

The humorous standard: Modern Standard Arabic in Tunisia and social embarrassment

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Abstract

Laughter has been extensively studied by Darwin (1890). Van Hooff (1972; 1989) traced the phylogeny of smiling and laughter to non-human primate “grin-face” and “play face”, which signals non-serious attacks. Human cognition evolved beyond primate “play”, with human laughter expanding to a wider range of social contexts (Gervais and Wilson 2005). Henceforth, smiling/laughter has been considered an expression of joy at varying intensities. The universality of this expression was studied by Ekman et al. (1982; 1990), identifying two universal kinds of smiles/laughs: felt (Duchenne) and fake (non-Duchenne)—the latter appearing in uncomfortable situations. Ekman and Friesen’s (1976, 1978) Facial Action Coding System distinguishes 44 action units, with AU6 and AU12 being the Duchenne smile marker (Martin et al., 2017), while AU12 alone signals a non-Duchenne smile (Ekman, 1990). Preliminary observations noting signs of discomfort such as non-Duchenne smiles, and gaze aversion (Tangney 1999), showed Tunisians exhibiting such signs when speaking in Modern Standard Arabic (MSA). In diglossic Tunisia, Low (Tunisian Arabic) and High (MSA) varieties coexist (Ferguson 1959), whereby code-switching may be appraised as incongruous, a source of humour for observers (Ferguson, 1959). This may elicit hearer amusement (even laughter) and speaker embarrassment for violating sociolinguistic norms (Goffman, 1956). This paper hypothesises that switching to MSA, results in embarrassment, manifesting through non-Duchenne smiles (AU12 only; Ekman, 1990), an expression associated with social discomfort, along with other embarrassment signs. This social emotion may relate to a broader negotiation of an ethno-cultural pan-Arab identity, prompting a re-evaluation of MSA pedagogy.

Keywords: diglossia, Tunisian Arabic, Modern Standard Arabic, humour, embarrassment.

1. Introduction

The human vocalisation of laughter, along with smiling, has been studied at length, most notably by Darwin (1890) and later van Hooff (1972; 1989) and Provine (2012). Laughter, which humans share with other primates, has been considered the signal of play. This function of laughter has expanded with humans’ cognitive capacities to a wider range of social contexts (Gervais & Wilson, 2005). The universality of smiling and laughter as an expression of joy

across cultures was studied in depth by Ekman et al. (1982; 1990). Of relevance to this paper is their identification of two universal kinds of smiles: felt (Duchenne) and fake (non-Duchenne). The latter was argued to appear predominantly in uncomfortable situations.

While traditional frameworks like Ekman's (1990) linked Duchenne smiles specifically to positive affect, "such as amusement, relief, contentment, satisfaction with achievement, or sensory pleasure, as well as the more general positive emotion terms such as enjoyment or happiness" (p. 350), contemporary research has significantly expanded our understanding of facial displays. The Social-Functional Framework for Smiles (Martin et al., 2017) offers a complementary perspective to the Duchenne/non-Duchenne dichotomy. This framework categorises smiles according to three primary social functions: reinforcing desired behaviours, forming and maintaining social bonds, and negotiating social hierarchies. The latter is displayed via dominance smiles (Martin et al., 2017), which Darwin (1890) characterised as more akin to sneers. These sneers are signalled by a unilateral presence of AU12 (lip corner puller), combined with AU14 (dimpler), and have been associated with contempt (Ekman, 1990). Reward and affiliation smiles, serving the first and second social functions, typically involve positive affect (aligning with Duchenne classifications).

Relating the interplay of human cognitive functions and the experience of humour, which may cause laughter (Gervais & Wilson, 2005), Mazzocconi et al. (2022) note that the laughable is categorised into four types: pleasant incongruity, social incongruity, pragmatic incongruity, and pleasantness/closeness. This nuanced understanding is particularly relevant in the Tunisian diglossic context, where language choices carry distinct social meanings. Particularly, social incongruity is described as "any situation where a clash between social norms and/or comfort and the laughable can be appraised"; these instances include "social discomfort (e.g., embarrassment or awkwardness), [and] a violation of social norms" (Mazzocconi et al., 2022, p. 5).

This paper, situated in the Tunisian diglossic context, where varieties L (low, Tunisian Arabic) and H (high, Modern Standard Arabic) coexist, looks at laughter and smiling in relation to the linguistic code used. Building on the aforementioned, the author hypothesises that code-switching between MSA and TA will elicit specific social-emotional responses for the speakers. The norm violation produces embarrassment-related smiles (AU12 without AU6), a specific subtype of non-Duchenne smiles, along with other signs of embarrassment such as gaze aversion, laughter, and hesitation.

2. Phylogeny of laughter

2.1. Human and primate laughter

The human vocalisation ha-ha upon hearing a joke or experiencing joy is assumed to be a unique human behaviour. Earlier studies, notably by Darwin (1890), have shown that *Homo Sapiens* share laughter with other primates. Darwin notes that laughter is the product of physical simulation as well as a cognitive process where the mind is "tickled by a ludicrous idea" (Darwin, 1890/2009, p. 210). Just like human bodies convulse when laughing, "anthropoid apes ... likewise utter a reiterated sound, corresponding with our laughter, when they are tickled, especially under the armpits" (Darwin, 1890/2009, p. 210).

A puzzling point for Darwin and others was this unique "reiterated character" of human laughter (1890/2009, p. 216). When humans laugh, they produce "a deep inspiration followed by short, interrupted, spasmodic contractions of the chest, and especially of the diaphragm" (1890/2009, p. 211). Conversely, non-human primate laughter is characterised by a "remarkable

aspect of the display [which] is the pattern of breathing. It is fast and shallow, consisting of alternating, short and staccato inspirations and expirations” (van Hooff, 1989, pp. 131-132).

The surface-level difference was explained by Provine’s (2000) Bipedal Theory. The theory argues that the genus *Homo*’s transition into *Homo Erectus* “freed the thorax of the mechanical demands of quadrupedal location and loosened the typical mammalian coupling of vocalisations with breathing” (Gervais & Wilson, 2005, p. 411). However, separating vocalisations from breathing was not the only gain from bipedalism. In fact, upright posture also allowed humans the ability to speak:

Freed of the rigid 1:1 link between stride and breath characteristic of quadrupeds, our early ancestors evolved a vocal system in which individual sounds were no longer tied to single breaths, permitting the subsequent natural selection for speech and, incidentally, our species’ characteristic ha-ha laugh.

(Provine, 2016, pp. 1535-1536)

The similarity between the human ha-ha and the primate panting ah-ah shows that they are indeed related, if not the same thing at different stages of evolution. Indeed, Provine notes that what humans and chimpanzees have in common in their laughing vocalisations is that, in both cases, it is the “sound of *play* [emphasis mine]” (Provine, 2016, p. 1535).

2.2. The sound of play

Van Hooff (1972) studied the phylogenetic similarities between human and ape laughter and smiling. He provided strong evidence that supported his hypothesis stipulating that smiling and laughing are varying intensities of a single emotive display. His hypothesis is supported by tracing back the evolution of grin face and play face in non-human primates. In his 1972 article, van Hooff elaborated on the two aforementioned displays. He writes that a grin face or a silent bared-teeth display involves the baring of the teeth. This display signals a “mainly defensive or protective pattern of behaviour, [which] becomes a signal of submission and non-hostility (cf. affiliative smile in Martin et al. 2017). In some species the latter aspect can become predominating, so that a reassuring and finally a friendly signal can develop” (van Hooff, 1972, p. 217). It is relatively easy then to liken this silent bared-teeth display in apes to the human smile which serves the same function: signalling non-hostility as well as friendliness.

The play face or the relaxed open-mouth display is what accompanies ape laughter during rough-and-tumble play. This primate activity consists mainly of apes chasing one another and mock-fighting. van Hooff points that this display “may function as a metacommunicative signal that the ongoing behaviour is not meant seriously” (1972, p. 217) and is only displayed by friendly individuals to others they deem friendly as well (van Hooff, 1972). The similarity of this display to human laughter in vocalisation and in social function (humans also laugh in non-serious situations), suggests that “both displays are phylogenetically closely related” (van Hooff, 1972, p. 217).

Going back to laughter and smiling being different intensities of the same display, van Hooff’s findings showed that in chimpanzees, grin face and play face have merged to a significant degree. This suggests that chimpanzees are at “the extreme of the developmental range of the silent bared-teeth display in non-human primates” (van Hooff, 1972, p. 225). Likewise, human laughter and smiling seem to have developed further to become “expressions of different intensities of the same motivational state” (van Hooff, 1972, p. 230). A more recent work by Girard et al. (2019) argued for a similar distribution of Duchenne and non-Duchenne smiles.

This state is an extension of rough-and-tumble social play, given that humans’ cognitive capacities have developed beyond those of other primates. This is what Martin (2006) notes:

As humans developed greater cognitive and linguistic abilities, complex patterns of group interaction, and the ability to infer the intentions and mental states of others, humour and laughter, while originating in rough-and-tumble social play, came to be used for additional purposes relating to social communication and influence, tension relief, and coping with adversity.

(Martin, 2006, p. 15)

What remains constant in the midst of this change is that humans laugh at what they consider ‘ridiculous’ (laughable, unreasonable) or ‘ludicrous’ (unreasonable). In humans, van Hooff points that a “situation becomes particularly ludicrous when some impressive, awe-inspiring, threatening or dignified character is suddenly seen from a perspective which reveals it as something not needed to be taken seriously after all” (van Hooff, 1989, p. 125). The incongruity theory of humour tackles this contradiction of seeming seriousness and actual non-seriousness at length. The incongruous, which is unreasonable by extension, must be non-serious to be humorous. Otherwise, it would be frightening, or even morbid.

Human apprehension of what is ridiculous cannot happen in isolation. Rather, the cognitive appraisal of what is humorous relies on social context, i.e. an implicit comparison to shared norms of “non-ridiculous” behaviour. This social grounding of humour perception helps explain why laughter, while often triggered by humour, serves primarily relational functions (Provine, 2012). In fact, laughter operates first as a signal of social alignment by flagging norm violations yet acknowledging them as non-threatening (this is discussed further below). Second, and as an appendix to the first function, laughter regulates group dynamics by reinforcing shared standards. In this respect, inappropriate code-switching violates diglossic norms, making the humorous appraisal by observers and the speakers’ embarrassed reaction the two ends of this social-relational framework.

3. Laughter and social behaviour

3.1. The social function of laughter

The social aspect of laughter was also discussed by van Hooff:

Other authors, again, have emphasised that social factors play an important role in the appreciation of a situation as humoristic, and, particularly, in the expression of this interpretation in the form of laughter. Few people laugh when reading a joke alone. Full-hearted laughter is released most easily, where people can share their appreciation with others. It obviously serves an important function in *regulating* social relationships.

(van Hooff, 1989, p. 126, emphasis mine)

Others have also pointed the “decidedly social basis” to laughter (Glenn, 2003, p. 24). Glenn writes that among the things that influence laughter are “social variables such as whether others are present, whether others are laughing, who they are, what is going on between participants, what the laughable is about, and so forth” (Glenn, 2003, p. 26). This is what Gervais and Wilson call Nonserious Social Incongruity, defined as a “a sudden unexpected change in events that is perceived to be at once not serious and in a social context” (2005, p. 399).

Henceforth, laughter and social context are in a bilateral relationship where the latter influences the former, while the former regulates the latter. In the same vein, van Hooff points out that one of the oldest sources of humour is laughing at those we dislike. This was supported by Glenn’s (2003) reports on a study by Pollio and Edgerly (1976) in which they found that among the situations where people laughed most are “stupidity of others” and “physical actions and antics of other people” (cf. Keltner & Buswell, 1997). Laughing in such situations would

have the function of “either to correct or to repel abnormal and non-conforming individuals... The genial aspect would derive from the binding of companions laughing together in a mutual realisation of safety” (van Hooff, 1972, p. 211).

Eibl-Eibesfeldt (1989/2017, p. 315) writes that laughter may be a “phylogenetically ancient form of mobbing”, where members of a group laugh at a single individual. Despite the act of laughing aloud at someone being rather aggressive, Eibl-Eibesfeldt (1989/2017) points that it does not negate that laughter serves a bonding function:

Those who deviate from the group norm are at first teased and laughed at... This does not contradict the fact that laughter is also bonding. But it only bonds those who laugh together; the person being laughed at rarely laughs along with the others, and he perceives this laughter as an aggressive act. People are laughed at because they are awkward or otherwise behave differently from the norm. The laughter makes the individual aware of his deviating behaviour and gives him an opportunity to conform.

(Eibl-Eibesfeldt, 1989/2017, p. 315)

Consequently, the social fabric is strengthened, and norms are maintained when those who laugh (aggressors) reassert the normal and avoid being laughed at. On the other hand, those laughed at (aggressed) are shamed into conforming.

3.2. Duchenne and non-Duchenne smiles

Following Darwin’s observations, the universality of human expression came into question. While some researchers argued that human expression varies per culture, Ekman et al. (1969; 1990) advanced that expressions of emotion are the same universally, with the only variation being when and to whom these expressions are shown. Ekman et al. (1990, p. 342) commented on the argument cited by cultural anthropologists that laughter can also “express surprise, wonder, *embarrassment* and even discomforture [*sic*]” (emphasis mine). They distinguished between two types of smiles: felt/enjoyment smiles, later referred to as Duchenne smiles, and false smiles (non-Duchenne). The Duchenne smile, deemed authentic, involves several facial muscles which make it distinguishable from other smiles. “Clearly the Duchenne smile, in which the orbicularis oculi, pars lateralis muscle that orbits the eye is contracted in addition to the zygomatic major muscle's pull on the lip corners, is a better sign of enjoyment” (Ekman et al., 1990, p. 350).

By contrast, false smiles are voluntary expressions made either for the purpose of deception or concealment. The latter type is called a masking smile where a “strong negative emotion is felt and an attempt is made to conceal those feelings by appearing to feel positive” (Ekman & Friesen, 1982, p. 244). Ekman and Friesen (1982) note that the orbicularis oculi (Action Unit 6 in FACS) are absent in false smiles, while the zygomatic major (Action Unit 12 in FACS) muscle is active in a non-Duchenne smile. Hence, it can be hypothesised that false smiles would be present when one experiences a negative emotion such as embarrassment and would rather conceal it.

Although the Duchenne marker (AU6+AU12) has been widely utilised as the indicator of an authentic positive affect (Ekman, 1990), contemporary research cautions against the automatic interpretation of these facial expressions as unambiguous authenticity signals. Indeed, Krumhuber and Manstead (2009, p. 818) have argued that Duchenne smiles “occurred as both felt and posed expressions”. In a similar vein, Girard et al. (2019) argued for the Duchenne marker (AU6) as being reflective of smile intensity rather than its authenticity.

Nevertheless, in diglossic code-switching contexts, where the speaker is theorised to produce more embarrassment-related facial movements, the absence of AU6 (the Duchenne marker) remains a valuable operationalisation. Even if the presence of AU6 is inauthentic, its

absence remains significant since the situation explored is that in which social discomfort occurs, rather than positive affect. Moreover, the comparison between MSA and TA conditions controls for individual, as well as cultural, variability in smile production (Thibault et al., 2012).

3.3. Social emotions: embarrassment

Damasio (1994) divides emotions in general into two main categories governed by two systems. While basic emotions (fear, anger, disgust, surprise, sadness, and happiness) are governed by the limbic system, “secondary or social emotions (sympathy, shame, embarrassment, guilt, pride, jealousy, envy, gratitude, admiration, indignation, contempt) are supported by the prefrontal and somatosensory cortices” (Pavlenko, 2005, p. 198). These secondary emotions, by definition, define the individual’s integration within a socio-cultural matrix. Hitokoto and Ishii (2022, p. 1197) argue that this “social constructionist approach to emotion” reveals emotion episodes to hinge on “culturally meaningful appraisals of antecedent events [which] intensify certain social emotions only among the members of certain cultures”.

Tangney (1999, p. 541) defines embarrassment as a self-conscious emotion where it involves “some form of self-reflection and self-evaluation”. She writes that “[v]ery young children first showed behavioural signs of embarrassment (smiling coupled with gaze aversion, touching the face, etc.) at precisely the same phase of development in which a rudimentary sense of self emerges” (Tangney, 1999, p. 542). The sense of self is not the only element of these emotions, but also the self’s relationship with other selves within a social frame.

These emotions [shame, guilt, pride and embarrassment] typically arise when we meet, surpass or violate our standards and goals. And in turn, our moral and social standards, our hopes and ideals for the self, are shaped by the key socialisation, experiences with parents, teachers, peers and others.

(Tangney, 1999, p. 543)

Tangney points that “[e]mbarrassment, in particular, seems to be the quintessential social emotion, occurring almost without exception in the company of others” (Tangney, 1999, p. 543). She writes that this particular emotion occurs

when implicit social roles and scripts are disrupted and social interactions go awry. A flubbed performance, an unanticipated belch, ... each present a dilemma in the sense that these situations deviate from accustomed social scripts. ... embarrassment occurs when one acts in a way that is inconsistent with one’s persona, or personal standards that help form a person’s identity.

(Tangney, 1999, p. 554)

Prior to Tangney’s work, Keltner and Buswell (1997, p. 252) enumerated what they deemed to be antecedents of embarrassment which “most typically involve violations of social conventions that increase social exposure”. These instances of social exposure could be

physical pratfalls (e.g., tripping), cognitive shortcomings (e.g., forgetting the name of a new acquaintance), loss of body control (e.g., belching or uncontrolled flatulence), failure to maintain privacy (e.g., having one’s feelings disclosed), and awkward social interactions and when they have been teased by others or been the object of undesirable social attention.

(Keltner & Buswell, 1997, p. 252)

In other words, embarrassment is the emotion emerging from being, or the fear of being, “laughed at”, either metaphorically or otherwise. This aligns with the argument provided by Mazzocconi et al. (2022) regarding the laughable, among other things, as socially incongruous. In fact, they point out that a possible social incongruity is when “an utterance... clashes with

the interlocutor's expectations concerning one's behaviour" (Mazzocconi et al., 2022, p. 5). This clash is deemed "painful" to the speaker, as it includes speaking about an unpleasant instance of norm violation. Furthermore, "when a laugh is produced in such circumstances, it fulfils the same effect as a laugh produced during felt embarrassment" (Mazzocconi et al., 2022, p. 5).

Thus, being ridiculed and "mobbed" by social peers is highly negative, generating the emotion of embarrassment. Embarrassment functions as an appeasement signal, communicating recognition of the social misstep and willingness to conform (Keltner & Buswell, 1997); otherwise, there would be no such emotion experienced by the speaker. What must be noted here is that this violation of the norm is minor (non-serious) which is why it is met with laughter but must still be corrected. It should be noted that what is incongruous and laughable, is not always a physical action. Verbal behaviour, per Mazzocconi et al. (2022), can also be incongruous, non-serious, and hence laughable.

4. Laughter and MSA production

4.1. Diglossia and the Tunisian context

The linguistic situation in the Arab world has interested several linguists (Ferguson, 1959; Blau, 1977; Versteegh, 1997, among others). In 1959, Ferguson introduced the term *diglossia* to describe the linguistic profile of the Arab world. Diglossia describes a speech community in which two varieties of the same language co-exist, with each variety having a distinct function. Ferguson (1959) writes:

[Diglossia is] a relatively stable language situation in which, in addition to the primary dialects of the language (which may include a standard or regional standards), there is a very divergent, highly codified... superposed variety, the vehicle of a large and respected body of written literature, either of an earlier period or in another speech community, which is learned largely by formal education and is used for most written and formal spoken purposes but is not used by any sector of the community for ordinary conversation.

(Ferguson, 1959, p. 336)

In Tunisia, the "superposed variety ... called the H ('high')" would be Modern Standard Arabic (MSA), while the L ('low') variety would be Tunisian Arabic (TA). According to Ferguson (1959), the two varieties differ on nine aspects, the most relevant of which to this paper is function. In terms of function, the H and L varieties are said to be in complementary distribution, whereby one variety cannot substitute the other in a given context (e.g. the L variety is reserved for informal use, while the H variety is formal). This allocation of functions is not arbitrary. A point that Ferguson advances is that "[a]n outsider who learns to speak fluent, accurate L and then uses it in a formal speech is an object of ridicule. A member of the speech community who uses H in a purely conversational situation or in an informal activity like shopping is equally an object of ridicule" (Ferguson, 1959, p. 329, emphasis mine).

This distribution of domains (Fishman, 1965) has ceased to be so clear-cut in recent years. This change is characterised by the expansion of one variety's domain at the expense of another. This is what Fasold (1984, p. 41) terms "leaky diglossia [which] refers to cases in which one variety 'leaks' into the functions formerly reserved for the other". He continues, that "if there is substantial leakage of H or L varieties into the functions of the opposite variety, this is usually a sign of the incipient breakdown of the diglossic relationship" (Fasold, 1984, p. 42).

These changes were noted in Tunisia. Sayahi (2014, p. 69) notes that "Tunisian Arabic is gradually spreading to domains that would have been expected to be reserved exclusively for the H variety... speakers are extending their usage of the dialects in a way that is paving the

way for their normalisation”. This is noticeable in the increasing use of TA in media, in *khutbas*, and in political speeches. However, this shift is not the fruit of a conscious effort but of an inescapable shift towards what is more pragmatic. It is common to hear Tunisians call their variety a corrupted version of Arabic, while others may praise its difference. This oscillation between a degraded L variety that dominates most aspects of society and a highly esteemed H variety that is rarely used is what Sayahi calls the “diglossia paradox” (Sayahi, 2014, p. 3). He elaborates that speakers

degrade the very same language they faithfully transmit to their children, thus perpetuating the situation of which they consciously disapprove. Both the illiterate speakers, often the ones who are deprived of any possible gains associated with knowing the standard form, and the educated speakers share a negative perception of the vernacular.

(Sayahi, 2014, p. 3)

This results in speakers venerating a variety they may not know and may not even speak, at least with confidence. Sayahi notes that for MSA to be unmarked in a communicative event, there has to be pre-set conditions “determining the topic and the participants (e.g., a class discussion of a literary work or a radio interview...)” (2014, p. 61). Yet, these conditions no longer apply since class discussions are often conducted in TA, except in foreign language classes, and radio shows inevitably switch to TA even if they start in MSA. Consequently, this leads to

the limited degree of comfort many Arabs experience when they use MSA in an unplanned manner. The fact that many speakers do not get the opportunity to participate in such predetermined events on a regular basis adds to the feeling of artificiality when the occasion arises for them to use MSA.

(Sayahi, 2014, p. 61)

The discomfort in speaking MSA rises from two factors: a) the language is nearly never used in oral discourse except for very formal contexts that most Tunisians do not go through daily. b) As a consequence of a), the domain of MSA has shrunk to the point where any use of MSA in speech feels misplaced. Hence, speaking a particular variety where it ought not be used would, evidently, be breaking the norm. On the part of the hearer, this would cause laughter, since the action is not serious enough to engender a stronger reaction. On the part of the speaker, this would cause embarrassment, causing him to revert to the norm.

4.2. Sample study

Building on Ferguson’s (1959) diglossia framework, this study hypothesises that in Tunisia’s Arabic diglossic context, Modern Standard Arabic (MSA; the H variety) and Tunisian Arabic (TA; the L variety) are functionally distributed, with MSA dominating formal domains and TA informal ones. Ferguson posited that violating these norms risks social ridicule, which elicits embarrassment in the speaker, a mechanism reinforcing linguistic conformity. In line with Ekman’s (1990) work on emotion, such embarrassment may manifest through non-Duchenne smiles (lacking AU6 activation), which serve as masked attempts to mitigate social discomfort. Embarrassment may also manifest in gaze aversion, hesitation, and laughter (Keltner & Buswell, 1997; Tangney, 1999).

Participants comprised 17 female native Tunisian Arabic speakers aged 20-22 (M = 21.1), all proficient in MSA due to formal education from age 5-6. Eight were Education majors at L’Institut Supérieur des Sciences Humaines de Jendouba (ISSHJ), and nine were English majors at La Faculté des Lettres, des Arts et des Humanités de la Manouba (FLAHM). All were third-year undergraduates with normal or corrected-to-normal vision and provided consent for video recording. Each participant was recorded individually.

Facial expression data were analysed using OpenFace 2.0 (Baltrušaitis et al., 2018), an open-source facial behaviour analysis toolkit that provides automated detection of facial Action Units (AUs) based on the Facial Action Coding System (FACS; Ekman & Friesen, 1978). Video recordings were processed frame by frame, and only frames with a confidence score above 0.5 were retained to ensure detection reliability. The analysis focused on AU6 (cheek raiser) and AU12 (lip corner puller), both of which are critical indicators in smile classification. A smile was classified as Duchenne when both AU6 and AU12 were present in a frame, and as non-Duchenne when only AU12 was detected.

This annotation process was conducted entirely through automated analysis. No manual coding or subjective judgment was applied, and no human raters were involved in the classification process. As such, inter-rater reliability statistics are not applicable. The decision to use OpenFace 2.0 was guided by its demonstrated accuracy in detecting AUs and its comparability to expert human FACS coding in prior validation studies (Baltrušaitis et al., 2018). Moreover, its open-source availability made it particularly well-suited for the research context of this study.

Each participant described five emotionally neutral pictures twice: once in MSA and once in TA, with task order counterbalanced. The output of processed recordings was saved as CSV files for MSA and for TA per participant. The proportions of Duchenne and non-Duchenne smiles were aggregated to subject and group-level means for within and between-group comparisons. The data was then analysed using IBM SPSS 23.

Descriptive statistics revealed that participants exhibited numerically more Duchenne smiles in Tunisian Arabic (TA; $M = 0.42$, $SD = 0.41$) than in Modern Standard Arabic (MSA; $M = 0.39$, $SD = 0.41$), while non-Duchenne smiles were more frequent in MSA ($M = 0.61$, $SD = 0.41$) compared to TA ($M = 0.58$, $SD = 0.41$). The ranges for both smile types spanned the full possible scale (0-1) across participants in both language conditions.

A 2 (Smile Type: Duchenne vs. non-Duchenne) \times 2 (Language: MSA vs. TA) repeated-measures multivariate analysis of variance (MANOVA) was conducted to examine the effect of language and smile type on smile frequency. The analysis revealed no significant main effect of Smile Type, $F(1, 16) = 1.20$, $p = .29$, $\eta^2 = .07$, indicating that Duchenne and non-Duchenne smiles occurred at comparable rates overall. Similarly, there was no significant main effect of Language, $F(1, 16) = 1.00$, $p = .33$, $\eta^2 = .059$, suggesting that the overall frequency of smiling did not differ reliably between the MSA and TA conditions. Finally, the Smile Type \times Language interaction was not significant, $F(1, 16) = 0.135$, $p = .718$, $\eta^2 = .008$, indicating that the relationship between smile type and frequency did not vary by language condition (see Figure 1). These findings suggest that language register (formal vs. informal) did not significantly impact participants' facial expressivity as measured by AU-based smile classifications.

Visual inspection of the estimated marginal means plot (Figure 1) from the MANOVA revealed a pattern consistent with the embarrassment hypothesis: non-Duchenne smiles showed a slight elevation in MSA relative to TA, while Duchenne smiles showed the opposite pattern. Although these differences were not statistically significant at conventional levels with the current sample size ($N = 17$), the observed effect directions align with theoretical predictions that the use of MSA may elicit more embarrassment-related facial expressions. The small effect sizes (all $\eta^2 < .07$) suggest that a larger sample might detect these subtle but theoretically meaningful differences in emotional response across diglossic contexts.

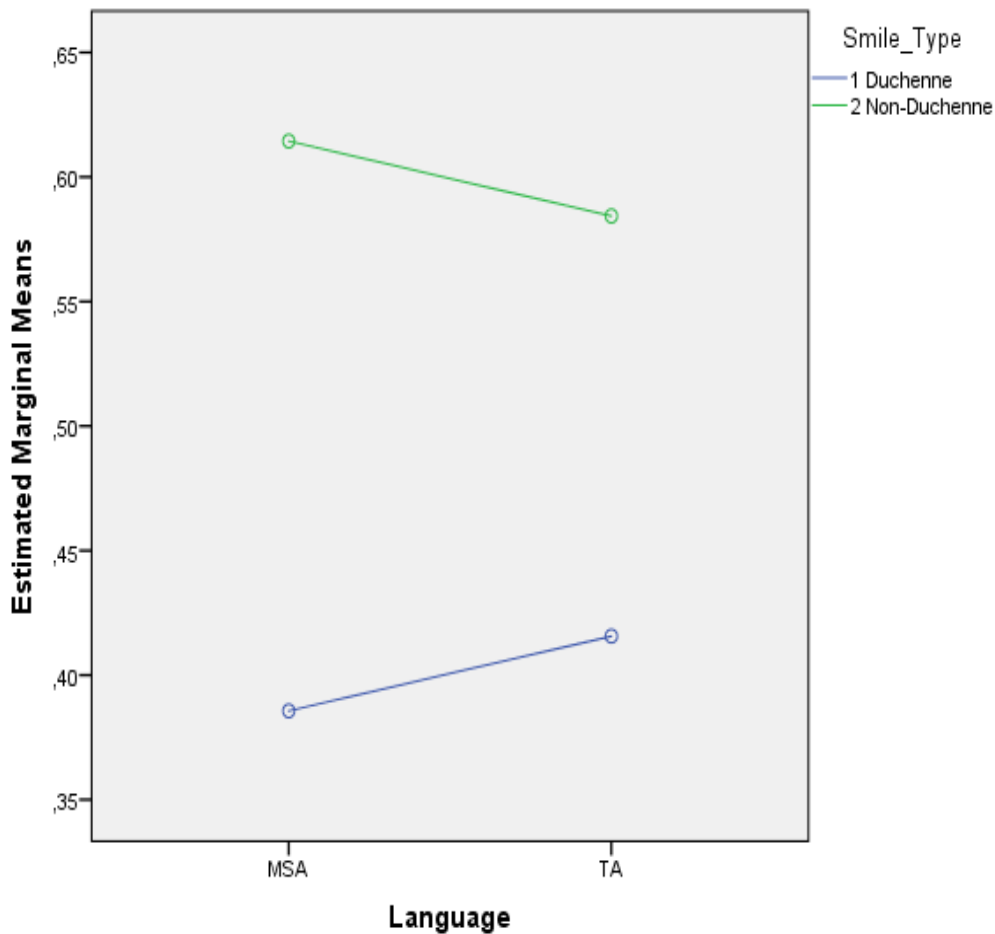


Figure 1. Non-significant trend toward more non-Duchenne smiles in MSA compared to TA

In order to better capture the emotional dynamics involved in language production, instances of laughter were analysed separately from other behaviours such as hesitations. Laughter was manually annotated and categorised into two functional types: positive laughter, defined as spontaneous, affiliative amusement arising from the act of producing language (e.g., laughing at one’s own performance or enjoying the task), and negative laughter, defined as emerging in contexts of lexical search, self-correction, or hesitation. To ensure the reliability of laughter classification, an independent rater—blind to the study’s hypotheses—verified a subset of the annotations (20% of the data). Inter-rater agreement was calculated at 95%, indicating a high level of consistency between coders and providing strong support for the validity of the manual coding scheme.

Paired-samples t-tests comparing laughter frequency in Modern Standard Arabic (MSA) and Tunisian Arabic (TA) revealed a significant increase in positive laughter in TA ($M = 0.65$, $SD = 1.06$) relative to MSA ($M = 0.12$, $SD = 0.33$), $t(16) = -2.17$, $p = .046$. This suggests that participants experienced greater positive affect when using TA. In contrast, negative laughter occurred more frequently in MSA ($M = 0.53$, $SD = 0.94$) than in TA ($M = 0.18$, $SD = 0.39$), though the difference did not reach statistical significance, $t(16) = 1.69$, $p = .111$. Correlations between positive and negative laughter across language conditions were moderate but not statistically significant ($r = .30$ and $.41$, respectively), indicating some individual variability in expressive patterns. Overall, these findings offer partial support for the hypothesis

that language variety affects emotional expression: the TA condition appears to invite more positive affect, while the MSA condition may subtly elicit more cognitive effort or self-monitoring, as evidenced by the trend toward more disfluency-related laughter.

A third display related to embarrassment is gaze aversion. To assess whether participants' gaze direction differed between language conditions, paired-samples t-tests were conducted on gaze position along the horizontal (X) and vertical (Y) axes during Modern Standard Arabic (MSA) and Tunisian Arabic (TA) descriptions, with values closer to zero indicating a more centred gaze. Gaze tracking was performed automatically using OpenFace 2.0, which provides frame-by-frame estimates of eye gaze direction in normalised X and Y coordinates, enabling precise comparison across conditions. For horizontal gaze (Gaze X), there was no significant difference between MSA ($M = -0.10$, $SD = 0.23$) and TA ($M = -0.10$, $SD = 0.24$), $t(16) = 0.00$, $p = 1.000$. Similarly, vertical gaze (Gaze Y) did not differ significantly between MSA ($M = 0.33$, $SD = 0.08$) and TA ($M = 0.31$, $SD = 0.09$), $t(16) = 1.14$, $p = .272$. These results suggest that gaze direction remained stable across both language conditions.

Strong positive correlations were observed between MSA and TA gaze values for both axes, indicating a high degree of consistency in gaze behaviour across conditions: $r = .97$ for Gaze X and $r = .81$ for Gaze Y, both $ps < .001$ (see Figure 2).

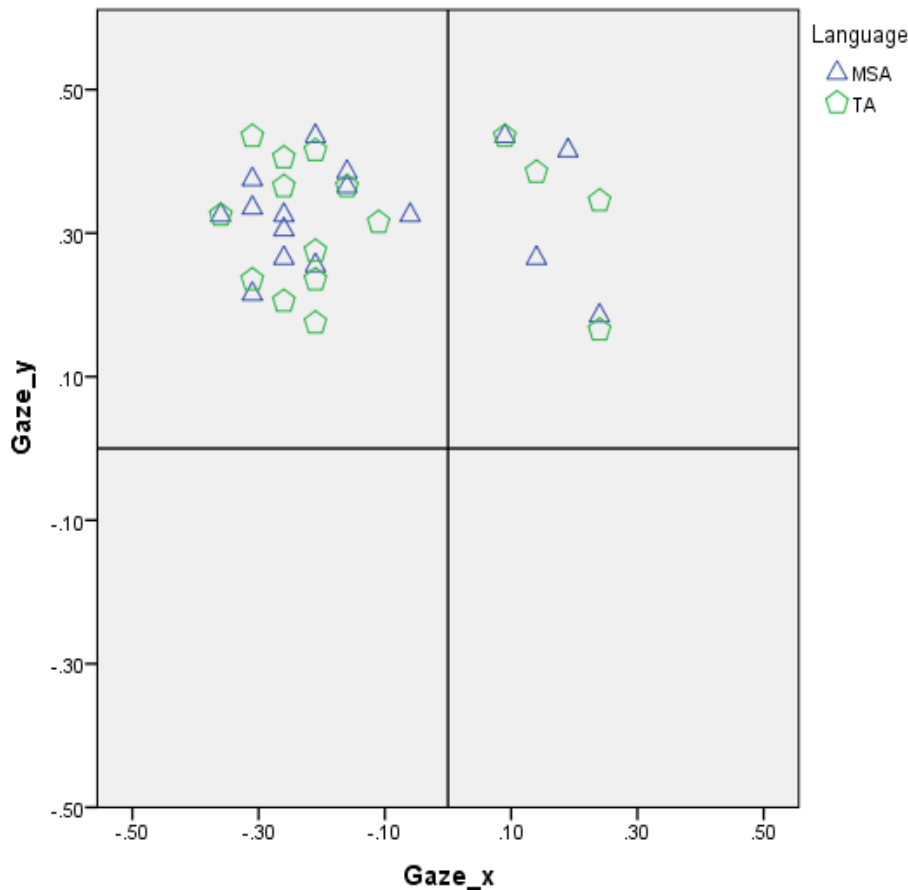


Figure 2. Gaze position consistency across MSA and TAc: horizontal (X) and vertical (Y) axis comparisons

Finally, a series of paired analyses examined temporal speech patterns across Modern Standard Arabic (MSA) and Tunisian Arabic (TA) conditions. For within-language relationships, extremely strong positive correlations emerged between speech duration and

hesitation duration in both MSA ($r = .89, p < .001$) and TA ($r = .85, p < .001$), indicating that participants who spoke longer also tended to have longer hesitation periods within each language condition.

Between-language comparisons revealed that participants spoke slightly longer in MSA ($M = 58.88s, SD = 34.82$) than in TA ($M = 52.18s, SD = 36.66$), though this difference was not statistically significant (mean difference = 6.71s, 95% *CI* [-3.78, 17.20], $t(16) = 1.36, p = .194, d = 0.33$). Hesitation durations were nearly identical between MSA ($M = 12.59s, SD = 14.78$) and TA ($M = 12.82s, SD = 23.45$), with no significant difference (mean difference = -0.24s, 95% *CI* [-7.98, 7.51], $t(16) = -0.06, p = .949, d = -0.02$). The strong positive between-language correlations for both speech duration ($r = .84, p < .001$) and hesitation duration ($r = .78, p < .001$) suggest consistent individual patterns across language varieties.

Crucially, within each language condition, speech duration significantly exceeded hesitation duration. For MSA, speech was substantially longer than hesitation (mean difference = 46.29s, 95% *CI* [34.64, 57.94], $t(16) = 8.43, p < .001, d = 2.04$). The same pattern held for TA (mean difference = 39.35s, 95% *CI* [28.75, 49.96], $t(16) = 7.87, p < .001, d = 1.91$), though the speech-hesitation discrepancy was numerically smaller in the L variety.

5. Discussion

5.1. Limitations

The limitations of this paper are evidently the small sample size as well as the absence of data from male speakers. Moreover, while OpenFace 2.0 provides a robust, accessible solution for automated AU detection, the absence of manual FACS-based annotation remains a methodological limitation. Commercial software packages such as FaceReader or iMotions offer alternative options for facial expression analysis but are financially prohibitive, especially for researchers working in under-resourced academic contexts such as Tunisia. Furthermore, formal FACS training—typically required for human-coded annotation—is not readily accessible to researchers in this region, both logistically and financially.

Given these constraints, the use of OpenFace represented a pragmatic and methodologically sound compromise, allowing for reproducible and standardised detection of smile-related Action Units without introducing coder bias. However, future studies may benefit from a hybrid approach that combines automated AU detection with human verification, particularly in contexts where facial behaviour is subtle. The current study is preliminary, and further investigation is essential to obtain more representative insights.

5.2. Summary of findings

This sample study explored whether Tunisian speakers exhibit varying emotional displays when using Modern Standard Arabic (MSA) versus Tunisian Arabic (TA), with the aim of examining how diglossic code-switching interacts with facial expression, namely that of embarrassment. Building on Ferguson's (1959) diglossia framework and Ekman's (1990) model of emotion signalling, the analysis focused on four main indicators of embarrassment: smile type (Duchenne and non-Duchenne), laughter function (positive and negative), gaze direction, and hesitation frequency.

While the multivariate analysis revealed no statistically significant differences in the frequency of Duchenne versus non-Duchenne smiles across MSA and TA, the direction of the effect was consistent with theoretical predictions: non-Duchenne (masked) smiles were more frequent in MSA, whereas Duchenne (authentic) smiles appeared more in TA. The researcher remains aware that Duchenne smiles may also be “posed expressions” (Krumhuber & Manstead,

2009, p. 818). Additional studies would be required to gauge the degree of authenticity in the Duchenne smiles displayed by the participants. Although small effect sizes ($\eta^2 < .07$) and the limited sample size ($N = 17$) preclude firm conclusions, the pattern aligns with the hypothesis that speaking MSA may trigger mild embarrassment.

The laughter analysis provided stronger support for this interpretation. Participants produced significantly more positive laughter in TA, i.e. laughter that was not triggered by lexical corrections, hesitations, grammatical errors, etc. In fact, participants responding in TA often joked about the content of the pictures, in line with affiliative behaviour discussed in Martin et al. (2017). This suggested greater degree and comfort, while more negative, disfluency-related laughter in MSA indicated elevated cognitive or social effort.

In contrast, gaze direction did not differ significantly between MSA and TA. Participants' horizontal and vertical eye movements remained remarkably stable in both conditions, as reflected in the high correlations on both axes. This suggests that gaze may be less sensitive to diglossic code-switching, or that a more advanced eye-tracking tool is required for a more precise detection of gaze aversion variation.

Finally, hesitation analysis revealed no statistically significant differences in hesitation duration between MSA and TA. However, speech duration was slightly longer in MSA, and within both conditions, speech time significantly exceeded hesitation time. However, the gap was numerically larger in MSA, likely indicating greater fluency or expressive efficiency in TA, consistent with its status as the L1.

Taken together, these results point to a subtle but recurring pattern: when speaking MSA, participants showed more signs of cognitive load and embarrassment, as reflected in increased non-Duchenne smiling, more frequent nervous laughter, and longer speech durations. By contrast, TA appeared to elicit more relaxed behaviours, including Duchenne smiles and affiliative laughter. While not all effects reached statistical significance, the convergence of findings supports the broader hypothesis that diglossic code-switching in Tunisia is shaped by social norms regarding language appropriateness, which may translate as embarrassment when the speaker has to perform in MSA.

5.3. Embarrassment or lack thereof

One of the interesting findings of the sample study is the high presence of Duchenne smiles in MSA ($M = 0.39$, $SD = 0.41$). These findings prompted the author to probe into the potential causes of such a frequent occurrence. Referring to the literature, namely van Hooff (1972) and Martin et al. (2017), these grin faces may be serving the role of signalling non-hostility in an otherwise “painful” context (Mazzocconi et al., 2022). Martin et al. (2017, p. 866) argue that the Duchenne marker (AU6) may be produced voluntarily by some individuals “when experiencing a variety of emotions or even little emotion... For example, smiles occur spontaneously during states of embarrassment, pride, misery, and discomfort, and during greetings”. Because these smiles may be engendered by negative affect, yet appearing as Duchenne smiles, Martin et al. (2017, p. 867) argue that embarrassed smiles “have an affiliation function” in the Social-Functional Framework as they aim at establishing or re-establishing a positive bond.

This is not a far-fetched explanation when taking into account that extemporising in MSA is a norm violating behaviour that results in discomfort for the speaker. The affiliative smile would therefore serve to attenuate the situation and re-establish the bond between the speaker and the hearer as members of the same group. In the context of the experiment, the hearer is the researcher and a member of the same speech community as the participants. Moreover, the use of TA has been reported to be a marker of in-group solidarity (Lawson & Sachdev, 2000),

whereby MSA use—deepening the distance between the participant and the hearer—is an undesirable behaviour that ought to be mitigated.

It is important to also take into consideration the gender of the participants. The participants sharing the same sex as the researcher may have diluted the overall sense of discomfort leading to a reduced display of the emotion of embarrassment. Previous research on the gender of the interviewer and interviewee (Colombotos et al., 1969; Hornik, 1982; Webster, 1996) have suggested that respondents may yield responses of varying quality when interviewed by female interviewers due to the latter's perception as "less threatening" (Hornik, 1982, p.149). Given that the task of the sample study required norm violation, lesser perceived degrees of embarrassment (visible in their averted gaze) may have been due to the non-threatening appraisal of the researcher, despite the full awareness of being recorded. Nevertheless, researchers should be aware of whether the embarrassment is related to the performed task or the general context of the experiment. Thus, neutralising the context and varying interviewers may alter the results obtained.

5.4. MSA, humour, and an Arab identity

Ferguson's (1959) observations about the non-interchangeability of the two varieties, as well as Sayahi's findings (2014, p. 61) regarding the limited comfort that Arabs display when using MSA "in an unplanned manner" were partially supported by the findings of this sample study. The sample study showed that positive laughter, i.e. spontaneous and not engendered by mistakes, self-corrections, and/or hesitation was more frequent in TA ($M = 0.65$, $SD = 1.06$) in comparison to MSA ($M = 0.12$, $SD = 0.33$). This aligns with previous studies (Lawson & Sachdev, 2000, p. 1355) whereby the use of Tunisian Arabic "signifies ingroup solidarity". Accordingly, this subset of laughter displayed by participants may be interpreted as serving a bonding behaviour that strengthens ingroup dynamics (Eibl-Eibesfeldt, 1989/2017). Meanwhile, the more frequent presence of negative laughter—triggered by lexical corrections, hesitation, and/or mistakes—in MSA ($M = 0.53$, $SD = 0.94$) than in TA ($M = 0.18$, $SD = 0.39$) may be indicative of higher cognitive load when performing in MSA. The nervous laughter produced by the participants was accompanied by remarks such as:

- (a) *"It's weird bil 'arbī"*.
It's weird in Arabic.
- (b) *Kīfāsh bil 'arabīyyah al-fuṣṣaḥa?*
How in Standard Arabic?

The first utterance was made by one of the participants after hesitating then laughing at her inability to describe the picture in MSA, while the second utterance was made by another participant after laughing for being unable to find the equivalent of "zra'" ("to plant" in TA) in MSA, which is the quasi-identical "zara'a". Moreover, productions in MSA were often ungrammatical and longer in duration, though providing less lexical items and often disregarding the use of case markings.

- (c) *bāhī, hūni apparemment maktbah 'ūmūmiyah ū fāhā des étudiants... zūmalā' qā'dīn yaqraw m'a b'adhom...yrīvzū m'a b'adhom for a certain exam... pour un examen.*
Okay, here is apparently a public library and there are students inside...classmates studying together... revising together for a certain exam...for an exam.
- (d) **zūmalā' [sic] yūraji'ūn [sic] dūrūsahom aw yūraji'ūn [sic] lil-'mtihān [sic] fi al-maktabah [sic] al-'ūmūmiyah [sic].*
*Classmates revising their lessons or revising for an exam in the public library.

The perception of MSA as “weird” or embarrassing, though mildly attested for in this study, is not a recent occurrence. Baccouche (1998) notes that despite the prestige of the standard, its usage in Tunisia has acquired the term “*fuqhi*”, derived from Islamic jurist (*faqih*), denoting the affected and pedantic use of an archaic language. A common insult in Tunisia is the verb “*yitfaqhi*”, meaning the artificial and superfluous use of language to appear intelligent. This aligns with the social sanctioning of misplaced use of varieties described by Ferguson (1959) and Sayahi (2014). Consequently, the speaker would be less confident in using MSA, for fear of being sanctioned as inauthentic. Returning to Tangney’s remarks about embarrassment as a violation of social scripts as well as due to a behaviour inconsistent with “one’s persona, or personal standards that help form a person’s identity” (1999, p. 554), deeming MSA “weird”, displaying nervous laughter as well as non-Duchenne smiles is incompatible with a nationally proclaimed Arab persona. Indeed, one is unlikely to imagine a French individual embarrassed of using his/her native French language in France. The crux of the argument here is the definition of a “native language”.

Suleiman (2013) distinguishes between the concepts of mother tongue and native tongue which in themselves signal a schism in the diglossic Arab identity. In the Arabophone world, Standard Arabic is the mother tongue due to its ideologically charged background, as well as a postcolonial tool to reclaim nationality and solidify a sense of belonging. It is precisely why Suleiman dubs language as a site of “identity conceptualisations” (2013, p. 266). On the other hand, the native tongue, being evidently the non-recognised dialect, makes the definition of an Arab identity a challenging task. This oscillation and middle-ground solution offered by Owens is none-other than another illustration of the inherent schism in diglossia that reflects a dual expression of the self. In the data presented, this schism is manifest in ungrammatical and (mildly) embarrassed use of the “mother tongue”.

The Arabic language has always been religiously as well as ethnically charged. In fact, while the standardisation process revolved around Islam and unifying the language of the Islamic Empire (Versteegh, 1997), the postcolonial Pan-Arab ideology united Arabs as an ethnic group rather than a religious group, since not all Arabs are Muslims. Hence, due to diverse cultures, traditions and dialects across the Arab world, the Arabic language (the H variety in every Arabophone country) proved to be the only component strong enough to unite these countries. A perceived lack of proficiency in one’s mother tongue, that may be exposed when asked to publicly use MSA is likely to cause embarrassment, for it violates the norms of the ingroup (Arabs).

In fact, it is not uncommon for Arabs to mock or “shame” ingroup members for committing a grammatical error while speaking MSA, despite learning it at school, akin to a second language. This practice goes back to the early grammarians such as Ibn Taymiyyah (1263 CE–1368 CE), who dedicated a chapter to *al-raṭānah* (solecism). Solecism has been the subject of much criticism for it was a signal not just of limited grammatical proficiency, but also a sign of a polluted community (Badawi, 1973). This persistent attitude towards the language spoken at home compared to the language claimed as a standard would only deepen the diglossia paradox. Speakers would continue to put the variety that they scarcely speak, and may be embarrassed to use, on a pedestal while the variety that they transmit across generations is what they consider corrupt/polluted.

The absence of statistically significant markers of embarrassment in this data prompts the question of whether Arabs remain an ingroup for Tunisians. In the case where genuine embarrassment was not masked by affiliative smiles and there is effectively no such emotion experienced by the participants, the author questions whether “the incipient breakdown of the diglossic relationship” ushered by Fasold (1984) has already occurred. Has Tunisian Arabic leaked into the domains of MSA so much that the use of MSA outside of formal domains is no

longer laughable, but simply odd? Answering this question would necessitate a larger and a more nuanced study.

It is important to note that Baccouche (1998) drew attention that certain pre-independence newspapers were written in Tunisian Arabic. This points to the fact that although the present linguistic situation makes Tunisian Arabic inappropriate for print, it was at a certain juncture in time acceptable; a fact that certainly has its repercussions on the perception of Tunisian Arabic by Tunisians.

5.5. Pedagogical implications

The presence of non-Duchenne smiles and nervous laughs while using MSA may reveal a limited comfort in using the language. Such findings, though modest in nature, put the position of MSA as the official language of Tunisia and the “mother tongue” of Tunisians into question. Although one cannot “technically” speak of foreign language anxiety when producing MSA, these findings should prompt a reconsideration of MSA’s representation in the diglossic brain, as well as a valorisation of the native tongue of Tunisians: Tunisian Arabic. Khamis-Dakwar and Froud’s (2007) study investigated brain activity in Palestinians switching between the H and L varieties. They found that

native Palestinian speakers process switching between the two language varieties similarly to switches between two different languages. Additionally, [their] data indicat[ed] that PCA [Palestinian Colloquial Arabic] is represented as a first language and MSA as a second language, for these participants.

(Khamis-Dakwar and Froud, 2007, p. 12)

In this sense Palestinian speakers process the switches between the two varieties as a bilingual brain processes switches between L1 and L2, i.e. L1 would correspond to Palestinian Colloquial Arabic (PCA), while the L2 would correspond to MSA. Even though one cannot subsume Tunisian speakers under this study, for they were not included in the aforementioned study; this paper ventures to hypothesise that replicating it would likely yield similar results.

The Tunisian student is introduced to the standard at school, along with other subjects such as math and science fully taught in MSA at the elementary level, then in French at the secondary level. This, in turn, may prompt revision of Arabic language teaching approaches.

To begin with, Arabic language educators would need to address the affective factors at play in the Standard Arabic classroom. As Guiora (1975, p. 53) mentions, “the time has come for a paradigm that will pay proper attention to the ‘affective variables’ at play in learning foreign languages”. Educators’ awareness of these affective variables and their approach to the teaching of MSA as a foreign language rather than as a mother tongue may enhance the academic achievement of students and also limit their discomfort in extemporising in the language.

Such a reform is not without its challenges for educators themselves have to overcome millennia of language ideology that has perpetuated the position of the Arabic language within the socio-political fabric. Guiora (1994, p. 93) remarks that “language and speech signal and reflect the achievement of a major developmental milestone: The integration of internal and external self-representation”. It is important to recall that language teachers are also language speakers with an individual and personal attachment to the language they teach. Reforming such ingrained ideologies would necessitate re-educating the teachers of Arabic.

A key element to consider in the teaching of MSA is that of authenticity. As the domains of Standard Arabic gradually shrink, Tunisian speakers bear witness to the language’s fall into disuse, coupled with a disregard of the native tongue. It is evidently harder to establish a personal connection to a “dying” language that is restricted to the formal and academic domain.

Reinvigorating the language and disseminating it into the informal domains does not seem possible in the present linguistic scene in Tunisia. In other words, one may argue that the fate of MSA is sealed. Nevertheless, reclassifying the language into a second language, perhaps even as a dying language, may prompt more enthusiastic and culturally meaningful approaches to teaching/learning it.

6. Conclusion

This paper looked at laughter and smiling in the context of complex sociolinguistic phenomena. Human laughter like other primate laughter is related to play that solidifies social bonds by non-serious mock-fighting. The function of play in human societies expanded along with their cognitive capacities. Indeed, laughing with someone serves to consolidate societal norms while laughing at serves to correct their behaviour. This nonconforming individual, embarrassed, corrects his behaviour and reverts to the norm.

The findings of this paper showed that, in Tunisia's diglossic context where both Modern Standard Arabic (MSA) and the Tunisian Arabic (TA) dialect are used, employing the H variety MSA, when it is not required would result in mild displays of the emotion of embarrassment, such as gaze aversion, hesitation, nervous laughter, and non-Duchenne smiles—a disingenuous type of smile that does not involve the movement of the orbicularis oculi (AU6) and is not associated with an authentic positive affect (Ekman, 1990). Though the findings did not reach statistical significance, they showed a numerical discrepancy between the two varieties. This does not warrant a complete negation of the hypothesis that MSA usage in non-formal situations is considered a norm-violating act. Rather, enlarging the sample in future studies is necessary to obtain results that are more representative of the Tunisian population.

The results of the study raise further questions regarding our understanding of the diglossic situation in Tunisia. While the mild displays of embarrassment triggered by a mismatch between the selected variety and the context of usage may reflect an acknowledgment of norm violation and a desire to conform, they may also reflect mild social sanctioning of out of domain MSA use. This calls for a revisiting of the Pan-Arab identity in Tunisia, and whether it remains as alive as it was in the country post-independence. The findings also invite an investigation of the cognitive representation of the two varieties in the diglossic brain, intertwining social norms and cognitive processes. This may, in turn, offer a novel insight into the interplay of cognition, emotion and language, particularly in diglossic communities.

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