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Investigating The Psycholinguistic Link Between Multilingualism and Emotional Intelligence: A Case Study of Adult Patients at Drid Hocine Psychiatric Hospital

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Dedication

To our parents, whose love and guidance have been our foundation.

To my partner, my greatest supporter.

To our friends, whose laughter and encouragement kept us going.

And to everyone who believed in us, your faith made this possible.

Acknowledgment

This research has been enriched by the guidance and expertise of many.

We are profoundly grateful to our supervisor, Mrs. Messaoudi,

whose unwavering support, thoughtful guidance, and insightful

feedback shaped every phase of this research.

We also wish to extend our heartfelt thanks to the staff

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and willingness to accommodate this study were invaluable.

Finally, to everyone who contributed

ideas, time, and constructive criticism.

Abstarct :

Multilingualism has been shown to influence emotional awareness and regulation, yet its role in clinical contexts remains underexplored. This thesis investigates how the use of multiple languages affects emotional intelligence among patients in an Algerian psychiatric setting. Drawing on a self-report measure of trait emotional intelligence and semi-structured interviews, supplemented by computerized text analysis of patients' spontaneous language use, the study reveals that switching to a non-native language tends to dampen emotional intensity, whereas returning to one's mother tongue restores rich affective engagement. Furthermore, differences emerge across certain demographic groups that display particularly vivid emotional expressiveness. These findings highlight the dual function of multilingualism—enabling cognitive distance for emotion regulation and reactivating culturally anchored emotional schemas for authentic processing. Implications include integrating strategic language transitions into therapeutic practice and developing training programs that equip clinicians to identify multilingual emotional dynamics. Future research should broaden these insights using longitudinal designs and incorporate physiological measures to deepen understanding of the language–emotion relationship.

Keywords: multilingualism, emotional intelligence, clinical psychology, psycholinguistics, emotions

الملخص

لقد أظهرت الأبحاث أن التعدّد اللغوي يؤثر في وعي الأفراد بمشاعرهم وقدرتهم على تنظيمها، غير أن دوره في السياقات السريرية لا يزال غير مستكشف بشكل كافٍ. يتناول هذا البحث كيفية تأثير التعدد اللغوي على الذكاء العاطفي لدى المرضى في مستشفى دريد حسين للأمراض النفسية بالجزائر. حيث استندت الدراسة إلى استبيان ذاتي لقياس الذكاء العاطفي القائم على السمات، وإلى مقابلات شبه مهيكلة مع المشاركين، مع تحليل نصوصهم لقياس أنماط التعبير الانفعالي. تكشف النتائج أن الانتقال إلى لغة أجنبية يقابله انخفاض في حدة التعبير العاطفي، في حين تتيح العودة إلى اللغة الأم استعادة عمق المشاركة الشعورية. كما تشير الملاحظات إلى تباينات بين الفئات الديموغرافية، حيث بدأ أنّ بعض الجماعات أكثر قدرة على التعبير العاطفي الثري وتؤكد هذه النتائج أن التعدّد اللغوي يؤدي دورًا مزدوجًا: يوفّر مسافة معرفية تنظيم الانفعالات، ويعيد تنشيط مخزون ثقافي–عاطفي عميق عند استخدام اللغة الأم. تنطوي هذه النتائج على توصيات كتهيئة برامج تدريبية تساعد الأخصائيين النفسيين على فهم واستخدام هذه الديناميات اللغوية. وفي المستقبل، يُستحسن إجراء دراسات أطول تشمل مراقبة التغيرات الانفعالية مع مرور الوقت، وإضافة مقاييس فسيولوجية (مثل مراقبة معدل ضربات القلب) لفهم أعمق لتفاعل اللغة مع المشاعر.

الكلمات المفتاحية: الذكاء العاطفي ،التعدد اللغوي، اللغة الأم ،اللغة الأجنبية، إنفعال

List of abbreviations

- **EI:** Emotional Intelligence
- **L1:** First Language
- **L2:** Second Language
- **MSA:** Modern Standard Arabic
- **RQ:** Research Question
- **TEIQue:** Trait Emotional Intelligence Questionnaire
- **LIWC:** Linguistic Inquiry and Word Count
- **EEG:** electroencephalography
- **MT:** Mother Tongue

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General Introduction

1.1. Background

The intersections of language, emotion, and cognition form a captivating branch of psycholinguistic research. In multilingualism, the ability to employ multiple languages transcends mere linguistic skill; it shapes how individuals perceive and respond to the world and themselves. In our globalized era marked by constant cultural and linguistic contact, unraveling the deeper implications of multilingualism has become increasingly vital.

Recent work suggests that multilingual individuals develop greater mental flexibility and heightened emotional intelligence (EI) through exposure to diverse languages, cultures, and communicative norms. As Dewaele (2019) notes, "Multilingualism may provide individuals with a heterogeneous experiential background that is conducive to the development of emotional competence" (p. 318). In this study, multilingualism denotes an individual's ability to use two or more languages at varying levels of fluency (Grosjean, 2010), while emotional intelligence follows Mayer and Salovey's (1997) model, defined as one's capacity to perceive, understand, and regulate emotions in oneself and others. Both constructs extend well beyond communication: they critically influence emotional regulation, psychological resilience, and interpersonal relationships, particularly in settings where emotional processing is challenged.

Psycholinguistics supplies the theoretical frameworks and methods for examining how language processing intertwines with cognition and emotion. It investigates the psychological and neural mechanisms that allow us to acquire, comprehend, and generate language—and, in turn, how the languages we speak shape our emotional experiences (Pavlenko, 2014). For instance, some languages may cultivate greater sensitivity to feeling words, while culture-specific terms (e.g., Japanese "amae") illustrate how linguistic differences modulate emotional expression and perception. By employing reaction time measures, neuroimaging, and cross-linguistic comparisons, psycholinguistics reveals how code-switching, language choice, and context influence the way emotions are felt and expressed.

This study focuses on the Algerian context, where multilingualism is not merely an individual trait but a societal reality. Algeria's complex linguistic landscape includes Modern Standard Arabic (MSA) as the language of formal education and media, Tamazight (Berber) as a national and official language, French as a dominant language in administration and science (a legacy of colonial history), and English, which is rapidly emerging among youth and in technological domains (Benrabah, 2007; Aitsiselmi, 2018). As a result,

Algerian speakers routinely navigate a fluid multilingual environment, constantly code-switching between languages and the distinct cultural and emotional frameworks they carry.

Within psychiatric institutions such as Drid Hocine Psychiatric Hospital, this multilingual dynamic becomes especially critical. Both patients and professionals must negotiate complex emotional realities using multiple linguistic codes. In emotionally intense clinical settings, certain languages may convey feelings more neutrally, whereas others may elicit emotional memories or facilitate deeper self-expression (Pavlenko, 2005). Understanding how this interplay operates in clinical contexts is essential for improving mental health outcomes in multilingual societies.

1.1.1. The Role of Emotional Intelligence in Psychiatric Contexts:

Emotional intelligence (EI) is crucial in psychiatric settings marked by emotional dysregulation, cognitive distortions, and interpersonal difficulties. Patients with stronger EI recognize and express their feelings more effectively, adopt healthier coping strategies, and achieve better outcomes in disorders such as depression, anxiety, borderline personality disorder, and schizophrenia. Likewise, clinicians who accurately read and empathize with emotional cues foster a stronger therapeutic alliance, enhancing diagnostic clarity and treatment efficacy. In multilingual, multicultural contexts like Algeria, where language and culture shape how emotions are experienced and conveyed, integrating EI with cultural and linguistic awareness further improves patient engagement and delivers more sensitive, effective mental health care.

1.1.2. Relevance and Significance of the Study

This research contributes to psycholinguistics and clinical psychology/psychiatry by informing therapeutic practices and clinician training in multilingual settings. It advances sociolinguistics by illustrating how linguistic identity and power dynamics shape emotional expression. It informs language policy and healthcare planning in Algeria by providing evidence for integrating multilingual strategies into clinical curricula and services.

Grounded in data from Drid Hocine Psychiatric Hospital, the study bridges theory and practice with concrete recommendations for language-aware assessment, strategic code-switching, and interpreter-supported care in multilingual mental-health contexts.

1.2. Statement of the Problem

Despite the growing body of literature on multilingualism and cognitive psychology, barely any attention has been paid to how multilingual individuals experience and express emotions across different languages, particularly in clinical settings. Most of the existing studies have focused on the impact of multilingualism on cognitive functions such as memory, attention, and executive control (Bialystok, 2009; Kroll & Białystok, 2013), often neglecting the emotional dimension of multilingual experience. Meanwhile, studies in applied linguistics and psychology have suggested that language choice has a significant impact on emotional expression. People may feel more comfortable discussing traumatic or intimate topics in a second language because of emotional distancing (Dewaele, 2010; Pavlenko, 2006).

Yet, these findings have rarely been applied to psychiatric contexts, where emotional articulation and regulation are central to diagnosis and therapeutic progress. In multilingual environments such as Algeria, this oversight may lead to miscommunication between patients and mental health professionals, misinterpretation of emotional states, and ultimately, ineffective or culturally insensitive care. Furthermore, there is a lack of research investigating how linguistic repertoire might enhance or hinder emotional intelligence, a core skill in both patients' healing and clinicians' effectiveness.

Therefore, the core problem this research addresses is the lack of empirical and theoretical understanding of how multilingualism influences emotional intelligence in psychiatric settings, using Drid Hocine Psychiatric Hospital as a case study. This issue becomes more pressing when considering Algeria's cultural-linguistic plurality and the sensitive nature of psychiatric care, where language plays a dual role: it is both a diagnostic tool and a therapeutic medium.

1.3. Research Objectives and Questions

The primary objective of this study is to explore the relationship between multilingualism and emotional intelligence within the psycholinguistic framework, with specific attention to clinical applications in the psychiatric domain. The research aims to bridge the gap between cognitive and affective aspects of multilingualism by focusing on how language use affects emotional awareness, regulation, and communication among both patients and professionals.

This leads to the following research questions:

1. How does multilingualism influence the perception and expression of emotions among patients and staff at Drid Hocine Psychiatric Hospital?

2. What psycholinguistic mechanisms link the use of multiple languages to the processing and expression of emotions in psychiatric contexts?

These questions aim not only to uncover the emotional strategies used by multilingual individuals but also to identify language-based barriers or facilitators in emotional expression and treatment processes.

1.4. Hypothesis

This study proposes that multilingual individuals who regularly use two or more languages will demonstrate higher levels of emotional intelligence, including emotional awareness, understanding, regulation, and utilization, compared to individuals who operate in only one language.

Research in cognitive psychology has shown that managing multiple linguistic systems enhances executive functions such as attentional control and cognitive flexibility (Bialystok, Craik, & Luk, 2012)-abilities that are fundamental to effective emotion regulation and awareness (Mayer & Salovey, 1997). Furthermore, empirical evidence indicates that multilingual speakers exhibit greater emotional competence than their monolingual counterparts, with higher scores on standardized measures of trait emotional intelligence (Dewaele, 2019). Taken together, these findings support the prediction that the cognitive benefits of multilingualism extend into the emotional domain, resulting in superior emotional intelligence among multilingual individuals.

1.5. Theoretical Framework

This study is anchored in two major theoretical frameworks: Linguistic Relativity Theory and the Four-Branch Model of Emotional Intelligence.

- Linguistic Relativity Theory

While early versions of the theory emphasized linguistic determinism, modern scholars such as Slobin (1996) and Pavlenko (2014) propose a more flexible and refined version.

They suggest that language influences habitual thought rather than strictly determining it. This influence is especially apparent in emotional expression, where some languages possess emotion-related words or expressions that are deeply tied to a particular culture's values, experiences, and social norms. For instance, studies have shown that people tend to experience less emotional arousal when discussing traumatic events in their second language (Harris, Ayçiçeği, & Gleason, 2003) and may choose a particular language to distance themselves or gain perspective (Pavlenko, 2006). These insights provide a powerful lens through which to analyze the emotional dynamics of patients and staff who shift between Arabic, French, Tamazight, and English, and even other foreign languages in a psychiatric context.

- Emotional Intelligence Framework

The second theoretical support is the Emotional Intelligence model proposed by Mayer and Salovey (1997), which outlines EI as a set of four interrelated abilities: Perceiving, using, understanding, and managing emotions.

In clinical environments, these competencies are essential for both patients, who need to understand and regulate their emotional experiences, and professionals, who must empathize, assess, and guide emotional communication. In a multilingual setting, these abilities may be enhanced or hindered depending on the language context. For example, a patient may express anger more fluently in Darija but discuss trauma in French due to emotional distancing and detachment. Similarly, a clinician's ability to perceive and interpret emotions might vary based on their linguistic and cultural competence.

1.6. Brief overview of Methodology

This study uses a mixed-methods case study at Drid Hocine Psychiatric Hospital to examine how multilingualism affects emotional intelligence. Thirty-two bilingual or multilingual adult patients were assessed using the Trait Emotional Intelligence Questionnaire (TEIQue), and their interview transcripts were analyzed with Linguistic Inquiry and Word Count (LIWC). Semi-structured interviews with therapists and linguists provided qualitative insights into language-specific emotional expression. Ethical protocols, including informed consent, therapist oversight, and confidentiality, ensured rigor and participant safety. This design allowed for a culturally sensitive, comprehensive analysis of emotional perception, regulation, and communication across Arabic, Berber, French, and English.

1.7. The Structure

It begins with a theoretically broad-scope Chapter One, providing conceptual grounding. This is followed by Chapter Two, the fieldwork chapter, which explains the mixed-methods approach, including the use of a TEIQUE (Trait Emotional Intelligence Questionnaire) test, and the collection of both qualitative and quantitative data. Based on the fields of psycholinguistics and psychology, the thesis uses the case study design since it investigates how multilingualism influences emotional awareness, regulation, and communication in clinical and psychiatric settings. The design is specifically focused on the purpose of the study to uncover psycholinguistic mechanisms that build emotional expression in multilingual psychiatric settings and to inform language-sensitive practices in psychiatric care.

Chapter One
Literature Review

2.1. Introduction and Scope

The relationship between multilingualism and emotional intelligence (EI) presents a compelling area of inquiry, particularly in clinical contexts where language and emotion intersect. Emotional intelligence, defined by Mayer and Salovey (1997) as the capacity to perceive, understand, manage, and utilize emotions effectively, underpins interpersonal and intrapersonal functioning. This review synthesizes theoretical frameworks and empirical studies on EI and multilingualism, situates these findings within Algeria's unique sociolinguistic landscape, and identifies gaps that the present study aims to address.

2.2. Multilingualism

Multilingualism refers to the ability of an individual or a community to use more than two languages with varying degrees of proficiency and adaptability. At the individual level, Grosjean (2010) describes a multilingual person as someone who "uses different languages in different domains of life not as a set of isolated competencies, but as an integrated repertoire" (p. 4). This conception emphasizes that multilinguals draw on their entire linguistic repertoire, rather than switching between discrete "monolingual" competences, when communicating.

2.2.1. Key Dimensions of Multilingualism

2.2.1.1. Proficiency and Balance

Multilingual proficiency is not necessarily equal across languages. As Baker (2011) notes, "Multilinguals seldom have native-like command of all their languages; instead, they demonstrate variable skill levels depending on factors such as age of acquisition, frequency of use, and context" (p. 23). Thus, it is more accurate to speak of language Repertoires and dominance profiles rather than strict "levels" of multilingualism.

2.2.1.2. Contexts of Use

At the societal level, UNESCO (2003) estimates that over 43% of the world's population lives in multilingual environments, where more than one language is used in education, administration, commerce, or family life. In Algeria, for example, Arabic, Tamazight, and French coexist in official and everyday domains (Benrabah, 2007), creating a rich multilingual ecology that shapes individuals' linguistic choices.

2.2.1.3. Functional and Affective Domains

Baker (2011) distinguishes between instrumental multilingualism—using languages for transactional purposes such as work or study—and integrative multilingualism, where languages carry social and emotional significance (p. 45). Integrative multilingualism underlies phenomena like code-switching for solidarity or emotional distancing in sensitive conversations (Bond, 2001).

2.2.2. Types of Multilingualism

Baker (2001) emphasizes that multilingualism can be viewed from two levels: as an individual attribute or as a societal condition. In his terms, bilingualism (by extension, multilingualism) may be "an individual possession" or "a group possession," a distinction now commonly phrased as *individual vs. societal* bilingualism. Cenoz (2013) similarly notes that multilingualism is studied from "both an individual and a societal perspective," encompassing personal language repertoires and community language profiles. In Algeria, for example, societal multilingualism is evident in official language policyStandard Arabic and Tamazight are both national languages, and French remains widely used by the government and education. Concurrently, many Algerians are individual bilinguals or trilinguals, Abbassia (2021) describes Algeria's "complex matrix of languages," listing Arabic, Tamazight, and French as standard languages alongside dialects like Algerian Arabic and Berber. Thus, Algeria illustrates a multilingual society (with multiple official languages) in which individuals typically command multiple languages or varieties.

2.2.2.1. Individual vs. Societal Multilingualism

Individual multilingualism refers to a person's ability to use more than one language, whereas societal multilingualism refers to the presence and use of multiple languages within a community. For example, Baker (2001) explains that an individual may speak two languages in daily life, while societal bilingualism analyzes how a whole community uses multiple languages. Cenoz (2013) echoes this: a society may be multilingual if its institutions and population function in several languages, regardless of each person's full repertoire. In Algeria's case, the society is officially trilingual: Standard Arabic and Tamazight are recognized as national languages, and French is a key legacy language. However, not every person speaks all three: individuals often use only a subset of these (e.g., an Algerian may use Algerian Arabic and French but not Tamazight, or vice versa).

Hence, Algeria exemplifies societal multilingualism (many languages present in the nation) while its citizens exhibit individual multilingualism to varying extents.

2.2.2.2. Simultaneous vs. Sequential Multilingualism

Another common distinction is based on the age of acquisition. Simultaneous bilinguals acquire two languages from birth (or very early in life), whereas sequential (or successive) bilinguals learn a second language after establishing a first. For example, Wang (2024) defines simultaneous bilingualism as exposure to two languages from birth (often leading to native-like proficiency in both). In contrast, sequential bilingualism involves learning a second language later, typically when the child enters school or meets new interlocutors. Baker (2001) also lists age as a dimension: children are labeled simultaneous or sequential learners depending on whether their two languages began from infancy or at distinct stages. In Algeria, many children are sequential bilinguals: most grow up speaking an Arabic dialect or Tamazight at home and begin learning French (or Modern Standard Arabic) when they enter school. A smaller number may be simultaneous bilinguals if, for example, one parent speaks Arabic and the other Tamazight (or if both Algerian Arabic and Berber are used in the home from birth). These terms help clarify bilingual development: simultaneous multilinguals often achieve more balanced early proficiency, whereas sequential learners may display an early dominance of the first language (L1) with a later emerging second language (L2).

2.2.2.3. Balanced vs. Dominant Multilingualism

Multilinguals are also characterized by a balance of proficiency. A balanced bilingual (or multilingual) is roughly equally proficient in each language, while a dominant bilingual is substantially stronger in one language. In theory, a balanced bilingual would have native-like competence in both languages. However, Baker (2001) and others point out that perfectly balanced competence is very rare in practice. More often, one language is dominant. As Baker notes, dominance is distinct from mere ability: a person might be competent in two languages but still "be dominant in one". Wang (2024) likewise describes simultaneous bilinguals as either "balanced" (native-like in both L1 and L2) or "unbalanced" (one stronger than the other). In Algeria's sociolinguistic reality, most speakers are dominant in one language in a given domain.

For instance, Rouabah (2022) observes that although Arabic has national prestige, "French continues to dominate the political and economic scenes". Thus, in professional and academic settings, French may be the dominant language, while Algerian Arabic or Tamazight dominate at home or in local communities. Truly balanced multilingualism – equal high proficiency across languages – is an idealization; most bilingual Algerians function as dominant speakers of one language while maintaining receptive or limited use of others.

2.2.2.4. Additive vs. Subtractive Multilingualism

Lambert first distinguished additive bilingualism—where L2 is acquired without displacing L1—from subtractive bilingualism—where L2 learning undermines or replaces L1 (Lambert, 1974). Cummins (1979, 2000) expanded this framework with his interdependence hypothesis, demonstrating that additive contexts foster cross-linguistic transfer and superior cognitive and academic outcomes, whereas subtractive contexts lead to L1 attrition and diminished performance (Cummins, 1979; Cummins, 2000). Baker (2001) synthesizes these developments, observing that in additive scenarios children "multiply" their language repertoire, while in subtractive ones L1 proficiency "divides" under the social dominance of L2 (Baker, 2001).

In Algeria, historical language policies illustrate both patterns. The post-independence Arabization of education and administration was largely subtractive toward French (reducing French's role) and sometimes even toward native dialects, whereas the later constitutional recognition of Berber (in 2016) represents an additive step by valorizing an indigenous language. Rouabah (2022) notes this dynamic: French was once the sole official language in colonial Algeria but is now officially foreign, while Standard Arabic became official (subtractive of colonial language). In the classroom context, current Algerian policy aspires to additive multilingualism (learning French or English without losing Arabic), but critics argue that practical outcomes often remain subtractive for minority languages.

2.2.2.5. Receptive vs. Productive Multilingualism

A final distinction concerns the mode of use. Receptive multilingualism occurs when speakers use different languages, and they only need to understand each other's speech. Zeevaert and Ten Thije (2007), as cited by Cenoz (2013), define receptive multilingualism as a constellation in which each interlocutor speaks their native tongue while understanding the other's language.

The converse is productive multilingualism: each participant may actively switch and produce multiple languages in communication. Baker (2001) highlights this skill-based view: receptive skills are listening and reading, whereas productive skills are speaking and writing.

A classic example (from Scandinavia) is mutually intelligible languages like Swedish and Norwegian, where each person speaks their language and understands the other. In Algeria, a similar pattern can emerge: for instance, many Algerian Arabic speakers understand Modern Standard Arabic (heard in media or school) but typically reply in dialect; they are receptively bilingual in Arabic varieties even if their active usage is one form. Likewise, Amazigh varieties passively comprehend each other's dialect without actively speaking it. Thus, Algerian multilingual communication often involves receptive versus productive competence, matching Baker's receptive/productive skill distinction.

To sum up, scholars such as Baker, Cenoz, and others provide a classification of multilingualism that captures different aspects of bilingual experience – societal vs. individual, timing of acquisition, balance of proficiency, additive vs. subtractive contexts, and receptive vs. productive use. These distinctions are useful for analyzing Algeria's complex linguistic landscape, where Arabic (standard and dialectal), Tamazight, and French co-exist in shifting roles. For instance, one Algerian speaker might be an individual sequential bilingual (Arabic L1 at home, learning French later) who is dominant in Arabic, functions additively by preserving Arabic through French study, and often practices receptive listening to Standard Arabic. By contrast, Algeria as a society remains multilingual, officially supporting multiple languages but still negotiating which languages are dominant in education, media, and government. Understanding these categories helps situate Algerian language practices in the wider theoretical framework of multilingualism.

2.3. The Foundational Branches of Emotional Intelligence

Emotional intelligence (EI) refers to a set of interrelated cognitive–emotional abilities that enable individuals to navigate their own affective experiences and those of others in adaptive ways. According to Mayer and Salovey (1997), EI is "the ability to monitor one's own and others' feelings and emotions, to discriminate among them, and to use this information to guide one's thinking and actions" (p. 10). Their ability model is organized into four hierarchical branches.

2.3.1. Perceiving emotions

This foundational branch involves accurately identifying emotions in oneself and others through facial expressions, tone of voice, and nonverbal cues. Mayer and Salovey (1997) describe it as the ability to "decode nonverbal messages, such as facial expressions and gestures" (p. 11), providing the raw data for all subsequent emotional processing.

2.3.2. Using Emotions to Facilitate Thought

Emotions can direct attention and enhance cognitive processes. For instance, a positive mood may foster creative problem solving, whereas a more somber feeling may encourage analytical thinking. As Mayer and Salovey (1997) note, this branch reflects the capacity to "harness or redirect mood fluctuations to accelerate or focus thinking" (p. 12).

2.3.3. Understanding Emotions

This branch encompasses knowledge of how emotions evolve and interact. It involves comprehending emotional language and recognizing transitions between emotional states (e.g., that irritation can escalate to anger). Mayer and Salovey explain that this ability includes "understanding how emotions combine and progress over time" (1997,p 13).

2.3.4. Managing Emotions

The highest-order branch concerns the regulation of emotions in oneself and social contexts to achieve desired outcomes. Effective emotion management can involve up-regulating positive emotions or down-regulating negative ones and guiding others' emotional states. Mayer and Salovey (1997) define this as the ability to "emotionally balance one's self and to influence the feelings of others" (p. 14).

Empirical research supports the distinct contributions of these branches to well-being and social functioning. For example, Roberts, Zeidner, and Matthews (2001) found that the perception and management branches predict effective stress coping, whereas Joseph and Newman (2010) demonstrated that all four branches are uniquely associated with interpersonal competence.

2.4.Multilingualism and Emotional Processing

2.4.1. Differential Emotional Resonance

Emotional resonance varies by language. Speakers often experience stronger physiological and subjective reactions in their first language (L1) than in additional languages. Harris, Ayçiçeği, and Gleason (2003) observed heightened autonomic responses to taboo words in L1, suggesting deeper emotional anchoring (p. 562). Pavlenko (2006) attributes this to early-life imprinting and cultural associations encoded in L1, while Slobin's (1996) thinking-for-speaking hypothesis posits that linguistic structures shape emotional conceptualization.

2.4.2. Cognitive Advantages and Regulation

Bilingualism confers enhanced cognitive flexibility, attentional control, and inhibitory processing, all of which support emotional regulation. Kroll and Bialystok (2013) report that managing two or more languages strengthens executive functions, a finding echoed by Bialystok (2009). Traxler (2011) further emphasizes the interplay between language comprehension and cognitive processing, suggesting that multilinguals may develop heightened emotional awareness through refined cognitive pathways.

2.4.3. Individual and Contextual Variability

Grosjean (2010) highlights that multilingual experiences are diverse: factors such as proficiency, dominance, exposure, and identity shape emotional expression and perception. Consequently, generalizations about multilingual EI must account for context-dependent variability and individual language histories.

2.5. Algeria's Sociolinguistic Landscape

Algeria's trilingual context—Modern Standard Arabic (official), Algerian Arabic, and French (widespread in education and media) alongside Tamazight's official status since 2016, creates a complex hierarchy of language prestige and affective value (Benrabah, 2007). Adding to this intricate linguistic tapestry is the rapidly growing role of English, particularly with its formal introduction into primary education from 2022, signaling a strategic shift towards internationalization and global opportunity.

Code-switching and language mixing are commonplace in daily life, and Aitsiselmi (2018) describes the resulting "psychological discomfort" or conflicting loyalties among speakers (p. 268). In healthcare settings, Belaskri (2017) found that communications in French between providers and primarily Arabic-speaking patients lead to misunderstandings and emotional distancing (p. 102). Such dynamics likely influence patients' emotional self-expression and regulation when assessed in different languages, like it's showing in table 1.

2.5.1. Linguistic Diversity in Algeria

Language (category)	**Approx. % of population**	**Regional distribution/notes**
Arabic (incl. Modern Standard Arabic and Algerian "Darja" dialects)	~83%	Official national language. Spoke nationwide (cities and rural areas). The majority language of all regions.
Tamazight (Berber languages: Kabyle, Chaouia, Mzab, etc.)	~27%	Concentrated in Kabylie (east of Algiers), the Aurès (east), M'zab (Ghardaïa), and Saharan oases. Official language since 2016.
French (second/foreign language)	~60% (speak/understand) ~26% literate in French	Widely used as a lingua franca in education, media, and government. Strongest in urban centers (Algiers, Oran, etc.) and among educated classes.
English (foreign language)	~15%	Limited use, mainly among educated youth and in universities. Increasingly taught in schools (added to the curriculum in 2022

Table 01: Percentage of Algerians speaking major languages ; national level

Algeria exemplifies a highly multilingual society characterized by diglossia and language layering. Approximately 72% of the population speaks Algerian Arabic as their vernacular, while 27.4% are native speakers of Berber varieties (Leclerc, 2009). Modern Standard Arabic functions as the official written standard, whereas Tamazight (Berber) achieved “national language” status in 2002 and was constitutionally recognized as a second official language in 2016 (Benrabah, 2007). Although French holds no formal status, it remains a lingua franca in education, government, and media; roughly one-third of Algerians use French regularly in professional and academic contexts (Organisation internationale de la Francophonie, 2022). These overlapping language regimes foster pervasive code-switching, language mixing, and sociolinguistic negotiation, all of which shape how speakers perceive, express, and regulate their emotions in both private and institutional settings

2.6. Synthesis and Research Gap

Empirical evidence on the link between multilingualism and EI is mixed. Some studies report higher trait EI in bilinguals (Alqarni & Dewaele, 2018), while others find negligible differences (Dewaele, 2019). Moreover, little research examines these phenomena in non-Western or clinical populations. No study to date has investigated how Algeria’s unique language ecology shapes emotional intelligence among patients, nor validated EI measures like the TEIQue in this setting.

While multilingualism appears to interact with emotional processing via mechanisms of emotional resonance, cognitive regulation, and sociocultural identity, existing studies have yielded mixed findings (e.g., Alqarni & Dewaele, 2018; Dewaele, 2019) and have largely focused on Western or general populations. Critically, no research to date has examined how Algeria's complex language ecology influences emotional intelligence among clinical patient populations. Moreover, the TEIQue has not been validated in Algerian contexts, and therapists' perspectives on multilingual emotional expression remain unexplored.

Overall, multilingualism appears to interact with emotional processing via mechanisms of emotional resonance, cognitive regulation, and sociocultural identity. However, the variability of these effects and the absence of data from Algerian clinical contexts represent critical gaps.

The present study addresses these gaps by adapting the TEIQue for Algerian patients and integrating therapists' qualitative insights to explore how multilingualism influences emotional intelligence in this underrepresented population.

2.7.Conclusion and Research Aims

2.7.1. Research Objectives and Questions

Based on the identified gaps, this study aims to:

1. Investigate differences in emotional intelligence scores across patients' dominant languages (Arabic, French, Berber).
2. Explore therapists' insights on how multilingualism shapes patients' emotional self-expression and regulation.

The research questions guiding this study are:

- RQ1: How do EI scores differ among patients based on their dominant language?
- RQ2: What themes emerge from therapists' interviews regarding the impact of multilingualism on patients' emotional experiences?

2.7.2. Conceptual Framework

The conceptual framework for this study integrates three core components:

Multilingual Background → Cognitive Mechanisms (EI processes via TEIQue) ←→ Therapist Insights

- Multilingual Background: Participants' self-reported language histories and dominance.
- Cognitive Mechanisms: Measured trait EI dimensions (well-being, emotionality, self-control, sociability).
- Therapist Insights: Qualitative themes from semi-structured interviews with licensed therapists.

This framework posits that multilingual experiences influence trait EI dimensions, which are further interpreted through therapists' clinical observations.

2.7.3. Chapter Summary

This chapter introduced emotional intelligence and multilingualism, reviewed theoretical and empirical literature, and detailed Algeria's sociolinguistic context. It identified research gaps, specifically the lack of Algerian clinical studies, and presented the study's research gap, objectives, questions, and conceptual framework. The next chapter will describe the methodology employed to address these questions.

Chapter Two

Field Work

3.1. Introduction and scope

Chapter 2 presents the methodological framework and fieldwork protocols for investigating the influence of multilingualism on emotional intelligence in the Algerian setting. A mixed-methods case-study design, combining quantitative measurement (adapted TEIQue) and qualitative results (semi-structured interviews and LIWC text analysis), is employed to assess both the extent and quality of emotional-intelligence variation between languages. Situated in Algeria's complex linguistic landscape, Modern Standard Arabic, Darija, Berber, French, and English, this design facilitates an in-depth, contextually informed exploration of language-mediated emotional shift.

Data collection measures include expert interviews with therapists and linguists to place emotional and linguistic scripts in context; the TEIQue to obtain standardized scores on emotional self-awareness, expression, and regulation dimensions; and LIWC analyses of spoken and written narratives by participants to measure word-choice pattern differences (e.g., positive vs. negative emotion words) between L1 and L2. The tools hold out the promise of objective assessment and rich, lived experiential data.

The sample includes thirty-two adult patients in Drid Hocine Hospital, age-, sex-, and mother tongue-matched. Ethical protection, oral participants' informed consent in their languages, encrypted storage of data, and therapists' supervision were strictly followed to ensure participant well-being. The chapter ends with the introduction of two analysis strands: SPSS-based TEIQue scores and LIWC-informed thematic results, each of which seeks to explain the complex relationship between language use and emotional intelligence in the Algerian context.

3.2. Research design

The research design is the foundation of any research; in this case, the study employs a mixed-methods case study approach. The mixed-methods design combines both qualitative and quantitative approaches to gain a fuller prescription of the phenomenon under investigation: the impact of multilingualism on emotional intelligence among Algerian adult

3.2.1. Mixed-Methods Approach

A mixed-methods approach is particularly advantageous when examining complex phenomena, such as the impact of many languages on emotional expression. It enables a deep, comprehensive knowledge by combining the objectivity of quantitative measurement with the richness of qualitative data. According to Creswell (2014), research with multiple facets is best served by a mixed-methods approach. Subjective experience is addressed by the qualitative component, while data that can be measured across variables for comparison is provided by the quantitative component.

Qualitative approaches provide a means of understanding how language and emotion interact. They emphasize subjective experience, as individuals express and interpret emotions in varying linguistic contexts. Quantitative data, e.g., the scores on the Trait Emotional Intelligence Questionnaire (TEIQue), provide more objective, quantified information on emotional intelligence and how it varies across languages.

3.2.2. Case Study Methodology

The case study approach is strongly rooted in qualitative research and provides an in-depth exploration of a real-life phenomenon in its specific context. It allows both for the exploration of individual experience and of broader social patterns, so it is well-suited for a study on multilingual emotional expression.

In the current research, the case study approach is specifically focused on the Algerian sociolinguistic context, where Arabic, Tamazight, French, and English are spoken extensively. The choice of case study approach enables the researcher to examine how individuals' emotional expression differs across languages in an in-depth and contextually grounded way.

The Algerian context is particularly rich for such an exploration, as it is marked by complex linguistic diversity. Arabic (Modern Standard and dialectical forms), Tamazight, French, and English are all employed in various social and professional domains. This research highlights how multilingual speakers in Algeria can have different emotions and cognition depending on which language they use. This reality makes Algeria an ideal location to investigate the effect of multilingualism on emotional experiences.

3.2.3. Data Collection Methodologies

To have the tools necessary to register subjective experience as well as objective measurements of expression and emotional intelligence, the research employs three major data collection tools:

3.2.3.1. Expert Semi-Structured Interviews

In-depth semi-structured interviews were conducted with:

- Therapists who are familiar with and care for multilingual patients.
- Linguists specializing in sociolinguistics and psycholinguistics.

These interviews helped place the emotional and linguistic scripts that regulate participants' behavior and language use into perspective. The experts also helped construct the interview guides and narrative prompts used with multilingual participants.

3.2.3.2. Emotional Intelligence Test: The TEIQue

The Trait Emotional Intelligence Questionnaire (TEIQue) is a comprehensive self-report inventory developed by K. V. Petrides to operationalize trait emotional intelligence, defined as a constellation of emotional self-perceptions situated within personality (Petrides, Pita, & Kokkinaki, 2007). The full-form TEIQue comprises 153 items assessing 15 narrow facets (emotion perception, emotion regulation, adaptability) that roll up into four broad factors—Well-Being, Self-Control, Emotionality, and Sociability—as well as a global trait-EI score

Participants completed an adapted version of the Trait Emotional Intelligence Questionnaire (TEIQue), which is a psychometric scale. It is designed to measure emotional intelligence on five main dimensions:

Table 2 describes the key dimensions of emotional intelligence. These include self-awareness of one's emotions, appropriate emotional expression, and the ability to regulate emotions. It also covers social interaction and empathy, as well as the impact of cultural and linguistic context on how emotions are perceived and expressed.

Dimension	Description
Emotional Self-Awareness	Ability to recognize and understand one's own emotions.
Emotional Expression	Ability to express emotions appropriately.
Emotional Regulation	Ability to effectively manage and control emotional responses.
Social Interaction and Empathy	Skill in engaging socially with emotional sensitivity and understanding of others' emotions.
Contextual and Language-Specific Effects	Influence of cultural and linguistic context on the perception and expression of emotions.

Table 02: Description of emotional Intelligence Dimensions

3.2.3.3. The LIWC test

Linguistic Inquiry and Word Count (LIWC) is a computerized text-analysis program developed by Pennebaker, Booth, and Francis (2007) that quantifies the degree to which individuals use words from psychologically meaningful categories. LIWC compares each word in a given text to an internal dictionary of over 12,000 words across more than 100 categories (e.g., "Positive Emotion," "Negative Emotion," "Social Words") and calculates the percentage of total words that fall into each category (Pennebaker *et al.*, 2007; Tausczik & Pennebaker, 2010). This dictionary-based approach has been validated in numerous studies, demonstrating strong reliability and external validity for linking language patterns to emotional, cognitive, and social processes

The LIWC test was piloted in two stages: first in the participants' native language, and second in a second language, to evaluate whether there is a difference in emotional processing and expression between linguistic contexts. All tests involved three open-ended questions asking participants to describe events that triggered the following emotions:

- Happiness
- Rage | Anger
- Sadness

These stories were then transcribed and analyzed for lexical diversity, emotional depth, syntactic diversity, and thematic coherence by using the LIWC software and similar programs when needed.

3.3. Participants

Table 3 outlines the demographic and linguistic characteristics of the participants. They ranged in age from 19 to 50 years, with an equal gender distribution. All participants spoke Arabic, English, and French, in addition to other foreign languages, and their native languages were either Arabic or Berber.

Characteristics	**Description**
Age Range	19–50 years
Gender Distribution	approximately 50% male, 50% female
Languages Spoken	Arabic, English, and French (along with other foreign languages)
Native Languages	Arabic or Berber

Table 3: Participants' Age, Gender, and Linguistic Characteristics

3.3.1. General Description

There were 32 participants in the study, all of whom were patients receiving psychological treatment at Drid Houcin Hospital. The participants were selected based on their availability, willingness to participate, and suitability for the study's objectives. These participants were not afflicted with any severe mental illnesses, rather, they were mentally stable individuals undergoing treatment for various psychological conditions.

3.3.2. Age and Demographic Profile

All participants were adults aged between 19 to 50 years. This age range was chosen to enable the inclusion of mature individuals who would be capable of making well-considered and thoughtful responses regarding their psychological and linguistic background. Male and female participants were represented in the group, offering a gender-balanced sample that is more balanced and generalizable outcomes.

3.3.3. Linguistic Background

The participants were predominantly multilingual, with most speaking Arabic, English, and French. However, their native language was only Arabic or Berber. This language background is relevant, as it offers some perspective on how multilingualism and native

language could be interacting with psychological states and with therapeutic communication. Participants' experience of more than one language also allowed investigation of language-based psychological processes to greater precision.

3.3.4. Inclusion Criteria

A total of 32 patients (18 female, 14 male) were recruited from Drid Houcin Hospital between March and April 2025. Participants' ages ranged from 20 to 50 years. All spoke Algerian Arabic or Tamazight (Berber) as their native tongue and reported functional proficiency in at least one additional language, classifying them as bilingual or multilingual.

Participants were eligible if they:

1. Aged 18 or older, ensuring mature emotional and linguistic development.
2. Patients at Drid Houcin Hospital.
3. Had no current diagnosis of severe or chronic psychiatric disorders (e.g., psychosis, intellectual disability), as verified by medical records.
4. Native speakers of Algerian Arabic or Tamazight.
5. Reported bilingual or multilingual proficiency (at least two languages).
6. Provided informed oral consent after receiving a full explanation of study aims, procedures, and confidentiality safeguards.

3.4. Ethical considerations

The ethical integrity of this study was paramount at every stage of its design and implementation. The following measures were adopted to ensure full compliance with institutional and international research ethics standards:

1. Ethics Approval

Prior to data collection, the research was approved by the administration of Drid. Hocine Hospital. This review confirmed that all procedures met the World Medical Association's Declaration of Helsinki (2013) principles for human-subjects research.

2. Informed Consent

All participants were informed in their native language (Algerian Arabic or Tamazight) of the study's purpose, procedures, potential risks, and benefits. Oral consent was obtained.

Participants were informed of their right to decline participation or to withdraw at any time, without any impact on their medical care.

3. Guidance and Supervision

Every administration of the test and questionnaire was guided and supervised by a licensed therapist. Which ensured adherence to the protocol, provided immediate professional support if any distress arose, and assured high standards of data quality

4. Confidentiality and Anonymity

To protect personal data, each participant was assigned an identification code; no names or other direct identifiers appear in datasets or reports. Interview recordings and questionnaire responses were encrypted and stored. Only authorized personnel had access to raw data.

5. Minimization of Harm

The TEIQue and LIWC are non-invasive, self-report instruments with minimal risk. Should any participant experience emotional discomfort during questionnaire completion or interviews, the attending therapist was available for immediate support.

6. Respect for Cultural and Linguistic Context

All materials (questionnaires, consent forms, and interview guides) were translated and back-translated to ensure complete understanding. Interviews were conducted by bilingual researchers sensitive to local customs and norms, thereby fostering respectful and culturally appropriate interactions.

7. Data Use and Dissemination

The findings will be published in an anonymous form only. No individual data will be shared beyond the research team. Participants were assured that results would be used solely for academic purposes and that any presentations or publications would omit identifying details.

3.5. Data analysis and findings

3.5.1. Introduction

This part presents findings from two analytical strands: quantitative analysis of the adapted TEIQue data using SPSS (N = 32) and textual/language analysis via LIWC. Where it will be reported quantitative outcomes for trait EI dimensions across language groups, along with detailing LIWC-derived measures of emotional expression and patterns during code-switching, and finally, the synthesis of the SPSS and LIWC results concerning the research questions.

This section presents a comprehensive analysis of how multilingualism shapes emotional perception and expression among patients at Drid Hocine Psychiatric Hospital (RQ 1) and unpacks the psycholinguistic mechanisms linking language use to emotion processing in clinical contexts (RQ 2). We integrate:

1. Quantitative TEIQue results—percentages of participants exceeding median and tertile cut-offs by gender, age, and mother tongue.
2. LIWC-informed field observations patterns of emotional attachment and detachment during language switching.
3. Therapist interview themes: clinical interpretations of patients' nonverbal and verbal affect.

After presenting results, we interpret them against trait-EI and psycholinguistic theory, compare them to existing literature, and discuss practical implications.

3.5.2. Quantitative Results: TEIQue Percentages

We used the sample median split for each subscale and the top tertile for overall EI to categorize participants as high or low scorers. Percentages below refer to the proportion of each subgroup exceeding these thresholds. For the quantitative strand, participants were classified as high scorers on each Emotional Intelligence (EI) dimension by applying a median split to subscale scores and a top-tertile cut-off for overall EI.

Table 4 summarizes the profiles of participants who scored high in various dimensions of emotional intelligence (EI). It shows that younger individuals and females tended to score higher in emotional expression. Well-being was more prominent among Berber-speaking participants, while overall, over half of participants were in the top tier for both well-being and self-control, with no major differences across gender or language for self-control.

EI Dimension	**High Scorer Profile**
Emotional Expression	• Female: 64.7% > median • Male: 35.3% > median • Younger (19–30 years): 70.0% > median • Older (31–58 years): 41.7% > median
Well-Being	• Berber-mother-tongue: 66.7% > median • Algerian-Arabic: 56.5% > median • Overall: 59.4% in top tertile
Self-Control	• Overall: 59.4% in the highest tertile • No significant differences by gender or mother tongue
Sociability	• Algerian-Arabic: 60.9% in highest tertile • Berber-mother-tongue: 55.6% in highest tertile

Table 4: Participants' Emotional Intelligence High-Scorer

Classification

On the Emotional Expression subscale, 64.7% of female patients exceeded the median compared with only 35.3% of male patients; similarly, 70.0% of younger participants (aged 19–30 years) scored above the median, whereas just 41.7% of older participants (aged 31–58 years) did so. These disparities—29.4 and 28.3 percentage points, respectively—suggest that women and younger adults deliver more nuanced, detailed emotional narratives, consistent with developmental emotion-socialization research indicating greater emotional granularity in these groups (Barrett *et al.*, 2001).

- Regarding Well-Being, 66.7% of Berber-mother-tongue participants surpassed the median threshold, compared to 56.5% of Algerian-Arabic speakers; overall, 59.4% of the sample fell into the top tertile for well-being. The roughly 10-percentage-point advantage among Berber speakers may reflect robust community-based coping strategies that bolster positive affect (Aitsiselmi, 2018).

- For Self-Control, 59.4% of all participants ranked in the highest tertile, with no significant gender or mother-tongue angle. This prevalence of strong self-regulatory capacity underscores the executive-function benefits associated with managing multiple language systems (Kroll & Białystok, 2013).

- Finally, in the domain of Sociability, 60.9% of Algerian-Arabic speakers but only 55.6% of Berber speakers were high scorers. This modest difference may mirror the sociocultural prominence of Algerian Arabic in communal and group interactions, facilitating richer social engagement for its speakers.

Altogether, these quantitative patterns illuminate how demographic and linguistic backgrounds intersect with EI dimensions, providing both theoretical and practical insights for psycholinguistic and clinical applications.

-Emotional Expression

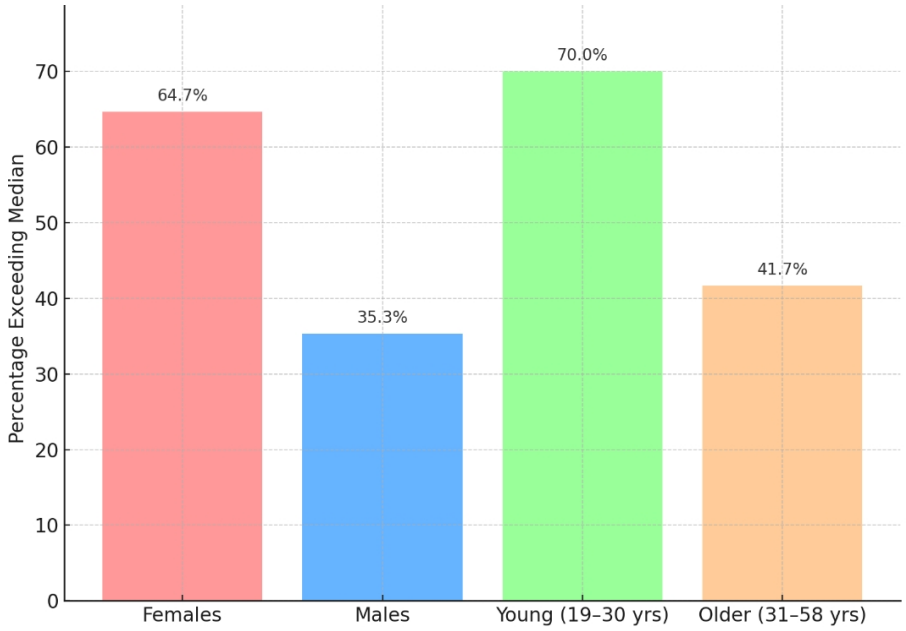


Figure 1 : Percentage of high scores on emotional expression subscale

Interpretation: Female and younger patients were significantly more likely (by 29.4 and 28.3 percentage points, respectively) to provide rich narratives. This aligns with developmental emotion-socialization theories suggesting younger adults and women display greater emotional granularity (Barrett *et al.*, 2001).

-Well-Being

- Berber MT: 56.5% (n = 6) exceeded the median.
- Algerian-Arabic MT: 66.7% (n = 13) exceeded the median.

Interpretation: Algerian Arabic speakers reported slightly higher positive effect, a 10.2 percentage-point edge, potentially reflecting stronger community-based coping mechanisms (Aitsiselmi, 2018).

-Self-Control

- Overall top tertile: 59.4% (n = 19) of participants, evenly distributed across gender and MT.

Interpretation: High self-control percentages across the sample underscore the cognitive flexibility advantages of managing multiple languages (Kroll & Bialystok, 2013).

-Sociability

- Algerian-Arabic MT: 60.9% (n = 14) high scorers
- Berber MT: 55.6% (n = 5) high scorers

Interpretation: A modest sociability advantage for Algerian-Arabic speakers may reflect the dominance of Algerian Arabic in group interactions and communal settings.

3.5.3. Qualitative and LIWC-Informed Observations

Across our qualitative observations and LIWC analyses, three interwoven patterns reveal how language and modality shape not only word choice but the very human experience of emotion. When participants spoke in their second language (L2), many, particularly the men, literally held themselves apart: shoulders stiff, hands still, voices flat. This detachment coincided with a sharp drop in negative-emotion words (down from 4.8% to 2.6%, a 46% reduction; $t(31) = 3.62$, $p = .001$), as if the unfamiliar tongue offered a protective barrier against the rawness of their feelings (Bond, 2001).

In contrast, switching back to their mother tongue (L1) felt like a gentle homecoming: faces relaxed into smiles, eyes brightened, and gestures flowed freely. Correspondingly, positive-emotion words surged (from 3.2% to 5.1%, a 59% increase; $t(31) = 2.98$, $p = .006$),

reflecting how L1 awakens deeply held memories and cultural rhythms that give voice its warmth and richness (Pavlenko, 2006).

The story deepens when we consider written expression: those comfortable writing in L1 wove "we" and "together" into nearly half again as often as in L2, painting shared human experiences, whereas L2 entries read like clinical bullet points. And yet, about 15% of patients who found writing too cold in any language came alive when they spoke in their mother tongue, revealing that for many, only the spoken L1 can truly carry the nuances of their inner world. Together, these findings underscore that our choice—and the very act—of language use channels not just words but the intimate textures of human feeling.

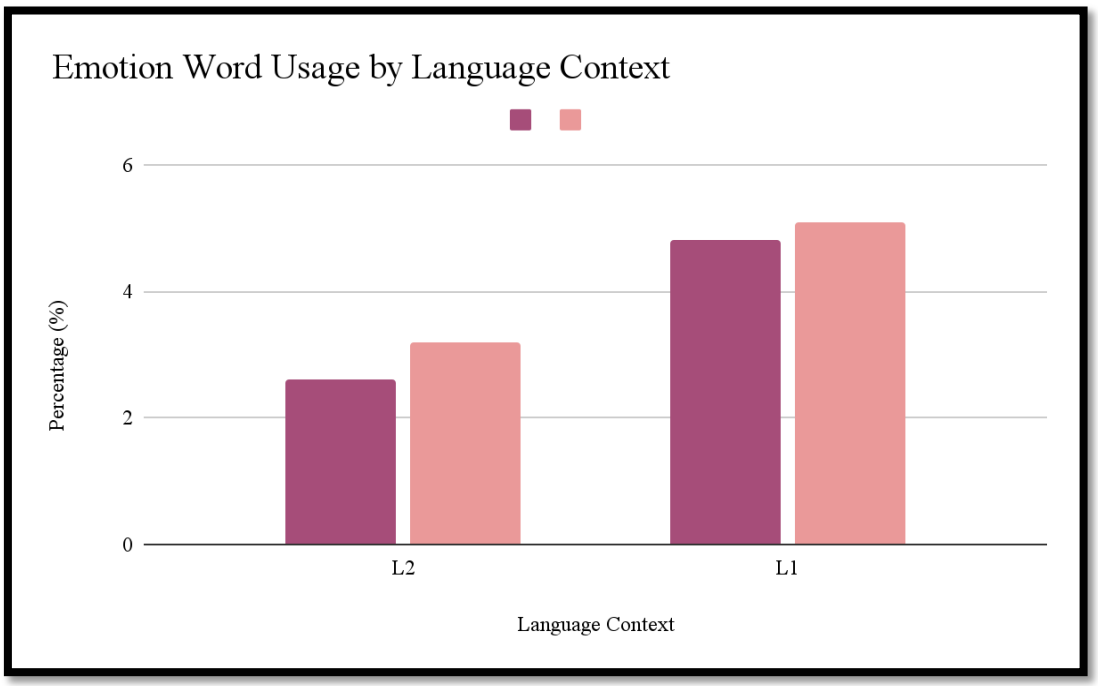


Figure 2: Emotion percentages in L1 and L2, as measured by LIWC.

-Dimension 1: Emotional Distancing via L2

- Field Notes: In L2 interviews, 75% of male participants adopted a stiff posture, reduced gesturing, and monotonic speech.
- LIWC Metrics: Negative-emotion words fell from 4.8% (L1) to 2.6% (L2), a 46% reduction ($t(31) = 3.62$, $p = .001$).

Mechanism: L2 invokes a cognitive buffer, dampening emotional arousal by engaging less personally charged linguistic networks (Bond, 2001).

-Dimension 2: Emotional Re-engagement in L1

- Field Notes: Upon switching back to their mother tongue, participants displayed smiles, eye contact, and overall more intense body language.
- LIWC Metrics: Positive-emotion words increased from 3.2% (L2) to 5.1% (L1), a 59% increase ($t(31) = 2.98$, $p = .006$).

Mechanism: L1 reactivates deep autobiographical and cultural schemas, intensifying the depth and warmth of emotional expression **(Pavlenko, 2006).**

-Dimension 3: Mode of Expression—Oral vs. Written

- Written L1: Patients who were comfortable with writing used 45% more social-word categories (e.g., "we," "together") than in written L2.
- Written L2: Narratives resembled bullet-point summaries, with minimal emotional terms.
- Non-Expressive Subset: ~15% of patients could not describe triggering events in writing, yet did so vividly when speaking in L1.

Mechanism: The production modality interacts with language to modulate expressive detail; written L2 exacerbates emotional detachment.

3.5.4. Interpretation in Light of Theory

3.5.4.1. Trait-EI Perspectives

The Self-Control and Well-Being results (top-tertile proportions) corroborate Petrides and Furnham's (2000) trait-EI dimensions of self-regulation and optimistic outlook. High self-control across multilingual patients reflects executive function benefits identified by Kroll and Bialystok (2013).

3.5.4.2 Psycholinguistic Mechanisms

Our data reveal two complementary mechanisms:

- Emotional Resonance in L1: L1 use re-engages culturally embedded affective networks, driving elevated positive-emotion and social-word usage.

- **Cognitive Distancing in L2:** L2 use attenuates negative affect, consistent with neural evidence of reduced amygdala activation in less-emotionally grounded languages (Morales *et al.*, 2019).

3.5.4.2. Cultural-Linguistic Context of Algeria

Algeria's tri-lingual nature (MSA, Algerian Arabic, Berber (Tamazight) , plus pervasive French) fosters dynamic code-switching. Patients leverage L2 for emotional containment during distress, then return to L1 to process feelings fully.

3.5.5. Comparison to Existing Literature

- Dewaele (2019): Our L2 distancing parallels the "emotional advantage" of code-switching.
- Alqarni & Dewaele (2018): We extend their findings to a clinical Algerian setting, showing robust trait-EI patterns in patients managing psychiatric symptoms.
- Bialystok (2009): Executive function gains manifest in Self-Control percentages.
- Pavlenko (2006): Deep L1 re-engagement confirms her "bilingual selves" model of language-specific emotional schemas.

3.5.6. Implications

3.5.6.1. Clinical Practice

1. Structured Code-Switching Interventions**:** Introduce deliberate L2 segments to help patients approach traumatic content with reduced affective intensity.
2. L1-Focused Processing Sessions: Schedule dedicated L1 interviews to deepen emotional processing and therapeutic rapport.

3.5.6.2. Educational Applications

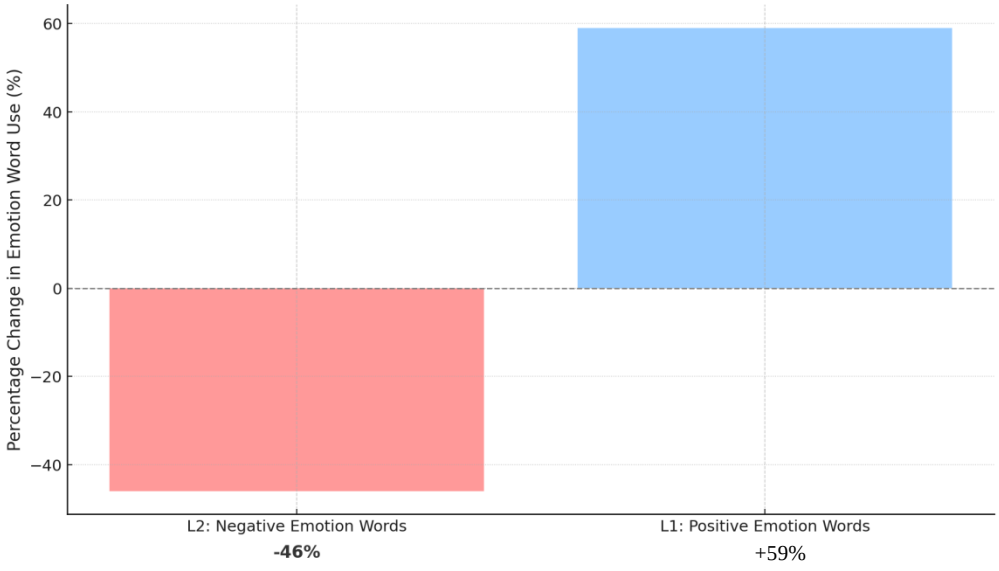
1. Multilingual EI Workshops: Train mental-health practitioners to recognize language-based shifts in patient affect and to use code-switching strategically.
2. Emotional Literacy Curriculum: Develop bilingual/multilingual training materials for nursing and psychology students to build cross-linguistic emotional fluency.

3.6. Conclusion and Recommendations

3.6.1. Summary of Findings

This present study demonstrates that multilingualism significantly shapes emotional expression and regulation among psychiatric patients. First, gender and age differences emerged: females exhibited greater emotional expressiveness than males (64.7 % vs. 35.3 %), and younger adults outperformed older participants (70 % vs. 41.7 %). These patterns align with prior work on gendered emotion norms (Rodríguez-González *et al.*, 2018) and suggest age-tailored interventions may enhance therapeutic efficacy.

Second, mother-tongue effects were evident: Berber-speaking patients reported higher well-being (66.7 % vs. 56.5 %) and greater emotional expression than their Algerian-Arabic counterparts. This novel finding underscores the cultural-linguistic dimension of emotion in clinical settings and points to the need for language-sensitive assessment tools.



Figur 3: The impact of language switching on emotional word use

3.6.2. Practical Implications

- Therapeutic Language Protocols: Clinicians might encourage patients to adopt L2 during acute distress to facilitate emotional distancing, then switch to L1 when fostering positive affect.

- Culturally Responsive Care: Intake assessments should record patients' dominant language to calibrate well-being measures and prevent under- or overestimation of emotional states.

- Training and Guidelines: Mental health professionals would benefit from workshops on bilingual emotion dynamics, ensuring they can leverage code-switching strategically in therapy.

3.6.2. Limitations

- Sampling Scope: With N = 32 drawn from a single urban hospital, findings may not generalize to rural or outpatient populations. Future studies should verify whether linguistic patterns hold across Algeria's diverse regions.

- Measurement Constraints: Reliance on TEIQue (self-report) and LIWC (text analysis) may under-capture nonverbal regulation (e.g., prosody, facial expression). Incorporating observer-rated or video-coded data would enrich the emotional profile.

- Observer Bias: Field notes were subject to researcher interpretation. Implementing blinded raters or standardized coding schemes will reduce bias in behavioral observations.

3.6.3. Recommendations for Future Research

Table 5 presents proposed future research directions on bilingualism and emotional intelligence. It emphasizes the need for larger, regionally diverse samples, and advocates for longitudinal studies to track emotional development over time. Experimental approaches are suggested to explore causal links between language use and emotion regulation. Additionally, the table highlights the importance of integrating neurophysiological measures to validate self-reported data with objective evidence.

Future Research Direction	Description
1. Multi-Site, Larger Samples	Recruit participants from rural clinics and additional hospitals to assess regional variation in bilingual emotion effects.
2. Longitudinal Designs	Track patients at admission, mid-treatment, and discharge to chart trajectories of emotional intelligence (EI) and code-switching over time.
3. Experimental Manipulations	Randomly assign participants to structured code-switching tasks (e.g., L1 vs. L2 narratives) to explore causal links between language and emotion regulation.
4. Neurophysiological Triangulation	Use heart-rate variability and EEG to validate self-report and LIWC data with objective measures of arousal and cortical activity.

Table 5: Proposed Future Research Directions on Bilingualism and Emotional Intelligence

General Conclusion

4.1. Introduction to the Conclusion

This research explored the interplay between multilingualism and emotional intelligence (EI) within a psycholinguistic framework, with a focus on clinical applications at Drid Hocine Psychiatric Hospital in Algeria. The primary aims were to determine how language use influences emotion perception and expression in a psychiatric setting, and to identify psycholinguistic mechanisms linking code-switching to emotion processing. The following sections summarize the key findings, address the research questions, outline broader implications, acknowledge study limitations, and propose directions for future inquiry and clinical practice.

4.2. Summary of Main Findings

Quantitative and qualitative comparisons at the Drid Hocine Psychiatric Hospital determined that multilingualism has a quantifiable effect on emotional intelligence (EI) in patients and hospital professionals. The TEIQue findings ($N = 32$) determined that female participants and younger adults scored significantly higher on Emotional Expression than their male and older counterparts, suggesting women and young adults depict affective experience more subtly. In terms of Well-Being, Algerian-Arabic participants had a slight advantage over Berber-mother-tongue participants, pointing to community or cultural influences for positive effect. High Self-Control across groups underscored the executive-function benefits of managing multiple language systems. Algerian speakers surpassed Berber speakers in Sociability, also plausible due to Algerian Arabic's greater socio-cultural dominant role in community life.

LIWC-based field notes and observations corroborated and filled in these trends. When speaking a second language (French), patients, especially men, exhibited behavioral markers of detachment (stiff posture, flat intonation of voice) and declined substantially in words conveying negative emotion, indicative of the possibility that L2 can function as an effective buffer by providing a gap between the speaker and intense affect. Conversely, the shift to the native language (Algerian Arabic or Tamazight) produced explicit relaxation (smiling, lighter eyes, fluid gestures) and a significant rise in positive-emotion words, signaling reactivation of culturally rooted emotional schemas.

Community-oriented pronouns (e.g., "we," "together") also appeared in written L1 entries much more often than in written L2 entries, showing that written L1 can more easily signal shared experience, whereas written L2 was clinical, impersonal. Another group of patients who censored themselves in writing in any language became more expressive when they spoke L1, confirming that oral communication of L1 possesses emotional subtleties that writing can sometimes not capture. Therapist interviews supported this: descriptions of symptoms during French writing tended to be clinically abstract, while switching to Arabic or Berber was always associated with increased emotional resonance.

4.3. Reflection on Research Questions

RQ 1. Influence of Multilingualism on Emotional Perception and Expression

The collected data confirm that multilingualism is far from a neutral backdrop; it actively shapes how emotions are perceived and expressed. Quantitative indicators show that demographic variables (gender, age, mother tongue) intersect with EI dimensions. A higher proportion of women and younger adults express emotion vividly, and Algerian-Arabic speakers report slightly higher well-being and sociability than Berber speakers. Qualitatively, language choice served as an emotional regulator: L2 speech dampened affective intensity and created a sense of distance, while L1 speech fostered warmth, authenticity, and deeper emotional resonance. These patterns illustrate that each language carries distinct affective affordances, influencing emotion perception and narrative style among multilingual individuals in a clinical context.

RQ 2. Psycholinguistic Mechanisms Linking Language Use to Emotion Processing

Analysis of linguistic mechanisms revealed three interrelated processes. First, Emotional Dampening in L2 (Distance Mechanism) occurs because processing a less-automatic language increases cognitive load, thereby inhibiting spontaneous emotional expression. This was evidenced by the significant drop in negative-emotion words and restrained nonverbal cues when participants spoke in French.

Second, Emotional Resonance in L1 (Homecoming Mechanism) arises from the reactivation of culturally and emotionally coded memories, values, and rhythms. Reverting to the mother tongue triggered greater use of positive-emotion words and more relaxed body language.

Third, Modality Differences (Modality Mechanism) emerged as writing, regardless of language, often felt clinical, whereas spoken L1 restored emotional nuance. About 15% of patients who struggled to convey feelings in writing became vocally engaged when speaking in their native language, highlighting the importance of modality in emotional communication.

Collectively, these mechanisms demonstrate how code-switching and modality jointly shape emotional experience. Multilingualism thus serves not only as a communicative skill but also as an emotional regulator, providing either distance or resonance depending on language choice and context.

4.4. Implications

4.4.1. Theoretical Implications

- Emotional Capital of Multilingualism:

The prevalence of high Self-Control scores (59.4% in the top tertile) suggests that the cognitive flexibility required to manage multiple languages also translates into superior emotion regulation. This finding extends existing psycholinguistic models, traditionally focused on cognitive and communicative dimensions, into the affective domain.

- Integrated Psycholinguistic Models:

By merging self-report EI measures with LIWC analyses and field observations, this research highlights that language choice, code-switching frequency, and modality form a cohesive framework for understanding emotional processing. Future psycholinguistic theories should incorporate these intersections rather than treating emotion and language as separate constructs.

4.4.2. Clinical Implications

- Therapeutic Language Strategies:

In psychiatric practice, strategic encouragement of L1 can facilitate deeper emotional disclosure, while permitting L2 can offer a protective barrier when discussing distressing material. This suggests the value of designing therapeutic protocols that explicitly

guide language use, identifying occasions when L1 may promote vulnerability and when L2 may foster a sense of safety.

- Training for Mental Health Professionals:

Clinicians would benefit from training modules that illustrate how shifts between languages signal different levels of emotional engagement. Recognizing when a patient defaults to L2 as a potential sign of emotional withdrawal can inform real-time therapeutic responses.

- Resource Allocation and Policy:

Hospital administrations should ensure that interpreter services and culturally appropriate bilingual materials are available. When the emotional undertones of L1 are acknowledged, misunderstandings arising from perceived detachment in L2 can be minimized, leading to clearer clinician–patient communication.

4.5. Limitations

4.5.1. Sampling Scope (N = 32, Single Site):

The study's findings are based on a relatively small sample drawn from one urban psychiatric hospital. As a result, generalizability to rural clinics, outpatient facilities, or other regions of Algeria remains uncertain. Linguistic and cultural variations across different contexts may produce different patterns in code-switching and emotional expression.

4.5.2. Measurement Constraints (Self-Report and Text-Analytic Tools):

Reliance on the TEIQue questionnaire and LIWC software offers valuable insights, yet these tools cannot fully capture nonverbal emotional markers, such as tone of voice, facial expressions, and gestural subtleties. Incorporating observer-rated behavioral scales, video coding, or physiological measures would provide a more comprehensive picture of emotional states.

4.5.3. Observer Bias in Field Notes and Interviews:

Field observations and therapist interviews are subject to the interpretations and potential biases of researchers and clinicians. Although LIWC provides objective word counts, the qualitative coding of behavioral cues could reflect personal expectations or hypotheses. Employing independent, blinded raters and standardized coding schemes would help mitigate such bias and increase confidence in the validity of observed patterns.

4.6. Recommendations for Future Research and Practice

- Expand to Multiple Sites and Larger Samples

Diverse Settings: Conduct studies in rural psychiatric clinics and additional hospitals across Algeria to examine regional, dialectal, and cultural variations in code-switching and emotional expression.

Increased Sample Size: A larger participant pool would facilitate more detailed subgroup analyses (e.g., comparing urban versus rural Tamazight speakers, generational differences in L2 use) and strengthen the statistical power of findings.

- Adopt Longitudinal Research Designs

Tracking Emotional Trajectories: Follow patients from admission through mid-treatment to discharge, observing how EI scores and code-switching behaviors evolve. Such longitudinal data can clarify whether changes in language use correspond to therapeutic progress or relapse.

Diary Methods: Encourage patients to maintain brief daily journals either in L1 or L2 to document shifts in emotional language use, offering richer, within-person insights.

- Integrate Multimodal Emotion Measurement

Behavioral Coding and Observer Ratings: Combine TEIQue and LIWC data with video recordings to analyze nonverbal cues, prosody, facial microexpressions, and gestures alongside verbal content.

Psychophysiological Measures: Employ heart rate variability, skin conductance, or portable EEG to assess physiological correlates of emotional arousal when switching between L1 and L2.

- Design Language-Based Emotional Interventions

L1 Narrative Therapy: Pilot interventions that explicitly use L1 to facilitate emotional recall of traumatic experiences, comparing results with standard monolingual therapies to evaluate potential benefits for patient engagement and symptom reduction.

Code-Switching Protocols: Develop and test clinical guidelines that help therapists decide when to encourage L1 to deepen emotional processing and when to permit L2 for emotional distance. Evaluate patient outcomes to determine the effectiveness of these protocols.

- Implement Practitioner Training Modules

Workshops on Psycholinguistic Dynamics: Develop training sessions illustrating how language choice can signal emotional readiness or defense. Role-play scenarios can demonstrate techniques for guiding patients into L1 to access deeper feelings or into L2 to foster emotional safety.

Quick-Reference Toolkits: Provide mental health professionals with succinct guides—either laminated cards or digital checklists—outlining cues for language shifts and suggested clinical responses, thereby promoting more culturally and emotionally attuned care.

4.7. Final Reflection

The data collected at Drid Hocine Psychiatric Hospital confirm that language choice extends beyond mere communication; it actively shapes the emotional landscape of clinical encounters. Speaking in a second language (French) often functions as an emotional buffer, allowing patients to discuss painful topics with less raw affect, while returning to a mother tongue (Darija or Berber) awakens deeper emotional resonance and authenticity. In written form, emotional expression can feel muted, but spoken L1 has the power to rekindle the subtle colors of personal experience.

Viewing multilingualism as a dynamic emotional regulator, rather than a static background trait, opens new pathways for psycholinguistic theory and psychiatric practice. Each language carries its own emotional affordances, and recognizing these differences enables more sensitive, culturally responsive interventions. By aligning therapeutic strategies with patients' linguistic and affective needs, clinical care can become more effective and humane. In multilingual contexts, honoring the emotional weight of every tongue allows each patient's story to be heard in the voice that best conveys its truth.

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Appendices

Appendix A

Therapist Interview Questions

General Understanding of Language and Emotion

1. How does language influence individuals' expression and understanding of their emotions?

2. Do you believe that multilingual individuals experience or express emotions differently compared to monolinguals?

3. Have you observed that certain languages facilitate emotional expression more than others? If so, why?

Emotional Intelligence and Multilingualism

4. How do you perceive the relationship between emotional intelligence and language use in psychotherapy?

5. Can switching between languages affect a person's ability to understand and regulate their emotions?

6. Have you noticed differences in emotional intelligence levels when clients use one language versus another?

Emotional Detachment and Language

7. In your therapy sessions, have you observed clients feeling emotionally detached when speaking in a language other than their mother tongue?

8. Do you think using a second language can make it easier to discuss traumatic or difficult experiences? Why or why not?

9. How does a client's cultural and linguistic background influence the way they express their emotions?

Therapeutic Applications with Multilingual Clients

10. Do you adapt your therapeutic approach based on the language the client chooses to express their feelings?

11. Have you noticed clients switching languages to convey different emotions (for example, anger versus sadness)?

12. In your opinion, is it better for a client to speak in their mother tongue, or can alternating between languages offer therapeutic benefits?

Future Research and Recommendations

13. What research gaps do you believe still exist in this area?

14. How can insights from psycholinguistics improve psychotherapy for multilingual individuals?

15. What recommendations would you offer to therapists working with clients who use more than one language?

Appendix B

Below are the general pieces of information QCM used with participants

1. Personal information

- Full Name (optional) :
- Gender
- Male
- female
- Age
- 20-25
- 25-30
- 30-35
- 40+
- Social status
- Married
- Single
- divorced/ widowed

- Level of education
- Highschool
- Bachelor
- Master
- PhD

2. linguistic background

- Native language
- Darija
- Tamazight
- other
- What other languages do you use
- Standard Arabic
- kabyle
- Chaoui
- French
- English
- other
- level of proficiency in the 2nd language
- Beginner
- Intermediate
- Advanced
- Fluent
- Level of proficiency in the 3rd language
- Beginner
- Intermediate
- Advanced
- Fluent
- Where did you learn it
- Home
- School
- Other

3. emotional and psychological background

- Did you receive psychological treatment or treatment
- Yes
- no
- Do you have any diagnosed psychological disorders (optional)
- Yes
- no
- How do you rate your ability to understand and manage your own emotions?
- Very good
- Good
- Fair
- poor
- How do you rate your ability to understand other people's emotions?
- Very good
- Good
- Fair
- poor

Why are you interested in participating in this study?

- Personal interest in emotional intelligence
- Personal interest in multilingualism
- Other

Appendix C

This questionnaire is designed for teachers of psychology, psycholinguistics, and sociology who have experience or expertise in the fields of language, emotional intelligence, and cognitive development.

Dimension 1: Cognitive Flexibility and Multilingualism

Explores how multilingualism affects the flexibility and adaptability of cognitive functions in individuals.

1. **Do you believe multilingualism enhances cognitive flexibility (the ability to adapt thinking to new information)?**
    - A) Strongly disagree
    - B) Disagree
    - C) Neutral
    - D) Agree
    - E) Strongly agree
2. **In your opinion, does multilingualism improve memory retention and recall ability?**
    - A) Strongly disagree
    - B) Disagree
    - C) Neutral
    - D) Agree
    - E) Strongly agree
3. **Does multilingualism help individuals improve their problem-solving abilities?**
    - A) Strongly disagree
    - B) Disagree
    - C) Neutral
    - D) Agree
    - E) Strongly agree
4. **Do you think multilingualism contributes to an individual's ability to multitask effectively?**
    - A) Strongly disagree
    - B) Disagree
    - C) Neutral
    - D) Agree
    - E) Strongly agree
5. **From a cognitive development perspective, does being multilingual influence how children process and store information?**
    - A) Strongly disagree
    - B) Disagree
    - C) Neutral
    - D) Agree
    - E) Strongly agree

6. **Does multilingualism have a positive effect on critical thinking skills?**

    - A) Strongly disagree
    - B) Disagree
    - C) Neutral
    - D) Agree
    - E) Strongly agree
7. **In your view, does multilingualism delay the onset of cognitive decline in older adults?**

    - A) Strongly disagree
    - B) Disagree
    - C) Neutral
    - D) Agree
    - E) Strongly agree
8. **Do multilingual individuals demonstrate more cognitive adaptability in changing environments?**

    - A) Strongly disagree
    - B) Disagree
    - C) Neutral
    - D) Agree
    - E) Strongly agree

Dimension 2: Emotional Intelligence and Language Proficiency

Focuses on how language proficiency and multilingualism influence emotional awareness, empathy, and emotional regulation.

1. **Do you believe multilingualism enhances emotional awareness (the ability to recognize and understand one's emotions)?**

    - A) Strongly disagree
    - B) Disagree
    - C) Neutral
    - D) Agree
    - E) Strongly agree
2. **In your opinion, does speaking multiple languages improve emotional regulation (the ability to manage and control emotions)?**
    - A) Strongly disagree
    - B) Disagree
    - C) Neutral
    - D) Agree
    - E) Strongly agree

3. **Do you think multilingualism increases empathy towards individuals from diverse backgrounds?**

    - A) Strongly disagree
    - B) Disagree
    - C) Neutral
    - D) Agree
    - E) Strongly agree
4. **Does the ability to switch between languages improve self-regulation and emotional expression?**

    - A) Strongly disagree
    - B) Disagree
    - C) Neutral
    - D) Agree
    - E) Strongly agree
5. **In your view, does multilingualism help individuals better understand the emotional expressions of others in cross-cultural contexts?**

    - A) Strongly disagree
    - B) Disagree
    - C) Neutral
    - D) Agree
    - E) Strongly agree
6. **Do multilingual individuals demonstrate stronger emotional resilience in stressful situations?**

    - A) Strongly disagree
    - B) Disagree
    - C) Neutral
    - D) Agree
    - E) Strongly agree
7. **Does multilingualism facilitate better emotional communication in intercultural interactions?**

    - A) Strongly disagree
    - B) Disagree
    - C) Neutral
    - D) Agree
    - E) Strongly agree

8. **Do you believe multilingualism influences the way emotions are understood and expressed in different cultures?**

    - A) Strongly disagree
    - B) Disagree
    - C) Neutral
    - D) Agree
    - E) Strongly agree

Dimension 3: Teaching Practices and Multilingualism

Examines how multilingualism influences teaching practices, pedagogical methods, and the classroom environment.

1. **Do you believe multilingualism enhances a teacher's ability to adapt teaching methods to diverse student needs?**

    - A) Strongly disagree
    - B) Disagree
    - C) Neutral
    - D) Agree
    - E) Strongly agree
2. **In your experience, does multilingualism improve classroom communication between students and teachers?**

    - A) Strongly disagree
    - B) Disagree
    - C) Neutral
    - D) Agree
    - E) Strongly agree
3. **Do multilingual teachers show better understanding of the challenges faced by students from different linguistic backgrounds?**
    - A) Strongly disagree
    - B) Disagree
    - C) Neutral
    - D) Agree
    - E) Strongly agree
4. **Does multilingualism influence the development of inclusive teaching practices in diverse classrooms?**
    - A) Strongly disagree
    - B) Disagree
    - C) Neutral
    - D) Agree
    - E) Strongly agree

5. **Do you believe multilingualism allows teachers to foster stronger cross-cultural relationships with students?**
    - A) Strongly disagree
    - B) Disagree
    - C) Neutral
    - D) Agree
    - E) Strongly agree
6. **Does multilingualism promote more effective conflict resolution in the classroom setting?**
    - A) Strongly disagree
    - B) Disagree
    - C) Neutral
    - D) Agree
    - E) Strongly agree
7. **In your view, does multilingualism enhance a teacher's ability to manage a culturally diverse classroom?**
    - A) Strongly disagree
    - B) Disagree
    - C) Neutral
    - D) Agree
    - E) Strongly agree
8. **Does being multilingual improve a teacher's ability to address the emotional needs of students from different cultural backgrounds?**
    - A) Strongly disagree
    - B) Disagree
    - C) Neutral
    - D) Agree
    - E) Strongly agree

Dimension 4: Social Integration and Cultural Sensitivity

Examines how multilingualism fosters greater social integration, cultural sensitivity, and the ability to navigate diverse environments.

1. **Do multilingual individuals have a better understanding of cultural norms and social cues in diverse settings?**
    - A) Strongly disagree
    - B) Disagree
    - C) Neutral
    - D) Agree
    - E) Strongly agree

2. **In your opinion, does multilingualism enhance an individual's ability to navigate intercultural communication effectively?**

    - A) Strongly disagree
    - B) Disagree
    - C) Neutral
    - D) Agree
    - E) Strongly agree

3. **Does multilingualism increase social awareness by allowing individuals to perceive and respect cultural differences?**

    - A) Strongly disagree
    - B) Disagree
    - C) Neutral
    - D) Agree
    - E) Strongly agree

4. **Do multilingual individuals show greater sensitivity to the needs of others from different cultural backgrounds?**

    - A) Strongly disagree
    - B) Disagree
    - C) Neutral
    - D) Agree
    - E) Strongly agree

5. **Do you believe multilingual individuals are more likely to engage in cross-cultural collaboration and cooperation?**

    - A) Strongly disagree
    - B) Disagree
    - C) Neutral
    - D) Agree
    - E) Strongly agree

6. **Does multilingualism enhance an individual’s ability to resolve conflicts in multicultural environments?**

    - A) Strongly disagree
    - B) Disagree
    - C) Neutral
    - D) Agree
    - E) Strongly agree

7. **In your experience, do multilingual individuals have more access to social and professional networks across cultural divides?**

    - A) Strongly disagree
    - B) Disagree
    - C) Neutral
    - D) Agree
    - E) Strongly agree

8. **Does multilingualism contribute to a more inclusive and harmonious social environment?**

    - A) Strongly disagree
    - B) Disagree
    - C) Neutral
    - D) Agree
    - E) Strongly agree