 2 women having good understanding of the merger and change in governance system. In addition, separate male and female FGDs were held with 8-12 participants each, selected purposively to promote age, family and residential area diversity. In this sampling technique, we have intentionally identified and selected information-rich available respondents for most effective collection of data (Castrén et al., 2015).

This was followed by a narrative analysis of the data to understand what the perceptions and expectations of local people are about the transition process from tribal area to settled area. Additionally, to gather secondary data, a comprehensive desk review of relevant literature and programme documents was also done. The study tool gathered perceptions and expectations of tribal district residents and how they felt about the merger in 2018 and the implementation of political, administrative and legal reforms. Further, the primary research focussed on the development processes taking place in conjunction with extension and improvement of political, legal and administrative structures. Hence, all the findings and policy recommendations emerged by an integrative analysis of key informants' interviews and qualitative analysis of the focus group discussions (FGDs).

3 Limitation of the study

The study started in 2019, one year after the merger. The situation was compounded by the Covid-19 pandemic, which adversely affected the Newly Merged Districts while they were transitioning from tribal to settled areas. Hence the pandemic needs to be taken into consideration, as it influenced the experiences and perceptions of the respondents. The pandemic cut across most lines of inquiry because it impacted livelihoods, service delivery, and roll-out of merger implementation. The observations and analysis that we gathered in the field consequently has to look separately at the impacts of economic, health, and government policies under these difficult conditions. Thus, we have to interpret our findings in the light of two challenges experienced by the local population: a history of militancy and conflict in the years before the merger, and Covid-related disruptions after the merger.

4 Research questions

This research undertakes to describe the perceptions and expectations of the local tribal people about the political, legal and administrative transition of the erstwhile Federally Administered Tribal Areas after their merger with Khyber Pakhtunkhwa. Hence, the central questions emanating from this discussion are: How far was the new social contract successful in meeting the aspirations of the local people? What is the perception of local people regarding the new structures and system?

This is a novel piece of research undertaken to study the new rules of political, social, moral and legal conduct between the state and the people of erstwhile FATA. This study is much needed because no effort has been made so far to assess the perceptions of the FATA people towards the merger which placed them in a new contractual relationship with the state. It is a rapid scoping study, which analysed data obtained through key informant interviews and focus group discussions on the merger.

5 New social contract and reforms in the erstwhile FATA

The merger of the erstwhile FATA into KP is a huge step towards the full realization of rights of tribal residents living in this troubled and underdeveloped peripheral area of Pakistan. With the 25th Amendment to the 1973 Constitution, full political, socio-economic and legal rights were extended to the people of erstwhile FATA (today's Newly Merged Districts), thus ushering these tribal agencies into a new system and tribal people into a new social contract with the state (Government of Pakistan, 2018). Before the FATA merger into KP, the special status of the tribal areas under direct governance of Federal Government had led to social, economic and political isolation from the rest of Pakistan. It was a peripheral territory adjacent to KP on the Pak-Afghan border, governed by Pakistan's President through his appointed Governor in KP, who in turn administered erstwhile FATA through his political agents. The local political agents appointed within this colonial administrative system exercised vast powers to control these border areas, with limited constitutional and legal rights for the people (Mahmood, 1990).

A very pertinent debate arises, which is how did the contractual legal and constitutional relationship of tribesmen in erstwhile FATA with the state change after the merger? The two primary assumptions of social contract theory had been propounded by Hugo Grotius, Thomas Hobbes, Samuel Pufendorf, and John Locke. The first assumption of this theory is that of a pre-political condition termed the "state of nature", or "original position" by the contemporary exponent of social contract theory John Rawls. Applying social contract theory to the tribesmen of erstwhile FATA, their traditional tribal existence presented the "state of nature" where all individuals in a tribe were equal in social status and rights. The tribesmen were situated symmetrically relative to one another, but they all had social, political and legal incentives to leave the initial situation in favour of an entry into civil society with relative advantage. The tribesmen were Rousseau's "noble savages" in an egalitarian society, however as per Western definition of civilized society they could only gain status in it by acquiring civilized conditions with a more stratified social order (see work of Grotius, Hobbes, Pufendorf and Locke on the social contract).

The tribesmen's existence under the colonial FCR law was not an advantageous condition for them. They were deprived of legal rights, there was collective punishment for entire tribes, absence of judicial platforms, and draconian laws. This situation continued even after the creation of Pakistan as their contract with the newly formed state was dictated under separate law, different from the laws applying to other citizens of the state (Naseer, 2015b). The merger of the FATA areas into KP districts in 2018 transitioned the entire tribal landscape from a semi-autonomous region into a region governed by the provincial and federal laws laid down in the Constitution. This merger profoundly realigned the constitutional / legal relationship between the tribes and the State. The new social contract between state and tribal people with this merger is that they are no longer individuals in some sense prior to any established social order, so that their obedience to the state now has to be justified on certain mutual interests. The legal repercussions of the merger, with abolition of the former semi-autonomous status under the federal government, are profound not only for the people of the merged districts but also for the state. Therefore, this paper attempts to explore the new legal relationship of the FATA people with the state after the abolishment of FCR and

extension of new legal, administrative and governance structures. We are not trying to draw any comparison between a hypothetical “state of nature” and the post-merger social contract, but between the FCR social contract and the post-merger social contract to understand people’s perceptions on the new structures, which promised them better living standards, security, and justice.

6 Theoretical frame of social contract and Newly Merged Districts

Social Contract Theory is a normative characterization of the advantages accruing to the parties of the contract in three ways (Martinich, 2012):

1. Motivation is driven by self-interest. Practically, the tribesmen would only agree to the merger, which is a new social contract with the state, if they discern that they will benefit from the merger, that it leads to progress in tribal society. Therefore, this paper undertakes to explore the perception of the merger from the viewpoint of tribal people and their trust in the new social contract. Social interaction is at the core of developing a perception. This includes education, health services, government services such as passport and NADRA offices, formal judicial institutions, businesses, and other areas of interaction.
2. Reciprocity is required. The tribesmen must recognize that the advantages they expect to derive from entering into another social contract with the state will be conditional on their willingness to guarantee similar advantages to their counterparts, the provincial and federal government and state institutions in this case. Conversely, the state as a party in the social contract needs to accept and recognise the equal legal rights of the tribal people. Robust rehabilitation policies for merged districts need to be designed to transition into settled districts. This is essential after years of conflict, which further degraded the already insufficient social structures.
3. The parties to the contract need to be rational. They must have a rational or common-sense understanding of their own interests and the interests of others, and the moral principles of justice that ought to govern their pursuit of those interests. From this last aspect of the third assumption of the social contract, this paper proceeds to study whether the new relationship improved the parties’ understanding of their mutual trust and interests on the backdrop of conflict, destruction, and the Covid pandemic.

The 25th Amendment merged the tribal areas into KP in a milieu of insecurity due to militancy. It abolished their special discriminatory status, ensuring that erstwhile FATA becomes a territory of KP province by altering Article 1 of the 1973 Constitution. Article 246 clause C, providing for legal distinction of tribal areas from the rest of Pakistan, was removed. Also abolished was Article 247 of the 1973 Constitution providing for discretionary powers to the President of Pakistan over these tribal areas. By removing the President as executive head of erstwhile FATA, it also transformed the administrative system by eliminating the control of the Governor of KP and his designated political agents over the tribal merged districts (Yousaf, 2020).

In the 1973 Constitution of Pakistan, Article 247, Pakistan had reaffirmed the special status of the Tribal Areas (erstwhile FATA). Neither national nor provincial laws could be applied to these areas. The President of Pakistan controlled and administered these areas through his agent, Governor of the Khyber Pakhtunkhwa Province. The Governor through his political agents administered 27 % of erstwhile FATA (government area) through FCR while the remaining 73 % of the area was “un-governed”: administered only through local elders and traditions of the area. Parliamentary or Provincial Act could not be applied to such areas unless the President directed so. The Judiciary of Pakistan had no jurisdiction powers in the erstwhile FATA. Thus, the President through his Governor enjoyed absolute executive and legislative powers in the FATA (Naseer, 2015b).

After the merger with Khyber Pakhtunkhwa Province, the new system of governance shifted executive authority from the provincial KP Governor designated by the President of Pakistan to the democratically elected Chief Minister and accountable state executive. This has been extended to the offices of Deputy

Commissioner and Assistant Commissioner. The representation of merged districts in the National Assembly is reduced to 6 seats, however, there is no reserved seat for women from merged districts anymore and the Senate membership is reduced to 96 from 104 seats (Government of Pakistan, 2018).

However, all these elected members from the now Newly Merged Districts can take part in the legislative process for their respective areas. The merger had repercussions for the KP Provincial Assembly as Article 106 was amended to increase KP seats from 124 to 145 to include 21 seats of the Newly Merged Districts. Historically, FATA had never been represented in the KP provincial administrative and legislative system, but after the 25th Amendment the Newly Merged Districts were represented through 21 seats in the KP Assembly with special representation for tribal women by allocating them 4 seats in the Provincial Assembly, and one seat is reserved for non-Muslim minorities from the merged areas (Government of Pakistan, 2018).

The legal system was given effect in newly merged districts by extending Peshawar High Court and Supreme Court of Pakistan jurisdiction, and the traditional local security system is replaced by a regular, trained and modern police system, hence transitioning tribal areas into the new administrative and legal system (Fayaz et al., 2021).

7 Merger and implementation process: Perceptions of local tribal population

In the key informant interviews from seven merged districts (28 KIIs, 2021-22), most participants claimed that they were aware of the merger's implications. However, in focus group discussions it emerged that half of the respondents had no information or understanding of the post-merger administrative and legal system. Interestingly but not surprisingly, most females participating in focus group discussions were illiterate. Therefore, they were completely unaware of the merger in the first place and unable to talk of its implications for women (FGDs Khyber, Kurram, Orakzai, Mohmand, N. & S. Waziristan and Bajaur, 2021-22). Socially dictated gender disparity in the tribal population significantly influenced awareness patterns, with men comparatively more cognisant of the pros and cons of the merger. The levels of awareness are different chiefly because FATA districts were traditionally patriarchal in character, therefore literacy rates are different for women and men. Furthermore, access to media or communication with local government officials is unthinkable for women.

One question related to change of system were fears related to coming under full control of state and government. Many key informants from North Waziristan, Mohmand and Orakzai feared that the new system implied more government control. There was apprehension that natural resources would be exploited by the government. The tribes anticipated inadequate compensation and royalties from provincial and federal governments for their resources such as gas, gold, precious stones, marble, and coal as had happened in Baluchistan (KIIs N. Waziristan, Mohmand & Orakzai, 2020-2021).

In Khyber, South Waziristan and Kurram, the key informants' interviews reflected that they were alarmed about the possible loss of tribal identity because the tribes had distinctive ethnic and cultural practices different from those of the settled areas of KP, although the latter are also Pashtun dominated (KIIs Khyber, S. Waziristan, & Kurram, 2020-21). The post-merger extension of new governance and legal systems raised different concerns which varied considerably across districts. For instance, in Mohmand, Orakzai and North Waziristan, resource exploitation was the greatest concern of the local population but an insignificant issue in the remaining districts.

In focus group discussions across the seven districts, most male and female respondents expressed that government's decision of the tribal areas' merger with settled districts of KP was not well thought-out. The Provincial Assembly and federal government should have developed a prior consensus with the local tribal communities before making an abrupt and haphazard decision. The merger should have been planned and implemented stepwise to deal with local complexities. For example, almost all land ownership in tribal areas is not documented (except some parts of Kurram district), and its registration as part of land reforms is a convoluted process.

Unforeseen problems in the suddenly merged tribal areas arose with the extension of the judiciary as an institutional legal forum for dispute resolution. Prompt abolition of the previous institutions of political agent and Jirga caused land disputes to be brought before the judicial courts instead. The entire judicial platform suffered a standstill because the courts were not prepared to adjudicate cases in the absence of local land Patwaris or title deeds. This was aggravated by the absence of trained lawyers to serve as legal counsels across the tribal areas.

Nevertheless, a majority expressed in the interviews and focus group discussions that generally, the population was satisfied with the disbanding of the Frontier Crimes Regulation (FCR), particularly the unfair punitive laws of 'collective punishment' of the whole tribe for the crimes of individuals. Almost all of them were disillusioned with immediate benefits of the merger because the anticipated legal reforms and development funding had not materialised as expected. Male focus group participants pointed to the non-allocation of the promised Annual Development Plan (ADP) and National Finance Commission (NFC) awards to their districts at the time of the merger (FGDs Kurram, Khyber, Mohmand, N. Waziristan, S. Waziristan, Mohmand & Bajaur, 2021-22).

On the positive side, several aspects of the anticipated merger reforms garnered encouraging feedback from participants, such as improved prospects for girls' education, more comprehensive district-level policing, and accessibility of formal court systems. Women participating in FGDs in Kurram district were particularly enthusiastic about dispute resolution mechanisms that the formal institution of the judiciary could provide to women. The respondents' enthusiasm can be contextualised by comparing the pre-merger institution of the very patriarchal and male-dominated Jirga system in which women were not represented at all (FGDs male and female Kurram, 2021-22). Most voiced moderate approval of the improvements in local policing as it evolves from the traditional policing system, but acknowledged that significant training was the need of the hour to make police operationally effective (KIIs Kurram, Mohmand & Bajaur, 2021-22).

Analysing the data from the field notes obtained during 28 KIIs and 14 FGDs more deeply, it is deduced that a correlation exists between positive perceptions of the merger (when announced) and greater satisfaction with its outcome and potential implementation. Conversely, it is surmised that individuals with negative perceptions of the merger (at the time of the announcement) are more likely to be dissatisfied with the current state of implementation. In male FGD South Waziristan, one participant summed up that "initially we all were very enthusiastic when the merger was announced because of the development we hoped would come to our areas. The government promised to spend billions of rupees over the next ten years to bring us in line with the rest of the country. But to date, we have not seen a single rupee spent on education, health, or agriculture" (male FGD, South Waziristan District, 2021).

8 Political rights and representation in the Provincial Assembly of Khyber Pakhtunkhwa (KP)

Residents of erstwhile FATA had no representation in the KP Provincial Assembly under the former constitutional arrangement although they were allocated representation in the National Assembly of Pakistan. However, the elected members from FATA could not legislate for their respective constituencies. After the merger, erstwhile FATA districts are given representation in the Provincial Assembly of KP, and their representatives in the National Assembly of Pakistan are empowered to legislate for their constituencies (Government of Pakistan, 2018). In focus group discussions from Kurram, Khyber, Mohmand, Orakzai and Bajaur, most participants confirmed that FATA residents are automatically registered to vote when they checked their voting status by sending their National Identity Card number through Short Message Service (SMS) to a government SMS service.

Similarly, obtaining a National Identity Card (NIC) is now much easier. Instead of requiring an affidavit from tribal elders, now they simply fill a form. They receive a follow-up confirmation via Short Message Service (SMS), in addition to a reminder to vote (FGDs Kurram, Khyber, Orakzai, Mohmand & Bajaur, 2021-22). Interesting variations in voter registration trends are ascertained in South Waziristan and parts of North Waziristan districts. The participants in key informant interviews and focus group discussions reasoned that there is a low rate of voter registration in their areas due to conflict-related displacement in

recent years. Thus, the internally displaced population was forced to register their vote in the neighbouring sub-districts of Bannu and DI Khan, as they resided close to host communities (respondents N. Waziristan and S. Waziristan, 2021-22).

Gender disparities in voting rights can be observed across all the Newly Merged Districts because socio-cultural barriers prevent women from voting. Most female respondents stated the male heads of their households prevented them from visiting a polling station. One participant from Orakzai said in the FGD: “I have my national identity-card but I did not vote. Only our men have knowledge about elections and voting. If women participate in the political system, we will be thrown out of our homes by men in our household as punishment” (female FGD Orakzai, 2022). This observation was further corroborated in male FGDs, where participants voiced concerns about female members of their households voting. They said that they would be willing to allow their womenfolk to vote if culturally appropriate mechanisms, such as gender-segregated polling stations and presence of female polling agents, could be guaranteed (male FGD Orakzai, 2022).

In response to the question about the allocation of representation (seats and right to legislate) to the Newly Merged Districts in KP Provincial Assembly most participants expressed satisfaction that the Newly Merged Districts now enjoyed representation in the Provincial Assembly and rights were vested in their FATA representatives to legislate for their areas in the National Assembly. One male participant in the North Waziristan FGD said: “We all participated in the most recent election and cast our vote. It was important to us because we previously never had representation at the provincial and national government level. Now, for the first time, we have an elected MNA (member of national assembly) and MPA (member of provincial assembly) representing our views in Peshawar.” (male FGD N. Waziristan, 2022).

In the 2018 elections, after extension of the Political Parties Act (Ahmed et al., 2021), mainstream political parties started enjoying varied degrees of support across districts. It can be concluded from the KIIs and FGDs that in comparison to local members of the Provincial Assembly (MPA), FATA residents had comparatively better acquaintance with the identity and political affiliation of their elected member of the National Assembly (MNA), and closer social and political connection. General ignorance existed amongst the FATA population towards the political role and responsibilities of the senators, signifying a popular disconnect with senate representatives (KIIs and FGDs Kurram, Orakzai, N. Waziristan, S. Waziristan, Khyber, Mohmand & Bajaur, 2021-22).

Participants of the study pointed to rigged voting and political engineering in elections. However, most of them agreed that this is normal in Pakistani politics and not specific to FATA. Male participants from the FGD held in Bajaur District reported eye-witnessing vote rigging at polling stations (FGD Bajaur, 2021). Others mentioned anecdotal instances of suspected vote rigging, also highlighted in local media. Whether these claims are valid or not, the analysis of responses exhibits that perceived misconduct during elections runs the risk of dis-incentivising and disillusioning the common people in FATA, discouraging political participation in future elections. The general perception that the military interferes in general elections may undermine the political transition of these areas at risk.

9 Local views and perceptions on administrative reforms and their effectiveness

This section specifically inquires into people's satisfaction with the post-merger administrative system and government performance. This work also makes an effort to record popular perceptions in target districts on the functioning of judicial institutions and changes of security dynamics if any. The inquiry into popular satisfaction with KP government's performance during the KIIs established that most people are not satisfied with the new administrative setup (male & female KIIs Kurram, Orakzai, Khyber, Mohmand, Bajaur, N. Waziristan & S. Waziristan, 2020-21). Government performance is measured by proxy indicators such as frequency of local inhabitants' visits to government offices and satisfaction with NADRA services in issuing National Identity Cards (NICs), birth and domicile certificates for residents. One participant of the male FGD in Kurram said: “In political agent office (previous system), it was near to impossible to visit him and only Malik (tribal influential elder) would access him. Now anyone can file a complaint and visit deputy commissioner *sahib*” (male FGD Kurram, 2021).

Corruption is another important metric which was explored qualitatively in focus group discussions in all districts. Most FGD participants felt that corruption has increased in post-merger administration, although accessibility of the officers is no longer an issue. During informal discussions, Khyber residents pointed to the exponential increase in bribe demands from officials of the Federal Board of Revenue (FBR) to facilitate trade and goods movement across the Pak-Afghan Torkham border crossing (male FGDs Khyber, 2022). Local businessmen (including small business owners) in Khyber district claimed that bribe demands from FBR officials have become routine. The residents asserted that the FBR officials take advantage of local people's ignorance of official procedures because many business owners have not attended formal education institutions and had no previous experience with tax authorities at all.

Moreover, the local judiciary cannot mete out justice or grant redress for grievances due to ineffective implementation of the new legal and administrative system. Likewise, participants from South Waziristan blamed the inefficient government for rising corruption, mismanagement, and misappropriation of development funds allocated to their areas. They mentioned that bribery rates across government departments had increased "from 10 % to 50 % in pre- to post-merger administration".

Some participants mentioned troubles that they faced on approaching administrative officials stationed far away from their area of residence. They shared their thoughts saying "we have very little access to our government officials because they sit 150 kilometres away from us in the Tank District. For a common person to visit local officials, such as the deputy commissioner or assistant commissioner, they have to travel long distances. When we reach their offices, we always get the same answer that they are out for a meeting or visiting another area" (male FGDs S. Waziristan, 2022). Participants from Bajaur emphasised the need for better training of bureaucrats to render efficient service under local tribal realities, because it would mitigate levels of perceived incompetence within local departments (male KIIs Bajaur, 2020). An interesting though unsurprising observation is that those individuals whose problems remained unresolved conveyed dissatisfaction with the provision of government services. Individuals whose grievances were redressed by the government officials indicated greater satisfaction and confidence in the post-merger administrative system.

Careful perusal of data collected from the participants suggests that tribal people's general discontent or satisfaction with post-merger administrative and executive performance is directly proportional to the stability of the Newly Merged Districts. Most participants in FGDs and KIIs expressed a phenomenal concern over legal property ownership. The participants expressed dissatisfaction with the traditional *Patwar*³ system for registration of land ownership. Residents of Khyber and Mohmand were most vocal about alleged corruption and bribes paid to local *patwaris*, frequently resulting in loss of land title due to misappropriation by *patwaris* (male FGDs Khyber and Mohmand, 2021-22).

10 Opinion regarding extension of judiciary and the new legal system

In 2019, the courts and land-laws were extended to the merged districts. This authorized the judiciary and new executive system, comprising deputy commissioner, additional district commissioner and political tehsildars, to adjudicate civil and criminal cases and collect revenues. In 2020, the KP land revenue department designed a project for land distribution and record keeping of tribes' communally owned property, but no implementation is carried out to address civil disputes which unfortunately are transforming into criminal cases and violent conflicts (Zeb, 2021). Compared to the recently introduced adjudication by formal courts, an interesting discovery during all KIIs and FGDs is that significant preference and support persists for the traditional justice mechanism of *Jirga*⁴ for civil dispute resolution (male KIIs Kurram, Orakzai, Mohmand, N. Waziristan and Bajaur, 2020-21).

A compelling reason for *Jirga* as a popular forum and tool of civil dispute resolution is the government's failure to register land records of 'combined owned properties'⁵. Land reforms can secure individuals' ownership

³ An office that keeps records of land ownership.

⁴ In the old system, *Jirga* consisting of maliks/elders of tribes nominated by the political agent was the only mechanism available to resolve cases and settle disputes among the tribals. It tried to resolve both criminal and civil cases according to customary law of the agencies among the tribes or, if not possible through customary law, then Islamic law was applied.

⁵ In tribal areas usually a piece of land is owned by an entire tribe/sub-tribe/sub-section/branch which is then distributed

rights. However, most of the land in the Newly Merged Districts is owned by families and tribes thus limiting individual ownership, which may cause lack of socio-economic progress. It renders individuals unable to generate revenue by sale or purchase of land, or be legally protected in business activities such as market, hotel, industry, crop cultivation, cattle farming etc. Instead, land disputes amongst families and tribes have strained individual relationships. Predictably, common people still rely on the traditional system of mediation by local elders.

Most participants mentioned that individuals with recent litigation experience made clear that those who took recourse to the Jirga system for dispute resolution were gratified with prompt justice rather than the lengthy and cumbersome adjudication procedure of the formal court system. However, there is disagreement between men and women on preferred dispute resolution institutions. To a question about preferred judicial forum, most women in KIIs and FGDs opted for family courts to adjudicate familial disputes, if only they were provided access to the courts (female KIIs and FGDs Kurram, Orakzai, Khyber, Mohmand, Bajaur, N. Waziristan & S. Waziristan, 2020-21-22).

Absence of easy access and commuting facilities to the courts rendered the new judicial system unpopular amongst common people. Due to lack of infrastructure, courts are stationed in the adjacent settled areas or at the headquarters of former agencies, compromising accessibility to the justice system. For instance, the district court for merged Khyber district is situated at Federal Judicial Complex in Hayatabad, the Bajaur local court is located at Timergara in Lower Dir, Kurram court is at Parachinar, South Waziristan is at Tank, Orakzai is at Hangu, Mohmand at Shabqadar, and the Charsadda and North Waziristan court is at Bannu. Currently, 28 judicial officers are posted to these seven tribal district courts to hear civil, criminal and family cases, an insufficient number to adjudicate the enormous number of cases in the FATA districts (Amin, 2019).

11 Perceptions about security and police service

There was a broad consensus amongst the participants that security in tribal areas had improved since the 2018 merger. This was attributed to an overall decline of militant activities and improvement in local policing. FGD participants from North Waziristan remarked on the substantial improvement in security due to police presence, as they were able to access markets in the evening and travel after dark in many areas. Nevertheless, they all agreed that some parts of the districts are still unsafe with frequent instances of targeted killing (male FGDs N. Waziristan, 2022). In Kurram, FGD participants mentioned the improvement of law and order, asserting that only the military could control that militancy (male FGDs Kurram, 2022).

In Khyber, the participants of KIIs and FGDs disagreed with the presence of police because they believed that police presence has increased corruption in the district. Every second day, the police extort money from the local traders and shopkeepers on the pretext of so-called police clean-up operation against criminals (male KIIs and FGDs Khyber, 2021-2022). South Waziristan, Bajaur and Mohmand's participants offered mixed responses towards the merger's impact on security and the law-and-order situation. Some believed things got better, while others opined that nothing has changed in their respective districts (male KIIs & FGDs S. Waziristan, Bajaur and Mohmand, 2021-2022).

Though diverse perceptions and divided opinions exist on security and police presence in these areas, a general consensus exists about lack of training and capacity to maintain security of the local police force. Participants in KIIs acknowledged that despite lack of infrastructure facilities police had increasingly assumed functions under municipal law from *khassadars* and *levies*⁶ during the transition. The participants in FGD South Waziristan highlighted that corruption has decreased as the Police Department performed more efficiently/professionally specifically during the period from October 2020 to August 2021. A general consensus over the possible reason for this professionalism was the appointment of an officer from Central Superior Services (CSS) in South Waziristan whose training, dedication and public relations made a remarkable difference. This proved to be a break from the former practice of appointing rank-and-file

among families, according to tribal law/custom/pre-settled rules which vary from district to district, and on the individual level. In most cases, documented proof is not available except in the district Kurram.

⁶ Former local (traditional) mechanism of security.

officers promoted from lower ranks within the Police Department, who encouraged corruption, malpractice and favouritism in appointments. The general perception debatably is that common officers compromised law and order and public interest (male KIIs and FGDs S. Waziristan, Bajaur and Mohmand, 2021-2022).

This issue can possibly be resolved in tribal districts if a proper mechanism is designed to appoint police officers based on seniority cum fitness criteria. Fascinatingly, a significant number of tribal residents are convinced that properly trained police officers who are efficient, professional and honest can be better than the military at dealing with the militants. The lower ranks of police are usually inducted from local people, therefore are cognisant of the nature of conflicts, culture, traditions and security dynamics. Arguably, there was a significant decline in militant attacks on police personnel in South Waziristan during the mentioned period.

The participants in FGDs from South and North Waziristan Districts also pointed out that the nature and role of institutions must be defined clearly. It is observed that military and police officials were confused about their assigned roles in the local security set-up. Militant groups took advantage of this lack of coordination between law enforcement agencies. Tribal elders among the participants from all the Newly Merged Districts in KIIs and FGDs revealed that the police system is not considered trustworthy by the local population, while many local elders remained unaware of the existence of a formal police system. This work also points to a correlation between age of the respondent and perceptions of trustworthiness of police; younger respondents are more likely than older ones to believe that police is trustworthy. This suggests that the younger generation is ready to accept the new security system while the older generation has less trust in the state's physical security apparatus (male KIIs and FGDs S. Waziristan & N. Waziristan 2021-2022).

12 Opinion on merger and improvement in welfare services

Another question asked during KIIs and FGDs was about the impact of the merger on access to health, education and related services. This included the supply of water, electricity and gas services, and assessing fair allocation of each service by the government. In the FGD of Kurram, a female participant replied with regard to health services: "For serious illnesses we travel to the hospital in Parachinar but it still lacks the facilities and equipment to deal with maternal issues. As a result, many of our babies die along the road to Peshawar before they can get treatment." (female FGD Kurram, 2022).

The data from different FATA districts suggested inconsistent outcomes. In North Waziristan both male and female FGD participants stated that their access to health services has improved, but FGD participants from Mohmand did not. FGD participants from North Waziristan, Bajaur, and Orakzai districts spoke positively about improvements in access to health (male and female FGDs North Waziristan, Bajaur & Orakzai, 2021-22), while those from Khyber, Kurram, Mohmand, and South Waziristan said there is no change in health services (male and female FGDs Khyber, Kurram & Mohmand, 2021-22).

The FGDs on access to education were inconsistent; however, most felt that the provincial government had failed to allocate education resources fairly. There was considerable regional variation. KIIs in Orakzai reported improved access to education facilities (male and female KII Orakzai, 2020) while KIIs in Kurram criticised the provincial government for neglecting merged areas (male and female KIIs Kurram, 2020). Most KII male and female participants disclosed that they had no formal education, and this was largely consistent across the Newly Merged Districts. There was, however, significant gender disparity. Most women participants falling in the age bracket of 30s and 40s in KIIs and FGDs mentioned that they had no formal education.

In the Kurram female FGD, one female teacher said that "the merger has badly impacted our education system. Previously at my school we had three teachers whose salaries were paid through the political agent's education fund. Now this fund has been dissolved as part of the merger. Our teachers are sitting at home, hoping to get their jobs back." (female FGD Kurram, 2021). Intense debate was generated on the quality of education among participants of focus group discussions. Women in North Waziristan applauded government efforts to enrol their daughters, while participants from Kurram revealed that teachers were rarely present in school. In FGDs of North Waziristan and Bajaur districts, there were references to newly introduced electronic monitoring mechanisms that are improving teacher attendance and providing the local

government with greater oversight of the education system (male and female FGDs N. Waziristan & Bajaur, 2021-22).

There are diverse findings on access to water, electricity, and gas. In N. Waziristan's FGDs and KIIs, the participants reported that provision of clean drinking water and electricity have improved after the merger, but FGD participants from Kurram and Mohmand districts expressed concerns that their access to clean drinking water is severely limited (male and female FGDs Kurram & Mohmand, 2021-22). In FGDs and KIIs of all seven districts, references to piped gas provision during discussions are sparse, likely due to its complete absence from the Newly Merged Districts to date. Because gas for kitchen stoves directly affects the lives of local women, one participant of the female FGD in Orakzai district emphasized the need, saying "I feel that it should be the number one priority for the new government as part of its plans for merger implementation to provide a running gas supply to households" (female FGDs Orakzai, 2021). On the question of access to electricity, most participants across all the Newly Merged Districts responded that the government allocated the resources unfairly. In focus group discussions, nearly all the participants voiced frustration over significant power outages due to load shedding all over these tribal districts. They all said they have hardly two hours of electricity every day (male and female FGDs S. Waziristan, 2021-22).

Concerning access to information, radio serves as an important means of information across all districts besides television, both being considered important sources of information and recreation. Connectivity and information dissemination through smartphones has improved too with the merger (male and female FGDs Kurram, Orakzai, N. Waziristan, S. Waziristan, Mohmand & Bajaur, 2021-22). The participants expressed that fake news has become an increasingly serious issue across TV and social media, necessitating greater caution when determining the facts. One of the participants from Khyber mentioned: "TV and radio are quickly being replaced by news we receive through our phones. But the media does not present news in an honest way because it is controlled by politicians. The only news that I trust is the sports news because it is impossible for them to give you the wrong scores." (male FGD Khyber, 2022).

13 New system, new government in Pakistan, and the pandemic

After the merger of erstwhile FATA with KP in 2018, there was a change of government which stalled the funds for the development of the Newly Merged Districts (Khan, 2022). Thus, the years 2018-19 were a difficult transition period for erstwhile FATA. In addition, in 2020 the world was hit by a pandemic that adversely affected the mainstreaming of erstwhile FATA. It was observed in the field study that the temporary lockdowns compromised the livelihoods of the already poor tribal population and their freedom of movement (male FGDs Kurram, Orakzai, Bajaur, Mohmand, Khyber, 2020; male FGDs North and South Waziristan, 2021). Among the varied economic impacts attributed to the pandemic, a majority of respondents in KIIs and FGDs complained that the greatest challenge was the spike in prices of local commodities. Lesser impacts included the closure of small businesses and loss of livelihood opportunities. The spike in prices was largely due to the disruption of local and regional supply chains, compounded by restricted access to markets and lack of ability to travel outside one's immediate community during lockdown.

Some reported receiving one-time PKR 12,000 cash assistance and food aid from the government, but this was considered insufficient to meet existing needs and also was distributed inconsistently among communities (male FGD Mohmand, 2020). In Jamrud, Khyber District, male FGDs mentioned that "before the pandemic, a bag of flour cost PKR 800 but now it has almost doubled to PKR 1400. We had rapid inflation which is made worse by the absence of jobs and businesses. I would have died of hunger and poverty and not because of Covid-19" (male FGD Khyber, 2021). The economic situation for some communities was further exacerbated by the sharp drop in domestic and international remittances to households. The key informant interviews across the seven Newly Merged Districts highlighted that many household incomes had been negatively affected by the reduction in foreign remittances (KIIs in Kurram, Orakzai, Mohmand, N. Waziristan, S. Waziristan & Bajaur, 2020-21). "People coming back and losing jobs indicates that pandemic-related restrictions in places like the United Arab Emirates (UAE) and the wider Middle East contributed to substantial job losses among Pakistani migrant workers, impeding their ability to travel home or send money to families" (male college teacher Kurram, 2021).

The health facilities are very poor in the Newly Merged Districts without a single hospital that can be labelled well-equipped with trained doctors and infrastructure (Government of Khyber Pakhtunkhwa, 2018). In districts such as Kurram, Orakzai and Bajaur, respondents declared that government-stipulated "Standard Operating Procedures" (hand washing, social distancing, mask wearing) promoted through television and radio were incompatible with the context and available facilities in tribal communities. Mandated items like masks and hand sanitisers were in very short supply. (Kills Kurram, Orakzai, Bajaur, 2020-2021).

In North and South Waziristan districts, focus group participants expressed that many in the beginning believed that the virus was a hoax or misinformation campaign by government to further repress tribal areas. Respondents particularly from South Waziristan said that accessing treatment for pressing issues of malaria and typhoid outbreaks was extremely challenging because of the pandemic. Some speculated that weak media coverage and frequent power cuts in remote parts of their respective districts partly led to awareness and observance disparity in pandemic protocols (male and female FGDs North and South Waziristan, 2021). The key informant interview respondents in Kurram informed that seriously ill patients were rushed to hospitals in Peshawar, while those from South Waziristan were transported to Dera Ismail Khan for treatment.

Apart from direct health threats posed by the corona virus, widespread spikes in mental health issues were reported. Particularly anxiety and depression occurred amongst men due to the prolonged lockdowns and associated job losses (male and female KIs Kurram, 2020). Women attending FGDs in Kurram and Orakzai districts reported increases in gender-based violence and other forms of domestic violence, aggravated by mental health issues and communal isolation (female FGDs Kurram and Orakzai, 2020). Schools across the districts remained closed for long periods during the pandemic. This disrupted education in these Newly Merged Districts as it did in the rest of Pakistan. In Kurram and Khyber districts, the private schools' fees continued to rise over the eight months since the pandemic began due to lack of monitoring by Khyber Pakhtunkhwa Private Schools Regulatory Authority, despite their children being unable to attend. In the educational institutes of urban areas of Pakistan, the tribal students / scholars living in boarding hostels were forced to vacate hostels in the wake of Covid-19 pandemic lockdowns and protocols. The tribal students returned to their villages could not continue with their online education due to lack of internet facilities in Newly Merged Districts (Yousafzai, 2020).

14 Recommendations

The findings from key informant interviews and focus group discussions suggest that certain emergency measures are required to create a positive perception about the merger of erstwhile FATA and implementation of the new system. The Report of the Committee on FATA Reforms (Government of Pakistan, 2016), headed by Sartaj Aziz, recommended a five-year transition period. During this transition, a number of necessary "complementary objectives and prerequisites" were to be fulfilled before the merger could be truly achieved.

The 2.1 billion rupees annual development programme and 3 % share in the National Finance Commission divisible pool was promised to Newly Merged Districts. Hence, it is very important to roll out promised funds and economic assistance to these merged districts to develop their administrative and judicial infrastructure.

The plan was also devised to double the quota seats in universities for students from merged tribal districts until the establishment of universities and a quality education system in these Newly Merged Districts. However, instead of the doubling of quota seats, attempts have been made by some other provinces to abolish the existing quota seats for tribal students. The field study found that the people of merged districts are aware of the importance of education. Therefore, serious attention shall be paid to the quotas and availability of scholarships for students from erstwhile FATA.

There is a need for quality health facilities. The findings in the field show that during the pandemic these merged districts were the least equipped, and due to lockdowns they could not access health facilities in the settled areas for their ailments.

The draconian FCR is replaced by the Peshawar High Court and Supreme Court. As an informal justice system, the introduction of the 'Tribal Areas Riway Act' based on the region's customary law for civil and criminal cases is promised. However, all these endeavours for justice need to be implemented in letter and spirit. Although some informal alternate dispute resolution mechanisms are extended to these areas, they are not getting a positive response and feedback due to incompetent and corrupt administration.

To end tribal enmities and violence, there is a need to establish land and revenue records and proper documentation. The recent worsening of the security situation in some tribal districts is due to tribal clashes over land and other resources amongst the tribes living in these merged districts.

Unemployment and poverty are a serious issue of concern for all in the merged districts. Therefore, the need to create new opportunities for livelihood resonated in the interviews and focus group discussions. Many who had been working in the Middle East came back due to the pandemic. Therefore the discussions gravitated towards the need and demand for livelihood opportunities and skills development for tribal people in post-merger settings.

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The Relationship between Intelligence and Ideological Views

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Abstract

Literature on the association between political views and intelligence has largely focused on the linear relationship between the two variables, with nonlinear relationships between them being rarely examined. The National Longitudinal Study of Youth (1979), a cohort of about 10,000 youth born between 1957 and 1963 who were administered the ASVAB in 1981, were used as a source of data. IQ and support for the Republican Party were related within Whites ($r = .13$, $p < .001$), Hispanics ($r = .12$, $p < .001$), and Blacks ($r = -.073$, $p < .001$). Within Blacks, IQ and support for the Republican Party were curvilinearly associated. Support for the Republican Party was highest among highly intelligent and unintelligent Blacks ($F = 18$, $p < .001$). IQ and conservative gender attitudes negatively correlated within all races, but this relationship did not hold in individuals with an IQ above 115, even within the large White subsample ($r = -.005$, $p = .85$, $n = 1060$).

Keywords: IQ, Tradition, Feminism, Politics, Ideology

1 Introduction

Extensive research has been done on the relationship between political views and intelligence. To summarise, cognitive ability has been linked with right-wing economic attitudes (Jedinger & Burger, 2021), but socially liberal (leftist, progressive) beliefs (Carl, 2014). Historically, White Republicans have been more intelligent than Democrats, but this relationship began to reverse around the early 80s and flipped around 2010 (Khan, 2020) according to statistical analysis from the General Social Survey (GSS). If ideology is considered instead of party affiliation, liberals seem to consistently outscore conservatives (Kanazawa, 2010; Kimmelman, 2008). While this was not the main objective of the study, Meisenberg (2010) found that the endorsement of conservative gender roles and intelligence were negatively related ($\beta = -0.27$, $p < .001$) within the NLSY79 dataset. Other studies have also replicated that intelligence is positively related to liberal gender attitudes and other socially liberal beliefs (Deary et al., 2008a).

Research about the relationship between specific cognitive abilities and political attitudes suggests that verbal ability is a stronger predictor of political beliefs than other abilities. Kimmelman (2008) found that verbal ability was a stronger predictor of political beliefs than mathematical ability. When verbal ability is controlled for, other cognitive abilities do not predict political views (Heaven et al., 2011; Ludeke et al., 2017). However, given that verbal and nonverbal ability are highly correlated due to the common influence of the g factor on both, it is difficult to test this hypothesis without a very large dataset.

Beyond linear associations, it has been hypothesized that political beliefs could potentially be non-monotonically related with intelligence (Solon, 2014, 2015). Unfortunately, very little academic research has been conducted to determine whether the effect of cognitive ability on political views is linear or monotonic. Noah Carl (2015) researched this question using the Wordsum test and found that most relationships were linear, though this was difficult to determine given that Wordsum (a 10-item vocabulary test) has a low ceiling. In addition, Jensen and Kirkegaard (2023) have tested this hypothesis in the NLSY97 dataset and found that belief in individual responsibility and belief in government responsibility were monotonically and positively related to intelligence.

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The relationship between political extremism (absolute value of ideology) and cognitive ability has also been researched in the literature. Lin and Bates (2022) found intelligence predicts lower economic conservatism ($r = -.105$, $p < .01$) but also higher economic extremism ($r = .115$, $p < .01$). However, in the longitudinal sample, they found intelligence positively correlated with economic conservatism ($r = .125$, $p < .001$). Zmigrod et al. (2019) found that cognitive ability and extremism correlate negatively, though their measurement of extremism was based on an individual's willingness to fight and die for groups, which is substantially different from ideological extremism. Other research suggests that supporters of the far-right British National Party (BNP) are less intelligent than other voters (Deary et al., 2008b), but the sample size was very small ($n = 27$ and $n = 62$). It is also unclear whether these associations could be due to the fact that intelligence may be associated with a particular style of responding to questions on a Likert scale. Also, if the distribution of the responses to the survey questions violates normality, then the association between intelligence and political beliefs will be biased.

Controversial in the literature has been the influence of demographic covariates on the association between political views and ideology. Carl (2015) found that the association between supporting the Republican Party and the score on the Wordsum test survives controls for covariates such as race and education; Ganzach (2016) was unable to replicate this finding in this dataset and found a null association between party affiliation and score on the Wordsum test, even when applying a very similar methodology. Jensen and Kirkegaard (2023) did not find that the association between IQ and ideological beliefs about government responsibility and personal responsibility substantially changed after controlling for sex, race, education, and income. However, it is still possible that the influence of covariates (or in the case of education and income, mediators) on the relationship between political beliefs and intelligence varies depending on the specific belief and the measurement of political affiliation.

Because there is very little research that tests the influence of specific abilities on ideological beliefs or non-monotonic relationships between cognitive ability and ideology, more needs to be done to determine the veracity of these findings. The purpose of the present study was to examine these variables using a large dataset with sufficient power to estimate non-linear relationships, and the effects of specific cognitive abilities in addition to the general factor of intelligence (g).

2 Data

Individuals were sampled from the National Longitudinal Study of Youth (1979), a large dataset of 12,686 individuals born between 1957 and 1964. These include an oversampling of lower class Whites, Hispanics, and youth in the military. The military sample was discontinued after the 1984 survey and the lower class Whites were no longer sampled after 1990. They were administered the ASVAB in 1981, a highly reliable ($\omega = .94$) aptitude test used in the military consisting of 10 cognitive tests. The 50 lowest scorers were excluded out of data quality concerns.

Gender attitudes were measured using 8 questions that were asked in four different years: 1979, 1982, 1987, and 2004. Participants could respond by saying they strongly disagreed, disagreed, agreed, strongly agreed, or had no opinion on the statements they were presented with. The general factor of these questions accounted for 18 % of the variation. Factor scores were subsequently calculated for each individual. Gender attitudes in which missing values were imputed correlated marginally more with IQ ($r = -.31$) than those in which listwise deletion was implemented ($r = -.30$), so missing values were filled in to increase the power of the study. The omega reliability of this 32 (4×8) item scale derived from different years was 0.85; within survey years, reliabilities were slightly lower (0.74, 0.80, 0.81, and 0.75). The questions are presented in Table 1. This variable was standardised at a mean of 0 and a standard deviation of 1.

Political party affiliation was measured in 2008 using three questions. In the first two, individuals revealed which political party they aligned with and how strong this alignment was. Those who did not align with the Republican or Democratic party were then asked if they felt close to one of the parties. Table 2 shows how these questions were used to construct seven categories:

IQ was measured using the ASVAB, a military entrance exam, which was administered to the respondents in 1981 when they were between 16 and 24 years old. 10 subtests were used: General science,

Table 1: List of questions asked to the respondents about their views on gender.

Number	Question
Q1	A woman's place is in the home, not in the office or shop
Q2	A woman who carries out her full family responsibilities doesn't have time for outside employment
Q3	A working wife feels more useful than one who doesn't hold a job (-)
Q4	The employment of wives leads to more juvenile delinquency
Q5	Employment of both parents is necessary to keep up with the high cost of living (-)
Q6	It is much better for everyone concerned if the man is the achiever outside the home and the woman takes care of the home and family
Q7	Men should share the work around the house with women, such as doing dishes, cleaning, and so forth (-)
Q8	Women are much happier if they stay at home and take care of their children

Note: (-) These questions were reverse coded.

Table 2: Description of party affiliation.

Party affiliation	Description
Strong Republican	Identifies as a Republican, claims affiliation is strong
Moderate Republican	Identifies as a Republican, claims affiliation is not very strong
Weak Republican	Does not identify with a party, but closer to the Republican Party
Centrist	Does not identify with a party, identifies equally well with both parties
Weak Democrat	Does not identify with a party, but closer to the Democratic Party
Moderate Democrat	Identifies as a Democrat, claims affiliation is not very strong
Strong Democrat	Identifies as a Democrat, claims affiliation is strong

Word knowledge, Paragraph comprehension, Arithmetic reasoning, Mathematical knowledge, Numerical operations, Coding speed, Mechanical comprehension, Electronic information, and Auto and shop information. The first general factor was extracted from these subtests and factor scores were computed for each individual. The scores were then standardized relative to the White mean, and recoded to a normal distribution where the White mean is 100 and White standard deviation is 15.

3 Results

Political party affiliation and intelligence covaried within all three racial samples, as shown in Figures 1 to 3. Within Whites and Hispanics, the relationship between intelligence and party affiliation was largely linear, but within Blacks, intelligence and party affiliation were related curvilinearly. The most unintelligent and intelligent Blacks were more likely to vote for the Republican Party.

The difference between the linear and non-linear model (using restricted cubic splines) was formally tested by comparing the residual sum of squares of both models to calculate the F statistic. The difference between the two models was negligible in Whites and Hispanics but not in Blacks, as shown in Table 3. Because the relationship between political views and intelligence is strongly nonlinear within Blacks, Blacks were separated into IQ bands to test at which levels of IQ the nonlinear relationship emerged. According to Table 4, this curvilinear relationship passed significance in both the low and high ability groups.

Non-linear interactions were also tested when the variables were reversed, that is, to see if individuals with one particular strength of ideology (e.g. Strong Democrats, weak Republicans) are more intelligent

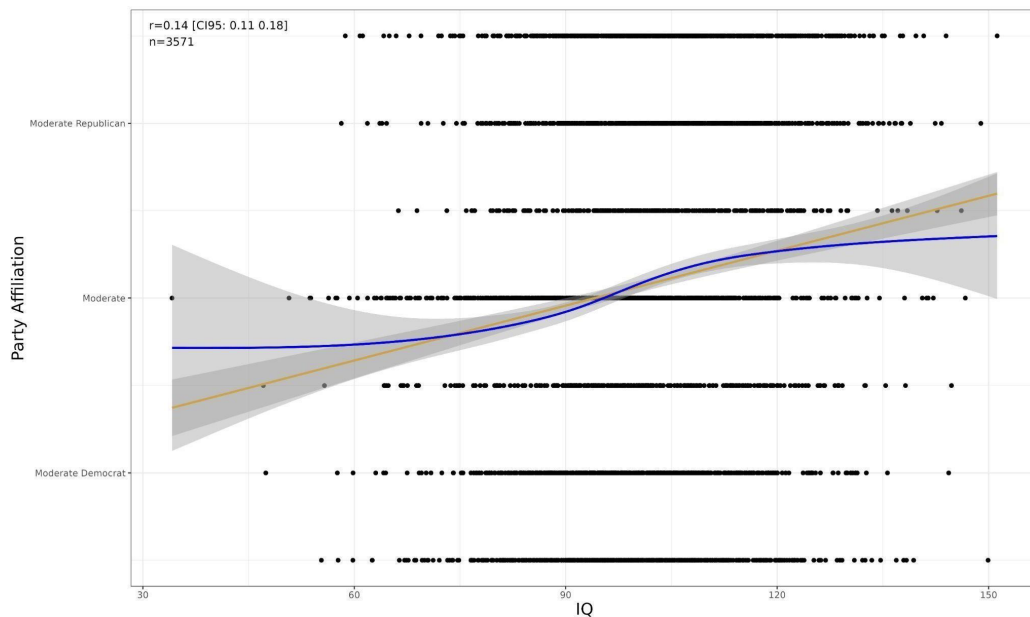


Figure 1: Relationship between intelligence and support for the Republican Party in the White subgroup. Yellow line is the linear relationship, blue line is the non-linear relationship based on smoothed conditional means. 95 % confidence intervals shaded in grey.

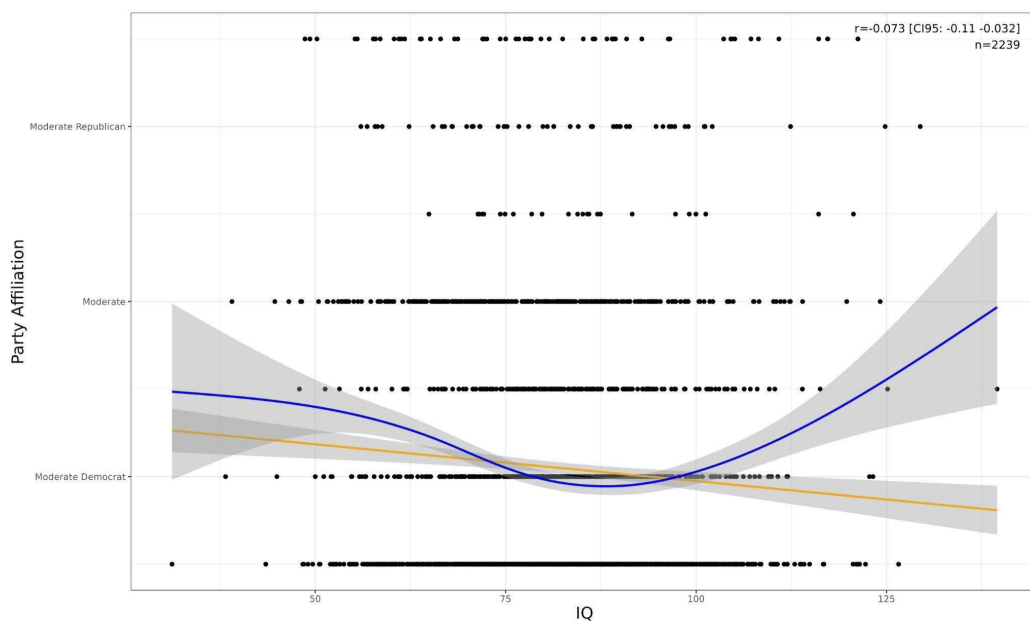


Figure 2: Relationship between intelligence and support for the Republican Party within Blacks. Yellow line is the linear relationship, blue line is the non-linear relationship based on smoothed conditional means. 95 % confidence intervals shaded in grey.

than what you would expect based on the linear relationship. Table 5 shows that the associations these variables have are largely linear, although centrists have lower levels of intelligence.

The same analysis conducted for political party affiliation was also conducted for conservative gender attitudes. Intelligence and conservative gender attitudes were negatively related within all races. The difference in correlation is statistically significant between Whites and Blacks ($z = 7.5$, $p < .001$), as well as between Whites and Hispanics ($z = 4.8$, $p < .001$). This correlation is no longer statistically significant once the sample is restricted to individuals with an IQ above 115 within Whites ($r = -.005$, $p = .85$), Blacks ($r = .010$, $p = .96$), and Hispanics ($r = -.042$, $p = .73$). This method was not powerful within Hispanics

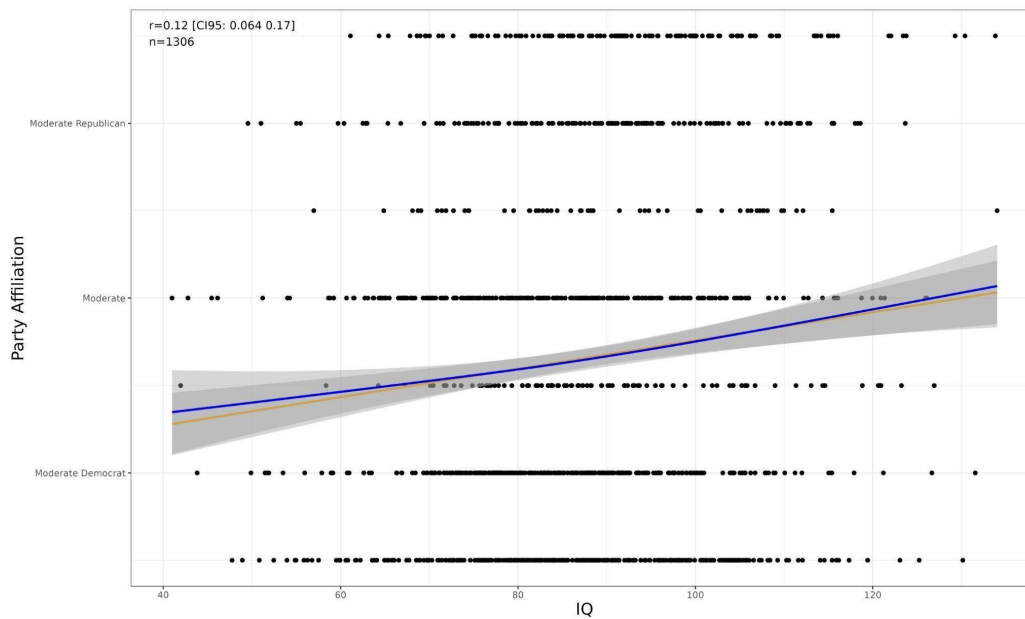


Figure 3: Relationship between intelligence and support for the Republican Party within Hispanics. Yellow line is the linear relationship, blue line is the non-linear relationship based on smoothed conditional means. 95 % confidence intervals shaded in grey.

Table 3: Comparison between linear and nonlinear models in three different groups. * $p < .05$, ** $p < .01$, *** $p < .001$.

Race	R of non-linear model	R of linear model	F-stat.
White	0.16	0.14	4.3**
Black	0.17	0.07	18.0***
Hispanic	0.13	0.12	1.1

Table 4: Support for the Republican Party by IQ group (standardised) within the Black sample. Reference group is Blacks scoring between 80 and 100. * $p < .05$, ** $p < .01$, *** $p < .001$.

IQ group	N	Support for Republican Party	Test-statistic
Far above average (IQ >115)	31	0.04	3.1**
Above average (115 >IQ >100)	232	-0.58	1.6
Below average (100 >IQ >80)	1487	-0.68	Baseline
Far below average (80 >IQ)	1269	-0.52	5.0***

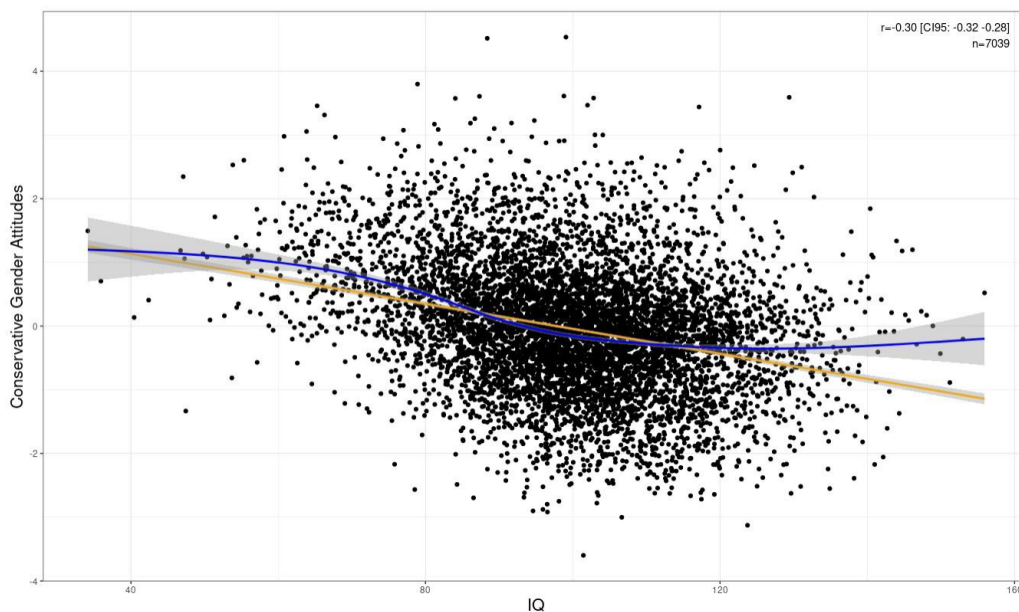
and Blacks due to the low sample sizes for these groups ($n = 70$ and $n = 31$ respectively), but it was highly powerful within Whites ($n = 1060$). The relationship between IQ and conservative gender attitudes within each race is displayed in Figures 4 to 6.

The difference between the linear and non-linear model (using restricted cubic splines) was formally tested by comparing the residual sum of squares of both models to calculate the F statistic. Table 6 shows that the non-linear models were slightly better than the linear ones within every single race.

Besides the relationship between IQ and conservative gender attitudes, races also differ in their average gender attitudes. Hispanics hold more conservative views about gender than Whites ($d = 0.29$, $p < .001$), and Blacks hold slightly more liberal views about gender than Whites ($d = -0.05$, $p = .028$). Table 7 shows that after controlling for intelligence, Blacks are more liberal than Whites and Hispanics are about as liberal as Whites.

Table 5: Average IQ by race and party affiliation. Sample sizes in parentheses.

Party affiliation	White	Black	Hispanic
Strong Republican	104.0 (679)	80.9 (57)	93.1 (140)
Moderate Republican	104.2 (624)	82.7 (53)	89.8 (154)
Weak Republican	104.1 (298)	85.8 (25)	90.2 (56)
Centrist	96.4 (733)	77.9 (357)	84.3 (305)
Weak Democrat	99.7 (285)	83.7 (198)	89.6 (96)
Moderate Democrat	99.1 (541)	82.4 (393)	85.7 (318)
Strong Democrat	99.4 (551)	82.8 (1234)	86.5 (341)

**Figure 4:** Relationship between IQ and conservative gender attitudes in Whites. Yellow line is the linear relationship, blue line is the non-linear relationship based on smoothed conditional means. 95 % confidence intervals shaded in grey.**Table 6:** Comparison of fit between linear and non-linear models within all three race/ethnicity groups. * $p < .05$, ** $p < .01$, *** $p < .001$.

Race/ethnicity	R of non-linear model	R of linear model	F
White	0.32	0.30	41.8***
Black	0.45	0.44	14.9***
Hispanic	0.44	0.41	42.9***

Table 8 shows the average IQ by race and gender values divided into 5 categories: very traditional (2 SD above the mean of the total sample, traditional (between 0.5 and 2 SD above the mean), moderate (between 0.5 SD below and 0.5 SD above the mean), liberal (between 0.5 and 2 SD below the mean), and very liberal (2 SD below the mean). Within every single racial group, IQ increased monotonically and linearly with more liberal gender attitudes.

Given that women have less traditional gender attitudes than men ($d = -0.57$, $p < .001$), it would be appropriate to test if the relationship between intelligence and conservative gender attitudes holds within both women and men. The results of the regression analysis in Table 9 suggest that the relationship is stronger within women, but this may be a statistical artefact as the correlation between IQ and gender

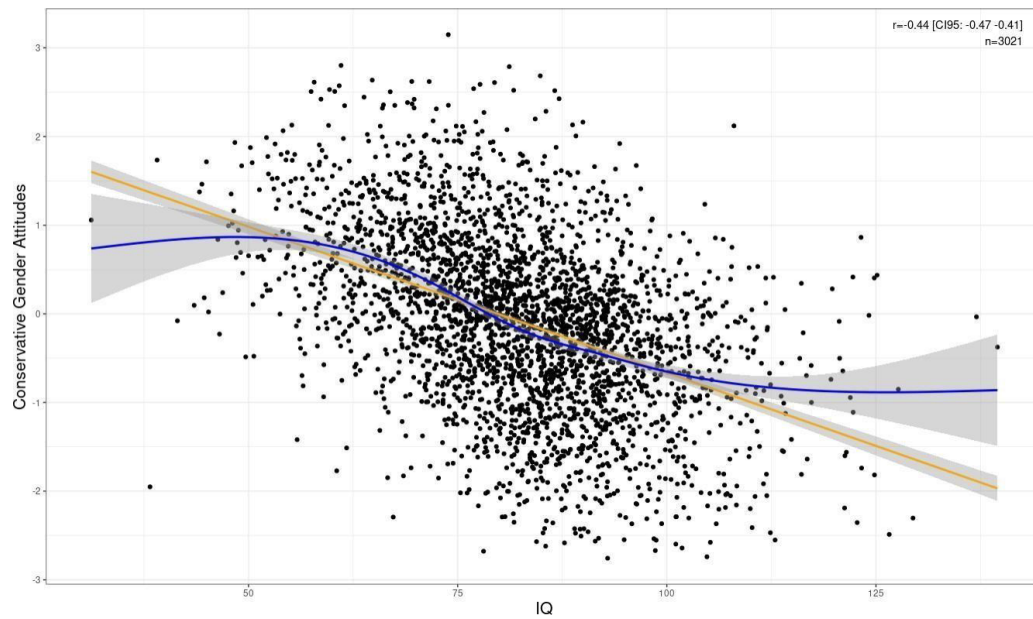


Figure 5: Relationship between IQ and conservative gender attitudes in Blacks. Yellow line is the linear relationship, blue line is the non-linear relationship based on smoothed conditional means. 95 % confidence intervals shaded in grey.

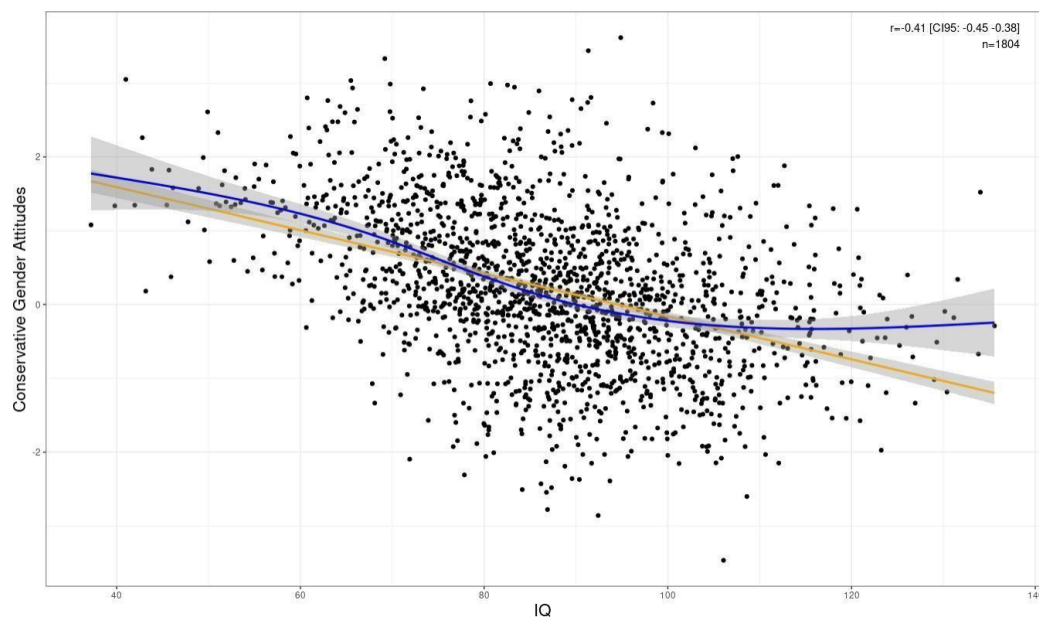


Figure 6: Relationship between IQ and conservative gender attitudes in Hispanics. Yellow line is the linear relationship, blue line is the non-linear relationship based on smoothed conditional means. 95 % confidence intervals shaded in grey.

attitudes is roughly the same in both sexes ($r = -.37$ in men, $r = -.35$ in women), as shown in Figures 7 and 8.

4 Discussion

This study was able to replicate that Americans with liberal gender attitudes ($r = -.32$, $p < .001$) and those supporting the Republican Party ($r = .14$, $p < .001$) were more intelligent. Within Blacks, IQ and support for the Republican Party were curvilinearly associated: Support for the Republican Party was higher among the most and least intelligent Blacks than those closer to the average. This effect could potentially be due to Blacks with low intelligence not recognizing the racial coding of American parties in the mainstream

Table 7: Regression model predicting conservative gender attitudes. t-statistic in parentheses. * $p < .05$, ** $p < .01$, *** $p < .001$. IQ is fit to the White mean and standard deviation, but in standardised units (mean = $-.43$, SD = 1.1).

Parameter	Estimate
IQ	-0.29 (26.5)***
Black	-0.62 (21.2)***
Hispanic	-0.12 (3.7)*
IQ × Black	-0.20 (9.0)***
IQ × Hispanic	-0.14 (5.7)***

Table 8: Average IQ by gender attitudes and race. * $p < .05$, ** $p < .01$, *** $p < .001$.

Gender attitudes	White	Black	Hispanic
Very traditional	91.8 (210)	72.5 (58)	76.5 (108)
Traditional	93.6 (1774)	74.3 (774)	80.4 (662)
Moderate	100.8 (3254)	82.8 (1328)	89.2 (781)
Liberal	104.3 (2092)	87.9 (915)	95.2 (423)
Very liberal	107.7 (180)	94.7 (99)	92.8 (28)

Table 9: Regression model predicting conservative gender attitudes. t-statistic in parentheses. * $p < .05$, ** $p < .01$, *** $p < .001$. IQ is fitted to the White mean and standard deviation, but in standardised units (mean = $-.43$, SD = 1.1).

Parameter	Estimate
IQ	-0.28 (29.2)***
Female	-0.66 (37.3)***
IQ × Female	-0.08 (5.3)***

media and therefore being more likely to vote Republican, while highly intelligent Blacks might be more integrated into White culture and therefore more likely to vote Republican. While the curvilinear hypothesis has been discussed frequently on social media, it has not been hypothesised to apply for this particular relationship. Centrists tended to be less intelligent than both Democrats and Republicans within Whites, Blacks, and Hispanics. It is possible that this is because people who are not very bright avoid having strong opinions because they find political theory or ideas confusing, know little about politics, or are not interested in politics.

Intelligence and traditional gender attitudes negatively correlated within all races. However, they were uncorrelated in individuals with an IQ above 115, even within the large White subsample ($r = -.005$, $p = .85$, $n = 1060$) of individuals with an IQ of above 115. It is possible that this is because gender-egalitarian ideas are more cognitively complex, and so they tend to be endorsed more by intelligent people, but past the level of intelligence which is necessary to understand both strands of thinking, intelligence is no longer a factor in adoption of traditional gender attitudes. While Hispanics held more conservative attitudes about gender than Whites ($d = 0.29$, $p < .001$), this was no longer true after intelligence was controlled for. Blacks were marginally more liberal than Whites ($d = -0.05$, $p = .028$), but much more liberal after controlling for intelligence ($d = -0.62$, $p < .001$).

There are various reasons why traditional gender attitudes and intelligence could be negatively associated. Given that IQ and political beliefs are associated at the genetic level (Edwards et al., 2024), and that this relationship survives controls (Carl, 2014), causality from IQ to political views appears likely. One explanation for this causal link could be the Savannah hypothesis (Kanazawa, 2010), which is that

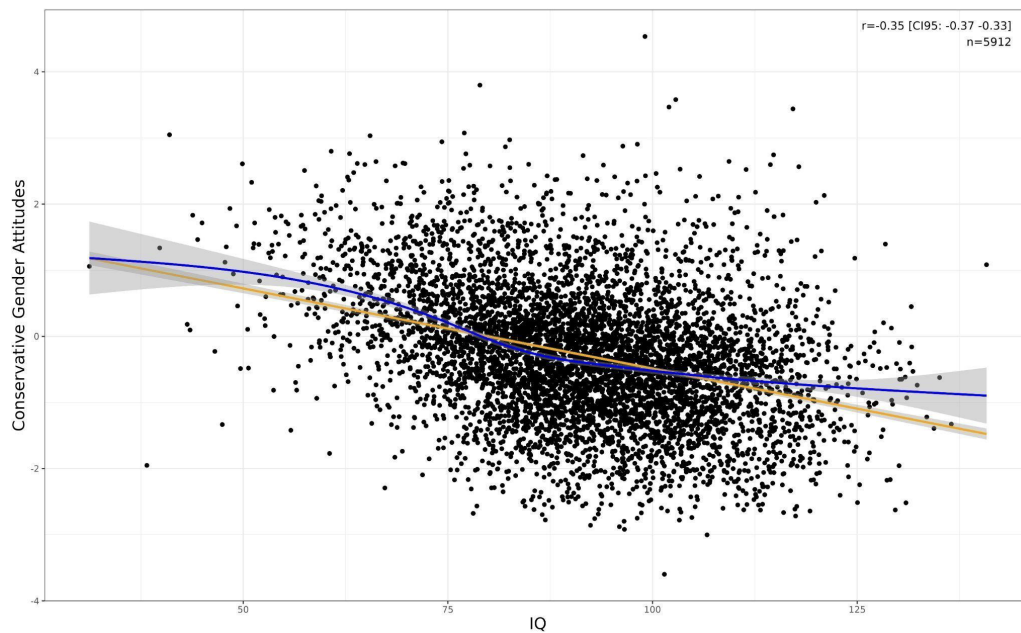


Figure 7: Relationship between intelligence and conservative gender attitudes within women. Yellow line is the linear relationship, blue line is the non-linear relationship based on smoothed conditional means.

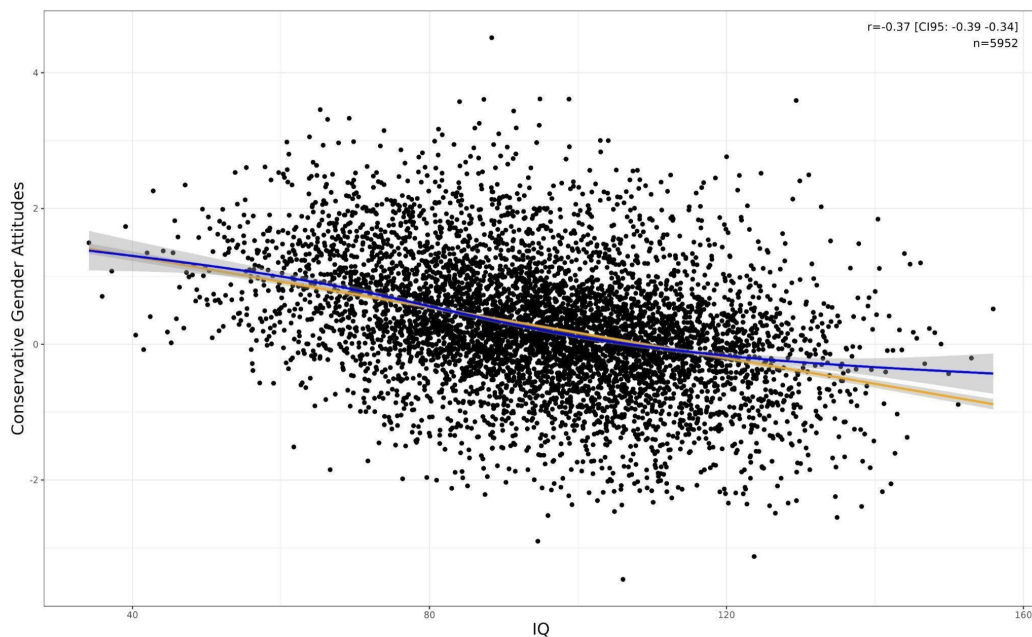


Figure 8: Relationship between intelligence and conservative gender attitudes within men. Yellow line is the linear relationship, black line is the non-linear relationship based on smoothed conditional means.

intelligent people are more likely to believe in novel ideas that are not consistent with the way humans behaved in the past and the behaviours to which they are innately predisposed. Alternatively, perhaps it could be a group-level effect where unintelligent groups are more likely to have gender-segregated behaviour, while more intelligent groups behave in more modern ways, where both men and women attend schools and work. Conventionally, in hunter-gatherer societies, women gathered while men hunted (Bliege Bird & Bird, 2008; Hérán et al., 1987). In contrast, men and women work at about the same rates in industrialized societies, although their rate of representation differs by industry. A different hypothesis could be that liberal gender attitudes are a mind virus, that is, a belief that spreads easily but is not necessarily true or functional.

Declaration of interest

None

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Appendix

Table A1: Traditional gender attitudes: Average IQ by response to the question within Whites, 1979.

Response	Question	Average IQ
Strongly disagree	Woman's place is in the home.	103.0
Disagree		100.9
Agree		95.9
Strongly agree		89.8
Not sure/refused		96.6
Strongly disagree	Wife with family has no time for other employment.	102.8
Disagree		101.5
Agree		96.0
Strongly agree		92.4
Not sure/refused		97.1
Strongly disagree	Working wife feels more useful.	103.1
Disagree		100.4
Agree		99.4
Strongly agree		100.2
Not sure/refused		100.9
Strongly disagree	Employment of wives leads to juvenile delinquency	102.9
Disagree		100.5
Agree		97.9
Strongly agree		94.7
Not sure/refused		92.3
Strongly disagree	Inflation necessitates employment of both parents.	102.0
Disagree		103.2
Agree		99.2

Continued on next page

Response	Question	Average IQ
Strongly agree		96.1
Not sure/refused		96.8
Strongly disagree	Traditional husband/wife roles best.	104.2
Disagree		102.3
Agree		97.1
Strongly agree		93.0
Not sure/refused		94.4
Strongly disagree	Men should share housework.	93.9
Disagree		95.4
Agree		100.9
Strongly agree		101.6
Not sure/refused		96.4
Strongly disagree	Women are happier in traditional roles.	103.7
Disagree		102.1
Agree		94.5
Strongly agree		89.3
Not sure/refused		102.2

Table A2: Multiple regression analysis where conservative gender attitudes are the dependent variable. Income is estimated from self-reports from 1979, 1982, 1987, 2004, and 2008; education is assessed with a 1-6 discrete variable (no high school, high school, associate, bachelor, master, PhD/professional). All estimates are standardised, with the exception of the racial variables. Standard error in parenthesis.

Parameter	Estimate
Income	0.029 (0.022)
IQ	-0.29 (0.026)***
Black	-0.45 (0.054)***
Hispanic	-0.051 (0.06)
Degree	-0.17 (0.21)***

Table A3: Multiple regression analysis where support for the Republican Party is the dependent variable. Income is estimated from self-reports from 1979, 1982, 1987, 2004, and 2008; education is assessed with a 1-6 discrete variable (no high school, high school, associate, bachelor, master, PhD/professional). All estimates are standardised, with the exception of the racial variables.

Parameter	Estimate
Income	0.080 (0.19)***
IQ	0.13 (0.024)***
Black	-0.84 (0.049)***
Hispanic	-0.34 (0.055)***
Degree	0.0057 (0.020)

Validation of the General Anxiety Disorder-7 (GAD-7): Its Association with Psychological Factors in an Iranian Community Sample

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Nazanin Navari[§]

Abstract

The aims of the present study were (a) to develop a Farsi version of the General Anxiety Disorder-7 (GAD-7), (b) to explore correlations between general anxiety disorder, psychological well-being, mental health, and happiness, and (c) to explore gender-related differences. A sample of 488 subjects representing the general population of one of the cities in the North of Iran responded to the GAD-7, the WHO-5 Well-Being Index, the Self-Rating Scale of Mental Health, and the Self-Rating Scale of Happiness. Cronbach's alpha was .89 for the GAD-7. One factor was extracted, labeled "Anxiety". GAD-7 scores correlated negatively with psychological well-being, mental health and happiness, indicating good validity. The sex difference in the GAD-7 was statistically significant; women had higher anxiety than men. The GAD-7 had good psychometric properties in the present sample from Iran. This study provides evidence for the usefulness of the Farsi version of the GAD-7 for assessing anxiety and anxiety disorder in Iranian community residents. The GAD-7 may be useful as a screening instrument not only for anxiety but for psychological/emotional problems more generally. Considering the high correlations between GAD-7 and the other scales, we can propose that the GAD-7 measures in large part a "general factor of subjective well-being".

Keywords: Anxiety, Well-being, Mental health, Happiness, Iran

1 Introduction

Mental disorders are among the leading causes of global health burden (Santomauro et al., 2021). The Global Study of Disease, Injury, and Risk Factors (GBD 2019) results reveal that the most essential disabling mental disorders are depression and anxiety disorders. In addition, these two mental disorders are among the 25 leading causes or risk factors for global health burden worldwide (Vos et al., 2020).

Anxiety is defined in the literature as a common negative mood that occurs in various forms and affects emotional, cognitive, physical, behavioral, and relational states. In the clinical literature, this term refers to the presence of fear or anxiety that is disproportionate to the situation (Black & Grant 2014, p. 123). It includes feelings of anxiety, restlessness, worry, fear, irritability, and sadness. Anxiety, a natural reaction that prepares the person to respond to perceived dangers (Cole 2009, p. 59), is ultimately associated with death (Freud, 1999, p. 75). Every thought and experience that threatens the individual's existence and self can cause anxiety (Burger 2006, p. 82; Uysal & Turan, 2019).

Anxiety has become quite common in today's modern societies (Twenge, 2000), which is somewhat paradoxical because dangers from illness, starvation, homicide etc. have been greatly reduced in modern societies. It seems that as a result, anxiety tends to be free-floating or becomes attached to inappropriate objects and situations in modern society. Parallel to this, research on anxiety has increased. Various types and forms of anxiety can be mentioned. Chronic or severe anxiety causes emotional distress, obsessive

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thinking, compulsive behavior, relational struggles, and generalized restlessness. Anxiety often coexists with depression, which aggravate each other (Cole 2009, p. 59; Dadfar et al., 2020).

Anxiety is defined as anxiety neurosis in the second version of the Diagnostic and Statistical Manual of Mental Disorders (DSM-II) (1968) published by the American Psychological Association, which does not have diagnoses of anxiety or generalized anxiety disorder. However, in DSM-III (1980), anxiety disorders were handled as a separate category, and Generalized Anxiety Disorder was defined as a sub-category. Generalized anxiety disorder, according to the DSM-III definition, is a generalized state of trait anxiety lasting at least one month without phobias, panic attacks, obsessions, or compulsions. Although the specific manifestations of anxiety vary from person to person, there are screening symptoms such as motor tension, autonomic hyperactivity, anxious anticipation, and alertness. Later, the duration of one month was increased to six months in the DSM-III-R (Black & Grant 2014, pp. 123-125).

It is estimated that between 2 % and 4 % of the general population have an anxiety disorder. This is not a small number. For example, although lifetime prevalence rates for any anxiety disorder in older adults (over 60 years) range from 10 % to 15.3 % based on a randomized population survey, anxiety disorders in this age group receive less clinical and research attention than depression or dementia (Diggs 2008, p. 127).

One of the most common anxiety disorders seen in general medical practice and the general population is generalized anxiety disorder (GAD). The current prevalence of the disorder is estimated between 2.8 % and 8.5 % in general medical practice and between 1.6 % and 5.0 % in the general population (Spitzer et al., 2006). Until recently, generalized anxiety disorders (GAD) were considered relatively unimportant by clinicians and the public, partly because of their commonalities, the persistence of diagnostic uncertainty, and the paucity of empirical studies documenting disability (Dadfar et al., 2023; Judd et al., 1998). Anxiety often occurs with depression, fear, and other mental disorders. In some cases, anxiety was considered a symptom of other mental disorders and was not diagnosed separately (Diagnostic and Statistical Manual of Mental Disorders (DSM-III), 1980; Judd et al., 1998).

This has led to the fact that studies on anxiety are not as systematic as those on other mental disorders, such as depression. Although there are many studies on clinical depression, there are fewer studies on anxiety (Spitzer et al., 2006). While valuable tools are available for the routine detection of depression, tools related to anxiety are not sufficient. In particular, it is sometimes difficult to diagnose a general anxiety disorder (Garcia-Campayo et al., 2010; Spitzer et al., 2006). Anxiety measures have rarely been used in clinical practice due to the difficulties arising from the measurement methods and the necessity of clinician management rather than patient self-report. The General Anxiety Disorder-7 (GAD-7) was developed to eliminate this deficiency in clinical applications, identify common anxiety cases, and determine the severity of the symptom (Spitzer et al., 2006).

Spitzer et al. (2006) report that during the development process of the GAD-7 scale, they chose seven items with the highest correlation with the total score of the 13-item scale. In addition, the first 3 items ask about two essential criteria (A and B) of the DSM-IV definition. GAD-7 has cut-off points such as 5-10 and 15 points. It is understood that increasing scores are strongly associated with more than one domain of functional impairment and with disability days, so the scale can be used as a good measure of severity. These cut-off points can be interpreted as representing mild, moderate, and severe anxiety levels. The fact that the developed GAD-7 scale can distinguish between anxiety and depression was confirmed by factor analyses. The GAD-7 scale is decisive in primary health care services diagnosis. In addition, the fact that it is a short scale that does not require a specialist and can be completed by the patient significantly increases its usability (Garcia-Campayo et al., 2010; Spitzer et al., 2006).

In the World Health Organization (WHO, 2020) Eastern Mediterranean Region Report, it was reported that one in five (22 %) people living in the region, including Iran, have some mental disorder. The rates of depression and anxiety in the countries of the region are among the highest in the world. However, although some tools that measure anxiety disorder are standardized to Farsi norms (Kaviani et al., 2009), there is no specific robust screening or diagnostic tool to help identify generalized anxiety disorder quickly (Fattah et al., 2021). In this context, the aims of the present study were (a) to develop a Farsi version of the GAD-7, (b) to explore correlations of GAD-7 scores with psychological well-being, mental health, and happiness, and (c) to explore gender-related differences.

2 Methods

2.1 Participants

This cross-sectional study included a sample of 488 subjects of the general population in Gonbad Kavos City, Golestan Province in the North of Iran ($M_{age} = 29.50$, $SD = 11.49$; 73.4% female). The participants were recruited via a self-selection method.

2.2 Measures

2.2.1 General Anxiety Disorder-7 (GAD-7)

The GAD-7 was developed by Spitzer et al. (2006) as a brief measure for assessing generalized anxiety disorder (Spitzer et al., 2006) and a screening tool for anxiety disorders, e.g., panic disorder, social anxiety disorder, and posttraumatic stress disorder (Kroenke et al., 2007). The GAD-7 consists of seven items, each rated on a 4-point Likert scale: 0 (Not at all), 1 (Several days), 2 (More than half the days), and 3 (Nearly every day). Total scores range from 0 to 21. Scores are rated as minimal anxiety (0–4), mild anxiety (5–9), moderate anxiety (10–14), and severe anxiety (15 and greater). A cut-off of 8 was recommended for the GAD-7 (Plummer et al., 2016).

2.2.2 World Health Organization-five Well-Being Index (WHO-5)

The five items of the WHO-5 ask about positive mood, vitality, and general interests. Each of the items is rated on a 6-point Likert scale. Previous studies have found acceptable psychometric properties of the WHO-5 in different versions and in various clinical and non-clinical samples (Dadfar et al., 2018). The Farsi version of the WHO-5 was available on the WHO website in 2017 (WHO, 2017).

2.2.3 The Self-Rating Scale of Mental Health and The Self-Rating Scale of Happiness

These scales consist of separate single-item questions: “What is your estimation of your mental health in general?” and “To what degree do you feel happy in general?” These questions are rated on a scale from 0 to 10. The participants were requested (a) to respond according to their global estimation and general feeling (and not their present states), (b) to know that 0 is the minimum and that 10 is the maximum score, and (c) to circle a number which seems to them to describe their actual feeling accurately. High scores indicate a high level of mental health and happiness. The one-week test-retest reliabilities of the two self-rating scales ranged between .86 and .89, indicating high temporal stability and corroborating the trait-like nature of the scores (Abdel-Khalek, 2006; Abdel-Khalek & Lester, 2017; Dadfar et al., 2021).

2.3 Procedure

In the present study, the GAD-7 was translated from English to Farsi and was back-translated from Farsi to English. Based on this, the final version of the Farsi GAD-7 was developed. The GAD-7 was designed as a Google form and delivered to subjects living in various areas of Gonbad Kavos City, Golestan Province, Iran. The respondents were recruited by a self-selection method. Data were collected between 30/07/2022 and 30/11/2022.

2.4 Data analysis

The data were analyzed with descriptive statistics, Pearson correlation coefficients, and a principal components analysis (PCA) with a varimax rotation using SPSS version 26. Eigenvalue greater than or equal to 1.0 and the scree plot were used to determine the number of factors to be retained. Factor loadings $> .5$ were considered adequate. Then, a structural equation model was used to analyze whether the factor structures of the new version were confirmed in the AMOS program.

3 Results

The mean total score for the Farsi version of the General Anxiety Disorder-7 (GAD-7) was 6.43 ($SD = 5.18$). Skewness and kurtosis of all scale items were examined, with ± 1.5 taken as the reference value (Curran et al., 1996). Based on this reference value, although the responses to the GAD7-5 statement deviate from the general trend, the data can still be considered to have a near-normal distribution despite their positive skewness (See Table 1).

Table 1: Means (M), standard deviations (SD), skewness, and kurtosis of the GAD-7 items.

	GAD7-1	GAD7-2	GAD7-3	GAD7-4	GAD7-5	GAD7-6	GAD7-7
Mean	1.12	0.88	1.11	0.92	0.55	1.02	0.83
SD	0.92	0.92	1.00	0.97	0.85	1.03	0.97
Skewness	0.607	0.800	0.546	0.768	1.463	0.683	0.907
Kurtosis	-0.357	-0.240	-0.757	-0.449	1.204	-0.695	-0.292
Variance	0.842	0.840	0.998	0.934	0.716	1.057	0.945
Median	1	1	1	1	1	1	1

The item-total correlations ranged from .690 to .844 (Table 2). They ranged from .633 to .849 for males, and from .705 to .841 for females. Cronbach's α was .89. The Kaiser-Meyer-Olkin Measure of Sampling Adequacy for the GAD-7 was .913. The Bartlett's Test of Sphericity χ^2 was 1722.9 ($df = 21$, $p > .001$). The GAD-7 is a unifactorial scale, with one salient component labeled Anxiety explaining 61.1 % of total variance (Table 2 and Figure 1).

Table 2: Inter-item correlations, item-total correlations, loadings on first principal component and Cronbach's α for the GAD-7 items ($N = 488$). All correlations are statistically significant at the .01 level.

Over the last 2 weeks, how often have you been bothered by any of the following problems?	2	3	4	5	6	7	r with total score	Factor loading
1. Feeling nervous, anxious, or on edge	.703	.682	.470	.491	.550	.555	.814	.823
2. Being unable to stop or control worrying	1	.703	.476	.526	.563	.563	.828	.839
3. Worrying too much about different things		1	.482	.528	.613	.577	.844	.848
4. Trouble relaxing			1	.512	.428	.401	.690	.674
5. Being so restless that it is hard to sit still				1	.498	.509	.734	.736
6. Becoming easily annoyed or irritable					1	.565	.780	.773
7. Feeling afraid something awful might happen						1	.766	.763
Cronbach's Alpha								.89
% of total variance explained								61.1

The confirmatory factor solution presented in Figure 2 produced an acceptable fit, with a χ^2/df ratio of 3.6. This is lower than 5, as recommended. GFI was 0.96 (> 0.95), AGFI = 0.93 (> 0.90), CFI = 0.97 (> 0.90), NFI = 0.97 (> 0.90), RMSEA = 0.074 (≤ 0.080), and SRMR = 0.031 (< 0.05). All estimated loadings were statistically significant ($p < 0.001$), the sign obtained was as expected, and the model was correctly identified (See Figure 2 and Table 3).

Table 4 shows that correlations of the GAD-7 with WHO-5 and the two self-rating scales of Mental Health and Happiness were statistically significant and negative, indicating good validity. Also the sex difference was statistically significant. Women had higher anxiety than men (Table 5).

In response to the question, "If you ticked any of the anxiety problems, to what extent have these problems made it difficult for you to do things, take care of household chores, or get along with others?", they reported as follows: not at all (33.4 %), some (55.3 %), much (8.2 %), and very much (3.1 %).

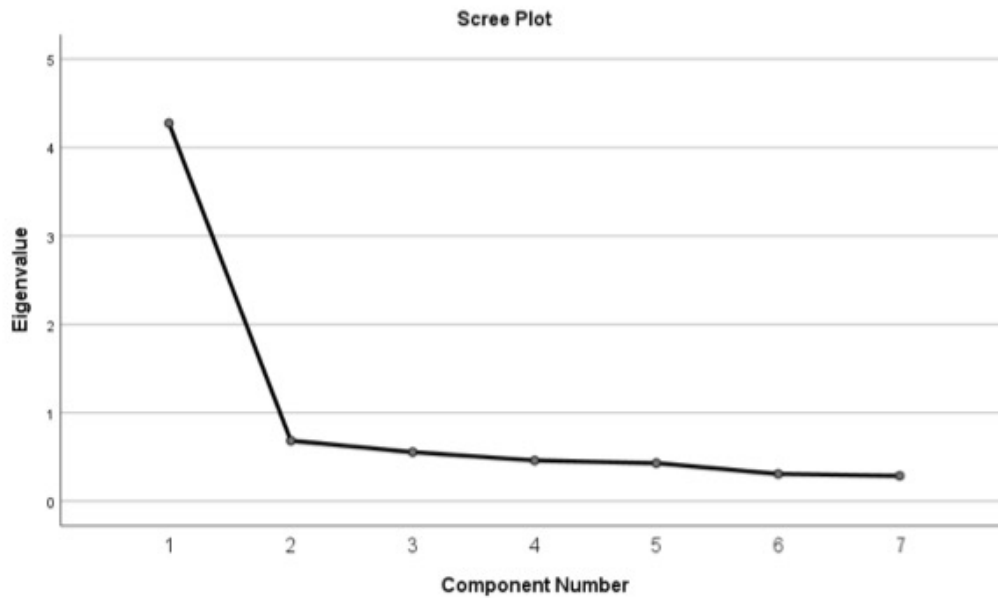


Figure 1: Scree plot of the General Anxiety Disorder-7 (GAD-7).

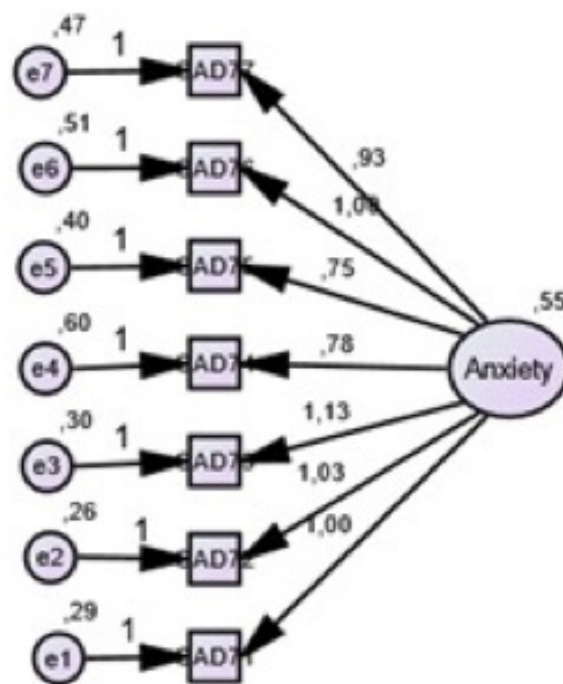


Figure 2: Measurement model with standardized loadings.

4 Discussion

This study applied various analyses to develop the Farsi version of the General Anxiety Disorder-7 (GAD-7) scale. Item-total correlations varied between .690 and .844 (Table 2). A single-factor structure emerged with a high correlation between each item of the scale and the total score. In addition, the Cronbach α value, a measure of internal consistency, is .89. Spitzer et al. (2006) found Cronbach $\alpha = .92$ when they created the short version of the Generalized Anxiety Disorder Scale. Garcia-Campayo et al. (2010) reported the Cronbach alpha value as .82 when they adapted the GAD-7 scale to the Spanish language and culture.

Table 3: Standardized regression weights: (Group number 1 - Default model).

Path	Estimate
GAD-7 1 <— GAD-7	.806
GAD-7 2 <— GAD-7	.827
GAD-7 3 <— GAD-7	.837
GAD-7 4 <— GAD-7	.595
GAD-7 5 <— GAD-7	.659
GAD-7 6 <— GAD-7	.718
GAD-7 7 <— GAD-7	.705

Table 4: Means (*M*), standard deviations (*SD*), and correlations of the GAD-7 with other scales. All correlations are statistically significant at the .01 level (2-tailed).

Scales	M (<i>SD</i>)	r with GAD-7 total
WHO-five Well-Being Index (WHO-5)	14.98 (6.13)	-.661
Self-Rating Scale of Mental Health	7.15 (2.34)	-.516
Self-Rating Scale of Happiness	7.28 (2.27)	-.477

Table 5: Means (*M*), standard deviations (*SD*), and t-test for sex in the GAD-7.

Sex	N	M	SD	F	t	p
Female	358	6.83	5.29	2.364	2.81	.005
Male	130	5.35	4.71			

Donker et al. (2011), who validated the GAD-7 into Dutch, determined Cronbach $\alpha = .86$. Tong et al. (2016), who validated the GAD-7 scale on Chinese patients with epilepsy, again found a high Cronbach alpha value of .88. The alpha value obtained in our Iranian study is similar to the values obtained in other adaptation studies. Considering that values of .90 and above are considered excellent, it can be said that the internal consistency coefficient for the Farsi version, whose psychometric properties and validity and reliability were examined in this study, is close to perfect.

In order to determine the structure of the GAD-7 scale in Iranian culture, exploratory factor analysis (EFA) was performed. The KMO value of .913 in this analysis indicates that the sample in which the scale was evaluated was sufficient. It also explains 61.1 % of the variance. In other words, the GAD-7 scale can explain 61 % of the individual differences in anxiety. Furthermore, when the factor loadings of each statement that make up the GAD-7 scale are examined, it is understood that the lowest factor loading is .674 (See Table 2). This confirms the structural validity of the Farsi version of the GAD-7 scale.

In addition, confirmatory factor analysis (CFA) was performed to determine the scale's psychometric properties. We examined all the more commonly used fit indices, and found that all of them indicate acceptable model fit according to Aylar (2017). In addition, when the table showing the regression weights is examined, it is seen that the lowest value is .595. Taken together, the results of both exploratory and confirmatory factor analysis show that the Farsi version of the GAD-7 has only one single dominant factor. It measures a single construct.

In addition to these analyses, the correlations of the Farsi-adapted GAD-7 scale with the Farsi version of the WHO-5 scale, which has acceptable psychometric properties and relates to positive mood, vitality, and general interests, were examined. There was a statistically significant negative correlation. Accordingly, while the individual's positive mood and vitality increase, his/her GAD-7 scores decrease. In addition, the GAD-7's relationships with the Self-Rating Scale of Mental Health and the Self-Rating Scale of Happiness

were examined. The two scales had moderate, statistically significant ($p < .01$) negative relationships with GAD-7. Accordingly, as the general anxiety level of the individual increases, perceptions of general mental health and happiness decrease.

This relationship between the three scales reveals that the GAD-7 scale is a suitable tool for measuring generalized anxiety in Iranian culture, a scale capable of distinguishing between good and anxious moods. It even suggests that it may be useful as a screening instrument not only for anxiety but for psychological/emotional problems more generally. In Table 4 we reported the correlations between GAD-7 and the other scales. We observed in addition that WHO-5 well-being positively correlated with mental health ($r = .561$) and happiness ($r = .621$), and mental health positively correlated with happiness ($r = .670$). Therefore we can propose that the GAD-7 measures in large part a “general factor of subjective well-being”.

The mean score on the GAD-7 scale obtained by our study participants is 6.43, in the “mild generalized anxiety disorder” range. When examined from this aspect (Spitzer et al., 2006), it is understood that the Iranian sample has mild GAD. In an earlier study conducted on a hospitalized sample diagnosed with Covid-19 in Iran, Fattah et al. (2021) reported the mean score as 4.37. For the Korean version, the researchers reported a mean of 9.98 ± 5.71 (Lee et al., 2022). In a study conducted on patients with migraine, it was reported that while an average of 3.7 ± 3.4 was obtained in people without a clinical diagnosis of GAD, this average increased to 10.2 ± 5.4 in participants with diagnosed GAD (Seo & Park, 2015). Donker et al. (2011) reported that in the Dutch adaptation study, the GAD-7 average of the participants without a clinical diagnosis of anxiety or depression was 8.0, while the average of those with any mental disorder diagnosed according to DSM increased to 11.6. Because our results are similar to these others, it can be said that anxiety levels in Iran are not markedly different from those in other countries, and the Farsi version of the GAD-7 is a measurement tool capable of measuring anxiety.

GAD-7 averages were found to be higher in women than in men. This is in line with numerous studies which all found that women score higher than men on measures of anxiety, as well as related constructs such as neuroticism. For example, Fattah et al. (2021) reported that female patients reported higher levels of generalized anxiety and death anxiety than male patients in their study conducted in Iran. Also a study conducted by Omani-Samani et al. (2018) with a sample in Iran found that women score substantially higher than men. The similarity between the results of Omani-Samani et al. and the present study indicates that the scale can accurately measure general anxiety. In the Garcia-Campayo et al. (2010) study, no statistically significant difference was found between the averages of the two gender groups. Accordingly, it can be said that the self-reported general anxiety levels of women usually are higher than those of men, especially in the Iranian samples.

The present study had some limitations. It is based on a convenience sample of Iran, and the findings were based only on Iranian community residents. Other limitations are the number of participants, and the cross-sectional nature of the design. A further limitation is the lack of other measures believed to measure anxiety or similar constructs, to confirm construct validity, or at least criterion validity. These limitations could be mentioned as possibilities for future work. A proposed next step would be to study the performance of different normal and clinical groups on the GAD-7. These are projects for future studies.

5 Conclusions

The General Anxiety Disorder-7 (GAD-7) had good psychometric properties in the present sample from Iran. The GAD-7 has a one dimensional structure. This study provides evidence for the usefulness of the Farsi version for assessing anxiety disorder in Iranian community residents. Therefore, use of the Farsi version of the GAD-7 for measuring anxiety disorder in Iranian populations is suggested. The GAD-7 may be useful as a screening instrument not only for anxiety but for psychological/emotional problems more generally. Regarding the correlations between GAD-7 and the other scales, but not those among the other scales, it is suspected these correlations are very substantial and most likely statistically significant. If this is so, it can propose that the GAD-7 measures in large part a “general factor of subjective well-being”.

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A Flynn Effect in Riyadh, the Capital of Saudi Arabia

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Abstract

There is evidence that the Flynn Effect is plateauing or even reversing in many Western countries, while it is still found in many developing countries. In order to understand the causes of these differences, as well as the Flynn Effect as such, data from diverse samples are needed. Here, we compare two similar and representative samples of schoolchildren with an average age of 12 years from the Saudi capital of Riyadh, tested in 2004 and 2018. We find that the test performance was higher in 2018, corresponding to 6.6 IQ points. We suggest that this represents part of a long-term Flynn Effect caused by broad societal changes, having considered other feasible explanations such as internal migration patterns or reforms in education policy.

Keywords: Flynn effect; Children's Intelligence Test; Saudi Arabia; Cognitive ability

1 Introduction

The Flynn Effect is the secular increase in IQ scores reported across the 20th century in developed countries, amounting to an average increase of approximately 2.5 IQ points per decade (Flynn, 2012), though its extent varies substantially between different countries and domains (Pietschnig & Voracek, 2015). This effect has been found to have occurred to the greatest extent on the less g-loaded and concomitantly on the less heritable subtests of the IQ battery (Dutton & Woodley of Menie, 2018; te Nijenhuis & van der Flier, 2013), implying that it is caused by environmental rather than genetic changes (see Dutton et al. (2016)). The precise causes of the Flynn Effect remain a matter of debate (Pietschnig & Voracek, 2015), though Flynn (2012) himself argued that it reflects an increasingly scientific society pushing its members to their phenotypic maximum on certain subtests, such as Similarities. Some researchers further argue that this happened to such an extent, and so quickly, that it has shown up as an IQ increase on the imperfect tests despite intelligence declining according to proxy measures such as reaction times (Dutton & Woodley of Menie, 2018; Sarraf et al., 2019). Intelligence can be understood as a very broad nexus of correlated abilities of which some but not all have been massively enhanced by education and the adoption of "scientific spectacles" while others, mostly those not measured by standard IQ tests (reaction times, wisdom, common sense, perhaps social skills) have not changed much or may even have deteriorated for either environmental or genetic reasons.

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There is evidence that many developed countries have already reached their phenotypic maximum of intelligence, followed by negative Flynn Effects in many of them. This has been argued to reflect an underlying intelligence decline which includes also the rarely measured aspects of the intelligence nexus that have changed little in response to the environmental changes causing the Flynn Effect (e.g., Dutton et al. (2016); Woodley of Menie et al. (2017)).

The Flynn Effect still appears to move toward “peak intelligence” in developing countries, however (Flynn, 2012). A number of studies have found Flynn Effects in the Arab world including in Khartoum in Sudan (Dutton, Bakhiet, Lynn, et al., 2018), Kuwait (Dutton et al., 2019), and Saudi Arabia (Batterjee et al., 2013). Where negative Flynn Effects have been found in Arab countries, they have been attributed to sampling errors or short-term declines in educational standards due to transient education policy changes (Dutton, Bakhiet, Ziada, et al., 2017; Dutton, Bakhiet, Essa, et al., 2017; Dutton, Bakhiet, Osman, et al., 2018). For example, the secondary school system is becoming less selective in such countries because a growing proportion of pupils are continuing beyond primary school. Most of these Arab studies administered cognitive tests to schoolchildren, with lower IQ pupils having historically been more likely to leave school at an earlier age.

Indeed, it has been argued that the poorer quality of education systems in Arab countries, compared to those in the West, at least partly explains why the increase of intelligence raw scores with age is smaller in Arab countries than in Western countries, causing a growing cognitive gap to open up with age (Bakhiet et al., 2018).

Accordingly, any new evidence of a Flynn Effect in the Arab World is worth exploring inasmuch as it permits us to get closer to making sense of the causes of this fascinating phenomenon. In this study, we will present evidence of a Flynn Effect in Riyadh, the capital of Saudi Arabia, between 2004 and 2018. A previous study reported a Flynn Effect in Saudi Arabia between 1977 and 2010 (Batterjee et al., 2013), a period over which Saudi Arabia developed very substantially from being, to a great extent, still broadly agrarian (Knauerhase, 1974) to being a highly urbanized modern economy. Examining the issue over a much shorter period of time may help us make sense of more nuanced explanations for the Flynn Effect, or any reversal of it, as have previous studies in the Arab World mentioned above (e.g., Dutton, Bakhiet, Osman, et al. (2018)). These explanations revolve around the question of whether there is a sustained Flynn Effect in these countries or only effects of specific localized or temporary factors.

2 Method

We compare previously reported results (Altrairy, 2004) to our own original data collection.

2.1 The 2004 Data

The Children's Intelligence Test (CIT) was administered to 969 students from fourth-year primary to second-intermediate (eighth grade), 461 males and 508 females (Altrairy, 2004). The test consists of 53 items that measure verbal, mathematical and spatial intelligence, and can be administered individually or group-wise to children aged 10 to 15. The split-half reliability was .81 and Cronbach's α was .90. An expert group consisting of academics in psychology and education assessed that the CIT scale exhibits face validity, as the percentage of agreement reached 90 % or more for all the items. As for factorial validity, Altrairy (2004) reported finding a strong first factor with an Eigenvalue of 9.28. The internal consistency was established by calculating each item's correlation with the total score. All item-total correlations were statistically significant at the level of $p < .01$. The difficulty index and discrimination index were also extracted, and their values were all acceptable.

The demographic properties of the sample, as reported by Altrairy (2004), are listed in Table 1. As he did not include their ages, we derived the age ranges based on the grades from <https://www.saudiarabiaeducation.info/K12/saudi-arabia-k-12-education-system.html>.

The 2004 sample was selected by dividing the city of Riyadh into 4 regions: North, South, West, and East. The schools in each region were listed, and a random selection of them was used to create the sample. The classes in each of the selected schools were then listed, and a random selection was again

Table 1: Descriptive demographic data for the 2004 sample.

	Category	N	Age
Sex	Male	461	
	Female	508	
Educational stage	Primary	644	9-12
	Intermediate	325	12-15
Grade	Fourth grade	218	9-10
	Fifth grade	173	10-11
	Sixth grade	253	11-12
	First-intermediate	192	12-13
	Second-intermediate	133	13-14

made across all grades from 4th to 8th grade. The students in each of the chosen classes were administered the Children's Intelligence Scale. Those who did not complete the instrument or did not respond to the general data form were excluded.

The test was group administered by trainees from the Department of Psychology in the final semester of their Bachelor's degree and by some of the school counselors. The administration of the test took 45 minutes, and the average response time was 33 minutes. Each answer was coded 1 if it was correct and zero if it was incorrect, to a total of 53.

2.2 The 2018 Sample

These data were collected in the academic year 2017-2018 for a sample of 1,320 students, 523 male and 797 female (Table 2). The item difficulty ranged between .27 and .95 across all 53 items. Reliability was assessed using Cronbach's alpha index which was .782, and a Gutman index of 0.619. There was no evidence of significant floor effects and ceiling effects. In order to ensure comparability, we used precisely the same sampling method as did Altrairy (2004).

Table 2: Descriptive demographic data for the 2017-2018 sample.

	Category	N	Age
Sex	Male	523	
	Female	797	
Educational stage	Primary	756	9-12
	Intermediate	564	12-15
Grade	Fourth grade	237	9-10
	Fifth grade	358	10-11
	Sixth grade	161	11-12
	First-intermediate	259	12-13
	Second-intermediate	305	13-14

3 Results

Because Altrairy (2004) did not report how many boys and girls there were in each grade, we can only compare the grand mean scores across the sexes and all grades. This is justified by the mean age being

almost exactly the same. Also the average grade level in the two samples is very similar, with a mean of 5.84th grade in 2004 and 6.03th grade in 2018. It can be seen that the mean score increased by 3.51 between 2004 and 2018. This is statistically significant at $p < .01$, according to a t-test: $t(1605.8) = 9.81$, where degrees of freedom is calculated with the Welch-Satterthwaite equation (Welch, 1947). Figure 1 provides a summary of the findings, showing that the scores are consistently higher in 2018, for every subgroup that we could compare. The descriptive statistics for both samples are shown in Table 3.

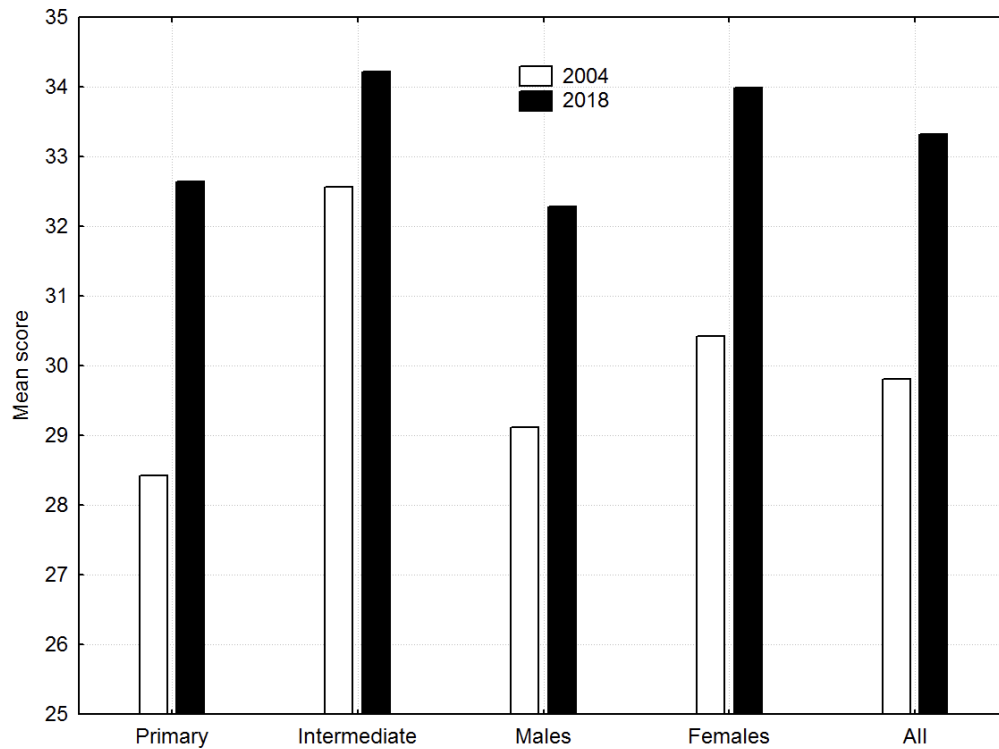


Figure 1: Compared means of 2004 and 2017-2018 samples.

Table 3: Mean age and test score mean and standard deviation (SD) for each sample.

	Age	Mean	SD
2004 sample			
Total sample	11.99	29.81	9.61
Males	~12	29.12	9.76
Female	~12	30.43	9.43
Primary	~11	28.42	9.41
Intermediate	~13	32.56	9.41
2017-18 sample			
Total sample	12.01	33.32	6.56
Males	12.11	32.28	6.91
Female	11.94	33.99	6.23
Primary	10.93	32.64	6.65
Intermediate	13.45	34.22	6.34

Combining the means and the standard deviations of both samples, we can estimate that mean IQ has increased by 6.6 points, corresponding to a standardized difference (Cohen's d) of 0.44 between the

samples, calculated with n-weighted pooled standard deviation according to Olejnik & Algina (2000).

4 Discussion

We compared the performance on the exact same test, administered to comparable samples of students 13-14 years apart, and found a substantial increase. However, it should be noted that the standard deviations were substantially larger in the 2004 sample. At least part of this difference might be explained by the tendency for the Flynn Effect to be stronger for the less intelligent and have little influence on the right tail of the distribution, hence compressing the range (e.g., Zhou et al. (2010); see a summary of this phenomenon in Kaufman (2009), 209–211).

This Flynn Effect in Riyadh is congruous with the hypothesis that increasingly Western living standards in Riyadh, including its education system, are raising IQ for environmental reasons. However, we should consider possible confounding factors.

Migration may cause changes in intelligence, because those who migrate are unlikely to be representative of their native population. For example, having the finances and planning ability to successfully migrate is associated with higher intelligence (Dutton & Woodley of Menie, 2018; Jensen, 1998). Migrants may also be characterized by a future time perspective to a greater extent than those staying, and this time preference is also associated with intelligence. However, the information that we have seems not to warrant any conclusions in this case.

There is evidence that there was substantial migration from the Saudi provinces to Riyadh between 1998 and 2018, in particular from the Makkah region in which are located the cities of Jeddah and Mecca (Alkowitz, 2018). As a previous study found no difference in IQ between the two regions (Al Maqel et al., 2021), we should not expect migration between them to impact regional intelligence much. But migration from elsewhere has also been reported in Tabouk, where the nation's military is headquartered, and the east of the country, which is its industrial hub. Migrations to these 'pull-factor' areas are heavily male. According to the most recent data, Makkah has more internal migrants per capita than Riyadh (Khraif et al., 2019). Still, we have no data on the intelligence in these regions that would predict an increase or decrease in the receiving region. If the region from which people migrate is rural, however, we can predict that these migrants more likely have lower average IQ than the city to which they migrate.

Another confounding factor may be changes in the education system that impact students of these ages. However, significant reform of the Saudi education system as part of the Kingdom's 'Education and Vision 2030 Program' only began to be implemented in 2019. These reforms include a more centralized curriculum presented by the Ministry of Education. It teaches English language from first grade onwards, and it focuses to a much greater extent than was previously the case on 'philosophy and critical thinking' (Almoaibed, 2020). Such reforms may be predicted to increase the performance of school pupils on cognitive tests through several mechanisms. However, these reforms were implemented only very recently and therefore cannot have impacted either of the samples assessed here. A slightly earlier suggestion at educational reform, the Tatweer Program, only began to be publicly discussed a few years prior to our test administration (Alyami, 2014). Our data seems to show that the IQ gains were stronger in the younger age groups. This means that whatever it was that raised intelligence, it must have acted on these children at a young age, implying 'scientific spectacles' acting at a highly plastic period in development.

Thus, in the absence of any clear confounding factors, it is reasonable to aver that the Flynn Effect in Riyadh between 2004 and 2018 among those aged approximately 12 years reflects what Flynn (2012) called the increasing use of 'scientific spectacles'. As a society develops, it compels its citizens to think in a more 'scientific' way, increasing their average abilities in the Similarities and related sub-tests on the IQ battery. It appears that what Flynn called scientific spectacles is in fact analytical thinking trained mainly in schools. Other aspects of intelligence, such as seeing connections between things that have been learned in different contexts, assessing the importance of things, reality checking and others are not core components of this scientific kind of thinking.

5 Limitations

It would have been useful if Altrairy (2004) had presented a finer-grained analysis, breaking up the findings according to chronological age and according to sex. The available data do not allow analyses of the secular changes for these subgroups separately, which could possibly have provided a deeper understanding of what is happening. The influence of internal migration is a potential confound, as already noted. However, there is no evidence to suggest that this factor could explain any substantial proportion of the secular increase observed.

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Declaration of Interest

All authors declare that they have no conflict of interest.

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Are There Gender Differences in Negotiation Roles? A Case Study in Shark Tank Vietnam

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Abstract

The study of gender language from a socio-pragmatic approach, based on quantitative data from real interactions or sources such as television programs, is considered a promising approach to identify gender language features objectively and accurately. Such findings are not framed in gender stereotypes as those obtained in previous approaches. This article, using a socio-pragmatic approach, identified gender language features from the uses of speech acts in Shark Tank Vietnam, a reality TV program about negotiations. Conversational analysis was adapted in the study to analyze 30 negotiation conversations in Shark Tank Vietnam Season 3, describing five groups of speech acts under Searle's theory in the utterances of male and female investors (sharks) and players. Quantitative analysis showed gender differences in the use of speech acts during negotiations in both groups of participants. The results point to a number of linguistic features in the speech of businessmen and -women from each role in negotiations.

Keywords: Gender language, Negotiations, Vietnamese, Speech acts, Shark Tank

1 Introduction

Gender language has been a theme for research since the 1960s, under multidisciplinary approaches. The literature on gender and communication, predominantly derived from Western cultural contexts, consistently demonstrates distinct differences in language use between men and women in everyday interactions. However, there are few studies on gender differences in Vietnam, especially in a business context. This study examines whether gender-specific communication patterns are evident in negotiation settings, using Vietnamese negotiations conducted in Shark Tank Vietnam, a reality TV program about participants ("players") and investors ("sharks"). The study explores the following research questions from the perspective of Speech Acts Theory:

1. Are there any differences between the speech acts of male and female sharks in Shark Tank Vietnam?
2. Are there any differences between male and female players' speech acts in Shark Tank Vietnam?
3. Are there any differences in males' speech acts in different roles in Shark Tank Vietnam?
4. Are there any differences in females' speech acts in different roles in Shark Tank Vietnam?

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2 Literature review

The worldwide previous research has shown that individuals tend to conform to gender norms and stereotypes when engaging in speech acts (Rahayu & Fauziah, 2021). For example, women are more likely to use polite and tentative language, while men tend to use assertive and direct language. Furthermore, societal expectations based on gender can affect the perception and reception of speech acts (Farrell, 1979), which illustrates that women may face criticism or backlash for being assertive or direct, while men may be viewed as dominant or authoritative for displaying such speech acts. These findings suggest that gender plays a significant role in shaping the way we communicate and how our speech acts are perceived by others. Additionally, several scholars examined how gendered speech acts can reinforce and perpetuate stereotypes and inequalities. They emphasized the importance of understanding and challenging gendered speech acts in order to promote more equitable and inclusive communication practices. Thus, they encouraged readers to critically examine the ways in which our gender influences the choices we make in our speech acts.

Negotiations play a crucial role in various aspects of our lives, from business deals to diplomacy. In these negotiations, language serves as a powerful tool for building relationships, conveying intentions, and achieving mutual understanding (Tylén et al., 2010). One important aspect of negotiation discourse is the use of speech acts. This refers to the actions performed through language, such as requesting, offering, and rejecting (Pinker et al., 2008). Speech act theory has been used to understand and analyze the dynamics of negotiation conversations (Winograd, 1986). The existing literature provides valuable insights into the role of speech acts in negotiations (Teodorescu, 2014). It has shown that the strategic use of speech acts, such as making concessions or issuing threats, can influence the negotiation outcome (Soedjarwo, 2020). Other studies have explored how nonverbal communication, such as facial expressions and gestures, can complement or contradict the speech acts used by negotiators (Adair & Loewenstein, 2013). Akinwotu (2013) stated that speech acts are particularly important as they allow individuals to express their intentions and make commitments.

Gender differences in language use have been observed in negotiation contexts (Pinker et al., 2008). Women and men may employ different linguistic strategies and communication styles, which can impact the negotiation process and outcomes. Baxter (2017) and Chang & McKeown (2019) found that the use of masculine language, such as assertive and dominant speech, can be perceived as more powerful and commanding. On the other hand, feminine language, which is characterized by politeness and accommodation, may be seen as less assertive and commanding (Bate, 1976). The gendered use of language may also impact the perceptions and expectations of negotiators. However, because the male mode of argumentation is taught in schools and colleges, it is not surprising to find many women who write and speak in the male mode. On the other hand, some educated women in certain situations may choose not to use the male mode of argumentation and instead employ the female mode, characterized by indirect and nuanced language (Farrell, 1979). This highlights the complex relationship between gender and speech acts, demonstrating the influence of societal norms and individual choices in shaping communication patterns.

Recent gender research in Vietnam also investigated the stereotypes as well as the transitions between sex speech styles in certain contexts. Particularly, three studies on gender differences in speech acts such as compliments, criticisms, bargaining, etc. were conducted by Le Thi Thuy Ha (2014), Pham Thi Ha (2013), and Tran Thanh Van (2012) on speech, verbal actions in short stories, in interviews and in everyday communication. Conversation and discourse analysis have produced some interesting observations. Le Thi Thuy Ha (2014) pointed out that in family interactions, both men and women tend to criticize people of the same age, and women criticize more than men in the same age group. However, both elderly men and the very young appear to be more critical than women, although their criticism strategies are different.

At work, men become more reserved and polite; women in a position of seniority criticize more than those in the younger group. Pham Thi Ha's (2013) findings were that women use compliments more than men, especially with people of the same sex, and for a wider range of purposes such as expressing agreement, admiration, and being social. For maintaining a conversation to soften face-threatening behavior; women use more indirect compliments with full complement structures accompanied by explanations than men; whereas men prefer direct, brief compliment structures, and affirm the compliment more. For receiving compliments, men prefer response strategies such as complimenting the person who just complimented

them, asking again about the compliment, or just saying "thank you". Women tend to use thanks and share information about the compliment, express emotions, etc. Research by Tran Thanh Van (2012) about specific negotiating situations shows that in successful sales conversations, male buyers agreed with the seller's price more than female buyers and often accepted the price offered by female sellers, while female sellers agreed with the buyer's price more often than male sellers. In unsuccessful sales conversations, female buyers took the initiative to end the sales conversation more often than male sellers. In the role of buyers, female buyers also took the initiative to end the conversation more often than male buyers; and both used speech acts such as compliments, thanks, instructions, agreements (in successful sales conversations) or acts of complaining, regretting (in unsuccessful sales conversations) to end the sale.

In a study examining cultural and linguistic dynamics, Vietnamese participants communicating in Vietnamese provided a unique context to test Searle's (1969) categorization of speech acts. While Searle's framework was developed in a Western context, research suggests that its principles are broadly applicable across cultures, capturing universal elements of language use. However, cultural nuances influence how men and women utilize speech acts, including politeness strategies and power dynamics, making it essential to validate these categories in non-Western settings like Vietnam. Vietnamese cultural norms, emphasizing indirectness and respect in communication, particularly align with Searle's directives and expressives, offering a culturally relevant means of analyzing gendered communication differences. Such cultural differences support the use of Searle's categorization to explore everyday communication in Vietnamese, to provide insights into its applicability beyond Western paradigms.

Searle's categorization of speech acts, which outlines the fundamental types of communicative functions, such as directives, expressives and declarations, is one prominent framework for analyzing language use (Brundrett & Dung, 2018). While Searle's theory emerged from a Western philosophical perspective, recent scholarship suggests its principles may be more broadly applicable, capturing universal elements of language (Searle, 1969; Smith, 2003). However, it is essential to validate these categories in non-Western contexts, as cultural nuances can significantly influence how speech acts are employed, particularly in terms of gendered communication dynamics (Searle, 1969). The Vietnamese cultural context, with its emphasis on indirectness and respect, provides a unique opportunity to examine the applicability of Searle's framework. Existing research indicates that Vietnamese cultural norms, which prioritize politeness and hierarchical relationships, may align particularly well with Searle's directives and expressives (Ha, 2011; Hang, 2023). Exploring everyday Vietnamese communication through the lens of Searle's theory can offer valuable insights into how gender shapes the use of various speech acts (Brundrett & Dung, 2018). This study aims to examine the validity of Searle's speech act categorization in the Vietnamese cultural context, with a specific focus on gendered communication patterns.

3 Theoretical framework

3.1 *Negotiations*

Effective communication is the lifeblood of successful business negotiations. Negotiators must master the art of expression, seamlessly exchanging ideas, thoughts, and opinions to achieve their desired outcomes. At its core, negotiation is a collaborative process where parties work together to find mutually beneficial solutions (Groth, 2001). Business negotiations (Koester 2014, p.37 quoted in Gardani, 2017) proceed through three main stages: (1) Information exchange; (2) Bargaining (the core of the activity); (3) Agreement. These stages can overlap, and if the parties do not reach an agreement, then they can recur. Their nature is reflected in communication and follows a structured format in business negotiations (Rehbein 1995, p.68).

Business negotiations are complex, multifaceted interactions that require a deep understanding of the underlying dynamics and strategies involved. One influential framework for analyzing negotiations is the argumentation theory developed by Frans H. van Eemeren, a leading scholar in the field of communication and rhetoric. Van Eemeren's concept of "strategic maneuvering" provides valuable insights into how negotiators can reconcile their pursuit of effectiveness with the need to be reasonable and adhere to principles of critical discussion (van Eemeren & Grootendorst, 2010). Strategic maneuvering occurs across

all stages of the negotiation process, as negotiators carefully select from the available topical potential, adapt to audience demands, and utilize specific presentational devices.

Effective business negotiators must be mindful of the potential pitfalls of negotiation, such as the cognitive biases that can systematically reduce their ability to reach agreements that maximize their interests. Recent research has identified key variables, including power balance, accountability, cooperative motivation and time constraints, that can influence the trajectory of a negotiation, moving the parties from “selfish misers” to “pro-social thinkers” capable of achieving mutually beneficial outcomes (De Dreu & Beersma, 2005; Jagodzińska, 2020).

According to van Eemeren (2010, 2023), the ideal debate process goes through four stages corresponding to the four stages in the critical discussion process including (1) the stage of confrontation, (2) the introductory phase, (3) the debate phase, (4) conclusion stage.

Within the scope of this article, negotiation is defined as a genre structured from van Eemeren’s model, including communicative facts, communicative members, and communicative purposes. Because the negotiations in this study are designed as reality TV talks with agreed-upon structure, the genre of the show reveals four parts corresponding to the four phases of van Eemeren’s model.

3.2 *Speech acts in negotiation conversations*

John Searle, a foundational figure in pragmatics and philosophy of language, defines speech acts as actions performed via utterances in communication. According to Searle (1969), every speech act has three key components:

1. *Locutionary Act*: The actual utterance and its literal meaning (e.g., “It’s raining” simply describes rain).
2. *Illocutionary Act*: The intended function or purpose of the utterance, such as making a statement, asking a question, giving a command, or making a promise.
3. *Perlocutionary Act*: The effect or outcome the utterance has on the listener, such as persuading, frightening, or comforting them.

Searle’s classification of speech acts (1969) serves as a foundational framework for analyzing how language functions in communication, making it a valuable tool for examining gender-language characteristics. By categorizing speech acts into assertives, directives, commissives, expressives, and declarations (see Table 1), Searle provides a lens through which researchers can explore differences in how men and women use language in various contexts.

There are three main applications of the speech acts framework in gender-language studies:

1. *Gender and speech act frequency*: Studies show that men and women differ in their preference and frequency of using certain speech acts. For instance, women often use more expressives and indirect directives, reflecting relational and emotional focus, while men are more likely to employ assertives and imperatives to convey authority and directness (Ghorsong, 2016; Holmes, 2013).
2. *Cultural and contextual variations*: Searle’s categories help researchers identify how gendered speech patterns vary across cultures and social situations. For example, in professional settings, men may dominate with declaratives tied to institutional roles, while women might use hedging in assertives to maintain politeness or reduce conflict (Bauler, 2019; Holmes, 2013).
3. *Quantitative and qualitative analyses*: By applying Searle’s taxonomy, researchers can measure the frequency and context of speech acts, correlating them with gender-specific traits like politeness strategies, power dynamics, or collaborative tendencies. This dual method allows for a nuanced understanding of how gender influences language use in different social interactions (Almusallam, 2018; Asma, 2023; Ghorsong, 2016).

Table 1: Searle's classification of speech acts and gender differences.

Speech Act	Definition	Example	Gender differences
Assertives	The speaker commits to the truth of what is asserted.	present, inform, comment, tell, explain, oppose, negate, affirm, show, agree, introduce, predict, describe, guide	Men are often found to use assertives more frequently and with greater confidence, emphasizing authority and certainty. Women may frame assertives with hedging or qualifiers (e.g., "I think", "It seems"), to convey politeness or mitigate the force of the statement.
Directives	The speaker makes an attempt to get the subject to do something by expressing his/ her wish.	suggest, request, ask, invite, advise	Men may use more direct and commanding forms of directives, reflecting a hierarchical or task-oriented approach. Women are more likely to use indirect or polite forms of directives (e.g., "Could you please...?"), emphasizing collaboration and relationship maintenance.
Commissives	The speaker commits to take a future action.	promises, hopes/wishes, commitments	Both genders may use commissives (e.g., promises or offers) in ways that align with traditional roles, with women often focusing on nurturing commitments and men on task-oriented agreements.
Expressives	The speaker expresses a variety of psychological states.	apologize, compliment, criticize, express positive feelings, express negative feelings, wishes	Women tend to use expressives more frequently, reflecting their greater emphasis on emotional expression and relational dynamics. Men may use expressives less often or in a more restrained manner, focusing on situational appropriateness or self-presentation.
Declarations	The speaker brings about a change in the world via words.	declare, baptize, abdicate	Gender differences in declarations are context-dependent, often influenced by societal roles and access to authority. Men, historically more likely to occupy formal positions of power, have greater opportunities to use declarations that affect social reality.

Source: Searle (1969); Holmes (2013), Gborsong (2016).

Searle's framework (Table 1) not only provides an objective basis for analyzing language but also highlights the social and cultural constructs underlying gender differences in communication. It continues to inform interdisciplinary research in linguistics, sociology, and gender studies.

Negotiation is a fundamental aspect of business interactions, requiring individuals to engage in effective communication and employ various speech acts to achieve desired outcomes (Fells & Sheer, 2019). These speech acts involve the use of language to express intentions, make offers, provide information, seek clarification, and reach agreements. By understanding and utilizing different speech acts, negotiators can navigate the complexities of a negotiation and establish rapport, build trust, and effectively convey their interests and perspectives. Additionally, speech acts play a crucial role in managing conflicts, resolving disputes, and finding mutually beneficial solutions. Furthermore, speech acts can help negotiators establish a positive and productive atmosphere during negotiations by fostering open dialogue, active listening, and constructive feedback. Overall, speech acts are a powerful tool in business negotiations as they enable negotiators to convey their intentions, gather information, make offers, and reach agreements in a way that facilitates effective communication, builds relationships, and ultimately achieves desired outcomes (Bardovi-Harlig, 2019). In any negotiation, the use of speech acts plays a vital role in shaping the outcome and promoting effective communication between parties involved. Whether negotiating a deal, resolving conflicts, or reaching agreements, effective communication is crucial (Searle, 1969) (Twitchell et al., 2013) (Teodorescu, 2014) (Mandel, 2019).

3.3 *Shark Tank Vietnam – a genre of negotiation*

Shark Tank Vietnam is a practical talk show, a Vietnamese version originated from Shark Tank, an American business reality television series. The show features a panel of investors called "sharks", who decide whether to invest as entrepreneurs make business presentations on their company or products. The reality show is vivid and natural, capable of clearly expressing gender language characteristics in groups of people

communicating in negotiations. The study's material was collected from episodes of Shark Tank Vietnam Season 3, which aired from October 7, 2018 to May 12, 2019 on VTV3 television.

As in van Eemeren's negotiation model, the negotiations in Shark Tank Vietnam are divided into three stages: *Introduction*, *Information Exchange*, and *Negotiation*. The scope of this article's research on gender-language characteristics is limited to the Negotiation phase.

4 Methods

A descriptive mixed method was adapted in the current research to identify gender differences in the use of speech acts in negotiation conversations. Data from 10 Vietnamese pitch conversations from episodes 1 to 5 in the Shark Tank Vietnam Season 3 program was recorded and transcribed. After transcribing the tapes, the utterances (in the forms of words, phrases and sentences) of the investors (sharks) and the players were identified and classified according to Searle's speech acts functions based on 5 types (Assertives, Directives, Commissives, Expressives, Declarations). Besides, Directives speech acts are also categorized into direct and indirect speech acts based on Yule (1996). The coded data were then analyzed quantitatively with the independent samples t-test in SPSS to check significant differences by gender in both investors/sharks' and players' speech acts. Then the most frequent speech acts would be chosen to compare and illustrate the different speech features according to gender and roles in negotiations. Besides, conversation analysis and contrastive analysis were used to describe speech/utterances in the interactions between sharks and players to clarify main speech acts in negotiation conversations and identify the similarities and differences in negotiating interactions between males and females in both roles.

In the Shark Tank program as a genre of negotiation (van Eemeren & van Haften, 2023), there are four main parts including: opening stage (presenting offer), confrontation stage (exchanging information), bargaining/argumentative stage, and concluding stage (accepting or refusing offer).

Participants in Shark Tank Vietnam all have certain characteristics of social position, occupation, and purpose of attending the show. Investors (called sharks) are entrepreneurs or managers who have capital invested in projects in the program. They are all social influencers having assets and high positions in society. The number of investors in the program is 5, of which three are males and two are females. Player(s), a total number of 4 women and 6 men, is one or a group of startups who have had experience or established a company for 1-3 years, registering to participate in the program with the purpose of calling and persuading investors to accompany and participate in investment for their projects. They are also the founders and operators of the company.

5 Results

5.1 Summary of results

Table 2 illustrates the frequency analysis of the five types of speech acts by gender from players' and sharks' roles during bargaining, the most interactive stage. Of those, Assertives, Directives, and Expressives are the most used in sharks' and players' utterances. The χ^2 test with $p = .223$ shows that there were no differences in male and female sharks' speech acts in the negotiating phase. However, there is a significant difference between male and female players ($p < .001$). In general, when male and female negotiators are in the role of soliciting investments, they have different speech features; whereas those in the role of deciding the investment (assumed to have more power in making decisions) show no differences in speech styles.

At the position of calling investment, male and female negotiators' speech acts were different in the following ways:

- Assertives: Female players give opinions, present, explain, etc. more than male players.
- Directives: Male players use more directive speech acts, which make effects or force the listeners to do something after getting the message.
- Commissives: Male players commit or promise twice as much as females do.

Table 2: Distribution of speech acts by male and female sharks and players in the negotiating phase.

Speech acts	Players				Sharks/Investors			
	Male		Female		Male		Female	
	Frequency	%	Frequency	%	Frequency	%	Frequency	%
Assertives	76	31.4 %	132	58.9 %	344	32.8 %	68	28.3 %
Directives	88	36.4 %	30	13.4 %	304	29.0 %	64	26.7 %
Commissives	32	13.2 %	14	6.3 %	134	12.8 %	40	16.7 %
Expressives	42	17.4 %	48	21.4 %	254	24.2 %	62	25.8 %
Declaratives	4	1.7 %	0	0.0 %	14	1.3 %	6	2.5 %
Total	242	100 %	224	100 %	1050	100 %	240	100 %
$p (\chi^2 \text{ test})$	0.000				0.223			

Source: Author's work.

- Expressives: Female players show their feelings or emotions more than males.
- Declaratives: No differences (limited number)

For detailed analysis into each type of speech acts, gendered language is illustrated according to each group of participants in the negotiations. Independent-samples t-test and descriptive analysis were applied to all categories of speech acts.

5.2 Gender differences in assertive speech acts in negotiations

5.2.1 For players

The χ^2 test with p -value of .000 demonstrated a gender difference in utterances containing assertive speech acts. Figure 1 shows that male and female players mainly perform assertive speech acts of presenting, explaining, replying, and affirming. Gender differences can be summarized as follows:

- Male players comment more than females.
- Female players present, affirm, explain, reply, and agree more than males.
- The frequencies of the assertives of informing, negating, admitting, telling, boasting and intending ($\sim 0\%$) are too low to be compared.

5.2.2 For investors (sharks)

The p value of the χ^2 statistic is .000, which shows that there are several differences in assertive speech acts between male and female investors. Figure 2 illustrates that both male and female investors comment and explain at high rates during the negotiating stage. Gendered features in Assertives can be generalised as follows:

- Male sharks/investors negate, explain, tell, boast and comment more than female ones.
- Female investors affirm, tease, offend, and agree more than male ones.

Findings of gender characteristics in assertive speech acts share similarities to the communication and negotiation styles of each gender in previous studies, that is, men communicate and speak with a focus on solving problems while females' communication is more about compromise and collaboration. Moreover, the gendered language features are different in different positions/roles in communication. Male sharks, assumed to be more powerful or active in conversations, tend to negate, boast, comment more than females, while female players who want to get the investment and try to persuade the listeners affirm and explain more than males.

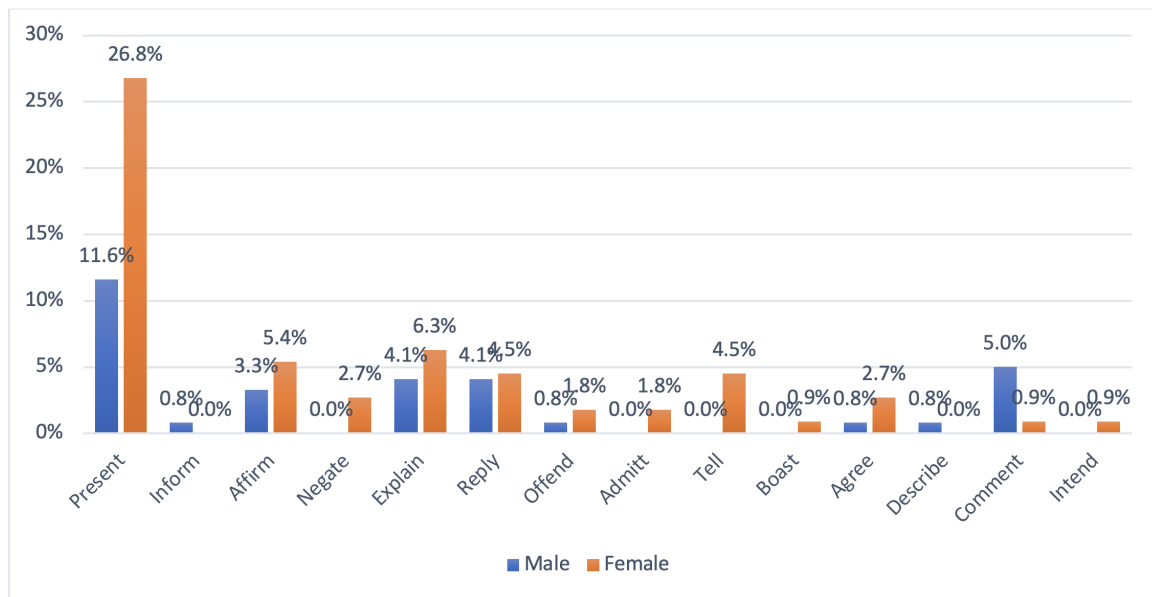


Figure 1: Distributions of assertives in players' speech by gender in the negotiating phase. Source: Author's work.

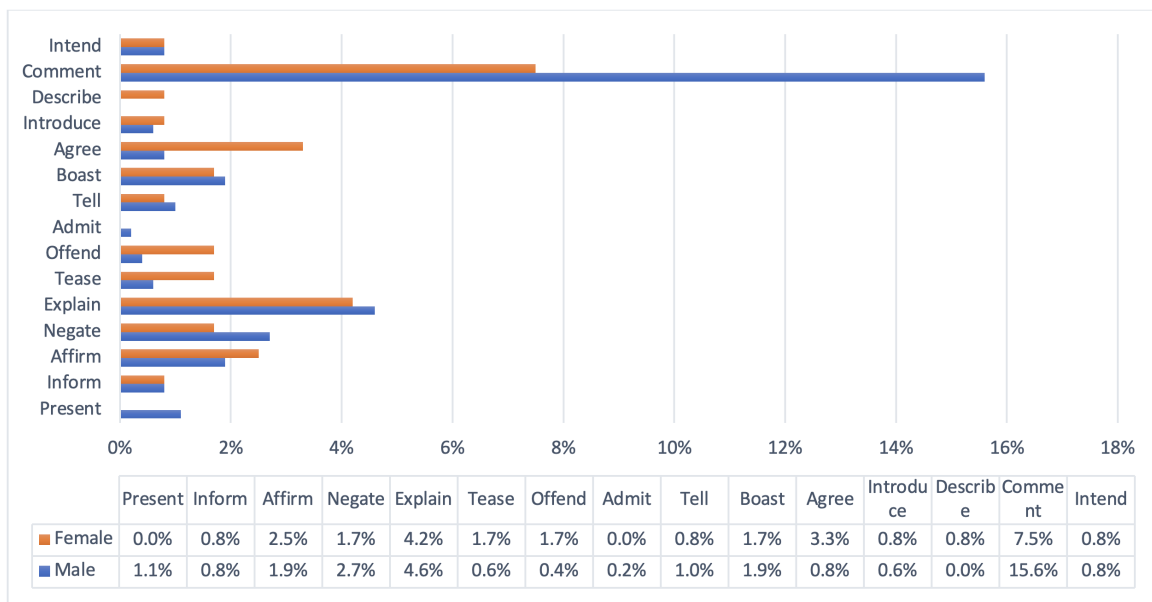


Figure 2: Distributions of assertives in sharks' speech by gender in the negotiating phase. Source: Author's work.

5.3 Gender differences in directive speech acts in negotiations

5.3.1 For players

A χ^2 test with p value of .002 shows the presence of gender differences in using directive speech acts in players' utterances. Males and females both use a large number of asking, bargaining, desire speech acts (Figure 3). From the detailed analysis, we can infer several features:

- Males use more bargaining, asking for permission, and asking speech acts than females.
- Females offer and want more than males.

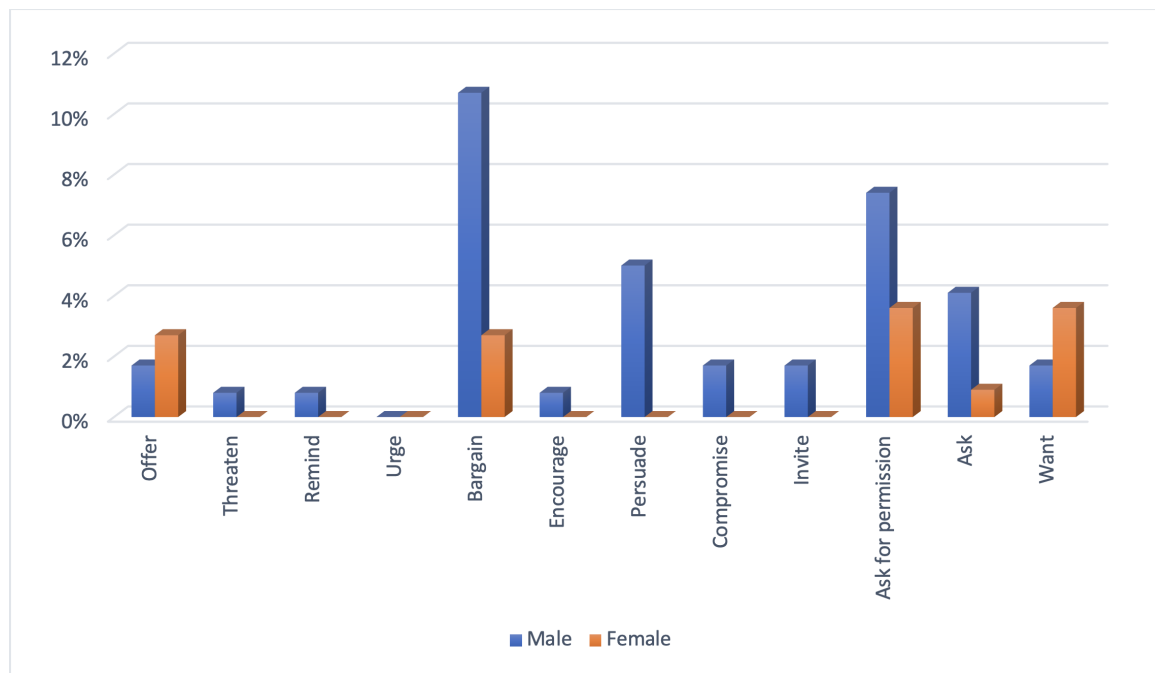


Figure 3: Distribution of directives in players' speech by gender in the negotiating phase. Source: Author's work.

5.3.2 For investors

A χ^2 test with p value of .000 shows the existence of gender differences in sharks' directive speech acts during the negotiating phase in which sharks mainly offer, ask, advise and want the players to do certain actions. The statistics in Figure 4 display several gender features in sharks' directive speech acts, as follows:

- Males ask and advise more than females.
- Females offer, threaten, encourage, compromise, and want more than males.

Table 3: Distribution of sharks' and players' direct and indirect directives by gender in the negotiating phase.

Directives	Players				Sharks			
	Male		Female		Male		Female	
	Frequency	%	Frequency	%	Frequency	%	Frequency	%
Indirect	24	27.3 %	2	6.7 %	36	11.8 %	2	3.1 %
Direct	64	72.7 %	28	93.3 %	268	88.2 %	62	96.9 %
$p = .019$					$p = .037$			

Source: Author's work.

To assess the direct and indirect styles of directive speech acts in sharks' and players' utterances, χ^2 tests were applied to 486 directives which were classified and coded into indirect and direct, as illustrated in Table 3. The findings indicate there are gender differences in indirect and direct directives. Direct ones were the most used by both genders, but females in Shark Tank Vietnam show more straightforwardness than the males:

- Regarding direct speech acts, the investors/sharks perform clearly through exact verbs with denotative meaning such as "*I offer, I want, I advise you...*" to implement illocutionary acts. For example, sharks use directive speech acts to give a recommendation: "*Shark offers to invest 1 million for 5 % and if there is a next round, we will go to the end*". Similarly, the players refuse and request through using a question and desire in speech: "*I am expecting whether there are any more attractive offers?*"

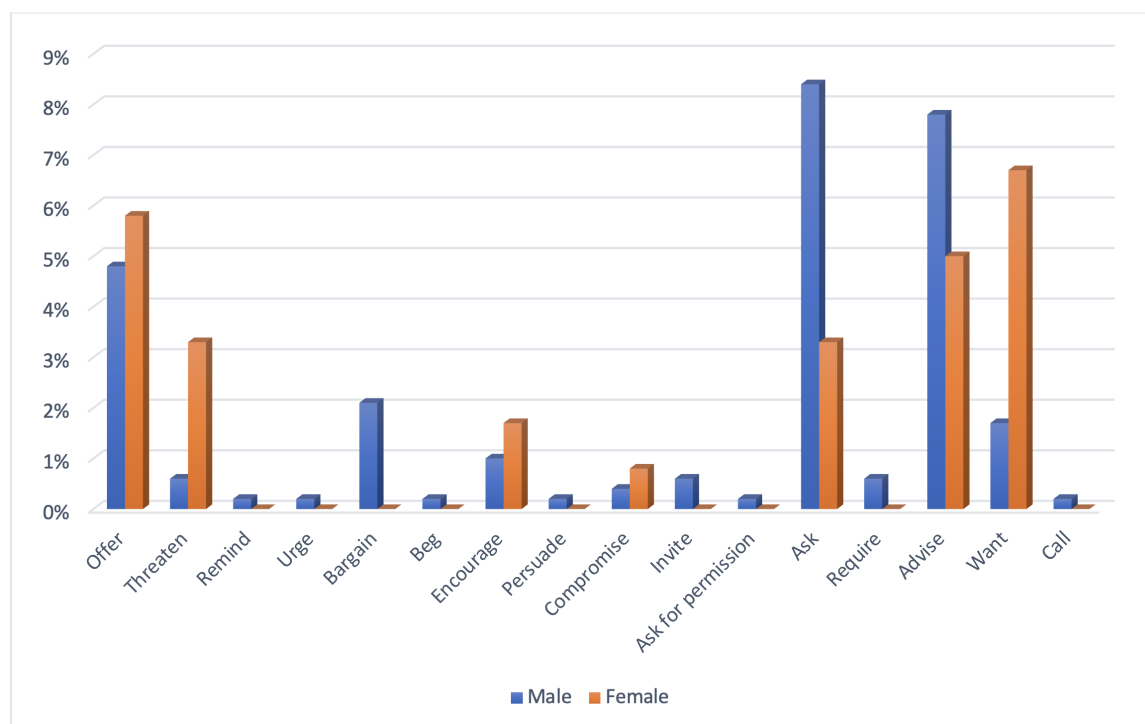


Figure 4: Distribution of directives in sharks' speech by gender in the negotiating phase. Source: Author's work.

- Regarding indirect speech acts, the investors/sharks used locutory speech acts for other purposes. For example, female sharks used indirect speech acts to motivate the players to agree or accept their offers: *"In fact, my offer of 35 % is very supportive"*, or to threaten the players to think about accepting an offer *"If you don't accept the offer, I am sure that we have to stop here."* In the examples, female sharks used comments or statements to imply the effects on listeners' decision. In another example, male sharks use re-offering acts indirectly through the question *"Why don't I rather take 1 million for 20 % discount to swing trade?"* This helps the shark avoid direct requests or suggestions.

As can be seen, sharks and players of both genders tend to use direct directives which are a common linguistic feature in negotiations. Particularly, females talk more directly than males, which is opposed to earlier findings about indirect speech as female speech style.

From the analysis of directives, there are significant gender differences in directive speech acts showing different speech styles of the genders. Males stereotypically demonstrate clear wants and needs to achieve their aims in negotiations, while females in positions of both sharks and players use directness, power in their utterances, although they also use a variety of conciliatory or cooperating speech acts in negotiating such as motivating, encouraging, desiring, etc.

5.4 Gender differences in commissive speech acts in negotiations

5.4.1 For players

The χ^2 test with a p value of .012 shows a statistically significant gender difference in commissives in players' speech. The results in Figure 5 illustrate that the players mainly promise, commit or agree to cooperate in the future. Analyzing gender features of Commissives, the findings can be summarized as follows:

- Male players show more hopes and commitments than females, which implies that player males are stronger and more determined than females in persuading sharks to invest in the projects.
- Female players have more agreements (accept) on future cooperations than males, which indicates that females are more cooperative and compromising in negotiations.

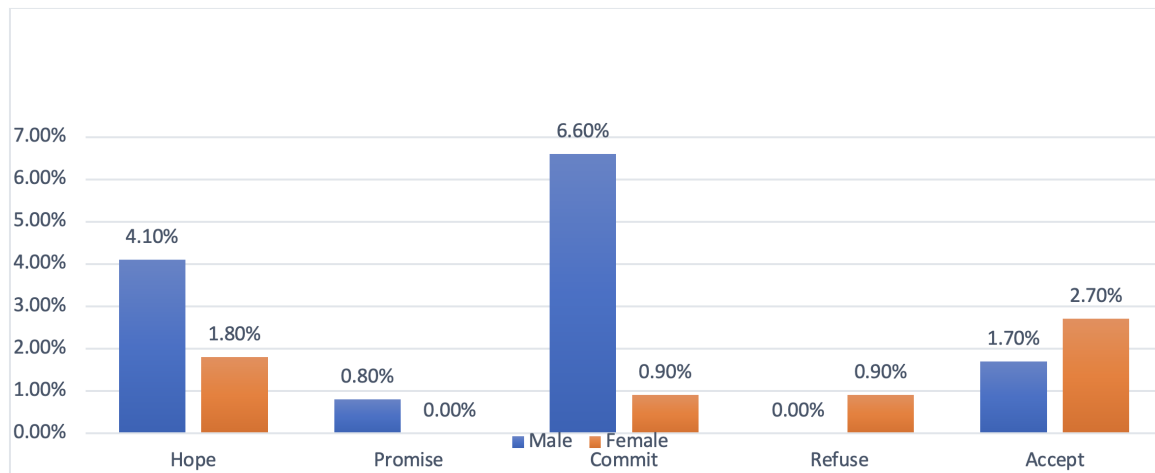


Figure 5: Distribution of commissives in players' speech by gender in the negotiating phase. Source: Author's work.

5.4.2 For investors

The χ^2 test with a p value of .000 shows that there are significant differences between male and female sharks' commissive acts. Specifically, female sharks promise and commit more than males while male sharks refuse more than females (Figure 6).

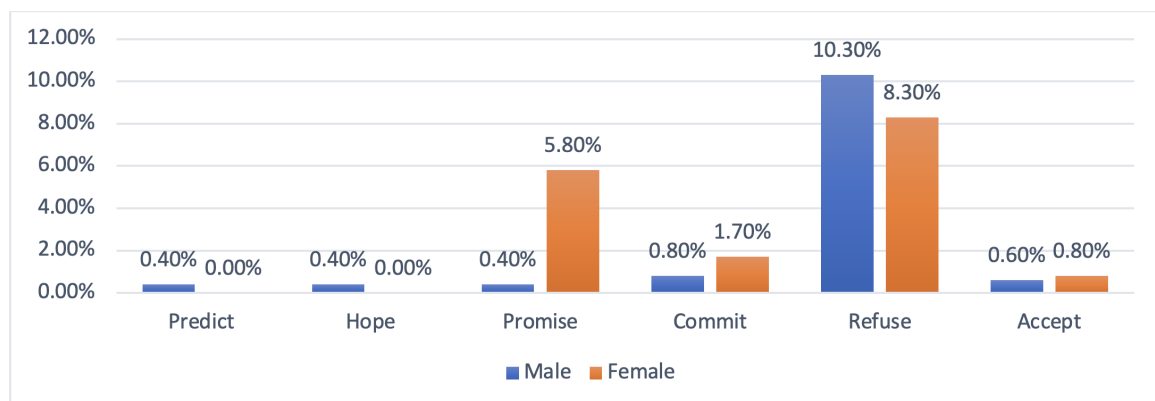


Figure 6: Distribution of commissives in sharks' speech by gender in the negotiating phase. Source: Author's work.

5.5 Gender differences in expressive speech acts in negotiations

5.5.1 For players

The p value of the χ^2 test is .174 meaning there is no statistically significant gender difference in expressive speech acts in the players' utterances.

5.5.2 For investors

The p value of the χ^2 test, .006, indicates gender differences in expressives in sharks' speech. Figure 7 shows that sharks use expressions such as complimenting, criticizing, wishing, and thanking during this stage. When we compare and contrast male and female speech, there are several features that are similar to common gender stereotypes:

- Male sharks criticize much more than females.
- Female sharks express more compliments, desires, and both positive and negative feelings than males.

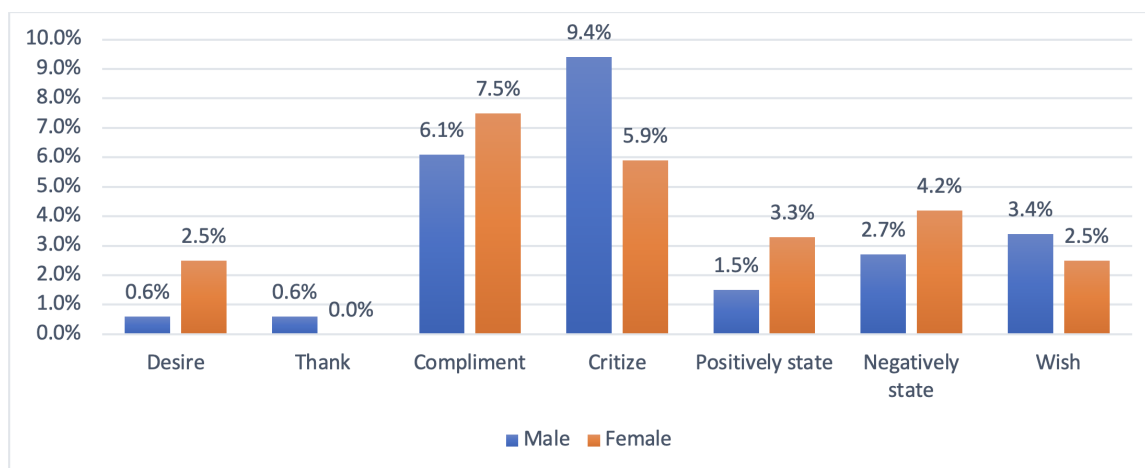


Figure 7: Distribution of expressives in sharks' speech by gender in the negotiating phase Source: Author's work.

6 Discussion

The purpose of this study was to gain a better understanding of the role of gender for negotiations through speech acts analysis in Shark Tank Vietnam. The results provide supporting evidence that male and female negotiators in different roles (sharks and players) applied assertive, directive, commissive, expressive and declarative speech acts differently to achieve their aims during the negotiating phase. In general analysis, some of the results are similar to common gender stereotypes/norms and previous findings as in Rahayu and Fauziah (2021), which indicate that females use more tentative, emotional, commissive language while males use more assertive and direct language.

However, in detailed analysis there are a number of significant findings which we assume may reflect the change of gender roles at work. Male sharks, who are considered to be more powerful than females in decision making, tend to use more assertive speech acts than female sharks. However, male players who ask for investment tend to use fewer assertives than do females. In deeper investigation into assertives, male sharks are more lecturing and give more comments, presentations and negative statements than females, while females state more descriptions, agreements, boasting and reports. One interpretation of these findings is that males in a position of power more often use assertives purposefully in their speech with the aim of giving lectures or showing their power in an effort to influence the player's decisions. In the meanwhile, females still use more gentle and descriptive speech as their norm.

For directive speech acts, male sharks and players both use more directives than females, supporting the view of males' speech as dominant and authoritative. However, for each speech act in directives, female sharks seem to be more dominant in the use of more offers, threats/ warnings than males, but they also use various speech acts to mitigate their language like motivating, showing their wants, and compromising in negotiations. These findings, which are consistent with Farrell (1979), imply that in some cases females at work could employ a male mode of argumentation to achieve their aims in conversations. Still, there remains the question of whether it is indeed power that affects the differences in language styles between men and women in negotiations.

7 Conclusion

The negotiation phase of the examined TV program is a dramatic and competitive period in which the investors and the players use a variety of speech acts to achieve the final goal of the negotiations. To identify significant gender differences in speech acts of negotiating conversations from the positions of sharks and players, the linguistic features of speech acts in the conversations are categorized and analyzed. The results indicate that there are similarities of the gender differences in language use by either investors or players to the norms or stereotypes identified in previous studies. However, there are also novel results

which describe how male and female speech changes in different positions in negotiations. These we can tentatively attribute to negotiators' social position or effort in negotiating.

This study has provided a descriptive and empirical study of gender language in negotiations from the theory of speech acts. Such data are needed to develop a more comprehensive understanding of social changes from the view of language. The findings can help negotiators and teachers to build up knowledge about gender language and styles in negotiations and adjust their negotiating speech appropriately. However, data which are limited in the scope of a reality TV program need to be confirmed on a larger corpus. In the future, the research hopes to be able to expand the scope and volume of the investigation to yield more reliable and valuable findings in the field of socio-pragmatics. From that, the further study can examine the social or cultural effects on gender speech features in Vietnam specifically as well as worldwide.

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Do You Like Dogs, Cats, Both, or Neither? An Examination of Western Dating Site Users

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Abstract

Prior research found that pet preferences and ownership relates to owners' characteristics, including psychological variation. We aimed to expand this literature. Subjects were OKCupid dating site users who had answered questions for the purpose of improving their matches on the site. We examined the relationship between dog and cat preferences and a broad selection of psychological traits scored using ad hoc scales of questions found in the dataset. Results were in line with prior research. People who prefer dogs were higher in extraversion, conservatism, desired and actual number of children, and mental health, while those preferring cats were higher in intelligence, enjoyed discussions more, and read more books. These associations were robust to controls for age, sex, and location.

Keywords: Pet preferences, psychological traits, fertility, political ideology, intelligence

1 Introduction

About 46 % of US households have a dog, and 32 % have a cat (Association, 2024). Humans have been living and co-evolving with these and other species for thousands of years. Dogs seem to be one of the first species that were domesticated, maybe as early as 40,000 years ago and no later than 15,000 years ago, while cats were domesticated perhaps 12,000 years ago as the first humans transitioned to farming (Nilson et al., 2022; Perri et al., 2021; Tancredi & Cardinali, 2023). The fact that dogs were domesticated prior to the farming transition while cats were domesticated afterwards speaks to their roles living with humans. Dogs are useful for hunting and for protection against predators and hostile humans, while cats protect stored food against rodents, which is primarily useful for farmers. Because of these ancestral relationships, we might expect that there are differences among humans in preferences for one kind of pet over the other, related to the kinds of labor that humans prefer.

There is a small literature exploring how human traits relate to pet ownership and preferences (Gosling et al., 2010; Guastello et al., 2017; Kidd & Kidds, 1980). Prior studies in the Big Five framework found that self-identified dog people were more extraverted, agreeable, conscientious and emotionally stable (lower neuroticism) but lower in openness to experience, with analogous results for the Cattell 16PF dimensions. Furthermore, cat people had higher intelligence. These patterns correspond roughly to the socially adapted, conservative average Joe/Jane versus the leftist, creative but neurotic, intellectual. These broad stereotypes also correspond to stereotypical behavior of the pets themselves to some extent, with dogs being generally less neurotic and more social. Some research finds congruence between owner personality and pet personality, even when using peer judgments instead of self-ratings for both dogs and owners (Turcsán et al., 2012). Owners of aggressive vs. non-aggressive dogs score higher on Eysenck's psychoticism scale Wells & Hepper (2012), and others find that third party observers are able to match up dogs and owners even when photos of them are taken in independent settings (Roy & Nicholas, 2004). Some of these findings have been replicated in multiple studies, whereas others are more in doubt (Bender et al., 2025).

In general, it seems that the pro-similarity patterns seen in the formation of human friendships (social homophily) and dating choices (assortative mating) are seen for pet owners and their pets Payne & Jaffe (2005). If this pattern was true also in human history, it would mean that dogs and cats may have been

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bred for similarity to humans in general, and that specific breeds may have been selected to be similar to those humans who worked in the kind of work the dogs were bred for. The purpose of the present study was to add to this literature using a large, high-powered dataset with many different personal characteristics of the humans.

2 Data and Methods

Subjects were dating site users on the OKCupid site. Subjects answered questions in order to be better matched with potential dates through the site's matching algorithm (Rudder, 2015). While many subjects did not answer many questions, some subjects answered over 1000 questions (maximum sample size was 68,371). Data for subjects was scraped (automatically downloaded using a script) from the website around 2016 and published as an open science dataset (Kirkegaard & Bjerrekær, 2016). During scraping, subjects with more questions answered were preferentially scraped as they would provide more data for research, though this causes more selection bias. Most subjects were from the Western, English-speaking world (English-speaking 85 %, Western world 95 %, mainly USA, Canada, and the United Kingdom).

The primary question of interest concerning pets was "Are you a cat person or a dog person?" with options: dogs, cats, both, neither (q997). 54,746 subjects answered this question. We sought to measure a variety of psychological traits and behaviors that might relate to dog-cat preferences. However, the questions on the website were not made by professionals, rather users could submit questions. Because of this, the questions do not cover the content of any existing, validated psychological scale, nor do they have consistent answer formats (from 2 to 4 options). Instead, in order to measure traits of interest, we searched the available questions for ones plausibly related to traits of interest. Based on our search, we constructed ad hoc scales for the following phenotypes:

- **Conservatism:** 15 items. Example: "Is a welfare system a good idea? Or does taxing for it just take money away from hard-working people who earned it?" from "Welfare is mostly good" to "Welfare is mostly bad". Reliability = .76.
- **Drug use:** 7 items. Example: "What's your deal with harder drugs (stuff beyond pot)?" from "I do drugs regularly." to "I never do drugs". Reliability = .82.
- **Enjoys discussion:** 4 items. Example: "Do you enjoy intense intellectual conversations? yes/no". Reliability = .65.
- **Extraversion:** 11 items. Example: "Do you like wild parties?" yes/no. Reliability = .76.
- **Intelligence:** 14 items. Example: "Etymology is..." with 4 options. Reliability = .61.
- **Sex/kink interest:** 14 items. Example: "How open are you to trying new things in bed?" from "Very Open" to "Not at all". Reliability = .78.
- **Mental health:** 5 items. Example: "Do you get depressed much?" from "Almost never" to "Despair is my life". Reliability = .43.
- **Antisocial behavior:** 16 items. Example: "People who throw cigarette butts out of their car window...", "Are not doing any real harm" or "Are being insensitive and/or rude" (reverse scored). Reliability = .50.
- **Prudence:** 8 items. Example: "Are you careful with your money?" yes/no. Reliability = .49.
- **Likes reading:** 4 items. Example: "Roughly how many books have you read in the past year?" from "Less than five" to "Fifty or more". Reliability = .67.
- **Religiousness:** 10 items. Example: "Do you believe in God?" yes/no. Reliability = .79.

- **Has children:** 1 item. Yes/no.
- **Ideal number of children:** 1 item, Options: 0, 1-2, 3-4, 5+.

Some of these scales had been previously used in other research using the same sample (Dutton & Kirkegaard, 2022; Kirkegaard, 2018; Kirkegaard & Dutton, 2023; Kirkegaard & Lasker, 2020). Each multi-item scale was scored using item response theory using the mirt package (Chalmers et al., 2020). A list of the items in the scales and their factor loadings can be found in the technical appendix (R notebook). Item choices were generally not far from professionally developed items. The example items given in the list above are the items with the strongest factor loadings for each scale. Generally, because of the small number of items and the non-trivial amount of missing data, scores from the scales were only moderately reliable. To offset this problem, data from subjects with at least 500 questions answered were used for the main analyses (max $n = 28,651$). The estimated score reliabilities for the scales at the minimum of 500 answers are given in the list above, from a minimum of .43 for mental health to a maximum of .82 for drug use.

For each outcome of interest, we used regression to determine its relationship to pet preference (in R formula syntax: `outcome ~ pet_preference + controls`). Linear regression was used for the factor scores while logistic and ordinal regression was used for the binary and ordinal types. As such, the results for the first 11 outcomes are on a comparable scale as the variables were standardized (mean 0, standard deviation 1), while for the latter two, they are in logits. The predictor of interest (dog-cat preference) could be encoded two different ways. In the first, the variable is taken as a nominal variable and the four levels are compared (base level being liking neither). Alternatively, it could be coded as two binary variables, one for dogs and one for cats. The first approach was preferred because unlike the second it would capture any differences that are not additive. People who like both dogs and cats may not have the same outcome average as expected from their liking of dogs and cats. The covariates were varied to see how this affected results. Control variables were age, sex, and optionally location (US or Canadian state/province, or country). The reason for the optionality of controlling for location was that it is not purely an exogenous variable. People move to or from cities as a function of their psychological variation, specifically for the purposes of having or not having a certain kind of pet. Since cats are smaller and require less space than most dogs, they are more suitable to city-living than dogs.

3 Results

The main results are shown in Figures 1 and 2. These are the betas from the linear, logistic, or ordinal regression predicting the outcome in question from the pet preference and the controls.

Results showed a variety of differences. Compared to subjects who answered they liked neither dogs nor cats, dog people were very slightly more antisocial and cat people slightly less. Dog people were more conservative and cat people less. Cat people had greater drug use, especially compared to those who liked neither pet type. Similarly, cat people enjoyed discussions more, while dog people were more extraverted. Liking cats but not dogs predicted higher intelligence. Having children was predicted by not liking either type of pet, but especially not liking cats. On the other hand, liking dogs predicted higher desired fertility, and cats lower. Liking any pet predicted greater interest in sex and sexual kinks. Dog people had better mental health than cat people, but there were no differences in prudence. Finally, cat people read more books, and dog people were more religious.

By comparing the results from Figure 1 and 2, one can see how controlling for residence affects results. The answer is that it didn't matter much, although effect sizes were slightly smaller when the control was added. Thus, the differences observed between dog and cat people cannot be explained simply as a matter of country or state/province level residence (within USA or Canada). Thus, the results do not merely show that inland Americans with bigger houses tend to like dogs more than people living in coastal cities.

By comparing the baseline of "neither dogs nor cats" to "cats only", "dogs only" and "both", one can observe that in some cases the effects don't seem additive. That is, people who like both don't have the average value of "dogs only" and "cats only". Statistically, this interaction effect was beyond chance for

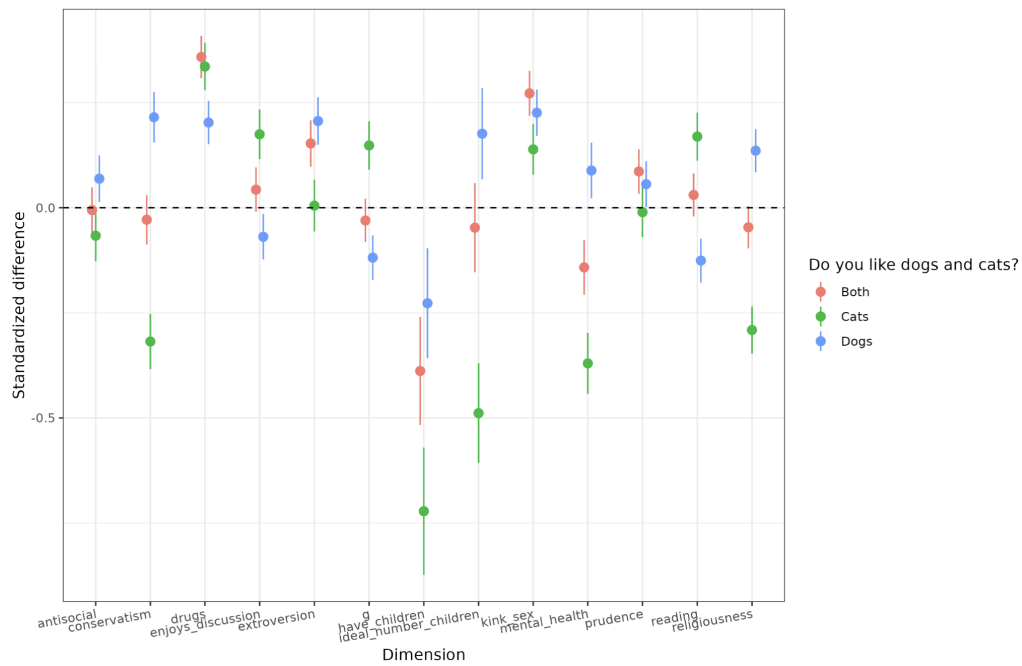


Figure 1: Standardized differences between dating site users as a function of their preference for dogs and cats. Age and sex were controlled, but not location. Results for users who answered at least 500 questions in total (sample size about 26k). Error bars show 95 % confidence intervals.

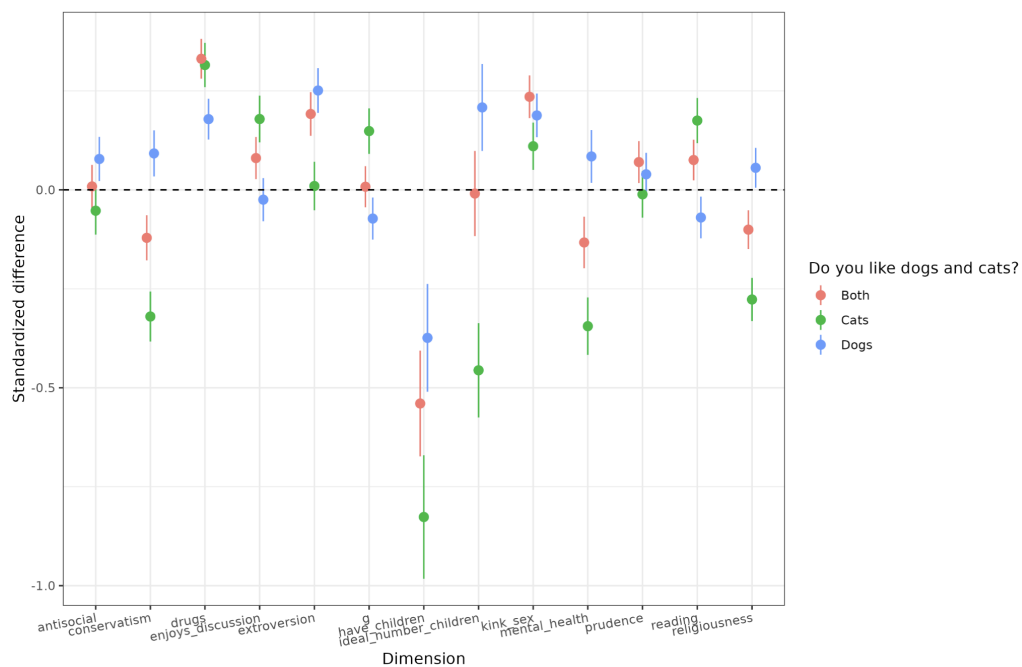


Figure 2: Standardized differences between dating site users as a function of their preference for dogs and cats. Age, sex and location were controlled. Results for users who answered at least 500 questions in total (sample size about 26k). Error bars show 95 % confidence intervals.

4 of the 13 tests (Bonferroni $p < .05$). This can most easily be seen when the pet preference was coded using the binary approach, shown in Figure 3.

The blue dots show the interaction effects. Most of these are close to 0 (no interaction), but for some traits, they deviate strongly from 0. The effect is most visible for having any children. The effect of liking cats is strongly negative, while that for dogs is only slightly negative, but liking both offsets this

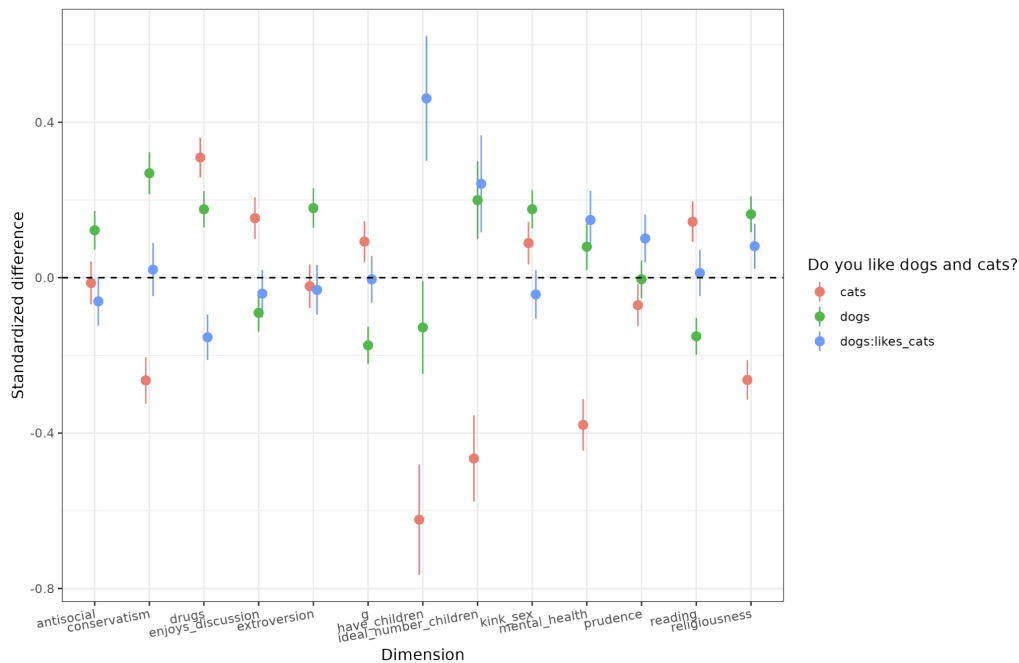


Figure 3: Standardized differences between dating site users as a function of their preference for dogs and cats coded as binary variables. Age and sex were controlled, but not location. Results for users who answered at least 500 questions in total. Error bars show 95 % confidence intervals. “dogs:cats” (blue) is the interaction term.

to some extent, though not enough to reach 0 effect (the same as liking neither, cf. Figure 1). A similar positive interaction is seen for the desired fertility variable. Thus it seems that having a general pro-pet preference associates with actual and desired fertility, but that for actual fertility, there is perhaps some substitution effect where people get pets instead of children.

To examine whether the imposed selection bias in the form of a minimum of 500 questions answered had an effect on the results, we refit the models without this restriction. This roughly doubled the sample sizes (to about 50,000). However, the findings were quite similar in directions (results shown in the technical output).

To examine whether the findings were plausibly limited to the broadly speaking Western world (any country mainly inhabited by Europeans), we limited the sample to the non-Western world. This resulted in a starkly reduced sample size of maximum 5,629. Results from this analysis are shown in Figure 4.

Some of the results from the full, mainly Western sample did not replicate. For instance, liking either dogs or cats predicted lower conservatism, rather than liking dogs predicting higher as in the main analysis. Other differences were consistent with Western results, for instance that cat people had higher intelligence. Because of the limited sample sizes, most of the confidence intervals were too wide for useful interpretation.

4 Discussion

Our findings were in line with prior research. For instance, we found that cat people tended towards negativity in the form of poorer mental health, whereas prior research has reported elevated neuroticism from the Big Five taxonomy. We replicated the finding that dog people are more extraverted and religious, while cat people are smarter, enjoy discussions more, and read more books. The previous findings in the literature thus appear to be fairly replicable in a different setting.

Our sample size was much larger than prior studies (the largest of which had a few thousand subjects), but this was offset by our generally worse measures of the traits in terms of reliability and their ad hoc nature. As such, the observed effect sizes should be taken more as indicators of the direction of effect rather than exact effect size measures.

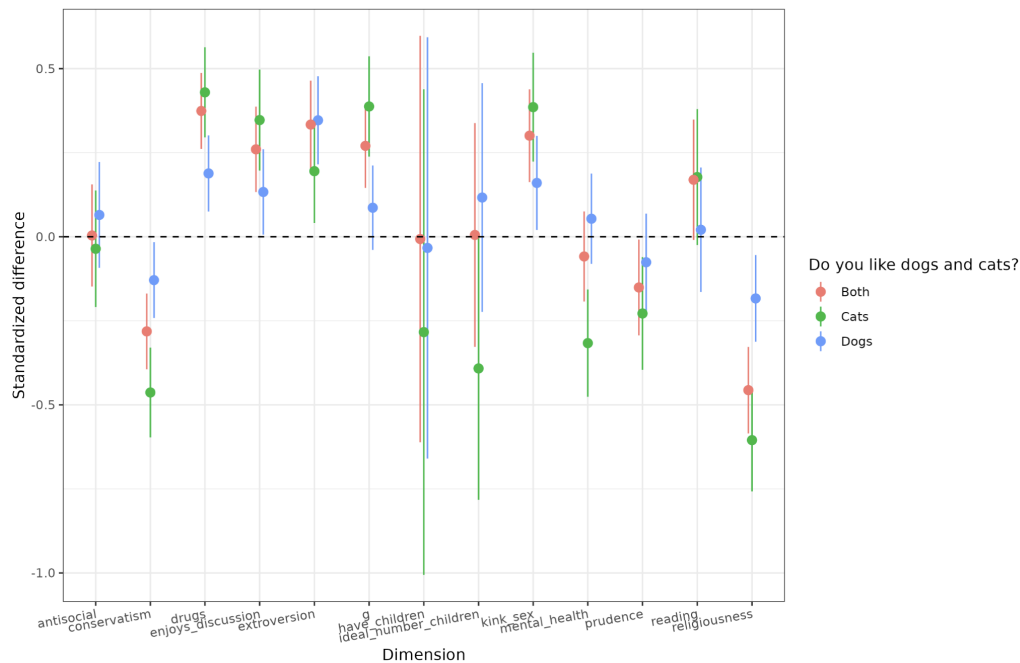


Figure 4: Standardized differences between dating site users as a function of their preference for dogs and cats. Age and sex were controlled, and location was limited to non-Western countries (sample size about 5k). Error bars show 95 % confidence intervals.

Aside from the poor reliability of some scales, the study also suffers from selection bias as all subjects were dating site users, mainly from English-speaking and other Western countries. The results may therefore not generalize to other settings, and especially not to non-Western samples. Our results were underpowered to analyze this question in detail.

A general limitation of the OKCupid dataset is that the dataset is only based on subjects who answered their questions “in public”, that is, visible to other users. If users selectively hid their responses, did not answer potentially self-incriminating questions, or lied, then the results may not reflect reality. This did not appear to be a large concern in a prior study analyzing antisocial behavior, which showed roughly the same associations as in other studies (e.g., related to lower intelligence) (Kirkegaard, 2018). The fact that the current results also replicated many findings from other samples shows that the selection bias is not a large concern despite the unusual nature of the data.

Supplementary materials

The R code, code output (R notebook) are available at <https://osf.io/rav59/>. The data are available at <https://mega.nz/folder/QIpXkL4Q#b3QXepE6tgyZ3zDhWbv1eg>.

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Age Trends in the Double Burden of Malnutrition (DBM) and Body Composition of the Jaunsari Adults of Uttarakhand, India

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Abstract

To investigate the age trends in body composition related to the double burden of malnutrition (DBM), the present cross-sectional study was conducted among the Jaunsari people living in Lakhamandal village of Dehradun district of Uttarakhand, India. A total of 304 Jaunsari adults (134 males, 170 females, 18-60 years) were randomly selected. Information on their socio-demographic profile was collected through a standardised schedule and anthropometric measurements of height (HT), weight (WT), waist circumference (WC) and hip circumference (HC) were taken following standard procedure. Derived variables including body mass index (BMI), waist-to-hip ratio (WHR), body fat percentage (BF %), fat mass (FM), fat-free mass (FFM), fat mass index (FMI), and fat-free mass index (FFMI) were calculated. To assess nutritional status including abdominal obesity, the World Health Organization's recommended cut-off values for BMI, WC and WHR were used. Results revealed the prevalence of overweight-obesity was higher among men than women (23.9 % vs. 22.4 %). Women were more undernourished (32.4 % vs. 26.9 %), but with higher abdominal obesity (WC: 21.2 % vs. 11.9 %, WHR: 30.0 % vs. 14.2 %). With increasing age, the mean values of most of the studied variables increased among women (except HT, FFM, FFMI, WHR). For men, the middle age group (26-39 years) exhibited the highest mean values for variables except BF %, FM, FMI, and WHR. The coexistence of undernutrition and overweight-obesity indicated the threat of DBM, demanding immediate nutritional intervention programmes among this community.

Keywords: Body composition, Double burden of malnutrition, Indian tribes, Jaunsari

1 Introduction

In 2022, the World Health Organization (WHO) estimated that globally 2.5 billion adults were overweight including 890 million obese, whereas 390 million were underweight (World Health Organization, 2024). Overweight/obesity is no longer a problem only in high-income countries. Today also low- and middle-income countries (LMICs) face the double burden of malnutrition (DBM), which is the coexistence of undernutrition and overweight/obesity in the population (Bhandari et al., 2021; Little et al., 2020; Mukherjee et al., 2022; Popkin et al., 2020; Singh, 2019). This DBM exists not only at the country or community level but within the same households as well (Little et al., 2020). It is even observed that individuals who were stunted in childhood have become overweight as adults (Ramachandran, 2019).

Like all other developing countries, India has long been suffering from the burden of malnutrition, especially undernutrition. However, recent trends show a rapid increase in overweight and obesity as well (Mukherjee et al., 2022). According to the latest National Family Health Survey-5 (NFHS-5) (2019-21) data, the prevalence of overweight among Indian adults (15-49 years) was higher for both men (22.9 %) and women (24.0 %) than underweight (men: 16.2 %; women: 18.7 %) (International Institute for Population Sciences, 2021). Further, NFHS-5 data also revealed that the prevalence of abdominal obesity among

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Indian men and women is 12 % and 40 %, respectively (Chaudhary & Sharma, 2023). It is, therefore, clear that India is undergoing a nutrition transition where undernutrition prevalence is declining while overweight/obesity is rising. The increasing prevalence of DBM has spurred significant research interest in understanding the associated changes in body composition with aging (Roy et al., 2020).

Anthropometric measurements of body composition help to track growth throughout life, understand how health and disease develop, formulate nutritional strategies, and see if treatments are working (Kuriyan, 2018). The most common and widely used model for assessing body composition is the two-compartment (2C) model, which divides body mass into fat mass (FM) and fat-free mass (FFM) (Jackson et al., 2013; James et al., 1988; Kuriyan, 2018; Saha & Sil, 2019). The amount of FM and FFM present in the human body has different health implications (Kulkarni et al., 2014; Saha & Sil, 2019). In particular, excess FM is associated with obesity-related chronic illnesses such as insulin resistance, hypertension, dyslipidemia, type 2 diabetes, heart disease, stroke, kidney disease, infertility, etc., whereas FFM helps to protect from chronic diseases like diabetes and osteoporosis (Das, Mukherjee, Ganguli, et al., 2020; James et al., 1988; Kulkarni et al., 2014; Milanović et al., 2011; Roy et al., 2020).

Body composition is influenced by several factors like age, sex, dietary habits, lifestyle, physical activity, hormones, genes, socio-economic condition, environment, disease, etc. (Das, Mukherjee, Ganguli, et al., 2020; Kulkarni et al., 2014; Kuriyan, 2018; Milanović et al., 2011; Saha & Sil, 2019). The natural progression of aging is accompanied by a number of physiological and nutritional changes such as a decrease in FFM and frequently an increase in FM, sometimes without visible changes in body mass (Milanović et al., 2011; Roy et al., 2020; St-Onge & Gallagher, 2010). Furthermore, studies also revealed that with aging, the accumulation of FM is more specifically concentrated in the abdominal region in both men and women (Roy et al., 2020; St-Onge & Gallagher, 2010). Therefore, the regular assessment of body composition changes with aging is crucial for health professionals to develop strategies for weight management and maintaining functional capacity (Roy et al., 2020).

A sizable portion of the Indian population is constituted by tribal people, who often live under unique social, cultural, and economic conditions. Indian tribes are among the most underprivileged sections of society, with high prevalence of undernutrition (Bhandari et al., 2021; Chaudhary & Sharma, 2023; Das, Mukherjee, Chanak, et al., 2020; Kshatriya & Acharya, 2016; Mukherjee et al., 2022; Singh, 2019). However, rapid urbanization has resulted in notable changes in the lifestyle of these people, particularly their dietary habits and occupational activities (Das, Mukherjee, Ganguli, et al., 2020; Mukherjee et al., 2022). The easy availability of less nutritious highly processed foods and beverages in local shops and supermarkets has affected body composition and aggravated the risk of excessive weight gain in tribal people (Kshatriya & Acharya, 2016; Mukherjee et al., 2022). A decade ago, the National Nutrition Monitoring Bureau (NNMB) conducted a study in tribal areas across nine states of India and reported that the prevalence of overweight among adult tribal people had increased from 5 % to 9 %, between 1997-98 and 2008-09 (National Nutrition Monitoring Bureau, 2009). Kshatriya & Acharya (2016) in their study reported that approximately 14.8 % of adult tribal men and 10.9 % of women were overweight and 1.7 % of men and 1.5 % of women were identified as obese. Such findings indicate that despite several initiatives taken by the state and central governments, the tribal people are suffering from DBM. This situation demands more exploratory studies among different indigenous communities living in varied ecological settings.

The present study focuses on the Jaunsari population residing in the Jaunsar region of Dehradun district, Uttarakhand, India. Traditionally, the Jaunsari community traces its ancestry to the Pandavas of the Mahabharata epic (Gill & Singh, 2023; Kumari et al., 2021; Majumdar, 1962; Mukherjee & Das, 2014; Tripathi, 2020). The Government of India designated the Jaunsar-Bawar region as a 'Scheduled Tribal Area' in 1967, granting ST status to its inhabitants (Gill & Singh, 2023; Kumari et al., 2021; Mukherjee & Das, 2014; Tripathi, 2020). The Jaunsar-Bawar region is characterized by geographic isolation and a distinct cultural identity. Notably, the Jaunsari practised fraternal polyandry, a form of marriage where multiple brothers share a wife (Gill & Singh, 2023; Kumari et al., 2021; Majumdar, 1962; Mukherjee & Das, 2014; Tripathi, 2020).

The Jaunsari population encompasses various castes within the Hindu caste system, including Brahmins, Rajputs, Luhar, Bajgi, Kolta, Dom, Chamar, etc. (Kumari et al., 2021; Mukherjee & Das, 2014). Social

stratification and caste differentiation persist within the community (Kumari et al., 2021). Subsistence for the Jaunsari primarily revolves around agriculture and animal husbandry (Kumari et al., 2021; Mukherjee & Das, 2014; Tripathi, 2020). Landless individuals often rely on daily wage labour (Mukherjee & Das, 2014; Mukherjee et al., 2022; Pawar et al., 2017; Tripathi, 2020). According to the 2011 census, the total population of Jaunsari in Uttarakhand was 88,664 (Gill & Singh, 2023; Mitra, 2020). The Jaunsari constitute approximately 32.5 % of Uttarakhand's ST population (Mukherjee et al., 2022; Pawar et al., 2017).

Prior research on the Jaunsari has predominantly explored their marriage practices, ethno-medicinal practices, magical practices, food and beverages, life expectancy, identity politics, health care practices, etc. (Gill & Singh, 2023; Kshatriya et al., 1997; Kumari et al., 2021; Majumdar, 1962; Mukherjee & Das, 2014; Pawar et al., 2017; Rana et al., 2022; Rizvi, 2013; Tripathi, 2020). However, only a limited number of studies have specifically investigated the Jaunsari community's nutritional status, revealing the prevalence of DBM, where underweight ranges between 26 %-35 % and overweight between 11 %-18 % irrespective of gender (Mukherjee et al., 2022; Ravi et al., 2019).

Against this backdrop, this study aimed to assess the age trends in DBM and body composition characteristics among the Jaunsari people living in Lakhamandal village of Dehradun district of Uttarakhand, India.

2 Materials and Methods

The present cross-sectional study was conducted among a total of 304 Jaunsari adults (134 males, 170 females) aged 18-60 years residing in Lakhamandal village of Jaunsar region of Chakrata block of Dehradun district, Uttarakhand, India. Lakhamandal village has been selected purposively as a representative village of the Jaunsar region due to its notable similarities with neighbouring villages. The village is currently experiencing a transformation in its traditional lifestyle due to the interactions with tourists from various regions of the country as this location is well known for the renowned Lakhamandal Temple dedicated to Lord Shiva. According to local legend, this temple and the surrounding area are believed to be the site where Duryodhan, from the Mahabharata, plotted to burn the Pandavas alive in the Lakshagriha house (Mukherjee & Das, 2014).

As part of the Garhwal Himalayas, the Jaunsar-Bawar region is characterised by dense forests, rugged mountains, and gorges (Mitra, 2020; Mukherjee & Das, 2014). Its unique geography and history contribute to a distinct ecological and cultural identity (Gill & Singh, 2023). The region falls between 30°31' and 31°3' 30" N latitude and 77°45' and 78°7' 20" E longitude, encompassing an area of 343.5 square miles (Gill & Singh, 2023). Participants were randomly selected while adhering to specific inclusion criteria, ensuring they had no visible physical deformities or self-reported illnesses at the time of data collection. They were also screened for clinical signs of nutritional deficiencies, such as phrynoderma, glossitis, angular stomatitis, goiter, and anemia. Individuals exhibiting any of these deficiency signs were purposefully excluded from the final sample. The study obeyed the ethical guidelines for human participants outlined in the Declaration of Helsinki (Touitou et al., 2004). Necessary approval was obtained from the institutional ethical committee and local authorities. Data was collected after getting consent from the participants. Primary information on the socio-demographic profile including age, sex, family size, education, earning source, and per capita monthly income (Rs.) of the studied individuals was collected through a standardised schedule.

The anthropometric measurements, including height (HT) (cm), weight (WT) (kg), waist circumference (WC) (cm) and hip circumference (HC) (cm) were done following standard procedure (Lohman et al., 1988). HT was measured by Martin's anthropometer rod to the nearest 0.1 cm and WT was measured by a digital scale (OMRON HBF-212) to the nearest 0.1 kg. HC and WC were measured by a calibrated non-elastic measuring tape (Gulick Anthropometric Tape). The technical error of measurement (TEM) was found to be within acceptable limits (Ulijaszek & Kerr, 1999). Body mass index (BMI) was calculated with the formula: $WT(kg) / HT(m)^2$ (James et al., 1988). To measure abdominal obesity, the waist-to-hip ratio (WHR) was calculated using the standard formula: $WHR = WC(cm) / HC(cm)$ (Valdez et al., 1993). BMI cut-off values for the Asian population as proposed by WHO were considered here and the participants were

categorised into three groups: underweight (BMI of $<18.5 \text{ kg/m}^2$), normal (BMI of $18.5\text{--}22.9 \text{ kg/m}^2$) and overweight-obesity (BMI of $\geq 23.0 \text{ kg/m}^2$) (World Health Organization, 2000). To determine abdominal obesity, internationally accepted cut-off values for WC (men: $\geq 90 \text{ cm}$, women: $\geq 80 \text{ cm}$) (World Health Organization, 2000) and WHR (men: >0.95 , women: >0.85) (World Health Organization, 1989) were used. Body composition variables, including body fat percentage (BF%), FM, FFM, fat mass index (FMI), and fat-free mass index (FFMI) were calculated following standard formulae (Deurenberg et al., 1991; VanItallie et al., 1990; Lohman, 1992; Heymsfield et al., 1996):

$$\text{BF\%} = (1.20 \times \text{BMI}) + (0.23 \times \text{Age}) - (10.8 \times \text{Sex}) - 5.4$$

where Sex: Male = 1, Female = 0.

$$\text{FM (kg)} = \text{Body Weight (kg)} \times \left(\frac{\text{BF\%}}{100} \right)$$

$$\text{FFM (kg)} = \text{Body Weight (kg)} - \text{FM (kg)}$$

$$\text{FMI (kg/m}^2\text{)} = \frac{\text{FM (kg)}}{\text{Height (m)}^2}$$

$$\text{FFMI (kg/m}^2\text{)} = \frac{\text{FFM (kg)}}{\text{Height (m)}^2}$$

All statistical analyses were conducted using SPSS software version 26.0 for Windows (IBM Corp., NY, USA). The participants were categorised into three age groups based on tertile values: Group I (≤ 25 years), Group II (26–39 years), and Group III (≥ 40 years). Descriptive statistics of mean and standard deviation (SD) were calculated for all anthropometric and derived variables. One-way ANOVA was performed to test significant mean differences between age groups for the studied variables. Pearson correlation and linear regression were used to find out the linear relationship between age and studied variables. In addition to this, the χ^2 test was conducted to examine the association between age groups, socio-demographic variables, and nutritional categories. A p-value of $<.05$ was considered to be statistically significant.

3 Results

The associations between socio-demographic variables and nutritional categories of the studied participants are given in Table 1. The overall prevalence of underweight was found to be 29.9 % and overweight-obesity was 23 % when classified by BMI. Underweight prevalence (14.5 %) was found higher among young participants (≤ 25 years). Medium-sized families of 4–6 members have the highest frequency (45.4 %) and higher prevalence of both underweight and overweight-obesity. Most of them were engaged in wage activities and agricultural work. 70 % of participants reported having a per capita monthly income below Rs.1001. Among different socio-demographic variables, education ($\chi^2 = 37.053$, $df = 22$, $p < .05$) and earning source ($\chi^2 = 39.548$, $df = 20$, $p < 0.01$) showed strong statistically significant association with nutritional categories.

Table 2 shows age trends in anthropometric and body composition variables of the studied participants. It was observed that with increasing age, the mean value of most of the studied variables increased among women (except for HT, FFM, FFMI, and WHR). For men, the middle age group (26–39 years) exhibited the highest mean values for variables except FM, FMI, and WHR. Statistically significant ($p < .05$) mean differences in anthropometric and body composition variables were observed for both men (except for HT) and women (except for HT, FFM, FFMI, and WHR) across different age groups.

Table 3 presents the age-wise distribution of the studied participants across different nutritional statuses. BMI assessment showed a higher prevalence of underweight in women than men (32.4 % vs. 26.9 %), while overweight-obesity was slightly more common in men (23.9 % vs. 22.4 %). Underweight was more frequent in younger age groups, whereas overweight-obesity increased with age. Abdominal obesity was more prevalent in women than men based on WC (21.2 % vs. 11.9 %) and WHR (30 % vs.

Table 1: Association between socio-demographic variables and nutritional status of the participants, with percentages in parentheses. * $p < .05$, ** $p < .01$, *** $p < .001$, NS, non-significant ($p > .05$).

Socio-demographic Characteristics	Nutritional Status (BMI)			Total	χ^2
	Underweight	Normal	Overweight-Obese		
Total	91 (29.9)	143 (47.0)	70 (23.0)	304 (100.0)	–
Age group (years)					26.0***
Group I (≤ 25 years)	44 (14.5)	63 (20.7)	9 (3.0)	116 (38.2)	
Group II (26-39 years)	22 (7.2)	44 (14.5)	30 (9.9)	96 (31.6)	
Group III (≥ 40 years)	25 (8.2)	36 (11.8)	31 (10.2)	92 (30.3)	
Family size (n)					21.3 ^{NS}
Less than 4	27 (8.9)	29 (9.5)	22 (7.2)	78 (25.7)	
4 – 6	43 (14.1)	69 (22.7)	26 (8.6)	138 (45.4)	
Above 6	21 (6.9)	45 (14.8)	22 (7.2)	88 (28.9)	
Education					37.1*
No education	13 (4.3)	23 (7.6)	18 (5.9)	54 (17.8)	
Primary	18 (5.9)	17 (5.6)	15 (4.9)	50 (16.4)	
Secondary	31 (10.2)	63 (20.7)	21 (6.9)	115 (37.8)	
Higher	29 (9.5)	40 (13.2)	16 (5.3)	85 (28.0)	
Earning source					39.5**
Daily Wage Labour	29 (9.5)	26 (8.6)	12 (3.9)	67 (22.0)	
Owner Cultivator	14 (4.6)	33 (10.9)	14 (4.6)	61 (20.1)	
Business	2 (0.7)	11 (3.6)	8 (2.6)	21 (6.9)	
Service	6 (2.0)	9 (3.0)	9 (3.0)	24 (7.9)	
Housewife	10 (3.3)	34 (11.2)	20 (6.6)	64 (21.1)	
Dependent	7 (2.3)	6 (2.0)	4 (1.3)	17 (5.6)	
Pensioner	3 (1.0)	3 (1.0)	2 (0.7)	8 (2.6)	
Student	20 (6.6)	21 (6.9)	1 (0.3)	42 (13.8)	
Per capita monthly income (Rs.)					26.0 ^{NS}
≤ 750.00	37 (12.2)	49 (16.1)	27 (8.9)	113 (37.2)	
751.00 – 1000.00	28 (9.2)	46 (15.1)	26 (8.6)	100 (32.9)	
≥ 1001.00	26 (8.6)	48 (15.8)	17 (5.6)	91 (29.9)	

14.2 %). Abdominal obesity increased with age in both sexes for both WC and WHR. The χ^2 test showed a significant association between age group and WC-based nutritional status in both sexes ($p < .01$). In contrast, BMI-based ($p < .001$) and WHR-based ($p < .01$) nutritional status were significantly associated with age only in men.

Table 4 displays a correlation analysis between age and anthropometric variables among the studied participants. The correlations indicate a significant linear relationship of anthropometric variables with age, except for HT and FFMI among men and HT, WT, and WHR among women. The strongest relationship was observed between age and BF% for both men ($r = .744$, $p < .001$) and women ($r = .643$, $p < .001$).

Table 5 represents the effect of age on the body composition variables of the studied participants. Age had a statistically significant positive impact on BF%, FM, and FMI. Its impact on FFM and FFMI was significantly negative for women but not men.

4 Discussion

This study examined the presence of DBM and age trends in body composition characteristics among the adult Jaunsaris in Uttarakhand, India. The community is experiencing a DBM. Socio-demographic variables

Table 2: Age trends in anthropometric and body composition variables (mean \pm SD) of the participants. M = male; F = female; HT = height; WT = weight; WC = waist circumference; HC = hip circumference; BF% = body fat percentage; FM = fat mass; FFM = fat free mass; FMI = fat mass index; FFMI = fat free mass index; BMI = body mass index; WHR = waist-to-hip ratio. * $p < .05$, ** $p < .01$, *** $p < .001$, NS, non-significant ($p > .05$).

Variable	Sex	Group I (≤ 25 years)	Group II (26-39 years)	Group III (≥ 40 years)	F value
HT	M	163.56 \pm 5.14	163.12 \pm 5.25	161.4 \pm 6.6	1.729 ^{NS}
	F	150.84 \pm 5.76	151.58 \pm 5.09	150.23 \pm 5.06	0.891 ^{NS}
WT	M	50.74 \pm 7.75	58.89 \pm 8.03	56.12 \pm 11.51	10.272***
	F	44.62 \pm 7.65	47.99 \pm 10.5	49.49 \pm 11.75	3.527*
WC	M	68.01 \pm 7.99	78.63 \pm 9.21	77.17 \pm 12.34	17.269***
	F	65.92 \pm 7.53	71.21 \pm 11.77	74.71 \pm 12.09	9.958***
HC	M	82.26 \pm 7.37	89.12 \pm 6.36	86.21 \pm 8.15	10.637***
	F	82.32 \pm 7.46	85.88 \pm 9.54	90.62 \pm 9.88	12.156***
BF%	M	11.26 \pm 2.71	18.01 \pm 3.99	20.74 \pm 4.19	89.088***
	F	23.06 \pm 3.59	26.87 \pm 4.96	32.7 \pm 5.77	56.994***
FM	M	5.89 \pm 2.42	10.84 \pm 3.52	12.04 \pm 4.76	41.149***
	F	10.53 \pm 3.50	13.38 \pm 5.80	16.77 \pm 7.36	16.862***
FFM	M	44.84 \pm 5.46	48.05 \pm 5.01	44.09 \pm 7.02	5.288**
	F	34.08 \pm 4.34	34.6 \pm 4.93	32.71 \pm 4.96	2.337 ^{NS}
FMI	M	2.18 \pm 0.81	4.07 \pm 1.29	4.56 \pm 1.58	52.069***
	F	4.61 \pm 1.44	5.78 \pm 2.33	7.42 \pm 3.20	19.404***
FFMI	M	16.72 \pm 1.38	18.05 \pm 1.58	16.85 \pm 1.89	9.013***
	F	14.95 \pm 1.41	15.03 \pm 1.73	14.46 \pm 1.82	1.892 ^{NS}
BMI	M	18.90 \pm 2.18	22.12 \pm 2.74	21.42 \pm 3.37	18.975***
	F	19.56 \pm 2.83	20.81 \pm 4.00	21.88 \pm 4.87	4.892***
WHR	M	0.82 \pm 0.05	0.88 \pm 0.07	0.89 \pm 0.08	12.570***
	F	0.80 \pm 0.05	0.82 \pm 0.07	0.82 \pm 0.06	2.606 ^{NS}

Table 3: Age-wise distribution of the studied participants among different nutritional statuses. Numbers, with percentages in parentheses. M = male, F = female. * $p < .05$, ** $p < .01$, *** $p < .001$, NS, non-significant ($p > .05$).

Nutritional Categories		Age group (years)						Total		χ^2
		Group I (≤ 25 years)		Group II (26-39 years)		Group III (≥ 40 years)		M	F	
		M	F	M	F	M	F			
BMI	Underweight	21 (36.8)	23 (39.0)	5 (12.5)	17 (30.4)	10 (27.0)	15 (27.3)	36 (26.9)	55 (32.4)	M: 25.2*** F: 7.4 ^{NS}
	Normal	34 (59.6)	29 (49.2)	18 (45.0)	26 (46.4)	14 (37.8)	22 (40.0)	66 (49.3)	77 (45.3)	
	Overweight-obesity	2 (3.5)	7 (11.9)	17 (42.5)	13 (23.2)	13 (35.1)	18 (32.7)	32 (23.9)	38 (22.4)	
WC	Normal	56 (98.2)	55 (93.2)	33 (82.5)	42 (75.0)	29 (78.4)	37 (67.3)	118 (88.1)	134 (78.8)	M: 10.1** F: 12.2**
	Abdominal obesity	1 (1.7)	4 (6.8)	7 (17.5)	14 (25.0)	8 (21.6)	18 (32.7)	16 (11.9)	36 (21.2)	
WHR	Normal	55 (96.5)	48 (81.4)	34 (85.0)	37 (66.1)	26 (70.3)	34 (61.8)	115 (85.8)	119 (70.0)	M: 12.7** F: 5.8 ^{NS}
	Abdominal obesity	2 (3.5)	11 (18.6)	6 (15.0)	19 (33.9)	11 (29.7)	21 (38.2)	19 (14.2)	51 (30.0)	

like education and earning source exhibited a strong association with nutritional status. The findings also demonstrated significant variation in most anthropometric and body composition characteristics across different age groups. Specifically, as age increased, most variables tended to rise in women (with the exceptions of HT, FFM, FFMI and WHR), while in men, the middle-aged group (26-39 years) had the highest average values for most variables excluding BF%, FM, FMI and WHR. Correlation analysis showed a strong linear relationship between age and anthropometric variables, with the exceptions of HT and FFMI in men; and HT, WT and WHR in women. Moreover, younger individuals were more likely to be classified

Table 4: Correlations of age with anthropometric variables. M = male; F = female; HT = height; WT = weight; WC = waist circumference; HC = hip circumference; BF% = body fat percentage; FM = fat mass; FFM = fat free mass; FMI = fat mass index; FFMI = fat free mass index; BMI = body mass index; WHR = waist-to-hip ratio. * $p < .05$, ** $p < .01$, *** $p < .001$, NS, non-significant ($p > .05$).

Sex	HT	WT	WT	WC	HC	BF%	FM	FFM	FMI	FFMI	BMI	WHR
M	-0.118 ^{NS}	0.229**	0.229**	0.327***	0.213*	0.744***	0.584***	-0.067 ^{NS}	0.619***	-0.020 ^{NS}	0.314***	0.317***
F	-0.103 ^{NS}	0.138 ^{NS}	0.138 ^{NS}	0.290***	0.327***	0.643***	0.381***	-0.202**	0.417***	-0.192*	0.194*	0.108 ^{NS}

Table 5: Linear regression analysis of age with body composition variables. M = male; F = female; BF% = body fat percentage; FM = fat mass; FFM = fat free mass; FMI = fat mass index; FFMI = fat free mass index. * $p < .05$, ** $p < .01$, *** $p < .001$, NS, non-significant ($p > .05$).

Body composition variables	Sex	B	95% CI	SE	Standardized β	t
BF%	M	1.704	1.440 – 1.967	0.133	.744	12.79***
BF%	F	1.375	1.126 – 1.625	0.126	.643	10.89***
FM (kg)	M	1.627	1.238 – 2.017	0.197	.584	8.27***
FM (kg)	F	0.813	0.512 – 1.114	0.152	.381	5.34***
FFM (kg)	M	-0.139	-0.496 – 0.218	0.180	-.067	-0.77
FFM (kg)	F	-0.564	-0.979 – -0.148	0.211	-.202	-2.68**
FMI (kg/m ²)	M	4.795	3.748 – 5.841	0.529	.619	9.06***
FMI (kg/m ²)	F	2.087	1.393 – 2.781	0.351	.416	5.94***
FFMI (kg/m ²)	M	-0.146	-1.140 – 1.119	0.639	-.020	-0.23
FFMI (kg/m ²)	F	-1.532	-2.725 – -0.339	0.604	-.192	-2.54*

as underweight, whereas older age groups had higher rates of overweight-obesity and abdominal obesity for both sexes.

Several studies have already reported that age plays a crucial role in influencing body composition, as various changes take place in the body over time, including alterations in muscle mass, fat distribution, and bone density (Das, Mukherjee, Ganguli, et al., 2020; Roy et al., 2020; St-Onge & Gallagher, 2010). In the present study, as age progresses, the mean \pm SD of BF%, FM and FMI consistently increased in both sexes. In men, FFM and FFMI gradually decline with age, while in women, these measures do not show a consistent decrease over time. Previous studies have reported an increase in BF% and FM, alongside a decline in FFM and FFMI with age (Das, Mukherjee, Ganguli, et al., 2020; Roy et al., 2020; St-Onge & Gallagher, 2010). However, some researchers have also argued that FFM does not necessarily decrease with age (Kalantari et al., 2017; Verreijen et al., 2017). In Jaunsari females, the increase of WT may be driven mainly by the accumulation of fat accompanied by a rather minor loss of muscle or other lean body mass. An interesting finding in our study was that a significant number of the women were involved in agricultural work and daily wage labour, about as frequently as the men. This suggests that physical activity might have played a crucial role in maintaining FFM, potentially counteracting the age-related decline in FFM reported by others (Das, Mukherjee, Ganguli, et al., 2020; Kulkarni et al., 2014; Roy et al., 2020). However, the slight reduction in FFM observed still requires further investigation.

Abdominal obesity is a major health issue for women in India, as many women with a normal BMI still carry excess fat around their abdomen, which raises the risk of metabolic disorders and non-communicable diseases such as type 2 diabetes (Chaudhary & Sharma, 2023). Numerous global studies have shown gender differences in obesity, with women being more prone than men to abdominal obesity (Ahmad et al., 2016; Kanter & Caballero, 2012). The prevalence of abdominal obesity among women in the present study is almost double that of men (WC: 21.2 % vs. 11.9 % ; WHR: 30.0 % vs. 14.2 %). A similar trend was observed among the Barwar community of Uttar Pradesh (WC: 23.6 % vs. 7.1 % ; WHR: 65.5 % vs. 34.8 %) (Mahapatra, 2023), rural people of Tamil Nadu (WC: 42.0 % vs. 25.2 %) (Little

et al., 2020), and scheduled tribes from the latest NFHS-5 data (WC: 24.0 % vs. 6.1 %) (Chaudhary & Sharma, 2023). High prevalence of abdominal obesity is also reported from previous global studies among women from Malaysia (WC: 66.4 % ; WHR: 54.2 %) (Ahmad et al., 2016), Iran (WC: 54.4 %) (Veghari et al., 2016), Syria (WC: 55.0 % ; WHR: 33.0 %) (Bakir et al., 2017) and Bangladesh (WC: 48.7 % ; WHR: 79.1 %) (Siddiquee et al., 2015). The factors associated with abdominal obesity in these studies are biological aspects, economic status, educational level, physical activity level, dietary habits, sedentary life, degree of urbanization, etc. (Ahmad et al., 2016; Bakir et al., 2017; Chaudhary & Sharma, 2023; Kanter & Caballero, 2012; Siddiquee et al., 2015). In India, tribal communities are currently experiencing an economic transition driven by rapid urbanization, which has led to rising prosperity and more comfortable lifestyles. This shift has introduced easier access to transportation, changes in occupation, urban processed foods, and more opportunities for sedentary living (Das, Mukherjee, Ganguli, et al., 2020; Mukherjee et al., 2022). The Jaunsar-Bawar region, which attracts tourists year-round due to the presence of the Lakhamandal Temple, has introduced urban influences such as modern amenities and changing food habits to the locals. This exposure may have played a role in the high rates of abdominal obesity observed in the Jaunsari population.

The current study observes a gradual increase from underweight to overweight-obesity with advancing age. The age group I of ≤ 25 years shows the highest prevalence of underweight, while those of group III aged ≥ 40 years have the highest prevalence of overweight-obesity. These findings align with an earlier study based on NFHS-4 data reporting the highest underweight prevalence among individuals aged 15-19 years (men: 44.9 %, women: 42.0 %) and the highest overweight/obesity prevalence among those aged 35-49 years (men: 27.6 %, women: 32.2 %) (Dutta et al., 2019).

Overall, women were found more undernourished than men (32.4 % vs. 26.8 %) in the present study. This result corroborates previous studies on the same community by Ravi et al. (2019), which reported 35.0 % of women and 32.0 % of men were undernourished, as well as with findings from rural adults of Uttarakhand (women: 43.5 %) (Pant, 2016). However, contrasting trends were noted among neighbouring communities in Uttarakhand, such as the Tharus (men: 26.4 %; women: 18.0 %) (Mukherjee et al., 2015) and the Rajis (men: 55.8 %; women: 37.3 %) (Alam & Jha, 2018). A large-scale cross-sectional study on nine tribes from three states in India also revealed a higher prevalence of undernutrition among tribal women than men (46.6 % vs. 32.1 %) (Kshatriya & Acharya, 2016). Various developmental and economic initiatives by state and central government agencies have enabled many tribes to achieve a relatively affluent lifestyle to varying degrees (Dutta et al., 2019; Kshatriya & Acharya, 2016; Rai et al., 2021). These communities now receive rice, wheat, and sugar at highly subsidized rates through government schemes, increasing their reliance on public food assistance programs (Dutta et al., 2019; Kshatriya & Acharya, 2016). This shift from traditional food autarky to a more limited diet, heavily reliant on public distribution systems, may be a key factor affecting the prevalence of undernutrition and obesity among India's tribal populations (Dutta et al., 2019; Rai et al., 2021). Research suggests that early-life undernutrition, followed by exposure to diets high in refined carbohydrates, increases the likelihood of obesity (Wells & Siervo, 2011; Grijalva-Eternod et al., 2012). The high prevalence of overweight-obesity (23.01 %) in the present study population may align with these observations.

According to the study by Meshram et al. (2016), the total prevalence of overweight and obesity in India is 29.0 %. In a recent study, Luhar et al. (2020) predicted the future prevalence of overweight and obesity among Indian adults aged 20-69 years and estimated that overweight will increase from 12.6 % to 30.5 % among men and 14.7 % to 27.4 % among women between 2010 and 2040. Over the same period, the prevalence of obesity is forecasted to increase from 2.4 % to 9.5 % among men and 4.4 % to 13.9 % among women (Luhar et al., 2020). Several recent studies expressed their concern about the increasing prevalence of overweight/obesity, despite persistent undernutrition, among indigenous populations of India (Ghosh, 2022; Kshatriya & Acharya, 2016; Mahapatra, 2023; Mukherjee et al., 2022; National Nutrition Monitoring Bureau, 2009; Singh, 2019). The prevalence of overweight-obesity in the present population (men: 23.9 %; women: 22.4 %) is higher than that among the Tharus (men: 14.9 %; women: 13.5 %) (Mukherjee et al., 2015), Jaunsaris (men: 15.0 %; women: 18.0 %) (Ravi et al., 2019), and Rajis (men: 0.0 %; women: 2.0 %) (Alam & Jha, 2018), as well as the state-level prevalence reported in the NFHS-4 data (men: 17.7 %; women: 20.4 %) (Ahirwar & Mondal, 2019), but lower than that in the

Bhotias of Uttarakhand (men: 54.8 %; women: 57.6 %) (Kandpal et al., 2016).

A notable finding of the present study is that, although 32.4 % of Jaunsari women were categorized as underweight based on BMI, 21.2 % and 30.0 % were found to be abdominally obese when assessed by WC and WHR, respectively. The coexistence of underweight and abdominal obesity among females in the present study aligns with the findings from various other studies conducted in India (Little et al., 2020; Meshram et al., 2016; Pengpid & Peltzer, 2019). Therefore, the high prevalence of overweight/obesity (23.01 %) alongside undernutrition (29.9 %) represents a significant health challenge for the studied population. The present study assumes several possible factors including the emergence of urban market centres near the region, exposure to urban diets and shifts in traditional lifestyles toward a more sedentary life, significantly impacting health and increasing the risk of several chronic diseases like cardiovascular disease, diabetes, multimorbidity, reducing overall health and well-being.

The present study, while providing valuable insights, is constrained by several methodological limitations. One of the primary concerns is the small sample size, which may compromise the study's ability to accurately represent the broader population resulting in a reduced statistical power, making it challenging to detect significant differences or associations between variables. Since the sample was collected from a single rural village, the trends of malnutrition may differ significantly among the semi-urban or urban Jaunsari population. Further, the study lacks quantification of individual physical activity. This may hinder the establishment of a causal relationship between physical activity and the dependent variables. Moreover, the cross-sectional design of the study also presents a methodological challenge and limits the ability to establish a clear temporal relationship between variables, making it difficult to delineate cause-and-effect relationships.

5 Conclusion

This study established the presence of DBM among the adult Jaunsari population, including a trend of age-related increase in abdominal obesity. Additionally, a significant age effect on body composition was seen. Interestingly, unlike other body composition variables, FFM did not show a predictable pattern with age, indicating a possible resistance in the population to chronic diseases. However, this finding underscores the complexity of body composition, suggesting that multiple factors must be considered when examining these changes. Understanding these shifts is essential for creating effective strategies to promote health and mitigate the risks of excess abdominal fat.

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Conflict of Interest

The authors declare no conflict of interest.

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Challenging the Therapeutic Narrative: Historical and Clinical Perspectives on the Genetics of Behavior

Review by: Aldric Hama

Author of the Book: Robert G. Goldstein*

Robert Goldstein, clinical instructor in psychiatry at Weill Cornell Medical College, offers an expansive view of the innateness of human behavioural traits through the lens of history, literature, sociobiology, and biomedical science. Goldstein not only lucidly explains that human mental traits and mental illness are genetically based, but goes on to chastise those still espousing the so-called “narrative” or “biographical” approach to entirely explain behaviour and mental illness. As Goldstein points out, “although Freud is long dead and buried”, psychiatrists still insist on the “formative impact of early experience” (p. 2) to explain behaviour and mental illness (Lewis, 2014). Diagnosis of mental illness has evolved but not by much, from now “dead and buried” Freudian “blocked libidos” and “incestuous fantasies” to today’s plausible sounding yet empirically limited “inadequate attachment during childhood” (Jewell et al., 2019) (p. 2).

With respect to diagnosis, based on his placement of the heritability of traits as the focal point, Goldstein suggests a dimensional approach to describe the origin of mental illness. The “therapeutic narrative” or “narrative therapy”, also known as “talk therapy” or “story telling”, claims that “early experiences and relationships shape behavioral responses exhibited throughout life and that there is therapeutic utility in attempting to trace how these experiences sculpt one’s behaviors and pathologies” (p. 9). The “therapeutic narrative” reveals itself as “guided introspection”, with “the goal of formulating etiological, biographical accounts of behavioral patterns” (p. 9). The narrative approach has been utilized to explain behaviour of, for example, violent criminals. One is constantly told by the intellectual elite and mainstream media that it is “common sense” that juvenile and adult criminals are products of childhood abuse and poverty. Alternate non-environmental explanations for criminal behaviour, such as defects in executive functioning, including intelligence and self-control, both of which are heritable, have yet to be openly acknowledged (e.g., on-going hostility to Herrnstein and Murray’s *The Bell Curve*).¹

Goldstein spends considerable effort explaining the persistent attractiveness of the flawed “narrative therapy” approach to psychiatrists and the general public. Both groups share the human tendency to “read coherence in seemingly related variables” (p. 16), to complete a “common sense” story based on incomplete or inaccurate information, perhaps even based on wishful thinking. For example, early agricultural humans have ascribed crop failure to a god’s wrath, as “some transgression... must have occurred.” One could speculate on the numerous events that could have upset the gods enough to evoke a crop failure. In any event, the supernatural explains crop failure. There is also a human tendency to ascribe “purpose”, a “certain instrumentality” (p. 26), to behavioural traits as well as to mental illness. There are those who view mental illnesses as “coping” mechanisms caused by inadequate childhood attachment while others shrug and label them as “God’s will”. In fact, Goldstein points out that relying on a cause-and-effect model to explain adult mental illness is problematic, as “the systems underlying behavior are not structured to discursive, commonsense rules” (p. 3).

Keeping one’s “common sense” stories to oneself harms only the bearer. However, humans do have a tendency, as Goldstein points out, “to convince others of the validity” of one’s self-deception (p. 29). Indeed, because of this human trait, Freudians “elaborated the causality-reading tendency into a therapeutic worldview that fundamentally shifted the way behavior was understood for generations” (p. 31).

In contrast to the modern Freudian construct of mental illness, Goldstein notes that cultures worldwide clearly saw mental pathologies and ill temperament, as well as physical traits, existing within some families

*Routledge, 2023

¹ <https://www.scientificamerican.com/blog/voices/the-real-problem-with-charles-murray-and-the-bell-curve/>

and not in others and that some traits are passed on to subsequent generations. This line of thinking existed well before the formal study of genetics. Indeed, the age-old custom of arranged marriages as practiced in numerous cultures, with the goal of keeping heritable pathologies out as well as retaining wealth, could be viewed as “the world’s oldest and most common eugenic practice” (p. 43). As an example, Goldstein notes the value Hasidic Jews place on good breeding. A Hasidic mother of a young female patient asked Goldstein whether it was better for her daughter to marry a suitor with a neurological defect or a physical deformity. As a practicing psychiatrist but not a matchmaker, Goldstein suggested to the concerned mother: “Ask the Rabbi” (p. 19).

Equally enlightening are chapters on the history of the “nativists”, those who view behavioural traits as mainly genetic in origin rather than acquired entirely through learning or training. These nativists include the familiar, such as Charles Darwin and his cousin Francis Galton. Goldstein notes that early 20th-century non-scientists took the nativist view of human behaviour, such as novelist George Bernard Shaw. Goldstein takes a chapter to delve into realist novelist Honoré de Balzac as a “crypto-nativist”, offering copious examples of Balzac’s view of human behaviour, particularly addiction, from his work as well as from his personal life. Balzac’s fictional characters recognized “the inborn and inflexible nature of behavior” (p. 49). Goldstein describes Balzac’s compulsive shopping, impulsive financial speculation and serial womanizing and notes Balzac’s “explicit portrayal” of addiction in his novels. We read that Balzac’s father also had self-control problems and that Balzac recognized that he had inherited his father’s addiction-prone personality.

Today, default thinking is that nativists are on the right of the political spectrum. In addition to Shaw, a Fabian socialist, Goldstein could have listed other prominent leftists such as Shaw’s contemporary and fellow Fabian H.G. Wells and birth control activist Margaret Sanger as within the nativist spectrum (Paul, 1984). Interestingly, geneticist J.B.S. Haldane, a “Marxist”, is presented in the book as an opponent of nativism, based on his attack on ethologist Konrad Lorenz’s black-and-white conception of behaviour as either all instinctive or all environmentally acquired. However, Haldane has expressed his tempered view that behavioural traits are heritable while not entirely dismissing a role for an effect of environment (Haldane, 1938).

Goldstein’s book is thin but heavy in insights. Of particular interest is his description of the historical explanations for behavioural traits: from innate and heritable in earlier times to the Freudian era explaining behaviour as an outcome of both conscious sexual desire and unconscious deviance, then back again to behavioural traits as genetically-mediated with a still unknown or unquantifiable contribution of environmental factors on behaviour (Runze et al., 2024). Given the eclectic blend of essays, from historical debates on the nature of human behaviour and mental illness to an illuminating biography of one of France’s renowned authors, Goldstein’s book should be read by every student of behavioural genetics as well as by psychiatry students.

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