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The Effect of Cultural Origin and Acculturation on Cognitive Assessment: A Pilot Study with A Population of Turkish Nationality

Supervisor
Prof. Paolo Francesco Cottone

Co-supervisor
Giulia Sebastianutto
Sonia Montemurro, PhD

Candidate: Melike Arikan Peggion
Student ID number: 2037293

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INTRODUCTION

The world is becoming more diverse and interconnected with people from many languages and sociocultural backgrounds. Globalisation and migration are two concepts that are critical in transforming populations in most parts of the world, leading to the emergence of diverse demographics with different cultural origins. Culture is an essential component that influences individuals' attention to their surroundings, perception of others, memory and learning abilities and decision-making processes. The question of how the social practices of specific cultures influence the formation of cognitive processes in distinct manners encompasses the examination of both universal cultural phenomena and the differences among various cultures.

Extensive studies have been conducted on the cultural variations in cognitive psychology, which might raise concerns about the potential for cultural stereotyping. In addition, most of the existing cognitive tests have been formulated and standardised using Western concepts and normative data; as the population from minority cultural backgrounds grows in Western countries, cognitive screening tests are required to address factors that influence performance bias (Czerwinski-Alley et al., 2024).

Cognitive assessment is significantly influenced by cultural origins and acculturation in various populations. Cultural origins are the innate culture and practices of individuals, which are typically determined by their country of origin. Cognitive development, learning patterns, and problem-solving strategies are significantly influenced by this background. In contrast, acculturation is the process of cultural and psychological changes resulting from a continuous interaction of individuals from different cultural backgrounds, observed as changes in psychological functioning and cultural identity (Berry, 2005). Openness to other cultures involves showing acceptance and appreciation for new and diverse cultural practices and views, facilitating communication with unfamiliar cultures, mastering language, embracing new social norms and establishing intercultural relationships. It leads to a more positive acculturation experience where the individual feels more integrated and accepted in the new cultural environment (Berry, 1997). While being open can facilitate acculturation, similarly successful acculturation may widen an individual's engagement with various cultures. As people get more settled in the new culture, their viewpoints tend to broaden and their respect for cultural variety deepens (Chen et al., 2008). Understanding these processes is crucial to developing cognitive evaluation instruments that are accurate and culturally sensitive.

This pilot study aims to examine the relationship between these concepts and the cognitive functioning of Turkish nationals. The advantageous position of Turkey as a link between Eastern and Western cultures makes it an ideal setting for analysing how Turkish cultural practices and values

interact with cognitive processes impacted by Western educational and social systems. Acculturation experience varies widely among Turkish nationals, particularly those living in diverse cultural contexts such as Europe or North America. These individuals frequently encounter considerable cultural adaptation, which can lead to changes in cognitive styles and abilities. Based on the bidirectional influence between acculturation and openness to other cultures, this study aims to examine how varying degrees of openness to other cultures among Turkish nationals influence their performance on cognitive assessments.

Previous research has stressed the importance of language and cultural elements in cognitive evaluation. When evaluating cognitive ability in diverse cultures, traditional cognitive tests may fail to account for cultural differences that could lead to biases and oversights (Ardila, 2005). Items related to language skills or cultural knowledge may disadvantage people from non-dominant cultural backgrounds. This leads to poorer results that do not adequately reflect their cognitive abilities. This highlights the importance of developing culturally appropriate assessment instruments that take into consideration test takers' cultural and acculturation backgrounds.

This pilot study uses combined methods to assess the cognitive abilities of Turkish nationals, comparing those who have mostly lived and are currently residing in Turkey to those who have spent significant time in foreign countries and are now residing overseas. The aim of this research is to provide a comprehensive understanding of how cultural origin and acculturation processes affect cognitive assessment results using semi-structured questionnaires and quantitative cognitive tests. The findings are intended to provide insights that can help in the design of more equitable and culturally sensitive cognitive assessment techniques and possibly enhance the validity and reliability of cognitive testing for less biased evaluations in multicultural contexts.

1. CULTURE AND COGNITION

The intersection of culture, brain, and cognition is a rapidly expanding field of research that has fascinated many psychologists. This interdisciplinary field of study, which incorporates linguistics, neuroscience, psychology and anthropology, focuses on the interplay between cognitive functions and cultural environments.

1.1. CULTURE

The concept of culture is broad and complex and has been explored and defined in various ways across literature and academic disciplines. Culture is widely and classically defined as the shared ideas, values, practices, traditions, language, arts and social behaviours of a certain group of people or society.

Cultural origin refers to the geographic, social and historical contexts from which a person's cultural traits, practices and values arise. Cultures are usually grouped into branches based on their origins. These groupings can be based on various factors, such as language families, historical development, geographical proximity and shared cultural practices, such as Latin, Slavic, Caribbean, Islamic, and Nordic. The widespread belief is that a group is analogous to a giant person and its "culture" represents its "personality" or "character", which is vulnerable to the stereotyping charge. (Kitayama and Cohen, 2007).

The modern recent scientific understanding of culture is not only an expression of a group's traditions and practices but also a continuous process that changes over time; throughout human history cultures have changed and evolved in response to many internal and external factors, such as external environments, interactions with other cultures, and internal cultural evolution (Ardila, 2007). This approach shifts the definition of culture from an internal trait of individuals to patterns that exist both within people and in their interactions with the outside world. Culture should focus on implicit and explicit patterns of meanings, practices and artefacts distributed across contexts in which people participate rather than focusing on groups like Japanese, Americans, whites, and Latinos; it’s not the groups themselves that should be studied. (Kitayama & Cohen, 2007).

Cultural concepts and definitions have undergone significant transformation because of globalization, migration, and technological advancements. Large-scale cultural interaction brought about by the globalisation phenomenon, which Pieterse (2020) calls cultural convergence or cultural hybridization,

results in the exchange of many economic, political, social, technological, cultural and ecological components (Fernandez & Evans, 2022). Globalization has both homogenizing and diversifying effects on culture. While global forces promote uniformity, local cultures adapt and transform these influences in distinctive ways. This interaction creates hybrid cultures that combine global and local elements, challenging the idea of culture as a static entity (Robertson, 1995).

The phenomenon of migration, whether voluntary or involuntary, has had a significant influence on the formation and expression of cultural identities and practices. The movement of individuals across national boundaries facilitates the convergence of diverse cultural elements, resulting in cultural exchange and transformation. Levitt (2001) introduced the concept of "social remittances" which refers to the transmission of ideas, behaviours and practices between migrants and their home communities, thereby further blurring cultural boundaries. These transnational linkages confound the notion of culture because they no longer align properly with geographic or national boundaries.

Furthermore, advancements in communication and information technologies have greatly influenced cultural behaviours and perceptions. The internet, social media and digital platforms facilitate the rapid distribution and interchange of cultural information globally. Castells (2010) described the development of the "network society," in which technology facilitates novel cultural production and social organisation forms. Digital platforms enable individuals to simultaneously participate in various cultural realms, resulting in a more fluid and fractured cultural landscape.

Adopting a dynamic and inclusive approach to cultural study is becoming increasingly crucial as culture continues to evolve in response to the cumulative effects of globalization, migration, and technology. Contemporary definitions of culture emphasize its relational nature, shaped by patterns of interaction and social processes, acknowledging its fluidity and hybridity. As these forces continue to evolve, so will the understanding and study of culture.

1.2. CULTURAL PSYCHOLOGY

Cultural psychology is the study of how cultural contexts shape and influence human behaviour, thoughts and emotions. It asserts that psychological processes are deeply embedded in and affected by cultural environments. According to this perspective, cognitive functions cannot be fully understood without considering the cultural environments in which individuals are situated (Cole, 1996). According to Cole, culture and cognition are mutually constitutive, which means they shape each other in reciprocal ways. Cultural practices and instruments have a substantial impact on

cognitive development, and cognitive processes, in turn, shape the evolution of cultural practices. This perspective challenges the conventional view that cognitive processes are universal and independent of cultural context.

Cross-cultural psychology is distinct from (but also influences and is influenced by) cultural psychology. It includes investigating potential universalities in behaviour and cognitive processes. By comparing different cultures, it investigates psychological diversity and its underlying causes (Berry et al., 2011). This viewpoint, known as the etic approach, examines behaviours from an external perspective while applying universal criteria. Cross-cultural psychology might be understood of as a research approach rather than a separate discipline in psychology, with the goal of identifying similarities and differences across cultures. Another viewpoint in cultural psychology is the emic approach, which involves examining behaviours within a cultural context using criteria that are meaningful and relevant to members of that specific culture, with the aim of gathering the unique aspects of a culture from an insider's perspective (Pike, 1976).

1.2.1. THEORETICAL FRAMEWORKS

Through an examination of empirical research in cultural psychology, several influential theoretical frameworks and models arise from the literature, providing insights on how to effectively represent the dynamic relationship between psychology and culture.

One of the fundamental theories in this field is the *Cultural-Historical Activity Theory (CHAT)* introduced by Vygotsky (1978). Vygotsky placed significant emphasis on the influence of social interaction and cultural tools in shaping cognitive development. He suggested that advanced cognitive abilities are developed through activities that involve cultural artefacts and social interaction.

Another significant theory, *Cultural Dimensions Theory*, developed by Geert Hofstede (1980), identifies dimensions on which cultures vary, providing a framework to compare cultural values and behaviours across different societies. Hofstede (1980) labels these six dimensions as "*power distance, individualism vs collectivism, masculinity vs femininity, uncertainty avoidance, long-term vs short-term orientation,* and *indulgence vs restraint"*. For instance, according to his theory, cultures with high individualism prioritise personal goals like the United States, while collectivist cultures like Japan emphasize group goals. Triandis (1996) called such dimensions *cultural syndromes*, which are patterns of beliefs, attitudes, self-definitions, norms and values that are organized around a theme and shared by members of a cultural group.

The Self-Construal Model proposed by Markus and Kitayama (1991) differentiates between independent and interdependent self-construals. It explores how individuals perceive themselves in relation to others and how this affects their cognitive processes, emotional responses and behavioural patterns. Independent self-construal focuses on individual goals, autonomy and self-expression, whereas interdependent self-construal prioritises interpersonal unity, relational responsibilities and collective goals. For instance, in Western cultures, individuals may describe themselves based on personal traits and achievements, whereas in East Asian cultures, self-descriptions may be framed in terms of relationships and social roles.

Another widely known framework, *Cultural Models Theory*, first introduced by Holland and Quinn (1987) and further developed by scholars D'Andrade (1990) and Shore (1996), suggests that shared mental representations within a culture influence individuals' thoughts, emotions and behaviours. These cultural models provide conceptual frameworks for understanding the world, guiding people in making sense of their experiences and motivating their actions. They are communicated by social norms, language and institutions. For example, a cultural model of independence in Western cultures encourages self-reliance and individual accomplishment, while an interdependence model in East Asian cultures emphasises social harmony and collective success.

The Ecocultural Framework examines how ecological and cultural contexts interact to shape human behaviour and development. Introduced by Berry (1992), this model emphasizes that human behaviour is adaptive and shaped by both environmental demands (e.g., climate, available resources) and cultural practices. The ecocultural approach is founded on the universalist assumption that basic mental processes are universally shared among all humans and the adaptive assumption that cultural variation is the result of adaptations to the objective requirements of the physical and social environment, which enable effective functioning in specific environments (Berry, 2000, as cited in Kitayama & Cohen, 2007). For instance, in flat landscapes such as those of Aboriginal Australia, people frequently use cardinal directions (north, south, east and west) for spatial orientation, a practice shaped by the need to navigate vast, featureless terrains, whereas in more varied and enclosed environments typical of many Western cultures, people tend to use an egocentric system (left, right, front, and back), which suits the complexities of navigating urban and dense environments.

The Dynamic Constructivist Approach to Culture and Cognition, presented by Hong, Morris, Chiu, and Benet-Martínez (2000), suggests that cultural knowledge is dynamically constructed and utilized by individuals depending on contextual and situational cues. Cultural influences on thinking and behaviour are not static; they are activated based on the situation and individuals can switch between different cultural frameworks depending on the context. Bicultural people who move between

multiple cultural environments are a good example of this method. For example, a Chinese American may exhibit distinct cognitive patterns when engaging with Chinese relatives compared to American coworkers (Hong et al., 2000).

Nisbett and his colleagues (2001) introduced *the Cognitive Toolkit Approach,* which posits that individuals possess a "toolkit" of cognitive strategies and cultural practices that they can employ depending on the context and cultural influences they encounter. This approach highlights how different cultures foster distinct cognitive styles. For example, it proposes that Western cultures mostly promote analytical thinking, focusing on objects and their attributes, while East Asian cultures foster more holistic thinking, emphasizing context and relationships. However, it also underlines the flexibility and adaptability of cognition, where individuals use different cognitive techniques from their cultural toolkit depending on situational needs (Nisbett et al., 2001)

The last and most recent framework to be presented is *The Cultural Cognitive–Affective Processing System (C-CAPS) Theory.* As described by Mendoza-Denton and Mischel (2007), C-CAPS integrates system approaches to understand how culture influences personality. This theory asserts that the cognitive and affective processes that underpin behaviour are influenced by cultural contexts. C-CAPS emphasizes that individuals have a dynamic system of cognitive and affective units (mental representations) such as beliefs, goals, expectations and emotional responses, which are activated in culturally relevant situations to guide how individuals interpret and respond to situations. An example of C-CAPS Theory in action can be a bicultural student who identifies with both their heritage culture and the mainstream culture of the country in which they live, and who demonstrates various cognitive and affective responses to academic performance depending on the cultural setting. When influenced by their heritage culture, they may prioritise academic performance as a way of family dignity and communal accomplishment, but in a mainstream culture environment, they may move to emphasising personal growth and individual achievement (Mendoza-Denton & Mischel, 2007).

1.2.2. METHODOLOGICAL APPROACHES

The methodologies used in this field are various and aim to capture the complex interactions between individuals' psychological processes and their cultural contexts. Some key methodologies are ethnographic studies, cross-cultural comparisons, experimental designs and neuroimaging techniques.

Ethnographic studies provide in-depth insights into how cultural practices and artefacts influence cognitive processes in real-life environments (Cole, 1996). They involve qualitative methods such as narrative analysis interviews, case studies and participant observation in natural settings to understand cultural practices and beliefs. Research is usually contextualized, focusing on specific cultural settings and the interpretations that people within those settings attribute to them. For example, Scribner and Cole (1981) used ethnographic methods to study the literacy practices of the Vai people of Liberia, demonstrating the impact of cultural environment on cognitive capacities.

Cross-cultural comparisons involve comparing psychological occurrences across different cultures in order to find universal and culturally specific components of cognitive development. They primarily use quantitative methods, such as surveys, experiments, administration of cognitive tasks and statistical analyses, to compare mental processes across various cultures (Triandis & Berry, 1980). Standardised tools and methodologies are frequently used to assure cross-cultural data comparability. Ensuring measurement equivalence and avoiding ethnocentric biases are significant challenges; thus, researchers must employ culturally validated instruments and methodologies. A well-known example is Triandis's (1995) study, which used cross-cultural comparisons to examine individualism and collectivism, highlighting substantial cultural differences in self-concept and behaviour.

Neuroimaging techniques, including functional magnetic resonance imaging (fMRI) and electroencephalography (EEG), offer researchers a modern approach to explore the neurological processes underlying cultural variations in cognition. Chiao et al. (2009) used fMRI to study how cultural differences in self-conception affect brain activity during self-reflective activities. Their research uncovered distinct brain patterns peculiar to each culture. A more in-depth explanation of Cultural Neuroscience is offered in the following section.

To understand complex cultural processes, a mixed-methods approach that blends qualitative and quantitative methods can take advantage of both, providing a more thorough knowledge of cultural phenomena (Creswell & Plano Clark, 2011).

Ensuring both methodological rigour and cultural sensitivity is a significant challenge in this field of study.

1.3. CULTURAL NEUROSCIENCE

Cultural neuroscience is a developing interdisciplinary field that aims to understand how cultural differences affect neural processes, brain structures and genetic processes. It aims to explain the reciprocal relationship between these processes and their emergent characteristics (Chiao, 2009).
One of the key concepts of this field is the *bidirectional influence of culture and biology,* where cultural contexts shape neural mechanisms and these neural mechanisms, in turn, influence cultural practices and beliefs. This bidirectional relationship underscores how deeply interconnected cultural and biological processes are.

Cultural neuroscience uses various techniques, such as event-related potentials (ERP), functional magnetic resonance imaging (fMRI) and genetic analysis. Cultural priming, in which subjects are exposed to cultural contexts or symbols to study the ensuing patterns of brain activation, is a common method used in cultural neuroscience research. This method helps in comprehending the dynamic ways in which cultural environments might affect brain function (Chiao et al., 2015).

Comparative neuroimaging research have shown brain pathways that are both universal and culturally distinctive. For example, cultural differences in self-representation have been demonstrated, with Western cultures activating brain regions linked with personal qualities and Eastern cultures activating regions related with social duties and relationships (Zhu et al., 2007).

Another core theme of this field is *neural plasticity in response to cultural experiences*. Cultural experiences, such as language, religious practices and social standards, can greatly influence neural pathways. For instance, research has demonstrated that bilingual persons display distinct cerebral activity patterns in comparison to monolinguals, underscoring the influence of cultural experiences on brain structure and function (Park & Huang, 2010).

Neurogenetics, an important subfield of cultural neuroscience, studies how genes influence brain functioning and behaviour. It explores how genetic variants manifest differently across cultural contexts. Natural selection and genetic drift are evolutionary factors that can explain the differences in gene allelic frequencies among cultures. For example, the serotonin transporter polymorphism (5-HTTLPR) gene influences mood regulation. The S allele of this gene, which is related to high negative feelings and increased anxiety (Sen et al., 2004), is more frequent in East Asian groups (70-80%) than in others (50% or less) (Gelernter et al., 1997, as cited in Chiao, 2009). Thus, it has been associated with cultural differences in emotional regulation and social behaviour.

By integrating discoveries from cultural psychology and neuroscience, this field provides novel insights into how culture influences mental processes. This interdisciplinary approach promotes culturally diverse research and challenges the universality of psychological theories predominantly based on Western populations (Chiao & Ambady, 2007).

1.4. ACCULTURATION, INTERCULTURAL COMPETENCE AND COGNITION

Acculturation is a transformation process that arises from continuous interactions between individuals from different cultural backgrounds. It is the multifaceted process through which individuals and groups undergo cultural and psychological transformations because of prolonged contact and interaction with a different culture, encompassing changes in cultural practices, values, and identity (Berry, 1997). This phenomenon is particularly relevant in the context of migration and globalization, where individuals are frequently exposed to new cultures.

Berry (1997) proposed a model with four acculturation strategies that explain how individuals balance their original culture with the new culture they are exposed to. These are *assimilation* (adopting the host culture while relinquishing one's original culture), *separation* (maintaining one's original culture and rejecting the host culture), *integration* (maintaining one's original culture while adopting aspects of the host culture) and *marginalization* (rejecting both the original and host cultures). Each strategy has distinct cognitive and psychological implications. Benet-Martínez et al. (2002) found that individuals who successfully integrate their native and new cultures have higher cognitive capacities, including creativity and flexibility.

Bourhis et al. (1997) improved on Berry's model, taking into account the relationship between the individual's acculturation technique and the host society's attitude towards immigrants. This approach emphasises the bidirectional aspect of acculturation and its impact on cognitive processes. Torres and Rollock (2011) discovered that high acculturative stress, caused by adjusting to a new culture while maintaining one's original identity, has a negative impact on cognitive performance, particularly memory and executive functions, but social support from family and community can mitigate these negative effects (Yeh et al., 2003). Research of Kim et al. (2008) demonstrated that acculturation can change brain structure and function, notably in areas such as language and executive control, demonstrating the brain's ability to reorganise in response to new cultural experiences.

Intercultural competence is defined as the ability to change one's cultural perspective and alter behaviour in response to cultural differences and similarities (Hammer, 2015). Byram (1997)

proposes a complete model that incorporates components such as curious and open attitudes, cultural knowledge, interpretive and relational abilities, discovery and interaction skills and critical cultural awareness. Openness to different cultures, a crucial component of this approach, promotes the development of intercultural competence by encouraging participation in diverse cultural experiences (Deardorff, 2006) and aids the acculturation process by lowering resistance to change and developing positive attitudes.

All these notions contribute to cognitive flexibility, which is the mental ability to switch between thinking about different concepts and thinking about multiple concepts in a simultaneous way (Bennett, 1993). Individuals who are open to other cultures are more likely to interact with new experiences and learning opportunities, which can improve cognitive processes like memory and executive control (McCrae, 2007). Exposure to other cultural perspectives, supported by openness and intercultural competence, improves innovative problem-solving abilities by incorporating different points of view and approaches (Maddux et al., 2010).

1.5. CULTURAL NEUROPSYCHOLOGY

Cultural neuropsychology is an interdisciplinary field that examines how cultural factors influence brain function and cognitive processes, integrating methods from neuropsychology, cultural psychology and neuroscience. As globalization continues to increase cultural interactions, understanding these relationships becomes crucial for fostering cognitive health and well-being in diverse populations. This field explores the impact of cultural backgrounds on cognitive processes such as memory, perception, attention, language and reasoning. It also addresses how culturally influenced cognitive styles affect performance on neuropsychological assessments. Standard neuropsychological tests may not be valid across cultures due to variations in educational background, language and cultural norms, making culturally sensitive assessments vital in clinical settings for accurate diagnosis and effective treatment (Ardila, 2005).

Gaining insight into the cultural background can enhance the development of cognitive and therapeutic interventions. For instance, culturally tailored cognitive-behavioural therapy (CBT) that integrates cultural values and practices has been demonstrated to be more effective for individuals from diverse backgrounds (Hinton et al., 2012).

Cultural neuropsychology contributes to global mental health by addressing the cultural determinants of cognitive health and disorders. This approach emphasises the necessity of culturally competent

healthcare providers and policies that consider the cultural context in promoting cognitive well-being (Prince et al., 2007).

1.5.1. COGNITIVE ASSESSMENT IN DIVERSE POPULATIONS

Most of the neuropsychological research has been conducted with participants from Western, Educated, Industrialised, Rich and Democratic (WEIRD; Henrich et al., 2010) societies. As a result, numerous assessments, methodologies and norms were created with a primary focus on these so-called WEIRD populations and are inappropriate for communities with a variety of educational, linguistic and cultural backgrounds (Huang & Huang, 2022; Aparna Dutt et al., 2022).

Since cultural and linguistic variety is a major yet frequently disregarded moderating factor, our knowledge of the organisation of cognitive abilities and impairments in the brain is not only incomplete but also culturally biased (Ardila, 2007). This bias can lead to inaccurate or unfair outcomes, often disadvantaging individuals from minority or non-dominant cultures (Reynolds & Suzuki, 2013). Understanding cultural bias is crucial in ensuring that tests are valid, reliable and equitable for all test-takers.

There are three types of cultural bias in testing: content bias, construct bias and method bias. *Content bias* occurs when the content of a test favours one cultural group over another (Suzuki et al., 2001). For example, a reading comprehension test that includes passages about skiing or sailing might favour individuals from cultures or socioeconomic backgrounds where these activities are common (Helms, 2006). *Construct bias* happens when the theoretical constructs measured by a test are not equivalent across different cultures (Van de Vijver & Poortinga, 1997). An example is the concept of intelligence, which might be viewed differently across cultures (Sternberg, 2004). *Method bias* involves biases in the administration, format or scoring of a test (Van de Vijver & Leung, 1997). For instance, a test administered in a language that is not the test-taker's first language can disadvantage those individuals (Hambleton et al., 2005).

Cultural bias can lead to an inaccurate assessment of a person's true abilities (Camilli & Shepard, 1994). Biased test results can have a negative impact on educational and employment possibilities (Gopaul-McNicol & Armour-Thomas, 2002). Furthermore, test bias can cause emotions of inadequacy, tension, and a lack of confidence (Reynolds & Suzuki, 2013).

What solutions may be implemented to address these issues and reduce cultural bias in testing? Fernández and Evans (2022) propose three major approaches: adapting current exams, inventing culturally appropriate tests, and building universal cross-cultural examinations.

Adaptation of existing tests involves translating them into the target language and verifying that the content is culturally relevant and understandable. After translation, pilot studies should verify the test materials' appropriateness, with corrections and re-testing as needed; validity and reliability studies must confirm the adapted version's equivalence to the original, followed by collecting normative data for the target population (Fernández & Evans, 2022). It is a lengthy, costly, and time-consuming process that may take several years, depending on the availability of resources.

Development of specific new tests designed specifically for different cultural groups presents nearly identical difficulties to modifying existing examinations. This method takes into account the cultural nuances and distinct cognitive processes of a certain population (Ardila, 2005). Cultural sensitivity in test creation can be achieved by bringing in specialists from various cultural backgrounds (Hambleton et al., 2005).

Another option is the *Development of cross-cultural tests* to create cross-cultural assessments that are universally applicable across cultures while being fair and accurate. This entails defining generally recognised cognitive functions and ensuring that these assessments are devoid of cultural biases (Van de Vijver & Leung, 1997). The primary problem of this technique is to achieve equivalence across cultural groups, ensuring that the test evaluates the same constructs consistently across cultures (Van de Vijver & Poortinga, 1997). Due to the challenges in developing norms and conducting psychometric studies, many translations of Cross-Cultural Tests (CCTs) lack reliability, validity testing and local norms; for instance, Komalasari et al. (2019) found that only three out of 12 studies on RUDAS adaptations reported validity and reliability data, which is insufficient to ensure the test's effectiveness in new contexts (Fernández & Evans, 2022).

Alternatively, adopting a variety of assessment methodologies, such as *Performance-Based Assessments*, can help to reduce cultural bias by offering a more thorough and equitable appraisal of abilities (Sternberg, 2004; Helms, 1992). Performance-based assessments measure abilities through real-world tasks and practical application, and they can be more culturally neutral than traditional examinations since they reduce the impact of language and cultural familiarity on performance.

2. THE RESEARCH STUDY

2.1. AIM OF THE STUDY

In the present era of increasing interconnections, societies have become more varied in terms of culture due to the influences of globalisation, migration and rapid technological progress, which have collectively transformed our perception of culture. Previous research has highlighted that cultural background influences cognitive development and functioning, with individuals from different cultural contexts exhibiting variations in cognitive abilities due to unique experiences and socialization patterns (Nisbett et al., 2001; Cole, 1996). Acculturation, defined as the process of cultural change and psychological adaptation that takes place when individuals from various cultures engage in continuous firsthand interaction (Berry, 2005), can also have an impact on cognitive performance. This is especially relevant in multicultural societies where individuals navigate and integrate multiple cultural contexts. Traditional cognitive tests have been criticized for their cultural bias, often disadvantaging individuals from non-Western backgrounds (Ardila, 2005). The primary aim of this pilot study is to investigate the relationship between cultural origin, acculturation and cognitive performance among individuals of Turkish nationality. Specifically, the study aims to determine whether openness to other cultures, a key component of intercultural competence and a strong connection to one's own culture, in particular Turkish culture in this case, influence cognitive performance as measured by the Tele-GEMS cognitive screening test.

To analyse this relationship, the Openness to Other Cultures vs. Closeness to Turkish Culture Questionnaire (OTCq) was designed by adapting an existing questionnaire that was previously created and utilised in a comparable academic study with Italian participants. As described in the previous chapter openness to different cultures promotes the development of intercultural competence by encouraging engagement with diverse cultural experiences and the acculturation process by decreasing resistance to change and fostering positive attitudes.

The adapted version of the questionnaire aims to measure Openness to Other Cultures by evaluating how people feel about cultural diversity and how ready they are to interact with and adapt to different cultural settings, determined by how much they interact with and are exposed to different cultural elements. Closeness to Turkish culture is identified by an understanding of and commitment to Turkish cultural values and norms and the extent to which they have been exposed to and engaged with Turkish cultural components.

Referring to the dynamic cultural context explained in the previous chapter, two participant groups were selected: individuals of Turkish nationality residing in Turkey and individuals of Turkish nationality residing abroad. Before the current examination, some assumptions were established. Individuals residing in Turkey and embracing Turkish culture are expected to exhibit greater scores on the Closeness to Turkish culture index (measured by OTCq) compared to those residing outside the country. Similarly, it is assumed that individuals residing overseas might exhibit higher scores on the Openness to Other Cultures index (measured by OTCq) in comparison to those residing in Turkey.

The study proposes two hypotheses. The first hypothesis argues that individuals with a greater connection to Turkish culture will exhibit different cognitive performance patterns on the Tele-GEMS test than those with a lesser connection. This hypothesis is based on the premise that a strong cultural connection can either positively or negatively affect cognitive performance, depending on the cultural congruence of the test content (Ardila, 2005). The Tele-GEMS test was originally created and validated in Italian for the Italian population and then translated into Turkish with minor adaptations; therefore, its validity for that population has yet to be demonstrated.

The second hypothesis posits that individuals who show a greater degree of openness to other cultures will demonstrate superior performance on the Tele-GEMS cognitive screening test in comparison to those who exhibit a lower degree of openness. This theory is based on the claim that engaging with diverse cultural experiences and remaining receptive enhances cognitive flexibility and adaptability, which is advantageous to cognitive performance (Bennett, 1993).

2.2. METHODOLOGY

2.2.1. PARTICIPANTS

A sample of 104 participants (80 female and 24 male; aged between 18 and 61 years, M = 36.3, SD = 6.99; with total years of educational attainment between 11 and 28, M= 18.6, SD = 3.40) was recruited for the study. This included 52 participants of Turkish nationality residing in Turkey (TUR-TUR; 41 female and 11 male; aged between 22 and 82 years, M = 37.3, SD = 8.45; total years of educational attainment between 11 and 27, M = 18.3, SD = 3.6) and 52 participants of Turkish nationality living abroad (TUR-ABR; 39 female and 13 male; aged between 23 and 73 years, M = 35.4, SD = 5.06; total years of educational attainment between 15 and 28, M = 19, SD = 3.17). The participants residing overseas were both born and raised in Turkey before relocating to another country throughout their adult years.

The frequencies of the participants' current countries of residence are detailed in Table 1.

Frequencies of ACTUAL COUNTRY

	GROUP	
ACTUAL COUNTRY	**TUR-TUR**	**TUR-ABR**
AUSTRALIA	0	1
BELGIUM	0	1
CANADA	0	3
DENMARK	0	1
FRANCE	0	2
GERMANY	0	12
HOLLAND	0	1
IRELAND	0	2
ITALY	0	7
JAPAN	0	7
KOSOVO	0	1
KUWAIT	0	1
PORTUGAL	0	1
SWEDEN	0	2
TURKEY	52	0
U.A.E.	0	1
UK	0	4
USA	0	5

Table 1. The table shows the frequencies of the participants' actual country of domicile for each group. The two groups reported in the table are participants with Turkish nationality living in Turkey (TUR-TUR) and participants with Turkish nationality living abroad (TUR-ABR).

2.2.2. INSTRUMENTS

This study employed two instruments: the Openness to Other Cultures vs. Closeness to Turkish Culture Questionnaire (OTCq) to measure attitudes towards cultural diversity, interaction with different cultures and engagement with Turkish cultural aspects and the Tele-Global Examination of Mental State (Tele-GEMS) (Montemurro et al., 2023) to assess cognitive performance.

Openness to Other Cultures vs. Closeness to Turkish Culture Questionnaire

The Openness to Other Cultures vs. Closeness to Turkish Culture Questionnaire (OTCq) is a semi-structured interview translated and adapted from the existing IICq questionnaire (Sebastianutto et al., 2022), which was previously created for and utilized in a similar academic study with Italian-speaking participants.

The OTCq is divided into four main sections: biographical data, education, working activity, and intellectual, cultural, and recreational activities. The questionnaire comprises 31 comprehensive questions in total, each subdivided to explore specific areas of interest in greater detail. Designed for efficient administration, the questionnaire takes approximately 25 minutes to complete, though the examiner must undergo brief training beforehand. The 31 questions are crafted to evaluate various aspects of cultural experiences in the above-mentioned four contexts, including one's cultural origin, the languages spoken in different situations, the degree of integration and openness to other cultures, and the time spent engaging with other cultures.

The OTCq employs a dual-independent scoring system to measure participants' openness to other cultures and closeness to Turkish culture, generating two distinct scores. The scores in one index do not affect the scores in the other despite the reciprocal relationship between the two indices, which are measured independently. The English and Turkish versions of the questions are presented in Appendix A. Given the preliminary nature of this investigation and the lack of evidence indicating that any item is more significant than others, each question is assigned equal weight in the final scoring. Each item is adjusted to its highest possible score for normalization and then multiplied by 100 to express the score in hundredths. The scores are distributed across two indices: one ranging from 0 (very far from Turkish culture) to 100 (very close to Turkish culture) and the other from 0 (not open to other cultures) to 100 (very open to other cultures).

Tele-Global Examination of Mental State

Tele-GEMS (Montemurro et al., 2023) is a cognitive screening instrument administered via telephone, developed as a remote version of the in-person test Global Examination of Mental State (Mondini et al., 2022). It comprises ten tasks: *orientation, immediate memory recall, working memory, spatial representation, naming, delayed memory recall, verbal comprehension, auditory attention, verbal fluency,* and *metaphor comprehension* (pragmatic language) (Montemurro et al., 2023). The English and Turkish versions of the test are presented in Appendix B.

Tele-GEMS takes approximately 10 minutes to administer. Its English version was translated into Turkish for application with a Turkish population, with minor adaptations made to some items, by native Turkish speakers with a Turkish cultural background and a high level of proficiency in English. Its translation has been double-checked for this study to ensure its appropriateness. The validity of the adapted Tele-GEMS for the Turkish population has yet to be confirmed through further studies comprising both clinical and control groups (a research project for this purpose is currently in progress under the leadership of Prof. Sara Mondini at the University of Padova).

2.2.3. PROCEDURE

The selection of volunteer participants was carried out using a combination of phone calls and social media sources. Appointments for the assessment were scheduled based on the availability and time zone of each participant. Before starting the interviews, each participant was informed about the study's objective and duration, and they provided consent to participate. Participants were expected to be in a quiet, undisturbed environment with a stable phone or internet connection.

The process began with the administration of OTCq, followed by the Tele-GEMS screening. Participants were specifically told not to use any equipment or materials, such as watches or maps, that could help them during the test. Each session lasted approximately 35 minutes.

2.3. STATISTICAL DATA ANALYSIS

The statistical data analysis was performed using the computer program Jamovi version 2.3.28 (The Jamovi project, 2022). Jamovi is free and openly available software for analysing data and performing statistical tests. It is a fork of JASP developed on top of the R statistical language.

Initially, descriptive statistics were used to assess the distribution of Age, Education, OTCq_CTC (Closeness to Turkish Culture), OTCq_OOC (Openness to Other Cultures) and Tele-GEMS screening findings among various groups.

Afterwards, an independent samples t-test was conducted to compare the means of two independent groups (TUR-TUR and TUR-ABR) to determine if there is statistical evidence that the population means differ significantly for the variables CTC, OOC and Tele-GEMS.

Ultimately, linear regression analyses were conducted to investigate the impact of the CTC and OOC indexes on cognitive performance. The study considered Tele-GEMS performance as the dependent variable, while Age and Education were included as covariates.

3. RESULTS

Descriptive Statistics

The distribution of Age, Education, CTC, OOC and Tele-GEMS results among different groups were examined. Table 2 presents the primary descriptive statistics for these indexes.

Descriptives

	GROUP	AGE	EDUCATION	OTCq_CTC_total	OTCq_OOC_total	Tele-GEMS_total
N	TUR-TUR	52	52	52	52	52
	TUR-ABR	52	52	52	52	52
Mean	TUR-TUR	37.3	18.3	83.0	19.6	86.1
	TUR-ABR	35.4	19.0	63.7	41.2	87.5
Median	TUR-TUR	37.0	18.0	82.4	19.9	85.8
	TUR-ABR	37.0	18.0	62.8	42.8	89.3
Mode	TUR-TUR	38.0	16.0	100	0.00	93.5
	TUR-ABR	37.0	18.0	44.0 [a]	10.3 [a]	86.0 [a]
Standard deviation	TUR-TUR	8.45	3.60	12.4	12.9	6.28
	TUR-ABR	5.06	3.17	12.2	11.5	7.26
Minimum	TUR-TUR	18	11	56.3	0.00	68.7
	TUR-ABR	24	15	44.0	10.3	51.7
Maximum	TUR-TUR	60	27	100	50.6	98.7
	TUR-ABR	46	28	98.9	60.8	95.7
Skewness	TUR-TUR	0.291	0.503	-0.267	0.316	-0.653
	TUR-ABR	-0.750	1.27	0.611	-0.346	-2.61
Kurtosis	TUR-TUR	0.755	0.210	-0.864	-0.565	1.19
	TUR-ABR	0.460	1.27	0.0330	-0.449	10.8
Shapiro-Wilk W	TUR-TUR	0.963	0.945	0.946	0.970	0.943
	TUR-ABR	0.922	0.867	0.956	0.970	0.780
Shapiro-Wilk p	TUR-TUR	0.111	0.017	0.019	0.214	0.015
	TUR-ABR	0.002	< .001	0.052	0.212	< .001

[a] There is more than one mode; only the first is reported

Table 2. Descriptive statistics for the TUR-TUR and TUR-ABR groups across five variables: Age, Education, OTCq_CTC_total (Closeness to Turkish Culture index), OTCq_OOC_total (Openness to Other Cultures index) and Tele-GEMS_total. Mean, Median, Mode, Standard Deviation, Minimum value, Maximum value, Kurtosis, Skewness, Shapiro-Wilk W and Shapiro-Wilk p are reported. The two groups reported in the table are participants with Turkish nationality living in Turkey (TUR-TUR) and participants with Turkish nationality living abroad (TUR-ABR).

Age and Education

The Age distribution in the TUR-TUR group is relatively symmetrical, with a slight right skew (Skewness: 0.291) and a slightly peaked distribution (Kurtosis: 0.755). The Shapiro-Wilk test shows normality (W: 0.963; p = 0.111). The Age distribution in the TUR-ABR group is, however, skewed to the left (Skewness: -0.750) and slightly peaked (Kurtosis: 0.460). The Shapiro-Wilk test shows a considerable divergence from normality (Shapiro-Wilk W = 0.922; p = 0.002). The Education distribution in the TUR-TUR group has a near-flat (Kurtosis: 0.210) and a right-skewed distribution (Skewness: 0.503). A significant deviation from normality is indicated by the Shapiro-Wilk test (Shapiro-Wilk W: 0.945; p = 0.017). The TUR-ABR group has a peaked distribution (Kurtosis: 1.27) and a substantial right skew (Skewness: 1.27) in the Education distribution. A considerable deviation from normality is indicated by the Shapiro-Wilk test (Shapiro-Wilk W: 0.867; p < 0.001). The Age data for the TUR-TUR group have an even distribution and are close to normality, allowing for acceptable parametric analysis, while TUR-ABR shows significant skew and non-normality, which suggests a need for nonparametric methods. The Education variable is non-normal in both groups, requiring nonparametric approaches for analysis.

The primary aim of this study is to investigate the impact of culture as a predictive factor. To mitigate the influence of demographic variables, samples for each group were selected from individuals with comparable age and educational attainment. Figure 1. a and Figure 1. b present graphs illustrating the data trends.

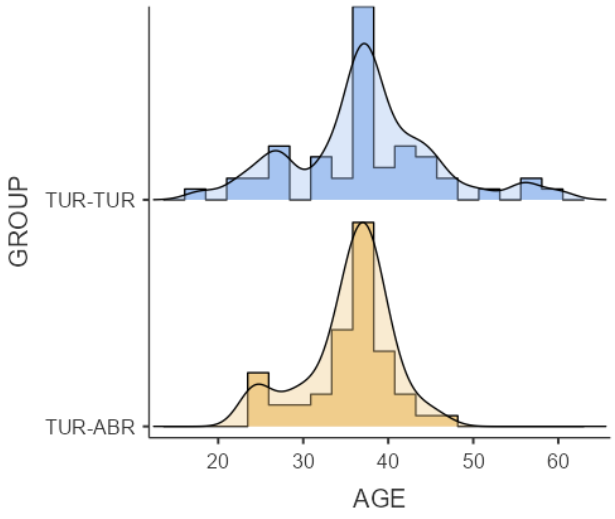

Figure 1. a Distribution of Age per group. The two groups reported in the table are participants with Turkish nationality living in Turkey (TUR-TUR) and participants with Turkish nationality living abroad (TUR-ABR).

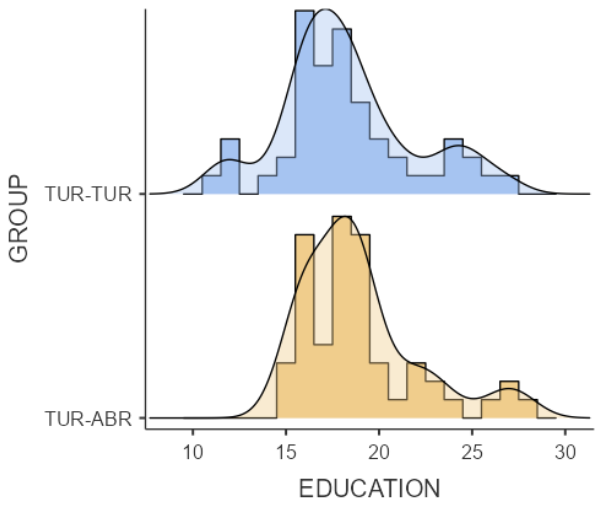

Figure 1. b Distribution of Education (total years of attainment) per group. The two groups reported in the table are participants with Turkish nationality living in Turkey (TUR-TUR) and participants with Turkish nationality living abroad (TUR-ABR).

OTCq Analysis

In the TUR-TUR group, the OTCq_CTC_total distribution is slightly left-skewed (Skewness: -0.267) and flatter (Kurtosis: -0.864). The Shapiro-Wilk test shows a divergence from normality (Shapiro-Wilk W: 0.946; p = 0.019). The TUR-ABR group's OTCq_CTC_total distribution has a right skew (Skewness: 0.611) and a normal distribution shape (Kurtosis: 0.033). The Shapiro-Wilk test shows that the data is close to normal (Shapiro-Wilk W = 0.956; p = 0.052).
The OTCq_CTC_total scores for TUR-ABR are nearly normal, making parametric tests possible. The TUR-TUR group's scores are slightly skewed, but they might be suitable for parametric analysis. However, caution is suggested due to partial normality.

Compared to the TUR-ABR group (M = 63.7) the TUR-TUR group (M = 83) has higher average OTCq_CTC_total scores, showing that the former group has superior results. Figure 2. a and Figure 2. b provide graphs illustrating the data trend. This finding supports our initial assumption, indicating that those who live in Turkey may have a stronger connection to Turkish culture.

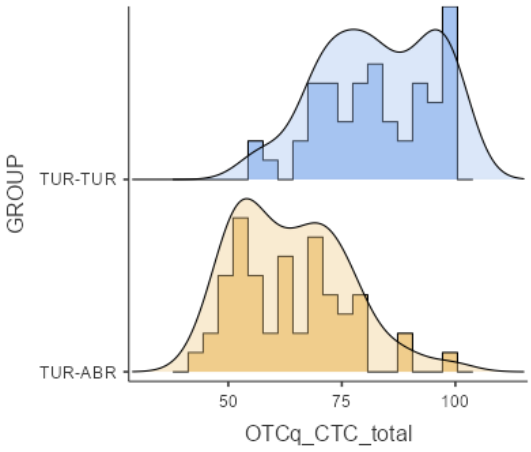

Figure 2. a Distribution of OTCq Closeness to Turkish Culture Index (CTC) per group. The two groups reported in the table are participants with Turkish nationality living in Turkey (TUR-TUR) and participants with Turkish nationality living abroad (TUR-ABR).

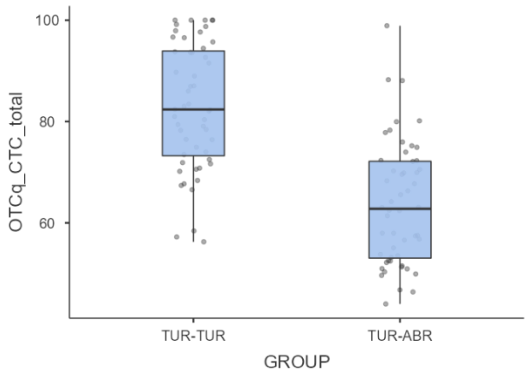

Figure 2. b Distribution of OTCq_CTC_total scores per group, showing the outliers. The two groups reported in the table are participants with Turkish nationality living in Turkey (TUR-TUR) and participants with Turkish nationality living abroad (TUR-ABR).

The McDonald's omega value, which was determined to be 0.748, is calculated to assess the internal consistency of the weighted CTC items. This result may suggest that the CTC scale is reliable and that the items are consistent in measuring the construct of Closeness to Turkish culture.

In the TUR-TUR group, the OTCq_OOC_total distribution is slightly right-skewed (Skewness: 0.316) and flatter than a normal distribution (Kurtosis: -0.565). The Shapiro-Wilk test demonstrates normality (Shapiro-Wilk W: 0.970; p = 0.214). In the TUR-ABR group, the OTCq_OOC_total distribution has a left skew (Kkewness: -0.346) and a flatter distribution (Kurtosis: -0.449). The Shapiro-Wilk test confirms normality (Shapiro-Wilk W: 0.970; p = 0.212). Both groups' distributions are close to normal and make parametric methods appropriate.

Compared to the TUR-TUR group (M = 19.6), the TUR-ABR group (M = 41.2) exhibits considerably higher OTCq_OOC_total scores, suggesting that the former group reports higher values in the evaluated outcomes. Figure 3. a and Figure 3. b show graphs demonstrating the data trend. This result supports our assumption that people who live abroad might be more open to accepting and embracing different cultures.

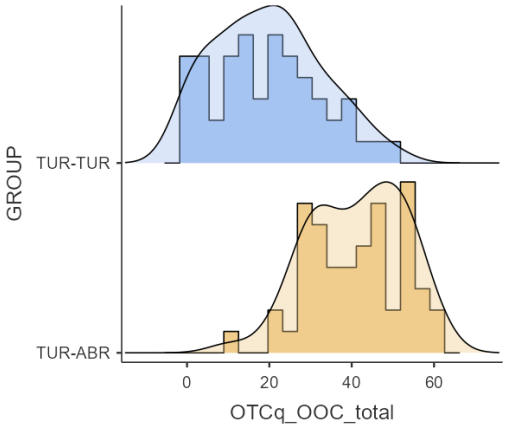

Figure 3. a Distribution of OTCq Openness to Other Cultures index (OOC) per group. The two groups reported in the table are participants with Turkish nationality living in Turkey (TUR-TUR) and participants with Turkish nationality living abroad (TUR-ABR).

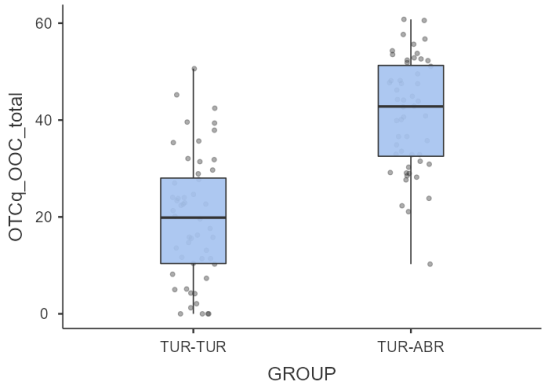

Figure 3. b Distribution of OTCq_OOC_total scores per group, showing the outliers. The two groups reported in the table are participants with Turkish nationality living in Turkey (TUR-TUR) and participants with Turkish nationality living abroad (TUR-ABR).

The McDonald's omega value, which was determined to be 0.794, is calculated to assess the internal consistency of the weighted OOC items. This value might suggest that the items on the OOC scale are consistent in measuring the underlying construct of openness to other cultures.

Tele-GEMS Analysis

Tele-GEMS_TOTAL distribution of the TUR-TUR group is slightly left-skewed (Skewness: -0.653) and moderately peaked (Kurtosis: 1.19). The Shapiro-Wilk test can be considered as close to normality (Shapiro-Wilk W: 0.943; p = 0.015) even if it shows some marginality. In the TUR-ABR group, the Tele-GEMS_TOTAL distribution has a substantial left skew (Skewness: -2.61) and a high peak (Kurtosis: 10.8). The Shapiro-Wilk test shows a significant deviation from normality (Shapiro-Wilk W = 0.780, p < 0.001). Parametric approaches should be used with caution in both groups, particularly in the TUR-ABR group, where non-parametric methods may be considered due to considerable skewness and kurtosis.

The distribution of Tele-GEMS scores among groups demonstrates that both groups have similar scores with the TUR-ABR group (M = 87.5) scoring slightly higher on average than the TUR-TUR group (M = 86.1). However, the distribution in the TUR-ABR group is significantly skewed and kurtotic, indicating some extreme values. Figure 4. a and Figure 4. b provides graphs illustrating the data trend.

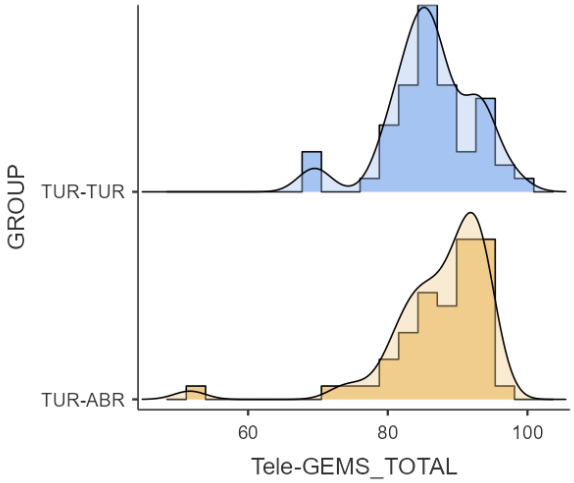

Figure 4. a Distribution of Tele-GEMS scores per group. The two groups reported in the table are participants with Turkish nationality living in Turkey (TUR-TUR) and participants with Turkish nationality living abroad (TUR-ABR).

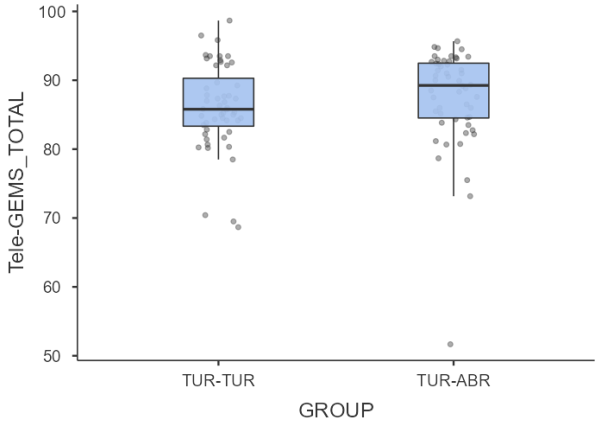

Figure 4. b Distribution of Tele-GEMS scores per group, showing the outliers. The two groups reported in the table are participants with Turkish nationality living in Turkey (TUR-TUR) and participants with Turkish nationality living abroad (TUR-ABR).

Independent Samples T-test

The independent samples t-test was used to compare the means of two separate groups (TUR-TUR and TUR-ABR) to determine if there was statistical evidence that the associated population means differed significantly for three variables: CTC, OOC, and Tele-GEMS.

Independent Samples T-Test

		Statistic	df	p	Mean difference	SE difference
OTCq_OOC_total	Student's t	-8.99	102	< .001	-21.57	2.40
OTCq_CTC_total	Student's t	8.00	102	< .001	19.30	2.41
Tele-GEMS_TOTAL	Student's t	-1.06	102	0.292	-1.41	1.33

Note. H_a $\mu_{TUR\text{-}TUR} \neq \mu_{TUR\text{-}ABR}$

Table 3. The independent samples t-test statistical results for three different variables: CTC, OOC and Tele-GEMS.

The p-values for Levene's Test for all three variables are greater than 0.05 (OTCq_OOC_total p = 0.463; OTCq_CTC_total p = 0.756; Tele-GEMS_total p = 0.633), showing no significant violation of the assumption of equal variances. This means that the t-test variances can be assumed to be homogeneous.

Regarding OTCq_OOC_total, the t-value of -8.99 is very large in magnitude, and the p-value is less than 0.001, which is highly significant. This large t-value and significant p-value suggest a large effect size, indicating a strong difference between the TUR-TUR and TUR-ABR groups. For OTCq_CTC_total, the t-value of 8.00, with a p-value less than 0.001, indicates a statistically significant, substantial positive difference between the two groups.

The above results support our initial assumptions, indicating that while individuals living in Turkey are probably more committed to Turkish cultural values, those living abroad might be more open to experiencing a variety of cultural practices. The notable findings for OTCq_OOC_total and OTCq_CTC_total could be utilised to investigate specific features that might affect these scores in each group differently.

On the Tele-GEMS_TOTAL scores, the t-value of -1.06 is relatively small, with a p-value of 0.292, which is not significant. This suggests no statistically significant difference in Tele-GEMS_TOTAL between the TUR-TUR and TUR-ABR groups.

The absence of a significant difference in the Tele-GEMS_TOTAL score implies that the groups have a consistent or equal degree of efficacy in cognitive assessment measures.

Linear Regression Model

The effect of the CTC and OOC indexes on cognitive performance was analysed through a linear regression model. While Tele-GEMS's performance was the dependent variable, age and education were considered covariates. The linear regression model includes either the CTC or OOC indexes. Table 4 presents the values of the first linear regression model, in which Age, Education and the CTC index are covariates.

Model Fit Measures

				Overall Model Test			
Model	R	R^2	Adjusted R^2	F	df1	df2	p
1	0.311	0.0967	0.0602	2.65	4	99	0.038

Model Coefficients - Tele-GEMS_TOTAL

Predictor	Estimate	SE	t	p
Intercept [a]	91.0117	6.7527	13.478	< .001
AGE	−0.0164	0.0969	−0.170	0.866
EDUCATION	0.3064	0.1998	1.533	0.128
OTCq_CTC_total	−0.1190	0.0561	−2.121	0.036
GROUP:				
TUR-ABR – TUR-TUR	−1.1377	1.6512	−0.689	0.492

[a] Represents reference level

Table 4. Linear Regression Model of Tele-GEMS total where AGE, EDUCATION, and CTC index are the covariates.

The correlation coefficient (R) of 0.311 shows a low to moderate linear relationship between the predictors and the dependent variable. With a moderate explanatory power (low R^2), the regression model is statistically significant at the 5% level (the F-value of 2.65 with a p-value of 0.038), meaning a significant correlation between the dependent variable and at least one of the predictors.

According to the coefficient values, OTCq_CTC_total is the only significant predictor of Tele-GEMS_TOTAL. The negative coefficient suggests that higher values of OTCq_CTC_total are

associated with lower values of Tele-GEMS_TOTAL as illustrated in Figure 5. In this model, Age, Education, and Group do not have significant effects on Tele-GEMS_TOTAL.

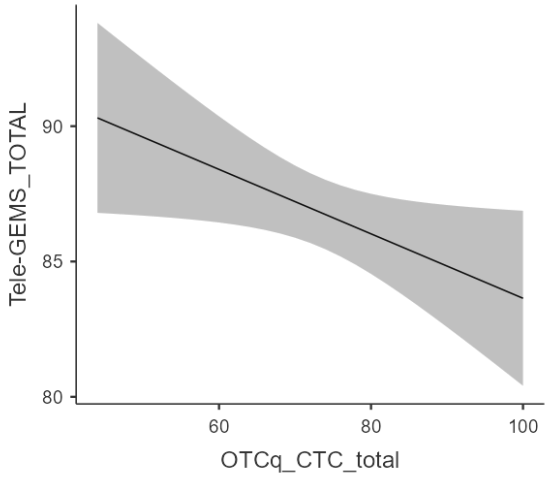

Figure 5. The scatterplot with the regression line shows the negative relationship between OTCq_CTC_total and Tele-GEMS_TOTAL, consistent with the negative slope.

The potential reasons for the trend found here need to be understood. The first hypothesis of the study, which proposed that high cultural attachment could affect cognitive performance either positively or adversely, depending on the cultural congruence of the test content, might be supported by the significant negative relation between OTCq_CTC_total and Tele-GEMS_TOTAL. These findings point to the latter option, which might imply that the translated and adapted Tele-GEMS screening may be insufficiently culturally compatible for those who strongly identify with Turkish cultural values, requiring additional cultural adaptations to its components. These findings point to the latter option, which might suggest the possibility that the translated and adapted Tele-GEMS screening might not be culturally compatible enough for those who strongly identify with Turkish cultural values and that additional cultural adaptations to its components may be necessary. However, there might be other confounding variables that have not been examined in this study that affect this trend. To make a more accurate inference, additional research into other potential variables is required.

Table 5 presents the values of the linear regression model, in which Age, Education and OOC index are covariates.

Model Fit Measures

				Overall Model Test			
Model	R	R^2	Adjusted R^2	F	df1	df2	p
1	0.303	0.0918	0.0551	2.50	4	99	0.047

Model Coefficients - Tele-GEMS_TOTAL

Predictor	Estimate	SE	t	p	Stand. Estimate
Intercept [a]	80.4212	4.8235	16.673	< .001	
EDUCATION	0.2585	0.2092	1.236	0.220	0.1294
AGE	−0.0348	0.0956	−0.364	0.717	−0.0358
OTCq_OOC_total	0.1154	0.0582	1.985	0.050	0.2771
GROUP:					
TUR-ABR – TUR-TUR	−1.3302	1.7593	−0.756	0.451	−0.1959

[a] Represents reference level

Table 5. Linear Regression Model of Tele-GEMS total where AGE, EDUCATION and OOC index are the covariates.

The correlation coefficient (R) of 0.303 indicates a low to moderate linear relationship between the predictors and the dependent variable. With a limited explanatory power (low R^2), the regression model is statistically significant at the 5% level (the F-value of 2.50 and p-value of 0.0479, meaning a significant correlation between the dependent variable and at least one of the predictors.

According to the coefficient values, OTCq_OOC_total is the only factor that significantly affects Tele-GEMS_TOTAL. As seen in Figure 6, the positive coefficient implies that higher values of OTCq_OOC_total are correlated with higher values of Tele-GEMS_TOTAL. Age, Education, and Group show no significant effect on Tele-GEMS_TOTAL in this model.

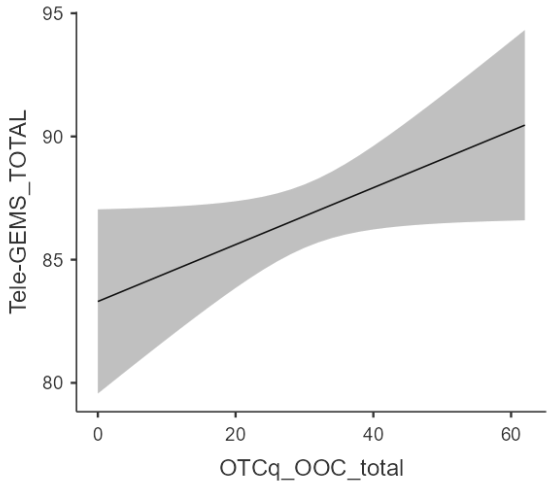

Figure 6. The scatterplot with the regression line shows the negative relationship between OTCq_OOC_total and Tele-GEMS_TOTAL, consistent with the positive slope.

The second hypothesis, which suggests that those who exhibit greater openness to other cultures may perform better on the Tele-GEMS cognitive screening compared to those with lesser openness, appears to be supported by the significant positive association between OTCq_OOC_total and Tele-GEMS_TOTAL. This finding suggests that interaction and engagement with diverse cultures have the potential to enhance cognitive flexibility and adaptability.

4. DISCUSSION AND CONCLUSION

This study is an investigation of the impact of cultural origin and a positive mindset toward integrating acculturation on cognitive abilities among Turkish nationals. Utilizing the Openness to Other Cultures vs. Closeness to Turkish Culture Questionnaire (OTCq) and the Tele-Global Examination of Mental State (Tele-GEMS) cognitive test, the research aimed to determine how these cultural factors influence cognitive outcomes. The sample consists of Turkish nationals residing both in Turkey and abroad to offer a comparative view. The study proposed two hypotheses. The first one concerns the effect of strong cultural attachment on cognitive performance, either positively or negatively depending on the cultural coherence of the test. The second one concerns the positive impact of openness to other cultures on cognitive performance, which leads to cognitive flexibility.

The findings of this study can contribute to the research in cultural psychology by highlighting the importance of addressing cultural and acculturation factors in cognitive assessments. The positive correlation between openness to other cultures and cognitive performance on the Tele-GEMS screening test supports the view that cultural diversity and engagement with new cultures can improve cognitive adaptability and flexibility (Bennett, 1993). This is consistent with research showing that exposure to varied cultural experiences might improve innovative problem-solving abilities and more extensive cognitive skills (Maddux et al., 2010). In contrast, the negative correlation found in the study between the cognitive screening scores and a strong attachment to Turkish culture might point out some limitations of culturally incongruent cognitive assessments. If this is the case, then it suggests that additional cultural adaptation might be required to improve their validity and reliability for diverse populations since numerous cognitive tests reflect the cultural context in which they were developed and may not accurately measure cognitive abilities

in populations from different cultural backgrounds (Berry, 2005; Ardila, 2005). However, as stated in the results section, there might be other confounding variables that have not been considered in this study that influence this tendency. More investigation into other such variables is needed to form a more accurate explanation. Additionally, the absence of a significant difference in the cognitive screening scores between the Turkish nationals residing in Turkey and Turkish nationals residing abroad might be interpreted as advanced education (over 12 years) has a determining impact on cognitive functioning, diminishing other environmental and contextual influences on cognitive tests. As different studies have shown, a significant number of cultural disparities can be attributed to variations in the level or quality of education (Fernández, 2022). However, because of the small sample size and scope of the data, this finding cannot be generalised to the entire population. Additional study with larger and more representative populations is required to validate these conclusions.

From a practical perspective, this study emphasises the importance of culturally sensitive and adaptive cognitive assessments which consider varied populations with different cultural backgrounds and acculturation experiences. Given the global nature of migration and cultural integration, cognitive tests need to account for many cultural contexts to give accurate and fair evaluations with the aim of improving the efficacy of cognitive and therapeutic interventions in clinical settings. Furthermore, the study implies that fostering openness to other cultures can improve cognitive flexibility and adaptability, which are favourable to cognitive function. Educational programmes that promote intercultural competency can assist individuals in navigating and integrating various cultural frameworks.

Regardless of its contributions, this study has several limitations. Although the sample size of 104 participants was appropriate for a pilot study, it was limited and weak in demographic homogeneity, particularly in the categories of age and education. As a result, it may not represent the entire population of Turkish nationals, limiting the generalizability of findings. The study focused on Turkish nationals living in Turkey and abroad. However, the diversity within these groups, like varied levels of acculturation and countries of residence, may not have been properly represented, and this limits the study's capacity to draw precise conclusions. Another limitation is the absence of a third comparative group consisting of "foreigners living in Turkey". Including this group could provide insights into the effect of the Turkish cultural context on individuals from a different cultural origin. Additionally, the study relied on self-reported measures of cultural engagement, which may be prone to bias, such as social desirability bias. Individual interpretation

and recall bias might alter the reliability and validity of the data collected. For example, during the interviews, participants often found the question “What is the culture you identify with the most?” difficult and ambiguous. This conflicts with the contemporary view of culture as fluid and hybrid, as the interpretation of Turkish culture can vary significantly among individuals. Furthermore, the use of the Tele-GEMS test, which was originally developed and validated in Italian, may have introduced cultural biases despite its translation and minor cultural adaptations. Extensive investigations involving both clinical and control groups are necessary to prove the validity and reliability of the adapted Tele-GEMS for the population of Turkish nationals.

By admitting the limitations, the study provides a base for further investigations. To improve the generalizability of the results, future studies should focus on increasing the sample size and heterogeneity and include people from a wider range of cultural backgrounds. Longitudinal research might shed further light on how acculturation processes evolve over time and affect cognitive function. Furthermore, additional validation is necessary to guarantee the efficacy and accuracy of culturally adapted cognitive assessments, including the Tele-GEMS (which is currently in progress under the leadership of Prof. Sara Mondini at the University of Padova), across a range of demographics.

This study contributes to the expanding field of cultural psychology by emphasizing the crucial role of cultural context in cognitive assessment. It advocates for the adoption of culturally sensitive approaches in psychological practice and underscores the importance of fostering intercultural competence to enhance cognitive performance across diverse populations.

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APPENDIX A

"Openness to Other Cultures vs. Closeness to Turkish Culture Questionnaire (OTCq)" Turkish Version

DİĞER KÜLTÜRLERE AÇIKLIK VS. TÜRK KÜLTÜRÜNE YAKINLIK ANKETİ

BIYOGRAFIK VERILER

Kültürel kökeniniz Türkiye mi?

Eğer değilse hangisi olduğunu belirtiniz.

- ○ Evet
- ○ _____ Hayır

Türkiye'de mi doğdunuz?

- ○ Evet
- ○ Hayır

Türkiye'de ne kadar süredir yaşıyorsunuz?

_____

Ailenizin kültürünü miras edindiği Türkiye haricinde bir ülke var mı?

Varsa belirtiniz

- ○ _____ Evet
- ○ Hayır

Aileniz, sizin doğumunuzdan önce, kaç kuşaktır Türkiye'de bulunuyordu?

Örneğin, büyükanne ve büyükbabanız Türkiye'ye geldiyse siz üçüncü kuşaksınız. Eğer ebeveynleriniz Türkiye'ye geldiyse siz ikinci kuşaksınız.

Eğer siz yalnız veya ebeveynlerinizle birlikte Türkiye'ye geldiyseniz birinci kuşaksınız.

_____

Ebeveynlerinizin kökeni aynı mı?

Hangi ebeveynin hangi kökene sahip olduğunu belirtin.

- ○ _____ Evet
- ○ _____ Hayır

DATI ANAGRAFICI PER LOOP

Kaç ülkede yaşadınız?

Lütfen sadece üç aydan uzun süre yaşadığınız ülkeleri belirtiniz (Turkiye dahil)

_____

LOOP PAESI ESTERI

Hangi ülkelerde yaşadınız?

Eğer yaşadığınız ülke birden fazla ise, lütfen her ülkeyi ayrı ayrı belirtiniz (Turkiye dahil)

Country [▾]

Bu ülkede ne kadar yaşadınız?

Üç ay ile bir yıl arasındaki süreler için 1 yazın. 1 yılın üzerindeki tarihler için, ayları her zaman bir sonraki tam sayıya (yıl olarak) kadar yuvarlayın.

Örneğin: 1 yıl 6 ay bir ülkede yaşadıysanız 2 yazın; 3 yıl 2 ay yaşadıysanız 4 yazın.

_____

Haftada en az bir kere kullanmak şartıyla, kaç dil konuşuyorsunuz?

_____

Kaç dil konuştuğunuzu, bu dilleri hangi durumlarda (örneğin: iş, aile, arkadaşlar) ve ne sıklıkta kullandığınızı belirtiniz.

Lütfen zamanınızın ne kadarını (yüzdelik oranıyla, %) bu dilleri konuşarak geçirdiğinizi belirtiniz. Toplam rakam %100'e eşit olmalıdır.

Dil 1		0
Dil 2		0
Dil 3		0
Dil 4		0
Dil 5		0
Dil 6		0
Dil 7		0
Dil 8		0
Dil 9		0
Dil 10		0
Totale		0

Lütfen Türkçedeki akıcılık seviyenizi belirtiniz.

	Çok zayıf	Zayıf	Orta derecede	İyi	Çok iyi
Konuşma	○	○	○	○	○
Okuma	○	○	○	○	○
Dinleme	○	○	○	○	○
Yazma	○	○	○	○	○

Bu anketi hangi dilde doldurmayı tercih edersiniz? İsterseniz nedenini belirtebilirsiniz.

EĞİTİM DURUMU

Türkçe öğrendiğinizde kaç yaşındaydınız?

Kaç ülkede eğitim gördünüz?

Türkiye dahil olmak üzere en az 3 ay süre ile okumuş olduğunuz ülkeri dikkate alınız.

DESCRIZIONE LOOP

Şimdi ilkokuldan/ilk öğretimden başlayarak okuduğunuz ülkeleri kronolojik sırayla listelemeniz istenecektir.

LOOP ISTRUZIONE

Hangi ülkede okudunuz?

Eğer okuduğunuz ülke birden fazla ise, lütfen her ülkeyi ayrı ayrı belirtiniz (Türkiye dahil)

Country

Bu ülkede kaç yıl okudunuz?

Üç ay ile bir yıl arasındaki süreler için 1 yazın. 1 yılın üzerindeki tarihler için, aylarını her zaman bir sonraki tam sayıya (yıl olarak) kadar yuvarlayın. Örneğin: 1 yıl 6 ay bir ülkede okuduysanız 2 yazın; 3 yıl 2 ay okuduysanız 4 yazın.

Bu Ülkede okurken en çok hangi dili kullandınız?

ÇALIŞMA FAALİYETİ

Kaç ülkede çalıştınız?

Türkiye dahil olmak üzere en az 3 ay süre ile çalışmış olduğunuz ülkeri dikkate alınız.

LOOP LAVORO

Hangi ülkede çalıştınız/çalışıyorsunuz?

Eğer birden fazla ise, lütfen her ülkeyi ayrı ayrı belirtiniz (Türkiye dahil)

Country

Bu ülkede kaç yıldır çalışıyorsunuz/çalıştınız?

Üç ay ile bir yıl arasındaki süreler için 1 yazın. 1 yılın üzerindeki tarihler için, ayları her zaman bir sonraki tam sayıya (yıl olarak) kadar yuvarlayın. Örneğin: 1 yıl 6 ay bir ülkede çalıştıysanız 2 yazın; 3 yıl 2 ay ise 4 yazın.

Bu ülkede çalışırken en çok hangi dili kullandınız/kullaniyorsunuz?

FİKRİ, KÜLTÜREL VE EĞLENCE FAALİYETLERİ

Şu kişilerle vakit geçiriyor musunuz?

"vakit geçirme", boş zamanlarda kişilerle birlikte haftada en az bir kere etkinliklerde bulunmak olarak sınıflandırılır

birden fazla cevap seçebilirsiniz

- [ ] Sizinle aynı kültürel kökenden kişilerle
- [ ] Türk kültüründen kişilerle
- [ ] Kendi kültürünüzden veya Türk kültüründen başka bir kökenden kişilerle (hangisi olduğunu belirtiniz)
- [ ] Türk kültürel kökeninden olmayan kişilerle (hangisi olduğunu belirtiniz)

İçerisinde en çok zaman geçirdiğiniz kültür hangisidir?

Kendinizi en çok hangi kültürle özdeşleştiriyorsunuz?

Örneğin; Türkiye, Kuzey Amerikan, Latin, İtalyan, Avrupalı veya belirli herhangi bir kültüre ait olmadığımı hissediyorum.

Şayet izliyorsanız, filmleri en çok hangi dilde izlersiniz?

- ( ) Evet film izlerim
- ( ) Hayır film izlemiyorum

Okuyorsanız (kitap, gazete, ...), genellikle hangi dilde okursunuz?

- ( ) Evet okuyorum
- ( ) Hayır okumuyorum

Aşağıdaki kültürlerle ilişkili olan etkinliklerde (ör. yemek yapmak/yemek yemek, televizyon programlarını izlemek, boş vakitlerde yapılan etkinlikler) bulunur musunuz?

Birden fazla cevap seçebilirsiniz. Lütfen örnekler veriniz.

- [ ] Menşe kültürünüz
- [ ] Türk kültürü
- [ ] Başka kültür

İbadet eden dindar biri misiniz?

Birden fazla cevap seçebilirsiniz.

- [ ] Menşe ülkenizin yaygın dini
- [ ] Yaşadığınız ülkenin yaygın dini
- [ ] Başka bir ülkenin yaygın dini
- [ ] Dini uygulamada bulunmuyorum

"Openness to Other Cultures vs. Closeness to Turkish Culture Questionnaire (OTCq)" English Version

BIOGRAPHICAL DATA

Is your culture of origin solely Turkish?

If not specify which

- ○ Yes
- ○ _____ No

Were you born in Turkey ?

- ○ Yes
- ○ No

How long have you been living in Turkey ?

_____

Does your family have culture and heritage other than Turkish?

If so specify which

- ○ _____ Yes
- ○ No

How many generations of your family were in Turkey before you?

e.g. If your grandparents came you are third generation. If your parents came you are second generation. If you came alone or with your parents, you are first generation.

_____

Do both of your parents have the same origin?

Specify which parent has which origin.

- ○ _____ Yes
- ○ _____ No

DATI ANAGRAFICI PER LOOP

How many countries have you lived in?

Please, indicate only countries in which you have lived for more than three months

_____

LOOP PAESI ESTERI

In which country did you live?

If more than one, please indicate one country at a time

Country _____

How long did you live/have you lived in this country?

For periods between three months and a year write 1, and so on and so forth; always round the months up to the next full year.

e.g. If you lived in the country for 1 year and 6 months write 2; if you lived in the country for 3 years and 2 months write 4.

_____

DATI ANAGRAFICI CONCLUSIONE

How many languages do you use, for oral interactions?

Indicate only languages you use with a frequency of at least once a week

_____

Indicate which languages you speak, in which circumstances you would use that language (e.g. work, family, friends) and how frequently

Please, indicate how much of your time (%) you spend speaking these languages. Must equal a combined total of 100%.

Lingua 1		0
Lingua 2		0
Lingua 3		0
Lingua 4		0
Lingua 5		0
Lingua 6		0
Lingua 7		0
Lingua 8		0
Lingua 9		0
Lingua 10		0
Totale		0

Please, indicate your level of competency in Turkish

	Very poor	Poor	Not strongly either way	Fair	Very good
Speaking	○	○	○	○	○
Reading	○	○	○	○	○
Listening	○	○	○	○	○
Writing	○	○	○	○	○

In what language would you prefer to complete this questionnaire?

If you wish you can specify why

EDUCATION

How old were you when you learned Turkish ?

How many countries have you studied in?

List only countries in which you have studied for at least 3 months

DESCRIZIONE LOOP

You will now be asked to list, in chronological order the countries you studied in starting from elementary/primary school.

LOOP ISTRUZIONE

In which country do/did you study?

List a country at a time

Country

How many years did you study in this country for?

For periods between three months and a year write 1, and so on and so forth; always round the months up to the next full year.

e.g. If you studied in the country for 1 year and 6 months write 2; if you studied in the country for 3 years and 2 months write 4.

What language did you use the most while studying in this country?

WORK ACTIVITY

In how many countries have you worked for periods longer than three months?

Consider only countries in which you have worked for at least 3 months (UK included)

LOOP LAVORO

In what country do/did you work?

If more than one, please indicate one country at a time

Paese

How many years have you been working/did you work in this country?

For periods between three months and a year write 1, and so on and so forth; always round the months up to the next full year.

e.g. If you worked in the country for 1 year and 6 months write 2; if you worked in the country for 3 years and 2 months write 4.

Which language do/did you use the most when working in this country?

INTELLECTUAL, CULTURAL AND RECREATIONAL ACTIVITIES

Do you spend time with people who:

classifying "spending time" as, in your free time, doing activities with people at least once a week

you can select more than one answer

- ☐ are of your same cultural origins
- ☐ are of Turkish origins
- ☐ are of origins other than your own or Turkish origins (specify which)
- ☐ are not of Turkish origins (specify which)

What is the culture of those you spend the most time with?

With what culture do you most identify with?

e.g. British, North American, Latino, Italian, European, I feel I don't belong to any specific culture...

In what language do you watch movies the most, if at all?

- ○ Yes, I watch movies
- ○ No, I do not watch movies

If you read (books, newspapers, ...), in which language do you usually do so?

- ○ Yes, I read
- ○ No, I do not read

Do you practice activities (e. g. cooking/eating, watching tv shows, leasure time activities, sports) related to

you can select more than one answer.

Please, provide examples

- ☐ your culture of origin
- ☐ Turkish culture
- ☐ other cultures

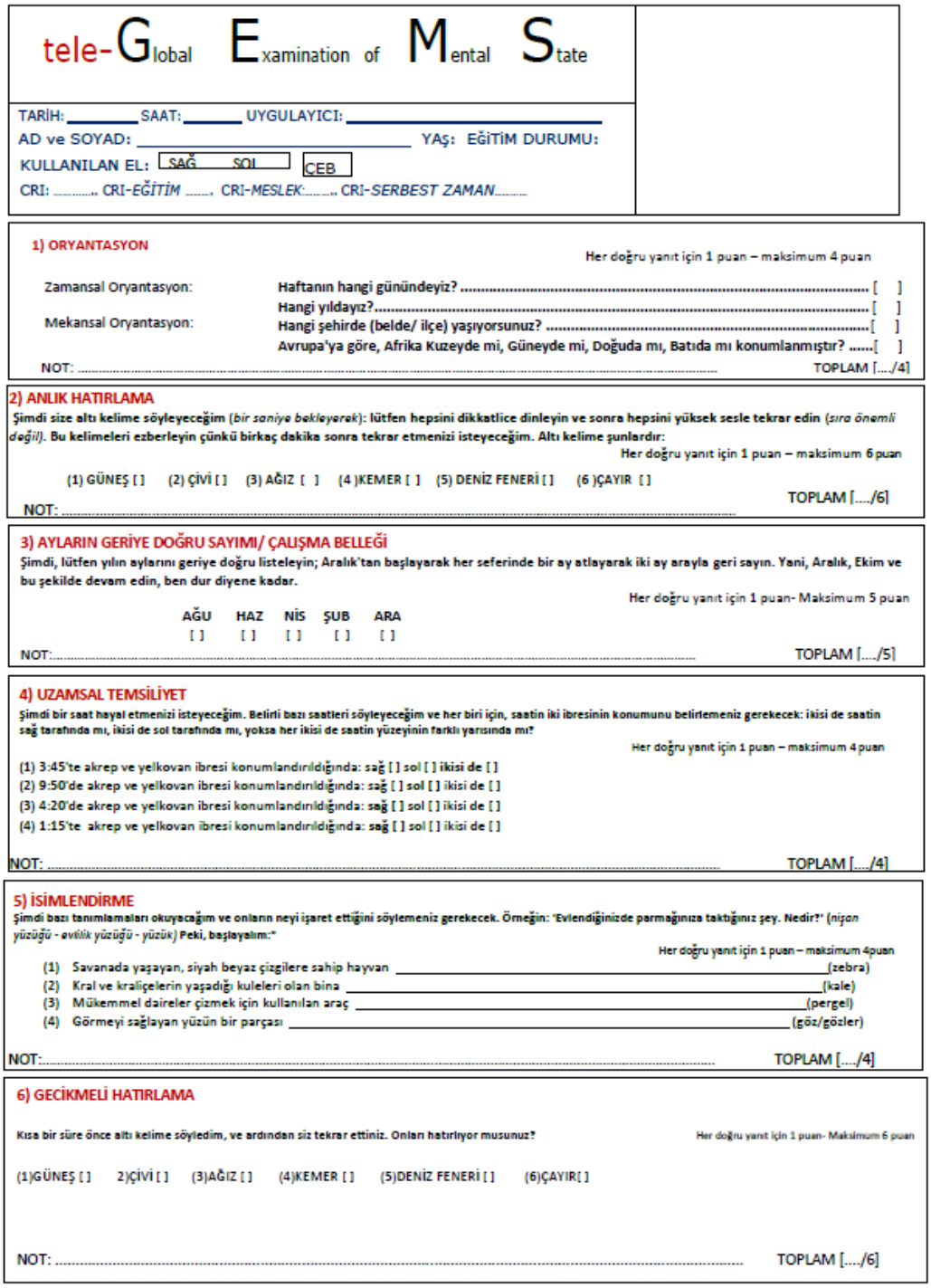
Are you a practising religious person?

You can select more than one answer

- ☐ Prevalent religion of your country of origin
- ☐ Prevalent religion of the country you live in
- ☐ Prevalent religion of another country
- ☐ I do not practice religion

APPENDIX B

"Tele-Global Examination of Mental State (Tele-GEMS)" Translated and Adapted Turkish Version



tele-Global Examination of Mental State

TARİH: _____ SAAT: _____ UYGULAYICI: _____

AD ve SOYAD: _____ YAŞ: EĞİTİM DURUMU:

KULLANILAN EL: SAĞ SOL CEB

CRI: ..... CRI-*EĞİTİM* ..... CRI-*MESLEK*:..... CRI-*SERBEST ZAMAN*.....

1) ORYANTASYON

Her doğru yanıt için 1 puan – maksimum 4 puan

Zamansal Oryantasyon: Haftanın hangi günündeyiz? ..... [ ]
Hangi yıldayız?..... [ ]

Mekansal Oryantasyon: Hangi şehirde (belde/ ilçe) yaşıyorsunuz? ..... [ ]
Avrupa'ya göre, Afrika Kuzeyde mi, Güneyde mi, Doğuda mı, Batıda mı konumlanmıştır? ..... [ ]

NOT: ..... TOPLAM [..../4]

2) ANLIK HATIRLAMA

Şimdi size altı kelime söyleyeceğim (*bir saniye bekleyerek*): lütfen hepsini dikkatlice dinleyin ve sonra hepsini yüksek sesle tekrar edin (*sıra önemli değil*). Bu kelimeleri ezberleyin çünkü birkaç dakika sonra tekrar etmenizi isteyeceğim. Altı kelime şunlardır:

Her doğru yanıt için 1 puan – maksimum 6 puan

(1) GÜNEŞ [ ] (2) ÇİVİ [ ] (3) AĞIZ [ ] (4)KEMER [ ] (5) DENİZ FENERİ [ ] (6)ÇAYIR [ ]

NOT: ..... TOPLAM [...../6]

3) AYLARIN GERİYE DOĞRU SAYIMI/ ÇALIŞMA BELLEĞİ

Şimdi, lütfen yılın aylarını geriye doğru listeleyin; Aralık'tan başlayarak her seferinde bir ay atlayarak iki ay arayla geri sayın. Yani, Aralık, Ekim ve bu şekilde devam edin, ben dur diyene kadar.

Her doğru yanıt için 1 puan- Maksimum 5 puan

AĞU	HAZ	NİS	ŞUB	ARA
[ ]	[ ]	[ ]	[ ]	[ ]

NOT:..... TOPLAM [...../5]

4) UZAMSAL TEMSİLİYET

Şimdi bir saat hayal etmenizi isteyeceğim. Belirli bazı saatleri söyleyeceğim ve her biri için, saatin iki ibresinin konumunu belirlemeniz gerekecek: ikisi de saatin sağ tarafında mı, ikisi de sol tarafında mı, yoksa her ikisi de saatin yüzeyinin farklı yarısında mı?

Her doğru yanıt için 1 puan – maksimum 4 puan

(1) 3:45'te akrep ve yelkovan ibresi konumlandırıldığında: **sağ [ ] sol [ ] ikisi de [ ]**
(2) 9:50'de akrep ve yelkovan ibresi konumlandırıldığında: **sağ [ ] sol [ ] ikisi de [ ]**
(3) 4:20'de akrep ve yelkovan ibresi konumlandırıldığında: **sağ [ ] sol [ ] ikisi de [ ]**
(4) 1:15'te akrep ve yelkovan ibresi konumlandırıldığında: **sağ [ ] sol [ ] ikisi de [ ]**

NOT: ..... TOPLAM [...../4]

5) İSİMLENDİRME

Şimdi bazı tanımlamaları okuyacağım ve onların neyi işaret ettiğini söylemeniz gerekecek. Örneğin: 'Evlendiğinizde parmağınıza taktığınız şey. Nedir?' (*nişan yüzüğü - evlilik yüzüğü - yüzük*) Peki, başlayalım:"

Her doğru yanıt için 1 puan – maksimum 4puan

(1) Savanada yaşayan, siyah beyaz çizgilere sahip hayvan _____(zebra)
(2) Kral ve kraliçelerin yaşadığı kuleleri olan bina _____(kale)
(3) Mükemmel daireler çizmek için kullanılan araç _____(pergel)
(4) Görmeyi sağlayan yüzün bir parçası _____(göz/gözler)

NOT:..... TOPLAM [...../4]

6) GECİKMELİ HATIRLAMA

Kısa bir süre önce altı kelime söyledim, ve ardından siz tekrar ettiniz. Onları hatırlıyor musunuz?

Her doğru yanıt için 1 puan- Maksimum 6 puan

(1)GÜNEŞ [ ] 2)ÇİVİ [ ] (3)AĞIZ [ ] (4)KEMER [ ] (5)DENİZ FENERİ [ ] (6)ÇAYIR[ ]

NOT: ..... TOPLAM [...../6]

7) KAVRAMA

Lütfen dikkatlice talimatları dinleyin ve istenileni yapın: B harfini bir kez söyledikten sonra A harfini iki kez söyleyin. ***Talimatların tekrarı veya önerilerde bulunmak YASAKTIR.***

1 puan, eğer uygulama doğruysa – maksimum 1 puan

[ ] B Harfi [ ] İki kez A Harfi

NOT: ..... TOPLAM [..../3]

8) İŞİTSEL DİKKAT

Şimdi size bir dizi sayı okuyacağım. '2' dediğimde 'YEŞİL' demeniz gerekecek, '4' dediğimde ise 'KIRMIZI' demeniz gerekecek. Diğer numaraları duyduğunuzda hiçbir şey söylemeyeceksiniz. Yani, eğer '2' dersem, siz ... diyeceksiniz ve eğer '4' dersem, siz ... diyeceksiniz. Deneyelim: 2, 3, 6, 2, 4. Anladıysanız, testi yapmaya devam edelim, ***(her iki saniyede bir sayı okuyun).***

Her doğru yanıt için 1 puan- Maksimum 8 puan

2	**6**	**7**	**4**	**9**	**1**	**3**	**2**	**2**	**9**	**8**	**5**	**6**
3	**2**	**4**	**6**	**7**	**9**	**1**	**4**	**7**	**6**	**8**	**9**	**4**

NOT: ..... TOPLAM [..../8]

9) SÖZEL AKICILIK

Şimdi, bir dakika içinde, ***(kişisel isimler ve şehir isimlerden kaçınınız)*** **'T' harfi ile başlayan mümkün olduğunca çok kelime söylemenizi istiyorum. Bir örnek 'Trafik'. (Eğer özel isim söylenilirse,onlara bu kategoriden kaçınmalarını hatırlatın ve süreyi durdurmayın). Her doğru kelime için 1 puan. 1 dakikada maksimum kelime sayısı.**

1_____	5_____	9_____	13_____	17_____	21_____	25_____
2_____	6_____	10_____	14_____	18_____	22_____	26_____
3_____	7_____	11_____	15_____	19_____	23_____	27_____
4_____	8_____	12_____	16_____	20_____	24_____	28_____

NOT: ..... TOPLAM [.....]

11) METAFOR KAVRAMA

Şimdi size bir cümle okuyacağım ve üç olası açıklama vereceğim. Lütfen, en uygun olanı seçin.

Bugün şehir kütüphanesini ziyaret ettim. O arşiv bir maden!

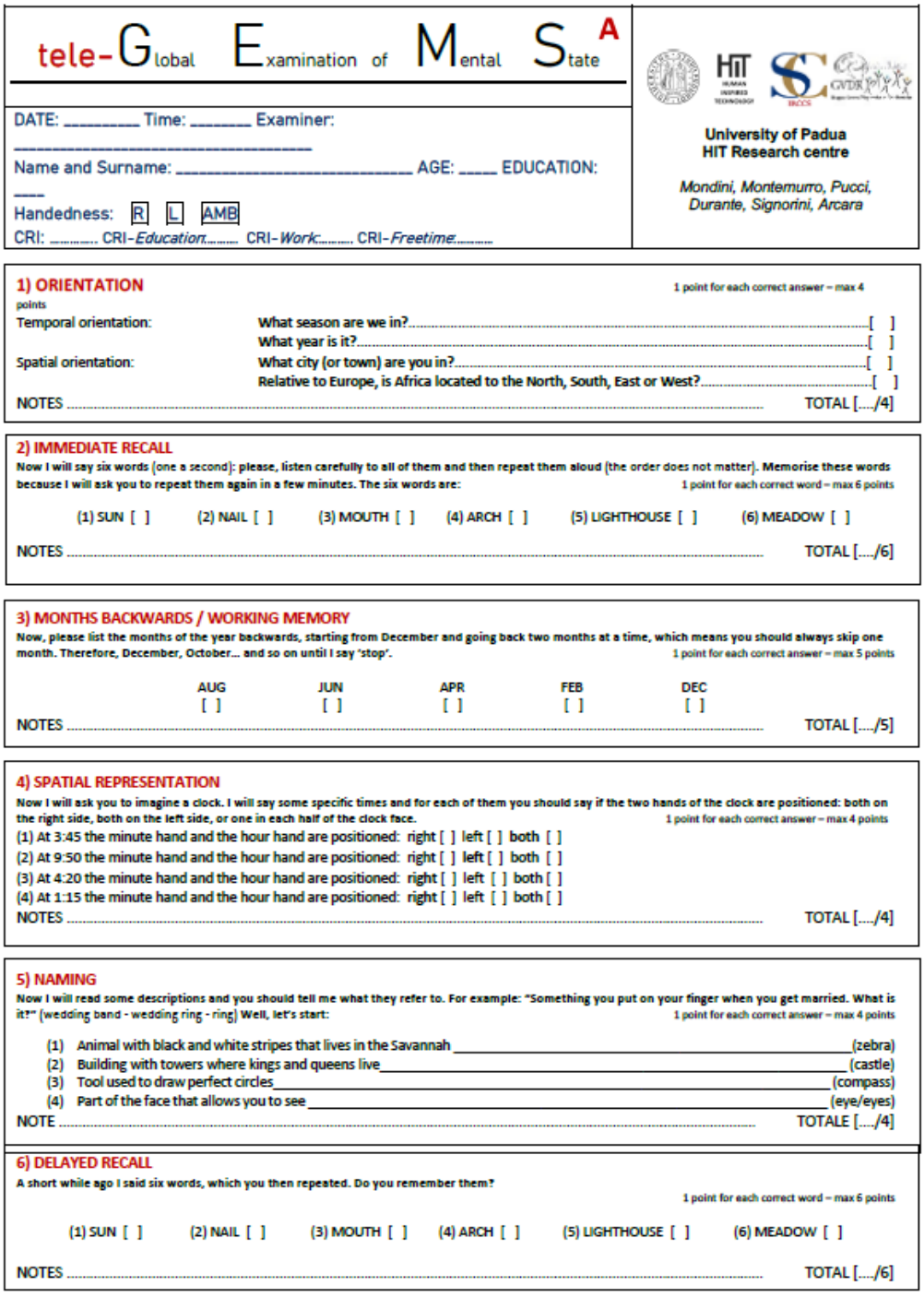
1 puan,eğer cevap doğruysa

- ▫ Bu arşiv değerli mücevherler içerir
- ▫ Bu arşiv ilginç belgeler içerir
- ▫ Bu arşiv şehir merkezindedir

NOT:..... TOPLAM [..../1]

TOPLAM HAM PUAN..... [ ]

“Tele-Global Examination of Mental State (Tele-GEMS)” English Version



tele-Global Examination of Mental State A

DATE: _____ Time: _____ Examiner: _____

Name and Surname: _____ AGE: _____ EDUCATION: _____

Handedness: R L AMB

CRI: _____ CRI-*Education*_____ CRI-*Work*_____ CRI-*Freetime*_____

University of Padua
HIT Research centre

Mondini, Montemurro, Pucci, Durante, Signorini, Arcara

1) ORIENTATION

1 point for each correct answer – max 4 points

Temporal orientation: What season are we in? [ ]
What year is it? [ ]

Spatial orientation: What city (or town) are you in? [ ]
Relative to Europe, is Africa located to the North, South, East or West? [ ]

NOTES ..... TOTAL [..../4]

2) IMMEDIATE RECALL

Now I will say six words (one a second): please, listen carefully to all of them and then repeat them aloud (the order does not matter). Memorise these words because I will ask you to repeat them again in a few minutes. The six words are:

1 point for each correct word – max 6 points

(1) SUN [ ] (2) NAIL [ ] (3) MOUTH [ ] (4) ARCH [ ] (5) LIGHTHOUSE [ ] (6) MEADOW [ ]

NOTES ..... TOTAL [..../6]

3) MONTHS BACKWARDS / WORKING MEMORY

Now, please list the months of the year backwards, starting from December and going back two months at a time, which means you should always skip one month. Therefore, December, October... and so on until I say 'stop'.

1 point for each correct answer – max 5 points

AUG [ ] JUN [ ] APR [ ] FEB [ ] DEC [ ]

NOTES ..... TOTAL [..../5]

4) SPATIAL REPRESENTATION

Now I will ask you to imagine a clock. I will say some specific times and for each of them you should say if the two hands of the clock are positioned: both on the right side, both on the left side, or one in each half of the clock face.

1 point for each correct answer – max 4 points

(1) At 3:45 the minute hand and the hour hand are positioned: right [ ] left [ ] both [ ]
(2) At 9:50 the minute hand and the hour hand are positioned: right [ ] left [ ] both [ ]
(3) At 4:20 the minute hand and the hour hand are positioned: right [ ] left [ ] both [ ]
(4) At 1:15 the minute hand and the hour hand are positioned: right [ ] left [ ] both [ ]

NOTES ..... TOTAL [..../4]

5) NAMING

Now I will read some descriptions and you should tell me what they refer to. For example: "Something you put on your finger when you get married. What is it?" (wedding band - wedding ring - ring) Well, let's start:

1 point for each correct answer – max 4 points

(1) Animal with black and white stripes that lives in the Savannah _____ (zebra)
(2) Building with towers where kings and queens live _____ (castle)
(3) Tool used to draw perfect circles _____ (compass)
(4) Part of the face that allows you to see _____ (eye/eyes)

NOTE ..... TOTALE [..../4]

6) DELAYED RECALL

A short while ago I said six words, which you then repeated. Do you remember them?

1 point for each correct word – max 6 points

(1) SUN [ ] (2) NAIL [ ] (3) MOUTH [ ] (4) ARCH [ ] (5) LIGHTHOUSE [ ] (6) MEADOW [ ]

NOTES ..... TOTAL [..../6]

7) COMPREHENSION

Please listen carefully to the following instructions and do what is requested of you: Say the letter A twice after saying the letter B once. Suggestions and repetitions of the instructions are NOT allowed.

1 point if the execution is correct – max 1 point

[ ] Letter B [ ] Twice letter A

NOTES ..... TOTAL [..../3]

8) AUDITORY ATTENTION

Now I will read a series of numbers and every time you hear '2' you must say the word 'GREEN', and every time you hear '4' you must say the word 'RED'; when I read other numbers, you must not say anything. So, if I say '2', you say ... and if I say '4', you say .... Let's try: 2, 3, 6, 2, 4. If understood, go on with the test reading a number every two seconds.

1 point for each correct answer – Max 8 points

2	6	7	4	9	1	3	2	2	9	8	5	6
3	2	4	6	7	9	1	4	7	6	8	9	4

NOTES ..... TOTAL [..../8]

9) VERBAL FLUENCY

Now, I would like you to say in one minute as many words as you can think of (avoiding personal names and city names) which begin with the letter 'T'. An example is 'table'. (If they say proper nouns, remind them to avoid these categories, without stopping the timer). 1 point for each correct word in max 1 minute

1_____	5_____	9_____	13_____	17_____	21_____	25_____
2_____	6_____	10_____	14_____	18_____	22_____	26_____
3_____	7_____	11_____	15_____	19_____	23_____	27_____
4_____	8_____	12_____	16_____	20_____	24_____	28_____

NOTES ..... TOTAL [.....]

11) METAPHOR COMPREHENSION

Now I'll read you a sentence and three possible explanations for it. Please, choose the most appropriate.

1 point if the answer is correct

Today I visited the city library. That archive is a mine!

- ☐ That archive contains precious jewels
- ☐ That archive contains interesting documents
- ☐ That archive is in the city centre

NOTES ..... TOTAL [..../1]

TOTAL raw score..... [ ]