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Multilingualism and Emotions

—Are Associations with an Image More Emotional in Our First or Second Language?

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Abstract

Background: In psychotherapy and psychodiagnostic assessments with multilingual individuals, our clinical experience is that there are differences in the quality of outcomes when using the first (L1) or later acquired language (L2). L1 is often closely intertwined with an individual's cultural background, childhood experiences, and inner world and may therefore carry greater emotional resonance. The purpose was to investigate whether there were differences in the number of emotion-related words in L1 versus L2 narratives, produced by multilingual participants in a psychodiagnostic assessment setting. **Method:** In an experimental cross-over study, 40 participants who spoke Persian as L1 and English as L2 were asked to tell a story about one picture from the Thematic Apperception Test twice: first in L1 and then in L2 ($n = 20$), or first in L2 and then in L1 ($n = 20$). The number of emotion-related words used in the two narratives was compared. **Results:** The linear mixed model showed a significant difference in language, with 1.35 more emotion-related words in Persian than in English. There was also a significant order effect of assessment (the second time the participants used 0.8 more emotion-related words). Post hoc qualitative analysis may suggest that some narratives in L1 were more coherent and contained richer descriptions of emotional content than the corresponding L2 narratives. **Discussion:** Although there were several limitations (e.g., a carry-over effect because of a five-minute break), the findings suggest that language choice may influence the emotional content of narratives in multilingual psychodiagnostic assessment. High proficiency in L2 does not necessarily imply equivalent use of emotion-related language compared with L1. Clinicians should therefore be cautious when interpreting emotionally relevant verbal material in multilingual clients and consider the potential influence of language on its expression, both in psychotherapy and in psychodiagnostic assessment.

Keywords

Multilingualism, First Language, Emotions, Narratives, Thematic Apperception Test

1. Introduction

He entered my office and started to talk in Persian (*his first language*). *I was shocked. After approximately one year of therapy with me and having conducted our weekly sessions in Dutch, he was suddenly speaking to me in fluent Persian. I watched him silently, how he was telling his story in our mother tongue. He looked so different, but he was the same young man that I had known for one year. He stopped talking and looked at me. The only words that I could come up with were*: "*You speak Persian*?"

He looked down and replied, "*Yes. I'm sorry I lied to you. I couldn't let you in. But now I'm ready...*"

This case concerns Aria, a 21-year-old man originally from Iran, who grew up in the Netherlands and therefore was able to speak both languages. The case illustrates that in psychotherapy and (narrative-based) psychodiagnostic assessment with multilingual clients, language choice may vary depending on the context and the connection with the therapist. Our clinical impression is that when multilingual clients switch to their first language, their narratives may contain more detailed descriptions of how they feel emotionally and may appear to reflect a more authentic emotional experience. Previous research suggests that using a first language may enhance emotional expressiveness, emotional resonance, and the accessibility of autobiographical memories, which in turn can improve self-disclosure and therapeutic engagement (Altarriba & Basnight-Brown, 2011; Dewaele, 2008; Schrauf & Rubin, 2000). However, to the best of our knowledge the specific use of emotion words in the first and second language has not been studied before. Therefore, we aimed to explore this phenomenon more closely by analyzing narrative content told in the first and second language. This may be important not only for our daily psychotherapy practice, but also for the use of narrative-based psychodiagnostic assessments (like well-known projective psychological tests) and the conclusions we draw from it.

Multilinguals have the ability to use two or more languages in their daily lives. Two types can be distinguished, namely early simultaneous and sequential multilingualism. These differ primarily in the timing and context of language acquisition. When a person is exposed to and learns two or more languages from birth or throughout the crucial stage of language development (namely before the age of three), this is generally referred to as simultaneous multilingualism (De Houwer, 1990; Genesee, 1989). Sequential multilingualism refers to the acquisition of a second or additional language after the first language has already been established. This may occur as a result of environmental changes, including moving to a new

country or starting school in another language (Ellis, 1994; Grosjean, 2010). The later-acquired language (L2) may differ from first language (L1) in its degree of emotional resonance and in the contexts in which it was acquired and used. Such differences may be reflected in language-dependent memories, particularly in contexts where language is closely tied to emotional experiences (Edrisi, 2010). For this reason, L1 may carry stronger intrapersonal emotional significance and resonance for multilingual speakers compared to the later acquired L2 (Dewaele, 2008; Pavlenko, 2005).

This emotional significance and resonance are mainly influenced by the emotional intensity of the setting when language is learned. L1, for example, is typically acquired during early childhood, in which settings are more often emotionally rich and intimate, such as interactions with family members or caregivers (Dewaele, 2010; Dewaele, 2014). Emotional expressions and word use linked to comfort, love, discipline, or anger may become closely associated with L1 and emotional memory when these experiences are primarily encountered in that language (Dewaele, 2008; Harris et al., 2006). This suggests that emotional expressions are more deeply embedded in the L1 due to early and emotionally rich experiences. For example, words of affection in L1 may evoke stronger emotional responses because they are tied to formative experiences—especially during childhood or adolescence—that have a significant and lasting impact on a person's development (Pavlenko, 2005). For instance, Dewaele (2008) found that a majority of multilingual participants perceived the phrase *I love you* as having greater emotional weight in their L1 than in a foreign language, although this varied depending on factors such as language dominance and the context in which the languages were acquired and used. Furthermore, research has shown that affective information can be processed in both L1 and L2, although the strength and nature of affective processing may differ between the two languages (Altarriba & Basnight-Brown, 2011).

Conversely, the way in which a second language (L2) is acquired may contribute to differences in its emotional associations and processing. Later-acquired languages are typically learned in more formal or less emotionally intense contexts, such as classrooms or workplaces. These settings are generally more structured and task-oriented, with less focus on deep emotional bonding, making L2 feel more neutral or detached from one's own inner world in comparison to L1 (Dewaele, 2010). Consequently, some multilinguals may experience greater emotional distance when expressing personal experiences in an L2, particularly when that language is less strongly associated with emotionally salient experiences (Dewaele, 2008; Pavlenko, 2005). Brase and Mani (2017) demonstrated that the emotional resonance of words in L2 may approach that of L1 when these are learned in emotionally rich, naturalistic contexts. Their findings suggest that learning context—specifically the presence of emotional cues—plays a crucial role in the acquisition and processing of emotional vocabulary in bilinguals (Brase & Mani, 2017).

In addition, multilingualism involves the ability to switch between languages depending on the context. Psychotherapy is one context in which emotional expression is particularly important. This linguistic flexibility may provide insights into emotional expression and identity but may also present challenges for mental health professionals (Pavlenko, 2005). On the one hand, multilingual individuals may express themselves more authentically in their first language, leading to deeper emotional access and more nuanced narratives (Dewaele, 2010; Pavlenko, 2005). Furthermore, these individuals often show heightened metalinguistic awareness, which may contribute to cognitive flexibility (Bialystok, 2009). Verkerk et al. (2023) highlighted how linguistic practices such as code-switching—this refers to the practice of alternating between two or more languages within a conversation—are common and often beneficial in therapeutic contexts. These authors note that L1 is often perceived as more emotionally charged, although the emotional significance of L2 can be fluid and context-dependent. Language is also closely tied to cultural identity; thus, allowing multilingual clients to choose their language may support identity exploration and cultural congruence within therapeutic work (Pavlenko, 2005; Verkerk et al., 2023). Emotional expression is influenced by the cultural norms associated with each language. For instance, what is considered an appropriate way to express emotions may differ across cultures, influencing how multilinguals use their languages in emotional contexts (Pavlenko, 2002, 2006).

On the other hand, this same linguistic flexibility can pose challenges. For instance, clients may shift to a second language to avoid emotional discomfort, potentially masking key affective content during psychotherapy (Marcos & Alpert, 1976). Shakiba and Stapleton (2022) found that Persian-English multilinguals' swearing preferences are influenced by personality traits, gender, and cultural context. Their study showed that language choice in swearing reflects both emotional expression and socio-biographical factors. For example, women with higher levels of Social Initiative (Extraversion) tended to swear more in English, whereas men with lower Emotional Stability (high Neuroticism) used Persian swearwords more frequently (Shakiba & Stapleton, 2022). The study also found positive associations between language-use frequency, self-rated language proficiency, and characteristics such as Cultural Empathy and Open-mindedness (Shakiba & Stapleton, 2022). Therapists who are not proficient in the client's first language may miss cultural or emotional nuances, while reliance on interpreters may introduce challenges to the therapeutic relationship, rapport and confidentiality (Santiago-Rivera & Altarriba, 2002; Bauer & Alegría, 2010; Fennig & Denov, 2021; Hanft-Robert et al., 2023). Furthermore, differences in language and culture can introduce bias into psychological assessment and complicate the interpretation of test scores across cultural groups (van de Vijver & Tanzer, 2004). Taken together, these opportunities and challenges underscore the importance of considering language choice in the therapeutic process for multilingual individuals.

Differences in emotional experience across languages in psychotherapy are also illustrated by the case of Aria. It seemed that the use of his first language brought

the conversation to a deeper emotional level. He began to talk about struggles related to topics that were more loaded with (subconscious) emotions. Such language switching may have implications for emotional processing during therapy and may offer therapists both opportunities and challenges (Pavlenko, 2002). One potential opportunity concerns the language which is chosen and can impact how authentic or "*true*" individuals feel when expressing emotions. Multilinguals report that they feel more emotionally connected to themselves and therefore more authentic when using L1, particularly when discussing more personal and intimate topics (Pavlenko, 2013). At the same time, using L2 can help to create emotional distance between individual and the situation or between individual and the therapist, making it easier for individuals to discuss traumatic or painful experiences (Altarriba & Santiago-Rivera, 1994). Dylman and Bjarta (2019), for example, investigated whether purposeful use of L2 could reduce psychological tension. Swedish (native) speakers were asked to answer questions about negative and neutral texts in their L1 (Swedish) and their L2 (English) and were asked to indicate their level of tension before or after the questions. It was found that texts written in the participants' L1 resulted in increased levels of anxiety, while in the L2 it resulted in a decrease in tension (Dylman & Bjarta, 2019).

A further consideration concerns the therapeutic relationship. Psychotherapy involves not only verbal communication but also emotional attunement and the development of a secure relational context. In therapy, when individuals are speaking in their L1, it allows for deeper emotional engagement. The language may contribute to opening up and to creating connection between therapist and client—possibly creating a different attachment experience—repairing previous and negative ones when the therapist responds sensitively (Pavlenko, 2005; Wallin, 2007). Language may thereby serve as a powerful medium for creating emotional safety and connection in psychotherapy. When a therapist responds with sensitivity and attunement, the language they use does more than facilitate communication. It may support clients in identifying, expressing, and regulating their emotions (Schore, 2001). In doing so, the therapist creates an environment where the clients can reconnect with their suffering in a supported, non-threatening way. For clients with histories of neglect, trauma, or emotional misattunement, this safe relational environment that uses the right language may foster a new attachment experience. In some cases, this may constitute a form of limited reparenting, where the therapist temporarily provides some of the emotional functions that were missing in the client's early life (Holmes, 2010).

Particularly for multilingual individuals, the choice of language in therapy may be particularly important; words in L1 often carry greater emotional depth due to their association with early formative experiences (Pavlenko, 2005). Thus, therapy conducted in L1—or that respectfully integrates both L1 and L2—may facilitate emotional processing and foster deeper connection between therapist and client. Verkerk et al. (2021) examined how therapists in the Netherlands navigate language use in multilingual therapy, particularly in relation to emotional communication.

Their study highlighted the importance of linguistic and cultural awareness, showing that language switching can facilitate memory recall, emotional expression, and the negotiation of cultural norms in therapeutic contexts. The study also emphasizes the importance of understanding the emotional context of language, as emotions encoded in one language may not be easily expressed in another. Overall, the study underscores the need for therapists to be linguistically and culturally aware to provide effective psychotherapy to multilingual clients (Verkerk et al., 2021).

Moreover, multilinguals' emotional responses may differ depending on the language used. Because different cultures express emotions in different ways, multilinguals sometimes have difficulty expressing their own emotions appropriately (Pavlenko, 2008, 2012). Panayiotou (2004), for example, examined bilinguals' emotional responses in English and Greek and found that participants reacted differently to the same story depending on the language in which it was presented. The findings suggested that emotional expressions vary across languages and that how bilinguals feel their reactions shift with language use (Panayiotou, 2004). The greater the linguistic and cultural distance between the L1 and the L2, the more attention will be needed to the verbal, vocal, and visual channels through which emotions are communicated. Multilingual individuals may also experience differences in their sense of self across languages, particularly when using a less emotionally familiar language (Dewaele, 2021). Returning to the case of Aria, this may illustrate a discrepancy between the individual's "ordinary self" and the "presented self" when expressing himself in a later-acquired language.

One way of understanding the linguistic factor (i.e., which language to use) for therapeutical purposes is by conducting psychodiagnostic assessments in both L1 and L2. In our clinical practice, we often do so when it comes to narration of life stories and examination of unconscious mental representations. Previous research suggests that language can influence how personal memories and emotions are accessed and expressed. Specifically, language choice may influence the retrieval of autobiographical memories and their associated emotional experiences (Schrauf & Rubin, 2000). Differences have been observed between assessment modalities that involve listening and speaking versus those that rely on reading and writing. For example, Edrisi (2008) found that when administering the NEO-FFI personality assessment in L1 (Persian) and L2 (Dutch), no significant differences were found across the five personality domains. No language-related effects were identified that would compromise the reliability of the assessment. Emotional variations that typically emerge during oral language switching—such as while narrating a story—do not appear to manifest during this particular written language task. This may be attributed to the greater emotional distance individuals are able to maintain when engaging with written text (Edrisi, 2008).

On the other hand, studies about the differences in narratives show us how language choice impacts the depth and emotional content of storytelling, suggesting that narratives in a first language are often richer and more emotionally expressive (Katsavdakis et al., 2001). In our daily practice, we also see differences in how

people narrate their life stories in one language compared to another, for example in psychodiagnostic assessments like the Thematic Apperception Test (TAT; a projective psychological assessment that examines unconscious mental representations, emotions, and relationship formation, Theory of Mind and Central Coherence (Murray, 1943)). However, to our knowledge, there is a relatively small body of research examining language-related differences in TAT narratives. Katsavdakis et al. (2001), for example, administered the TAT to participants in both their mother tongue and an acquired language and found differences in aspects of the narratives across languages. Although the study involved only four participants and therefore does not permit broad generalization, it suggests that individuals may tell stories differently depending on the language used (Katsavdakis et al., 2001). Similarly, Ervin (1964) examined French-English bilinguals' TAT stories and found that the thematic content of stories differed depending on whether participants responded in French or English. Some themes were more common in one language than the other, suggesting that language choice may influence the thematic content of TAT narratives (Ervin, 1964).

Given the potential relevance of language choice for therapeutic and psychodiagnostic purposes, we aimed to address this scarcity in research by studying the use of language (L1 and L2) in spoken psychodiagnostic assessment. We specifically aimed to investigate the number of emotion-related words in the narratives across the two languages and in the context of telling a story about one of the pictures of the TAT. To account for potential order and practice effects associated with telling the same story twice in different languages, we used a cross-over design to examine the number of emotion-related words in which participants narrated the story first in L1 and then in L2, or first in L2 and then in L1. Based on previous research suggesting that language choice can influence emotional expression and that L1 may carry stronger emotional associations for some multilingual individuals (e.g., Panayiotou, 2004; Verkerk et al., 2021), we hypothesized that participants would use more emotion-related words when narrating in L1 than in L2.

2. Methodology

2.1. Design

This study used a cross-over, experimental design. It also has elements of a qualitative study, as the outcome (number of emotion-related words) was derived from narratives in both languages in response to the same picture of the TAT. The study design is presented visually in **Table 1**.

Table 1. Visual representation of the design.

Group	First TAT assessment	*Break*	Second TAT assessment
Persian-English	Persian		English
English-Persian	English		Persian

2.2. Participants

Prior to analyzing data, a power analysis was conducted using G*Power (version 3.1.9.7; Faul et al., 2007). Based on a *t*-test, the program indicated that a sample size of 34 would be sufficient to detect a medium effect size ($f = 0.25$; Cohen, 1988) with 80% power and a significance level of $\alpha = 0.05$. A final sample size of 40 adults was deemed to ensure robust analysis while accounting for potential participant dropouts.

Participants were recruited informally within the Persian community and did not have any therapeutic or other dependent relationship with one of the researchers, making it a convenience, but independent sample. A pre-designed questionnaire (based on Pavlenko, 2006) was administered as an interview, to gather detailed information regarding demographics and participants' language usage, linguistic background, and comfort level in expressing emotions across both languages. Table 2 provides an overview of these questions. This questionnaire was also used to make the distinction who was included in this study, based on predefined inclusion and exclusion criteria.

Table 2. Questionnaire for demographic and linguistic background.

Question	Response Type
1) How old are you?	Open-ended
2) What is your highest education level?	Multiple choice (e.g., High school, Bachelor's, Master's, PhD)
3) What is your current function at work?	Open-ended
4) How long have you lived outside Iran, after the age of 12?	Open-ended (in years)
5) How long have you lived in the Netherlands?	Open-ended (in years)
6) At what age did you come in contact with English?	Open-ended
7) In which language are you more comfortable expressing your emotions?	Multiple choice (Persian, English, Both equally)
8) To what extent do you use both languages daily? (Distinguish between listening, reading, and speaking)	Open-ended; Hours a day, for each language skill (listening, reading, speaking)

Note: Based on Bilingualism and Emotions web questionnaire of Pavlenko (2006).

Inclusion and exclusion criteria

Participants were carefully chosen to ensure a homogeneous sample. Eligible individuals had to be 18 years or older, with Persian (Farsi) as their first language, and they were required to report a high level of proficiency in English. A crucial criterion was that both participants and their parents were born and raised in Iran and lived there until at least the age of 12. This ensured that participants completed primary school and had a strong connection to their native language and culture, and that the Persian language passed down to the participant was rich and authentic, and cultivated in a deeply immersive cultural context. At the time of

the study, all participants needed to be residing in the Netherlands and actively engaged in studying or working in English, ensuring they could comfortably navigate in multilingual environments. We deliberately selected participants living in the Netherlands because this reflects the multilingual context in which psychotherapy and psychodiagnostic assessment may take place. English was selected as the later-acquired language (L2) because participants were highly proficient in English and actively used it in educational and/or professional contexts. Active use of English was used as a pragmatic indicator of sufficient experience with relatively complex communication. Although participants were also exposed to Dutch through their residence in the Netherlands, the present study specifically examined differences between Persian as the first language (L1) and English as the later-acquired language (L2).

In addition to these inclusion criteria, potential participants were excluded in case of severe hearing or vision impairments (as such conditions could interfere with their ability to participate in the storytelling task). Based on all criteria, we excluded three eligible participants from the study sample. One of them was found to have a dialect from the northwestern region of Iran as their mother tongue, rather than Persian, and two participants had not completed their primary education in Iran. The study sample eventually consisted of 40 adult participants, ranging in age from 21 to 61 years.

2.3. Material

For the psychodiagnostic assessment, we used one picture from the TAT (Murray, 1943) for both languages (Persian and English). The TAT is grounded in the idea that ambiguous images allow us to project unconscious drives, fears, and internalized relationships (Cramer, 1996). It consists of various pictures that are presented and asked to create a story. We use this psychodiagnostic assessment regularly in our practice, because of its non-verbal characteristics it is applicable across different languages. The content of TAT narratives contributes to effectively analyzing an individual's inner world. Additionally, the extent to which emotions and thoughts are discussed helps in forming hypotheses that can subsequently be further investigated. For consistency purposes, we chose one picture of the TAT (picture 2), in order to relate possible differences in narratives as much as possible to language-related differences and to reduce the influence of other factors (such as variations related to the differences in the pictures). Picture 2 shows three different people, standing a bit separate from each other in a rural environment. A young woman holding a few books standing in the front and a man clutching a farm tool standing beside a horse and another woman standing against a tree (Murray, 1943). This particular picture was chosen because of the potential clinical relevance associated with the complexity of this picture. It can address various themes, including contrast between emotions and intellect, feminine and masculine qualities, participation and distance, past and future. Also, whether the people in the picture have any contact or a particular relationship with each other (e.g.

family dynamics) and if the relationships are conflictual or harmonious (Eurelings-Bontekoe & Frohn-de Winter, 2003).

2.4. Procedure

Prior to the start, ethical approval was obtained by the ethical committee of the Faculty of Humanities and Faculty of Archaeology by Leiden University (REF number 2024/06).

When interested in participation, potential participants were sent an information sheet and consent from. If they were willing to participate, they provided written informed consent before participating in the study. After consent, participants were alternating assigned to one of two research groups: (1) one group began the storytelling task in Persian followed by English, and (2) the other group started in English and then Persian. Prior to administering the TAT picture, all participants received the same standardized instructions (Murray, 1943), but in the language that was used during the administration of the test. To minimize stress associated with taking this test, one instruction was that there were no right or wrong answers.

Participants were instructed to create a story in L1 or L2 based on the picture, answering the following questions: 1) "*What is happening here*?", 2) "*What happened before this*?", 3) "*How will it end*?", and "*Can you say something about their relationship and what they are thinking and feeling*?" (Murray, 1943). These questions were repeated when the participant asked for it.

After completing the first storytelling task, participants took a 5-minute break and were restricted from using any known languages and engaging in activities such as speaking, reading, or listening (including use of smartphone). They were asked to "empty their minds" by having tea/coffee or going to the restroom. After the break, participants completed the same storytelling task in the other language, using the same TAT picture. The revelation of the second picture was at the time of the task. It was not disclosed in advance that the same picture would be used for both sessions to prevent participants from making any preparations during their break. The entire participation was completed within a maximum of 30 minutes (both story-telling tasks, including break). The storytelling sessions were audio-recorded and subsequently transcribed. The recordings were deleted following transcription.

2.5. Data Analysis

The stories were analyzed by counting the number of emotion-related words used in each language (scoring 1 for each emotion-related word). The initial counting was conducted by the first author and 25% of the verbatim transcripts were verified by the second author to assess inter-rater agreement. Both authors are fluent in both languages. Within this 25% subsample, only one word (in Persian and English) was scored differently by the two assessors. That is the use of "*I feel*" *, which turned out not to be an emotion word, but the way in which that person

told her story, in both languages:

"*I feel like I see a girl who's like around twentyish*, *like* 20, 21 *or* 22 *or something or even we could say younger like* 19."

This example was subsequently removed after discussion. During scoring the subsample, we noted complex forms of emotional expressions that required further categorization. The motivation for creating these categories was the presence of expressions, such as "*pessimistic*" and "*optimistic*", where it was initially unclear if these should be classified as emotion-related words. This led us to conceptualize the category of *emotional states* to capture such expressions more accurately. Consequently, we identified several distinct categories as a manual for scoring the emotion-related words in the rest of the narratives (see Table 3).

Table 3. Manual for identifying emotion-related words.

-Plain Emotions: Basic, core feelings or emotions that people experience, e.g.;
Happiness (joy, love, excitement, delight, elation, bliss), **Sadness** (sorrow, grief, melancholy, heartache, misery), **Anger** (rage, frustration, irritation, resentment, fury), **Fear** (terror, panic, dread, worry), **Disgust** (revulsion, loathing, contempt, aversion), **Surprise** (amazement, astonishment, shock, awe)
-Emotional States: Prolonged or more complex emotional experiences, often lasting longer than plain emotions, e.g.;
Contentment (calmness, satisfaction, serenity), **Depression** (hopelessness, despair, helplessness), **Anxiety** (nervousness, apprehension, insecurity), **Love** (affection, passion, infatuation), **Jealousy** (envy, suspicion, possessiveness), **Empathy** (compassion, understanding, sympathy), **Apathy** (indifference, detachment, lack of concern)
-Expressions: Outward signs or manifestations of emotions, often shown through facial expressions, body language, or behavior, e.g.;
Smiling (grinning, laughing, beaming), **Crying** (weeping, sobbing, tearing up), **Frowning** (scowling, glaring, grimacing), **Sighing** (groaning, huffing), **Shaking** (trembling, quivering from fear or anger), **Blushing** (flushing, reddening from embarrassment), **Yawning** (**i**ndicating boredom), **Clenching fists** (tightening jaw showing anger or frustration)
-Verbs: Actions or processes that describe feelings or expressing emotions, e.g.;
To Love (adore, cherish, admire), **To Fear** (dread, worry, panic, tremble), **To Hate** (despise, loathe, detest), **To Grieve** (mourn, lament, cry), **To Laugh** (chuckle, giggle, snicker), **To Smile** (beam, grin, smir), **To Cry** (sob, tear up, weep), **To Yell** (shout, scream, holler), **To Rejoice** (celebrate, exult, cheer), **To Comfort** (console, reassure, soothe)

The words provided under each category serve as examples to clarify what may fall within a given category. This does not imply that these words were actually mentioned by the participants, but it supported the identification of emotion-related words. This categorization was based on clinical experience and literature (i.e., Pavlenko, 2008) and distinguished four categories: 1) what we feel (plain emotions), 2) how we experience it (emotional states), 3) how we express it (expressions), and 4) what we do in relation to emotions (verbs). In Appendix A, we present examples from participants' narratives for each of these categories.

For the actual statistical analyses of the background characteristics and the effect of language (L1 versus L2) and order of assessment (L1-L2 or L2-L1) SPSS v 26 was used. First, the descriptive statistics and differences between both groups regarding the background characteristics (see Table 4) were analyzed. Second, as a pre-analysis, the descriptive statistics and differences between both groups with regard to the number of emotion-related words were examined. Because not all background

characteristics and number of emotion-related words were normally distributed in all groups (i.e., Shapiro W-value < 0.90 and a check of the histogram) median and inter quartile range were presented and non-parametric tests were performed (Field, 2013). For example, to examine the number of emotion-related words between both groups in one of the languages, a Mann-Whitney U test was done (instead of an independent sample t-test). Differences in sex and educational level were examined using chi-square tests. Third, for providing an answer on the main research question a linear mixed model (extension of multivariate regression, by including a random intercept to account for repeated measures within the same person; maximum likelihood estimation) was used to examine the effect of the language and order of assessment. We build two models: 1) with only language and 2) with language and order of assessment. Each model also included age, sex and use of Persian per day (in minutes) as covariates. Significance was set at $p < 0.05$.

3. Results

3.1. Background Characteristics of the Groups

Table 4 presents background characteristics for the total sample and separately for the Persian-English and English-Persian groups. Both research groups seem to be comparable regarding these characteristics. Only the use of Persian (in minutes per day) was significantly different between the two groups. Looking at the means, next to the median scores, the Persian-English group used Persian on average more ($M = 208.50$ ($SD = 84.00$) vs. $M = 151.50$ ($SD = 72.50$)).

The background variables are added in terms of median and 25 - 75 percentile (Table 4) and also tested non-parametric and with chi-square test for the dichotomous variables such as gender. The groups are comparable with the largest difference in number of words Persian per day.

Table 4. Demographic characteristics and background variables for the total and both groups separately.

	Total ($n = 40$)	Persian-English ($n = 20$)	English-Persian ($n = 20$)	p
Female sex (n (%))	19 (47.5)	9 (45.0)	10 (50.0)	0.75
Theoretical education level (≥higher education; n (%))	38 (95.0)	19 (95.0)	19 (95.0)	1.00
Age (Median(IQR))	38.00 [32.75 - 43.00]	38.50 [27.50 - 43.75]	38.00 [35.25 - 42.00]	0.72
Prefer to use Persian > English (n (%))	27 (67.5)	15 (75.0)	12 (60.0)	0.31
Age leaving Iran (Median (IQR))	26.00 (14.00 - 30.00)	23.00 (12.25 - 29.75)	27.50 (15.25 - 32.50)	0.24
Age moving to the Netherlands (Median (IQR))	26.50 (14.00 - 30.75)	23.00 (12.25 - 30.00)	26.50 (15.25 - 32.75)	0.22
Age starting to learn English (Median (IQR))	10.00 (8.00 - 12.00)	10.00 (8.00 - 12.00)	10.00 (8.00 - 12.00)	0.97

Continued

Use of Persian (minutes/day; Median (IQR))	180.00 (120.00 - 240.00)	240.00 (120.00 - 300.00)	120.00 (120.00 - 180.00)	<0.05
Use of English (minutes/day; Median (IQR))	420.00 (360.00 - 525.00)	450.00 (360.00 - 540.00)	420.00 (360.00 - 480.00)	0.78

Note. IQR = inter quartile range. Differences between research groups, analyzed using chi-square tests and Mann-Whitney U tests.

3.2. Descriptive Statistics of the Number of Emotion-Related Words

Table 5 shows the number of emotion-related words for both research groups separately, as well as for the total group. The number of words in Persian was significantly higher than in English in the total group ($M_{\text{difference}} = 1.3$; Wilcoxon $W = 77.5$; $Z = -3.52$; $p < 0.001$). Mann-Whitney U-tests revealed no significant difference between the groups in the number of emotion-related words used in English (Mann Whitney $\underline{U} = 201$; $z = 0.03$; $p = 0.98$), but a significant difference in the number of emotion-related words used in Persian (Mann Whitney $\underline{U} = 208$; $z = 2.20$; $p = 0.03$). The English-Persian group used more emotion-related words in Persian compared to the Persian-English group.

Table 5. Total and group-specific number of emotion-related words.

	Total ($n = 40$)		**Persian-English ($n = 20$)**		**English-Persian ($n = 20$)**	
	Mean (*SD*)	Median [IQR]	Mean (*SD*)	Median [IQR]	Mean (*SD*)	Median [IQR]
Persian	4.1 (3.3)	4.0 [2.0 - 5.0]	3.0 (1.9)	3.0 [1.3 - 4.0]	5.2(4.0)	4.0 [3.0 - 5.8]
English	2.8 (2.3)	2.0 [1.3 - 4.0]	2.5 (1.4)	2.5 [2.0 - 3.0]	3.1(3.0)	2.0 [1.0 - 4.0]

Note. IQR = inter quartile range.

3.3. Effect of Language and Order of Assessment on the Number of Emotion-Related Words

In Table 6, the results of the linear mixed models are presented. The number of emotion-related words in English was significantly lower than in Persian, even when including the order of assessment (1st or 2nd time). The order of assessment itself was also significant, indicating that regardless of language, the second time participants used 0.80 more emotion-related words on average than the first assessment.

3.4. Qualitative Differences in the Narratives

During the interviews we noted that there were differences in richness of the narratives told in the two different languages. Therefore, post hoc, all narratives were reviewed to explore whether these differences could also be identified in the stories. These observations were not systematically analyzed. The following examples illustrate differences in 1) coherence and 2) emotional depth. These differences were observed in some, but not all, narratives.

Table 6. The effect of language and order of assessment on the number of emotion-related words.

	Estimate (SE)	Confidence Interval 95%		t-value	*p*
		Lower bound	Upper Bound		
Model with language					
English vs, Persian	−1.35 (0.32)	−2.00	−0.70	−4.20	<0.001
Model with language and order of assessment					
English vs, Persian	−1.35 (0.30)	−1.95	−0.75	−4.57	<0.001
1st assessment vs. 2nd assessment	−0.80 (0.30)	1.40	−0.20	−2.71	0.01

Note. Both linear mixed models included a random intercept and sex, age and use of Persian per day (in minutes) as covariates. N = 40.

Some narratives produced by participants in L2 appeared more fragmented and less coherent and conveyed greater emotional distance, even when the narratives were produced during the second assessment.

An example is a participant (male, 42 years old) in the Persian-English group:

Persian (L1):

"*There is a farm where a countrywoman lives with her husband. She is likely pregnant and dreams about the future. A doctor has visited her and will return again.*"

English (L2):

"*I see a vague… Basically it's in… the picture is not very clear. Now it's in the mountain but it's also with a good view on the sea…. It's own by a… a family so they are… it seems that they are… Now I see more details basically compared to the previous one.*"

Another example is from a female participant (40 years) in the English-Persian group, who also seemed to be better able to tell a coherent and more detailed story in L1, that consisted more strongly phrased references to underlying emotions, such as anger, that might be felt by people in the picture compared with L2.

English (L2):

"*I'm not very good at telling stories, so let's see. I actually see a farm* (*silence*)*... and a man working on his farm, there is a woman, I think, watching him as if... is he doing well or not? And in the foreground, there's a girl with a book looking at the whole situation, thinking… this is not what I want. I really need to get out of here. This is not the life I want. And the woman in the background is looking at the whole situation, I don't really know.*"

Persian (L1):

"*Once upon a time, there was a man who was enjoying himself with his horse. He was plowing here and there. He had his upper body bare and was doing his own thing. He didn't concern himself with others. From the other side, his wife was watching everyone there and said: 'Oh, fool, what are you doing? With a body like that, you should have finished this by now.' And she thinks, it's a shame that I'm in this situation; I'm so unhappy.*"

4. Discussion

This cross-over study aimed to investigate differences in the number of emotion-related words during storytelling in the participants' L1 (Persian) and L2 (English) using the same picture from the TAT (Murray, 1943; Cramer, 1996). In line with our hypothesis, results indicated that participants indeed used significantly more emotion-related words in their L1 than in L2 (L1-L2 or L2-L1). On average, participants used 1.35 more emotion-related words in Persian, regardless of assessment order. This finding is consistent with previous studies suggesting that emotional processing and verbal emotional expression may differ between a first and a later-acquired language (Dewaele, 2010; Harris et al., 2006; Pavlenko, 2012). It also resonates with research on multilingual psychotherapy suggesting that using L1 may facilitate emotional processing and foster a deeper connection between therapist and client (Verkerk et al., 2021).

Another finding was a significant order effect. Regardless of language, participants used, on average, 0.80 more emotion-related words during the second assessment. This may reflect a warming-up or practice effect, as familiarity with a task can influence performance during repeated assessments (Calamia et al., 2012). This possibility is particularly relevant to the TAT, as characteristics of the administration procedure have been shown to influence narrative output, including narrative length and story richness (Slavin-Mulford et al., 2025). In the present study, greater familiarity with the assessment procedure may have helped participants become more comfortable with the narrative task and may have facilitated the production of emotion-related content during the second assessment. Notably, this increase occurred regardless of the language used, suggesting that repeated exposure to the task may facilitate the expression of emotion-related content in TAT narratives. Thus, the order effect may reflect not only a general practice effect, but also a possible warming-up process in which participants became increasingly engaged with the narrative and more likely to articulate emotion-related content. This observation suggests that familiarity with the task may facilitate access to and verbal expression of emotional content during TAT-storytelling, although this interpretation remains tentative because emotional access itself was not directly assessed.

The results also revealed that the English–Persian group used significantly more emotion-related words in their L1 (Persian) than the Persian-English group, despite reporting less daily use of Persian. The English-Persian group reported an average of 151.50 minutes of daily Persian use (SD = 72.50), compared with 208.50 minutes (SD = 84.00) in the Persian-English group. This suggests that daily language use alone may not explain differences in emotion-related word production. Assessment order may have contributed, as the English-Persian group told their Persian story second, and participants generally used more emotion-related words in their second assessment. However, this finding may also relate to our central hypothesis that participants use more emotion-related words in their L1 than in their L2. Previous research has highlighted differences in affective processing

across languages (Pavlenko, 2012) and in emotion-word use in bilingual narratives (Pavlenko & Driagina, 2007). Thus, the emotional significance of a language may not correspond directly to its frequency of daily use. Several mechanisms may help explain the overall difference in emotion-related word production between languages. The first language is typically acquired in emotionally rich contexts, deeply embedded in early autobiographical memories, family interactions, and cultural frameworks, which can facilitate faster and more direct access to emotion-related vocabulary and concepts (Harris et al., 2006; Altarriba, 2014; Pavlenko, 2012, 2013). In contrast, narrating in a later-acquired language may impose greater cognitive demands, as speakers must allocate more mental resources to grammar and lexical retrieval, potentially leaving fewer resources available for elaborating on complex emotional experiences (Schroeder & Marian, 2017). These demands may contribute to more superficial or less emotionally nuanced narratives in L2. Moreover, emotional words may be less strongly encoded or carry weaker affective resonance in L2, which could reduce the likelihood of their spontaneous use (Pavlenko, 2012). Together, these factors may explain why participants in our study used fewer emotion-related words in their L2 (English) than their L1 (Persian), despite narrating about the same picture under similar conditions. However, it is important to note that this study focused primarily on quantifying the use of emotion-related words and thereby may not necessarily say something about the emotional depth or significance of the used words. But during our study, we saw that the narratives in Persian were pointing in this direction. We therefore included, post hoc, some examples of narratives showing differences in coherence and emotional depth. Even when some participants described the same picture after only a short interval, their stories in L2 tended to be more fragmented and emotionally distant compared to their L1 narratives. For example, one participant's account in L1 contained richer descriptions of underlying emotions such as aggression, whereas the corresponding L2 narrative was less detailed and affectively muted. This suggests that the differences may extend beyond quantity to the *quality* of emotional expression. Because this was not systematically analyzed, conclusions about narrative richness or emotional depth remain tentative. Future research could incorporate methods or linguistic markers of emotional elaboration to formally assess these dimensions (Pennebaker et al., 2003).

4.1. Limitations

This study also had several limitations that should be considered when interpreting the results. First, due to pragmatic considerations, the interval between the two storytelling assessments was relatively short (approximately five minutes). This interval may have introduced carry-over effects. Participants could have been influenced by their first narrative when producing the second. Repeated exposure to the same picture may also have increased familiarity with the task, potentially influencing narrative content and the number of emotion-related words produced. The observed order effect, whereby participants used an average of 0.80

more emotion-related words during the second assessment, is consistent with the possibility of a practice or warm-up effect. However, the relative contributions of task familiarity and carry-over cannot be determined with certainty. Although the short interval may have affected the observed language difference, the direction and magnitude of this influence remain unclear. Future studies could use longer intervals and different but comparable TAT pictures to distinguish language effects from practice and carry-over effects more effectively.

Second, the sample consisted predominantly of highly educated individuals. Education levels have been linked to greater metalinguistic awareness and richer expressive vocabulary (Snow, 1991), which could influence emotional expression. It is conceivable that less educated multilinguals might show even larger differences between L1 and L2 due to reduced proficiency in articulating complex emotional content in their second language (Bialystok, 2009). Alternatively, they might show smaller differences if emotional vocabulary is generally less elaborated in both languages. This suggests that the generalizability of our findings to other educational groups remains uncertain.

Third, the groups were relatively small and differed significantly in their daily use of Persian. Although this difference may have influenced emotion-related word production, its contribution cannot be disentangled from other group differences, particularly assessment of order. As the English-Persian group used more emotion-related words in Persian despite reporting less daily Persian use, future studies should recruit larger samples and account for daily language use and assessment order to clarify their respective contributions to emotion-related word production.

Fourth, participants' exposure to Dutch should be considered when interpreting the findings. All participants were living in the Netherlands and were therefore exposed to Dutch as an additional language. This population was intentionally selected because it reflects a clinically relevant group of multilingual individuals who may undergo psychotherapy or psychodiagnostic assessment in English despite having another first language. English was selected as the L2 because all participants were highly proficient in English and regularly used it in educational or professional contexts. In multilingual speakers, the languages in a person's repertoire may remain activated and may influence language processing and production depending on the linguistic context (Grosjean, 2023; de Bruin et al., 2023). Consequently, potential cross-linguistic influences or code-switching involving Dutch cannot be completely excluded. Dutch proficiency and language use were not systematically assessed in this study. Future research should assess proficiency and language use across all languages to clarify their potential influence on emotion-related word production.

Despite these limitations, the results strengthen existing evidence that emotional expression is typically richer in one's first language (Dewaele, 2010; Pavlenko, 2012). This study also highlights potential risks of missing information in psychodiagnostic assessments conducted in an L2, where emotional content may be underrepresented.

4.2. Implications for Clinical Practice and Research

These findings have implications for psychological assessment and psychotherapy with multilingual individuals. Our results suggest that high proficiency in a later-acquired language does not necessarily correspond to the same frequency of emotion-related word use as in the first language. In psychotherapy and psychodiagnostic assessment, multilingual clients may be assessed or treated in a later-acquired language that they speak fluently, often because this language is used in their education, work, or the country in which they live. Clinicians should therefore consider the language used during assessment and therapy, particularly when interpreting sensitive narratives involving emotionally charged experiences. This does not imply that assessment or therapy in L2 is invalid, but it suggests that language choice should be taken into account when interpreting the information expressed by multilingual clients. When clinicians do not speak the client's first language, the involvement of a qualified professional interpreter may be particularly valuable in psychodiagnostic assessment and psychotherapy, where subtle emotional and culturally nuanced expressions can be important for clinical interpretation (Bauer & Alegría, 2010; Burdeus-Domingo et al., 2020).

Future research should examine whether these findings generalize to clinical populations and individuals with different educational backgrounds, and whether language proficiency, daily language use, and exposure to additional languages influence emotion-related word production. Larger studies with standardized language proficiency measures, counterbalanced assessment order, and longer intervals between assessments could help distinguish language effects from practice and carry-over effects. Qualitative analyses could further investigate whether differences in emotion-related word frequency correspond to differences in narrative coherence or emotional elaboration. Finally, neuroimaging and physiological measures may help clarify the mechanisms underlying language-related differences in emotional processing. Research suggests that semantic processes are involved not only in describing emotions but may also contribute to how emotional experiences are constructed (Satpute & Lindquist, 2021). Integrating these approaches could help clarify further the relationship between language, emotional expression, and clinical assessment.

5. Conclusion

This study aimed to investigate whether there were differences in the number of emotion-related words in L1 versus L2 narratives. Overall, participants used significantly more emotion-related words in their L1 (Persian) than in their L2 (English), and underscore the importance of language in psychodiagnostic contexts, particularly for multilingual individuals. The significant differences in emotion-related word usage highlight the need for culturally and linguistically sensitive practices in psychological assessment to ensure accuracy and fairness. The study shows the importance of considering language choice in contexts where assessments conducted in a non-native language may underrepresent the individual's

emotional experience. Future research should build on these findings by exploring both quantitative and qualitative aspects of emotional expression across different multilingual populations, in longitudinal designs and by examining how these patterns evolve with greater second-language exposure.

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Conflicts of Interest

The authors declare no conflicts of interest.

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Appendix

Plain emotions:

"*I think that in this story, those two are the mother and the father of that girl, which are working in the farm because I see a horse. Their clothes are a little more local than that girl's. The girl with the book in her hand looks like she's studying. Maybe she's going to school somewhere. Her face is a little* ***sad****. I can't see the man's face, but the girl's face is a little* ***sad****. Maybe she thinks that I should go to study and then get a good job. Maybe I can help my parents*".

(*Female*, 21 *years, group Persian-English, this story was told in Persian*)

Emotional states:

"*I see a village and... one old farm, two ladies, one powerful and one man and one horse, a white horse... the weather is so good, sunny weather and... the two ladies have* ***depression*** *and... one lady is young and one lady is not young. I think... the first lady is... man's girlfriend and the second lady is man's mother and I think they were fighting two minutes ago*".

(*Male*, 38 *years, group English-Persian, this story was told in English*)

Expressions:

"*I'm not sure what the connection is, it could be her mother, it could be only like a neighbor or something… She…on the other hand* **looks very relaxed**".

(*Male*, 43 *years, group Persian-English, this story was told in Persian*)

Verbs:

"*And I don't know the role of this gentleman, let's assume that the lady is looking at him. I mean, I can't say where it starts and where it ends... if you want to make it very dramatic, for example, this girl* ***loves*** *a boy. I don't know if his mother wants to stop them*".

(*Male*, 43 *years, group Persian-English, this story was told in Persian*)