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DO SOCIOECONOMIC DETERMINANTS INFLUENCE METALINGUISTIC AWARENESS OF MULTIPLE LANGUAGE LEARNERS? A case study in the multilingual region of South Tyrol

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Abstract – Research on multiple language learning has shown that through the interaction of several language systems, high-level metacognitive features such as metalinguistic awareness (MeLA) are particularly pronounced. MeLA, as the ability to consciously reflect on language, has proven to be a catalyst for further language acquisition and language maintenance, closely tied to an awareness of the intricate relationships between language systems. However, this triggers an exploration into whether additional factors may affect the development of MeLA as a pivotal metacognitive characteristic in multiple language learning processes. The present MeLA-SES study, following a longitudinal investigation in South Tyrol, explores the potential relationship between adolescent multiple language learners' MeLA and their socioeconomic status (SES). The primary focus of the longitudinal study was to examine the MeLA development across the three curricular languages and investigate how learners with different metalinguistic skills decode a novel language system. While the initial study revealed an interconnectedness of metalinguistic knowledge, demonstrating a facilitative effect on decoding strategies, the present investigation, indicates a link between participants' MeLA development and their families' SES. Positive correlations were found among several SES factors, with the most robust association identified between the books-at-home measure and participants' MeLA scores. Additionally, the study revealed that the participants with a migration background, who constituted a small minority in this research, had low SES values on average but medium to higher MeLA scores. In these cases, it was assumed that despite less favorable SES factors, MeLA could develop well due to the interaction of even more language systems that these participants have in their minds.

Keywords: multiple language learners; multilingual metalinguistic abilities; metacognition; socioeconomic status; dynamic multilingual systems

1. Introduction

In the twenty-first century, heightened scholarly attention has been directed towards the exploration of the influence of language experiences, particularly those characterised by multilingual experiences, on cognitive development (see, among others Jessner 2008; Bialystok, Craik 2010; Bono 2011). Nevertheless, despite significant progress in these fields, there are still a number of open questions concerning aspects of multilingual development, especially when approached from a perspective that considers the complexity of multilingual phenomena. However, prior to turning to the ever-fascinating realm of multilingual development, it is crucial to note that in some scholarly investigations the terms bilingualism and multilingualism are sometimes still understood as interchangeable in this context (Aronin 2019; Hufeisen, Jessner 2019; De Angelis 2021). Within this perspective, multilingualism is seen as a mere amplification of bilingualism, and Second Language Acquisition (SLA) is used as an overarching term; however, the lack of distinction between SLA and the acquisition of third and subsequent

languages may lead to an oversimplification (see De Angelis 2021). Hence, this once prevailing scientific perspective, which assumed that the acquisition of a third, fourth, etc. language merely meant "adding" another language to the existing language systems, is now increasingly being challenged. Contemporary research suggests that multiple language learning is not simply about the addition of “more language” (see Vetter 2013a; De Angelis 2021) but has an impact on the system as a whole (see Cook, Wei 2016; Allgäuer-Hackl, Jessner 2019). Some basic principles are applicable to both bilingualism and multilingualism, allowing for the extrapolation of conclusions from SLA studies to research on multiple language learning (Herdina, Jessner 2002), but at the same time, the growing body of empirical evidence, which shows that third and subsequent language acquisition has certain properties that are distinct from SLA, cannot be ignored (Jessner 2008; Cenoz 2013; Schroeder, Marian 2017; Allgäuer-Hackl, Jessner 2019; Aronin 2019).

From this stance, it is difficult to compare monolingual with multilingual systems since multilingual systems develop some properties or characteristics that monolingual systems do not have. In addition, the common properties shared by both systems have another relevance within the system (Herdina, Jessner 2002; see also De Angelis 2007; Jessner 2023). Bilingualism and multilingualism, meanwhile, are both complex phenomena, but what distinguishes them has primarily to be seen in the higher degree of complexity of multilingualism, which in this sense can be described as hypercomplex (cf. Aronin, Jessner 2015). In such hypercomplex systems, properties emerge through the interaction of the various languages (Jessner 2023). In this context, MeLA, which has been identified as a key metacognitive property (Jessner 2006; Bono 2011; Hofer 2015; Haukås *et al.* 2018; Allgäuer-Hackl 2020; Spechtenhauser 2022), stands out as a major driving force within multilingual systems (Hofer 2017; Jessner 2023; Spechtenhauser, Jessner 2024). Moreover, different variables that depend on contextual factors such as cultural, economic, and social factors are expected to influence the system (Aronin, Ó Laoire 2004; Jessner 2023). Nevertheless, a noticeable gap exists in current research concerning the investigation of the development of metacognitive properties among multilingual learners (specifically when they are exposed to more than two languages) and the potential impact of socioeconomic variables on this developmental process. Hence, the primary aim of the present study is to explore multilingual metalinguistic awareness in relation to the socioeconomic (SES) factor, building upon a prior longitudinal study which focused on the development of MeLA across languages among language learners in South Tyrol.

The article is organised as follows: Section 2, to give an overview, presents a theoretical framework that situates MeLA as an emergent property within complex and dynamic multilingual systems. It then provides a definition of MeLA as a metacognitive factor that changes in quality in multilinguals, as well as a brief look back at the assessment of MeLA in the earlier longitudinal study. In Section 3, the focus is on the operationalisation of the SES factor, highlighting the scarcity of studies in multiple language learning settings in this context; the research questions are then presented. The context of the investigation and the educational system are addressed in Section 4. Section 5 describes the investigation, starting with the description of the setting and participants involved, and continuing with the study design. Section 7 discusses the results, considering the multifaceted relationship between multilingual metalinguistic awareness and SES factors. Finally, in Section 8 potential instructional implications are outlined.

2. Multilingual systems as complex systems

As anticipated, complexity is a decisive and defining factor in multilingual systems. However, complexity in multilingual systems should not be understood as a synonym for complicated; rather, it should be perceived as an indication of a system complexity that allows for numerous interactions between the components that can lead to different outcomes. Higher or lower levels of complexity in systems can be identified in terms of the number of elements involved (Aronin, Jessner 2015). Since in regular users of multiple languages, a constant co-activation of languages occurs (Grosjean 2001; Green 1998, 2018), influencing and refining executive function through the constant demand for language selection (cf. Bialystok 2015), multilinguals have, for example, more language modes at their disposal. Moreover, multiple language users can draw on a wider spectrum of prior language learning knowledge and experience and employ language learning strategies more effectively in comparison to monolinguals when it comes to learning new languages and decoding novel language systems (Dahm 2015; Spechtenhauser 2022; Spechtenhauser, Jessner 2024). The multilingual mind, characterised by the multitude of interacting language subsystems, also encompasses a more extensive array of information at lexical, grammatical, and morphological levels. This heightened complexity can be expected to lead to a much broader range of metalinguistic awareness (MeLA) and cross-linguistic awareness, which can be defined as multilingual awareness (Jessner 2006; 2008; Kemp 2007; De Angelis, Dewaele 2009; Allgäuer-Hackl 2020; Spechtenhauser 2022).

Multilingual language systems from this perspective, as described in Herdina and Jessner's (2002) Dynamic Model of Multilingualism (DMM), share similarities with living entities, portraying complex systems in a perpetual state of change. As noted by the authors, DMM operates on the fundamental assumption that human beings are complex, dynamic systems that can most appropriately be studied on the grounds of CDST (Complexity and Dynamic Systems Theory). At the core of such a theory is the understanding that dynamic systems are to be viewed as evolutionary systems that continue to develop in a process of interaction between the subsystems and input from the changing environment. Thus, modelling multilingualism within a dynamic systems concept is grounded on the premise that various components are in constant interaction, which entails that they affect each other and shape their changes over time (Jessner 2023; see also Van Geert 2008). Through the interaction of multiple language subsystems, as anticipated above, properties such as MeLA and cross-linguistic awareness manifest. MeLA is expected to undergo changes in quality during the multiple language learning process (Jessner 2023) and is intricately linked with cross-linguistic awareness, constituting an essential part of the speakers' multilingual awareness (Hofer 2017; Allgäuer-Hackl, Jessner 2019; Allgäuer-Hackl 2020; Hofer *et al.* submitted).

2.1. Defining and assessing multilingual metalinguistic awareness

The following section briefly outlines the concept of MeLA. It extends the initial conceptualization of this metacognitive ability in monolinguals to emphasize its evolving significance as an emergent property in multilingual systems. This is followed by a brief overview of the longitudinal study on MeLA development among multiple language learners in South Tyrol, which preceded the present study.

MeLA was first used as a distinctive concept in the 1970s to describe a specific type of language performance that involves particular cognitive demands (see Cazden 1974). This notion was expounded by Benveniste (1974), who stated that MeLA refers to the ability to use language abstractly as well as to the possibility of the speaker to rise

above language, implying the possibility of distancing oneself from language in order to think about it when using it. Similarly, Tunmer *et al.* (1984) noted that MeLA can be understood as the capacity to reflect upon language and consider language itself as an object of our thinking. They underlined that, in this sense, it can be encompassed in the overarching category of metacognition. In this context, Pinto *et al.* (1999) indicated that the emerging metalinguistic abilities reflect the underlying cognitive changes. This implies, as the authors outlined, a rather drastic change in the ability to deal with information in human beings as it affects all major mental activities and typically manifests itself in the capacity to consciously consider (and look back at) the products of mental operations with direct functional value such as speech and problem solving. MeLA, against this background, must thus be considered in the light of the entire linguistic and cognitive development. Ianco-Worrall (1972), who along with Ben-Zeev (1977), can be considered as one of the first researchers to address MeLA in connection with bilingual learners, identified an increase in metacognitive functioning among bilinguals in this study. She concluded that the heightened level of metalinguistic awareness could be determined by the constant handling of two languages. Bialystok's (1991, 2001, 2007, 2011) seminal work on bilingual language processing and metacognitive development corroborated an underlying cognitive change in bilinguals. In her matrix outlining metalinguistic uses of language, Bialystok (2001) referred to both linguistic and psychological notions of metalinguistic awareness. She described the control of linguistic processing, dependent on executive control that directs attention to relevant information, alongside the analysis of linguistic knowledge, which refers to the analysis of representational structure; these aspects are integral to MeLA. According to Bialystok's Analysis/Control framework (1991, 2001), distinct metalinguistic tasks involve varying levels of analysis and control.

In relation to multilingualism, Cenoz and Valencia (1994), as one of the first scholars, found that Basque and Spanish bilinguals were more successful in learning English as a third language than Spanish monolinguals and suggested that the learners' knowledge of two systems and their ability to compare it to a third system, hence their MeLA, could be responsible for a higher competence in the third language. As outlined above, Herdina and Jessner (2002), who pioneered this field, considered MeLA from a dynamic systems perspective, positing that it emerges through the interaction of various language systems and manifests distinct qualities within such systems. Recent research is consistent with this conclusion and suggests that exposure to multiple languages and the associated language learning experience influences speakers' linguistic and non-linguistic abilities, apparently especially their metalinguistic awareness (see Gibson, Hufeisen 2011; Hofer 2017; Sanz 2019; Allgäuer-Hackl 2020; Spechtenhauser 2022; Spechtenhauser, Jessner 2024). Jessner (2006, p. 42) characterized MeLA as "the ability to focus attention on language as an object in itself or to think abstractly about language, and consequently, to play with or manipulate language". However, it can be observed that, in research on multiple language users, MeLA is often just confined to grammatical knowledge and is frequently explored in isolation within one language rather than holistically across the languages involved. Hence, the aim of the preceding longitudinal study was to investigate the development of MeLA across the curricular languages - German, Italian, and English - taught in German schools in South Tyrol.

In order to explore MeLA and its development in several languages, a test battery based on Pinto *et al.'s* (2003) TAM Test for adolescents (*Test di Abilità Metalinguistiche*) was used. The Pinto test was translated into several languages in the past but has mainly been used to assess MeLA in isolation for a particular language. For the longitudinal study, the TAM test was tailored to cover the three curricular languages. The tests

elaborated for the study were, in this sense, not simple translations of the TAM Test, but MeLA Tests adapted to the average language proficiency of the participants in the respective languages. Consequently, the German MKT (*Metalinguistischer Kompetenztest*), the Italian TAM (*Test di Abilità Metalinguistiche*), and the English MAT (*Metalinguistic Awareness Test*) did not repeat identical tasks, but they included similar tasks, with all three tests covering the same MeLA domains (synonymy, acceptance, ambiguity, and phonological awareness) to allow for comparability of the tests. The scoring procedure developed for the original TAM Test, based on a three-level scale guided by Piaget's equilibrium concept (see Pinto *et al.* 2003), was also used to score the given metalinguistic responses in the three MeLA Tests. The maximum score that could be obtained in this way in the three respective tests was 26, giving a maximum total score of 78 based on all three MeLA Tests (see Spechtenhauser, Jessner 2024 for more details on the scoring procedure).

In Part one of the longitudinal study, the question of how the participants' MeLA skills develop during the testing period and whether a development of MeLA across languages can be observed, was investigated. To this end, the three MeLA Tests were carried out in the first year of lower secondary school (T1) as well as in grade three (T2). In Part two of the study, the question of how learners with different MeLA values on the three MeLA Tests decode a new, unknown language system was pursued. For this purpose, 27 participants, according to their MeLA performance on the three tests, were divided into three groups: the HighMeLA group, the MediumMeLA group and the LowMeLA group. In order to gain a more in-depth insight into the learners' use of strategic decoding practices, interviews were conducted with the respondents. The text used to better understand the multilingual learners' mental activities during the decoding process was a comic strip in French (a language unknown to them at the time of the study).

The results obtained from the analysis of the data of the first part of the study indicated that the multiple language learners improved their MeLA skills during the testing phase in all the languages involved, albeit to varying degrees. Moreover, the analysis also revealed strong, significant, positive correlations between all three MeLA Tests at both testing phases. Hence, the findings of Part one of the longitudinal study suggested that MeLA appears not to be an awareness that functions independently in the various languages, implying a high degree of interconnectivity between languages at the metacognitive level.

The findings of the second part of the study indicated significant variations among respondents of the three MeLA groups regarding their use of decoding strategies, both in terms of quantity and quality. Respondents of the HighMeLA group consistently relied on their prior language learning knowledge and experience, regularly activated their cross-linguistic awareness, and showed more frequently a metalinguistic behaviour that led to a decoding at the level of understanding (see Leow 2015 for different levels of awareness). Similarly, in the MediumMeLA group, references to prior language learning knowledge, regular metalinguistic and cross-linguistic thinking could be observed, albeit less frequently. In contrast, the decoding of the LowMeLA group respondents was generally marked by rare verbalized metalinguistic reflections and only sporadic references to previous linguistic experiences, thus indicating a significantly lower level of awareness. Consequently, only a low number of items and text passages could be decoded in this group. In this sense, the findings of the part of the study in which the impact of different MeLA levels on the learners' decoding abilities was analyzed, highlighted the catalytic impact of MeLA on decoding strategies and ongoing multilingual language development

(see Spechtenhauser 2022; Spechtenhauser, Jessner 2024 for more comprehensive insights into the longitudinal study).

Towards the end of the longitudinal investigation, questions arose concerning the potential relationship between the linguistic-cognitive factors influencing adolescents' multilingual MeLA development and socioeconomic factors (SES). Hence, data on families' SES were collected after the longitudinal study to investigate possible correlations between SES factors and the multiple language learners' MeLA. Furthermore, it was explored whether there is a teacher-perceived association between the adolescents' linguistic-cognitive and socioeconomic aspects as well as the perceived influence of the educational environment on such factors. Consequently, following the longitudinal study that focused on the interconnectivity of multilingual metalinguistic skills, this sequel study was specifically designed to examine the potential influence of the learners' socioeconomic background on the development of these skills, in order to capture the multilinguals' linguistic-cognitive progress from a more comprehensive perspective.

3. Socioeconomic factors and metacognitive aspects of multilingual development

The ensuing part focuses on the operationalisation of the SES factor and presents the research questions. The next section provides a brief overview of the geographic area of the investigation and the educational system in this region.

The socioeconomic status (SES) is often operationalised in literature as maternal and paternal education. Additionally, other measures, such as parental occupation, either in combination with educational attainment or as a stand-alone measure, are also frequently used to determine SES. To better capture the adolescents' context, combined measures have proven to be more revealing (see Gatt *et al.* 2020). This consideration was also taken into account in the present study, as detailed in the 'Instruments and coding criteria' Section below.

In literature, it is quite well documented that social contexts affect children's language development (see Hoff 2006 for an overview; see also Dale *et al.* 2015 on gene-environment correlation, who emphasize that language development is not based on genetic determinism but that genes need the social context to exert their effect). There are a fair number of studies that addresses children's monolingual competencies, typically focusing on specific aspects of language acquisition such as reading performance (see, among others Kieffer 2010), or vocabulary development (see, among others Hoff 2003) and the SES factor influencing them. Some research also specifically looks at the linguistic-cognitive performance in monolinguals and the effects of the SES factor on it (see Noble *et al*. 2005), as well as the linguistic and cognitive development in monolinguals compared to bilinguals (see Calvo, Bialystok 2014) in relation to SES. The majority of studies that focus on linguistic-cognitive performance and SES in monolinguals confirm the influence of family social status in this context, thus attesting that children from higher SES families tend to have an advantage over children from lower SES families due to factors such as different social practices, better access to learning materials, and better quality of the home environment (see Perkins *et al.* 2013 for a review). Calvo and Bialystok, 2014, meanwhile, corroborate in their study of monolingual and bilingual children that bilingualism has different effects on the two groups (with bilinguals scoring higher on executive functions tests), while the SES factor has similar effects on the linguistic and cognitive aspects of both groups, demonstrating the negative impact of lower SES on executive functions and vocabulary size.

When interpreting data in this context, however, challenges arise due to the small number of existing studies on bilingual learners and their metalinguistic or metacognitive development in relation to the SES factor. Complicating matters are differences in bilingual settings, variations in the measurement of cognitive functions in relation to MeLA, diverse research foci, and discrepancies in the parameters used to measure SES in the investigations, making comparison difficult. The relationship between SES and metalinguistic development turns out to be even more multi-layered when considered and examined across several languages that are interacting within the multilingual system. Thus, when multiple languages are present in the family and at school the exploration of levels of MeLA, as a relevant emergent property of various interacting language systems, and its relationship to SES as an environmental factor, becomes even more complex.

For this reason, as anticipated earlier, the present study, aims to further explore and extend the understudied line of research dealing with the interconnection of various language systems and the ensuing development of multilingual metalinguistic skills in connection with SES factors. Consequently, the MeLA-SES study was guided by the following research questions:

1) To what extent can SES factors be identified as additional influencing factors on the metalinguistic development of adolescents engaged in multiple language learning and is there a consequential significant correlation between the learners' MeLA development and SES?
2) Do teachers perceive a relationship between the varying development of the multiple language learners' MeLA skills and their socioeconomic background, and what is their estimation of the impact of the educational setting on overall metacognitive development?

4. Demographic context and educational system

In South Tyrol, a province in northern Italy which belonged to the former Habsburg crown land of Tyrol until World War I, today three autochthonous languages are recognised as official languages: German, Italian and Ladin.[1] According to the ASTAT annual report of 2021,[2] the demographic composition of South Tyrol reveals a linguistic distribution where 69.64% of the population belongs to the German-speaking language group, 25.84% to the Italian-speaking group, and 4,52% to the Ladin-speaking one. In this region, migrants are required to assign themselves to one of the three official language groups. However, based on the March 2022 ASTAT report,[3] which specifically focuses on the migrant population (consisting of individuals from EU and non-EU countries), it can be seen that 56,500 out of South Tyrol's total population of 533,725 have a migration background.

The region's history has led to various implications for educational policy. As a result, South Tyrol today has a tripartite school system, with separate, independent educational systems for the German, Italian, and Ladin communities, ranging from kindergarten to secondary and vocational schools. In German and Italian schools, instruction in the different subjects takes place in the respective so-called first languages.

[1] Ladin is archaic language containing Celtic strands, Vulgar Latin features, Rhaetian, as well as Bavarian dialect fragments and is today considered by most linguists a Rhaeto-Romance language.
[2] Data as of ASTAT report 2021. For detailed data consult ASTAT, Provincial Statistics Institute (2021).
[3] Data as of ASTAT report, March 2022. For detailed data consult ASTAT, Provincial Statistics Institute (2022).

From the first year of primary school, everyone is required to learn the L2: Italian in German schools and German in Italian schools. English as L3 is taught from grade one in Italian primary schools and from grade four in German primary schools. Typically, these languages are taught as separate units, and multilingual approaches to languages that promote language awareness and intercomprehension between languages are rare. The Ladin schools, for their part, chose a different path and introduced the so-called *scora paritetica ladina*, a school model in which the principle of language parity prevails. Therefore, in Ladin schools, the curriculum includes the instruction of Italian, German, Ladin, and English as subjects. Additionally, Italian and German are used to the same extent as languages of instruction in the different subjects.

5. The MeLA-SES study

5.1. Settings

The MeLA-SES study was conducted in the same two lower secondary German schools that had taken part in the previous study. In these two schools, the public school MS Deutschnofen (Setting A) and the private boarding school Herz-Jesu Institut Mühlbach (Setting B), Italian, as the official L2, is taught with a weekly allocation of three to four hours. In parallel, English, as the official L3, is taught for two hours per week. Notably, in contrast to the conventional practices that can be observed in many primary and lower secondary schools, both institutions where the present investigation was carried out are actively endeavoring to expand language learning opportunities. This endeavour is reflected in the introduction of some CLIL lessons as well as additional projects that include cross-linguistic didactic approaches.

5.2. Participants

The testing population of the MeLA-SES study was the same as the one involved in the longitudinal study in testing phase two (T2): n = 60. In the present study, in a few questionnaires, some responses were missing or incomplete and could, for these reasons, not be taken into consideration. The mean age of the participating adolescents in the MeLA-SES study was between 13 and 14 years.

At the time of the study, for most of the participating adolescents, German is their so-called first language. At home, most of them speak one of the German South Tyrolean dialects, whereas standard German is the predominant language spoken at school. The majority has learnt Italian from grade one and English from grade four of primary school. The acquisition order of the three languages – or four if we also consider the dialect – can therefore be considered consecutive in most cases. However, the study included three participants with a migration background. Since their families have been living in this region for a long time, German is actively spoken in their families. Additionally, one family uses Urdu, another uses Albanian, and the third uses both Macedonian and Albanian, depending on which friends or relatives are visiting. In certain situations, Italian or English also serve as a 'bridge language' in two families when not all those present share the same language. It is worth noting that the number of students with a migration background in Setting A and Setting B, which are both located in more rural areas, is relatively modest. This phenomenon can likely be ascribed to the fact that migrant families in this region tend to favour urban areas.

In the MeLA-SES study, as previously mentioned, the teachers were also involved to investigate their perceptions regarding the adolescents' MeLA development. For this purpose, the teachers (n = 11) who teach German, Italian, and English in the respective classes in which the study was conducted were queried.

5.3. Instruments and coding criteria

In order to determine the socioeconomic status of the families, a SES questionnaire was administered to the participants following the completion of data collection for measuring the MeLA values (T2) in the longitudinal study. The purpose of this questionnaire was to establish the families' SES, enabling an investigation into possible correlations with the respondents' MeLA levels. As discussed above, SES is a multifaceted concept incorporating various aspects. For this reason, the SES questionnaire, designed for this study, includes closed-ended questions about the mother's and father's educational attainment, the occupational status of both parents, and a query regarding the home literacy environment. Therefore, it is based on the use of combined measures rather than a single metric to determine the families' SES. Specifically, this means that first the UNESCO-developed ISCED 2011 (International Standard Classification of Education) scale, was applied to determine the parents' educational attainment. Within this classification system, educational levels are reflected in aggregated ISCED codes, with values ranging from 0 to 2 for early childhood, primary, and lower secondary education, from 3 to 4 for upper- and post-secondary education but not tertiary education, and from 5 to 8 for short-cycle tertiary education, bachelor's programmes/first university cycle studies, master's programmes/second cycle studies, and research doctorates/third cycle studies. Since the ISCED framework was developed to categorize educational programmes with similar educational content, thus enabling the generation of internationally comparable educational statistics and indicators, it was deemed appropriate to use this scale in the present study to determine the parental educational level.[4]

In determining a value for parental occupation, a classification system that attempts to overcome the traditional measures of social stratification, which often follow rigid class distinctions (as noted in Barbieri *et al.* 2020), and better captures the multiple dimensions defining SES was considered suitable. A classification that adheres most closely to these requirements and consequently treats stratification as a coherent measure can be found on the ISEI scale (International Socioeconomic Index of Occupational Status), originally developed by Ganzeboom *et al.* (1992). An updated and thus more diverse and comprehensive version of this scale is the ISEI-08, as it was constructed on the basis of a cross-national database of men *and* women (see Ganzeboom 2010 for a description of the procedure and the construction of the ISEI-08).

In the ISEI scales, in order to solve the problem that the education needed to be able to perform certain occupations varies internationally, education was considered a relative good. It was ranked nationally and then subjected to a z-transformation. This process entailed dividing income by the national means, followed by a logarithmic transformation and subsequent z-transformation (to avoid outliers in income, the z-values were constrained within the range of -3.7 and 3.7). An iterative algorithm, as detailed in Ganzeboom *et al.* 1992, was employed to compute the status values. The values on the

[4] The full descriptions of ISCED levels is accessible at: http://uis.unesco.org/sites/default/files/documents/international-standard-classification-of-education-isced-2011-en.pdf

ISEI-08 scale range from 10 as the lowest value to 88.96 (89) as the highest value, including new occupations such as 'web and multimedia developers' that were not present in former versions.

Ganzeboom and Treimann (2003) emphasize that the SEI (socioeconomic measures of occupational status) are not identical to the measures found in occupational prestige scales such as the SIOPS (Standard International Occupation Prestige Score) scale. Although they are related and empirically correlated (around 0.75), they are conceptually different. The authors outline that, while prestige scales are based on popular evaluations, socioeconomic indexes move away from subjective approaches and also refer to an important precondition of an occupation (education) and its main consequence (income) as defining components. Consequently, a SEI score also includes the cultural and economic resources characteristic of individuals in a given position (cf. Ganzeboom, Treimann 2003). SEI, in this regard, is related "to prestige more as a cause than as a consequence" (Ganzeboom *et al.* 1992, p. 9). ISEI also differs from occupation-based social classifications such as ESeC, ICSE-18 or ISEC, based on the Erikson-Goldthorpe-Portocarero (EGP) scheme (originally proposed by Erikson *et al.* 1979) because such classifications assume a certain intra-class homogeneity and focus primarily on qualitative differences in employment relationships. Considering the detailed scaling of occupational categories in the ISEI-08 scale index and its widespread use in education research due to its international applicability, this scale was deemed to be an appropriate tool for the present study.

As a combination of metrics should contribute to a more comprehensive understanding of the families' SES, as outlined above, a final question was included in the SES questionnaire, which specifically inquired about the number of books at home, including both physical and e-books. Given that book ownership is widely used as a proxy for the home reading environment in many studies, this typical indicator of family SES was also integrated to complement the above-mentioned parameters for determining SES. In the first technical report on PISA, Haider (2000) points out that the books-at-home question can be used well to map reading habits on the one hand, but also reading opportunities on the other. When comparing PISA studies of OECD countries, it is striking that, in most cases, an association between reading skills and the number of books present in the families' households can be observed. Bergen *et al.* 2016 also report such an association in their study on home literacy environment and children's reading abilities. Given the close connection between metalinguistic awareness and the development and monitoring of basic and higher-order reading skills (see, e.g., Bialystok 2001), this served as an additional rationale for including the question on home literacy environment in the present study.

In order to explore the teachers' perceptions of the possible relationship between their students' MeLA development and their SES, as well as the schools' influence on this developmental process, an open-ended questionnaire was designed. The open-ended question format was chosen to allow respondents to freely express their opinions on the topic without steering them in a specific direction. In the analysis of the open-ended responses, the data was first coded into general (or basic-level) concepts based on the respondents' statements. Analogue concepts identified in the analysed data were then grouped to form the 'core' coding categories within a coding scheme (see Charmaz 2014; Corbin, Strauss 2015). The formation of core coding categories considered teachers' most common perceptions, beliefs, opinions, and assumptions regarding:

A The potential relationship between MeLA and SES.
B The perceived extent of the school's influence on learners' linguistic-cognitive development.

C The connection between low SES scores and high to medium MeLA scores among learners with a migration background.

This coding scheme, based on the data collected, that apart from the categories, contains the encoding rules to form the core categories and some anchor samples, was then used for consistent analysis. The coding scheme, along with the SES questionnaire and the questionnaire on teachers' perceptions, can be found in the Annex.

6. Findings

6.1. Three combined measures of family SES

Given the design of the MeLA-SES study and the nature of the data, a quantitative-qualitative analysis process was conducted. While the quantitative analysis was concerned with data derived from the SES questionnaire and its possible correlation with the respondents' MeLA scores, the qualitative analysis focused on teachers' perceptions of the relationship between MeLA scores and SES values. As indicated above, in order to gain a more complete picture of the families' SES, recognized as a multidimensional construct, we analysed the ISEI-08 scores (to determine the occupational status of the parents), the ISCED scores (to determine the educational level of the mother and father) and the question concerning the books-at-home (as a proxy for home literature environment). Since, as anticipated in section 5.2, very few questionnaires had missing answers (note: just two participants omitted one question related to ISEI, one participant did not complete one question related to ISCED, and one participant left the home literacy environment question blank), but we nevertheless wanted to include the same test population in the present study as in the preceding study – in order to draw as accurate conclusions as possible regarding the interplay between MeLA scores and the SES factors – we decided, as permissible according to the APA guidelines, to remove only the data points/answers that were missing in the questionnaire, while retaining the other data points/answers (pairwise deletion). This approach allowed us to avoid reducing the overall test population and to conserve more data, as all available data from the participants could be included. In this way we could perform analyses with multiple variables which include only participants with complete data for each variable (see pairwise deletion according to the APA guidelines). The other option would have been a listwise deletion, which would have meant that data from all participants with missing data points/answers would have been deleted from the dataset, resulting in an overall smaller test population, which in turn would have increased the risk of a biased cohort.

It was also important to us to use a consistent method to better compare the correlation values and since the majority of the considered variables (ISCED mother, ISCED father, books-at-home) deviate significantly from normal distribution[5], Spearman's Rank-Order Correlation was used for all combinations of variables. In addition, we also wanted to identify non-linear correlations when they are at least monotonic. Therefore, to examine whether the three combined measures of families' SES (ISCED, ISEI-08 and books-at-home) correlate with each other, nonparametric correlation analyses (using Spearman's Rank-Order Correlation) were conducted between the measures (Table 1). The analyses were completed, including all participants. The analyses found large, highly significant, positive correlations between all proxy measures of education (ISCED) and

[5] Analysed with Kolmogorov-Smirnov Test

occupational status (ISEI-08). Every measure of ISCED and ISEI-08 correlated strongly with the books-at-home measure.

	ISCED Mother	ISCED Father	ISCED Total	ISEI-08 Mother	ISEI-08 Father	ISEI-08 Total	Books
ISCED Mother	- -						
ISCED Father	*.549*** *p* < .001 [.334, .710]	- -					
ISCED Total	.845** *p* < .001 [.749, .907]	.875** *p* < .001 [.795, .925]	- -				
ISEI-08 Mother	**.771**** *p* < .001 [.635, .860]	.497** *p* < .001 [.267, .674]	.715** *p* < .001 [554., .824]	- -			
ISEI-08 Father	.578** *p* < .001 [.369, .731]	**.738**** *p* < .001 [.587, .839]	.737** *p* < .001 [.587, .839]	*.664*** *p* < .001 [.484, .790]	- -		
ISEI-08 Total	.714** *p* < .001 [.554, .824]	.689** *p* < .001 [.522, .809]	.796** *p* < .001 [.673, .876]	.899** *p* < .001 [.831, .940]	.906** *p* < .001 [.844, .944]	- -	
Books-at-home	.678** *p* < .001 [.503, .800]	.655** *p* < .001 [.471, .784]	.772** *p* < .001 [.636, .861]	.751** *p* < .001 [.606, .847]	.703** *p* < .001 [.538, .816]	.792** *p* < .001 [.667, .847]	- -

Table 1
Correlation between the three measures of family SES.

** Correlation is significant at the 0.01 level (2-tailed)
[,] 95% CI = confidence interval of the correlation
Strength of relationship (Cohen, 1988, pp 79-81): small *r/rho*= .10 to .29; medium *r/rho*= .30 to .49; large *r/rho*= .50 to 1

6.2. Occupational status, level of education and MeLA scores

The relationship between scores at T2 on all three MeLA Tests (German MKT Test, Italian TAM Test, English MAT Test) plus the sum scores on these MeLA Tests, and the parental ISEI-08 (occupational status) were investigated using the Spearman's Rank-Order Correlation (Table 2a). The analysis found small, significant, positive correlations between T2 MeLA sum scores and parental occupational status, $r(56) = .266$. $p < 0.05$. In case of the correlations between paternal ISEI-08 and T2 MeLA sum scores, the analysis revealed small, positive correlations between T2 MeLA sum scores and the father's ISEI-08, $r(56) = .205$, $p > 0.05$. Slightly higher, significant, positive correlations were found between maternal ISEI-08 and the scores on all MeLA Tests $r(56) = .271$, $p < 0.05$.

	T2 MeLA MKT (German)	T2 MeLA TAM (Italian)	T2 MeLA MAT (English)	T2 MeLA SUM
ISEI-08 Mother	.241, p = .068 [-.026, .476]	.252, p = .057 [-.15, .485]	.287*, p = .029 [.023, .513]	.271*, p = .040 [.006, .501]
ISEI-08 Father	.215, p = .104 [-.053, .455]	.178, p = .182 [-.092, .423]	.195, p = .143 [-.075, .438]	.205, p = .205 [-.064, .446]
ISEI-08 TOTAL	.253, p = .055 [-.14, .486]	.236, p = .075 [-.032, .472]	.277*, p = .035 [.013, .506]	.266*, p = .044 [.000, .496]

Table 2a
Correlation of three MeLA Tests scores and ISEI-08 values.

n = 58 (2 participants out of 60: no information provided on ISEI-08)

* Correlation is significant at the 0.05 level (2-tailed)
[,] 95% CI = confidence interval
Strength of relationship (Cohen, 1988, pp 79-81): small *r/rho*= .10 to .29; medium *r/rho*= .30 to .49; large *r/rho*= .50 to 1

However, when the three participants with a migration background were removed from the analysis (Table 2b), the correlations between the T2 MeLA sum scores and parental ISEI-08 values became stronger, $r(53) = .362$, $p < 0.01$. This is particularly striking in the case of the maternal occupational status; the analysis found strong, significant, positive correlations between T2 MeLA sum scores and maternal ISEI-08 $r(53) = .357$, $p < 0.01$.

	T2 MeLA MKT	T2 MeLA TAM	T2 MeLA MAT	T2 MeLA SUM
ISEI-08 Mother	.310*, p = .021 [.041, .537]	.325*, p = .015 [.058, .549]	.404**, p = .002 [.147, .609]	.357**, p = .007 [.093, .547]
ISEI-08 Father	.300*, p = .026 [.029, .529]	.259, p = .056 [-.015, .497]	.317*, p = .018 [.048, .543]	.299*, p = .026 [.029, .529]
ISEI-08 TOTAL	.335*, p = .012 [.068, .557]	.319*, p = .018 [.051, .544]	.404**, p = .002 [.148, .610]	.362**, p = .007 [.099, .578]

Table 2b
Correlation between the three MeLA Tests scores and ISEI-08 values.[6]

n = 55 (2 participants out of 60: no information provided on ISEI-08)

** Correlation is significant at the 0.01 level (2-tailed)
* Correlation is significant at the 0.05 level (2-tailed)
[,] 95% CI = confidence interval
Strength of relationship (Cohen, 1988, pp 79-81): small *r/rho*= .10 to .29; medium *r/rho*= .30 to .49; large *r/rho*= .50 to 1

The correlation between MeLA scores at T2 on the three different MeLA Tests plus the sum score on the tests and the parental education level (ISCED) were also investigated using the Spearman's Rank Order Correlation (Table 3a). The analysis revealed small, significant, positive correlations between parental educational level and MeLA sum scores, $r(57) = .043$, $p < 0.05$.

[6] Three participants with a migration background not included.

	T2 MeLA MKT	T2 MeLA TAM	T2 MeLA MAT	T2 MeLA SUM
ISCED Mother	.188, p = .153 [-0.079., .430]	.195, p = .139 [-.072, .436]	.186, p = .158 [-.081, .428]	.195, p = .138 [-.072, .436]
ISCED Father	.170, p = .198 [-.097, .415]	.245, p = .061 [-.019, .468]	.156, p = .239 [-.112, .403]	.201, p = .126 [-.065, .441]
ISCED TOTAL	.226, p = .086 [-.040, .461]	.295*, p = .023 [.034, .518]	.238, p = .069 [-.027, .472]	.265*, p = .043 [.002, .494]

Table 3a
Correlation between the three MeLA Tests scores and ISCED values.

n = 59 (1 participant out of 60: no information provided on ISCED)

* Correlation is significant at the 0.05 level (2-tailed)
[,] 95% CI = confidence interval
Strength of relationship (Cohen, 1988, pp 79-81): small *r/rho*= .10 to .29; medium *r/rho*= .30 to .49; large *r/rho*= .50 to 1

The correlations between ISCED values and T2 MeLA scores were again found to be stronger when the three participants with a migration background were not included in the analysis (Table 3b). The analysis revealed medium, significant, positive correlations between parental educational level and MeLA sum scores, $r(54) = .377$, $p < 0.01$.

	T2 MeLA MKT	T2 MeLA TAM	T2 MeLA MAT	T2 MeLA SUM
ISCED Mother	.271*, p = .044 [-.000, .504]	.293*, p = .029 [.024, .522]	.322*, p = .016 [.056, .545]	.301*, p = .024 [.034, .529]
ISCED Father	.259, p = .054 [-.012, .495]	.354**, p = .007 [.093, .570]	.293* , p = .028 [.025, .522]	.312*, p = .019 [.045, .537]
ISCED TOTAL	.314*, p = .019 [.047, .538]	.402**, p = .002 [.148, .606]	.378**, p = .004 [.120, .589]	.377**, p = .004 [.119, .588]

Table 3b
Correlation between the three MeLA Tests scores and ISCED values.[7]

n = 56 (1 participant out of 60: no information provided on ISCED)

** Correlation is significant at the 0.01 level (2-tailed)
* Correlation is significant at the 0.05 level (2-tailed)
[,] 95% CI = confidence interval
Strength of relationship (Cohen, 1988, pp 79-81): small *r/rho*= .10 to .29; medium *r/rho*= .30 to .49; large *r/rho*= .50 to 1

6.3. Books-at-home and MeLA scores

To investigate a potential relationship between the number of books at home (serving as a proxy for home literacy environment) and T2 MeLA scores on the three MeLA Tests, in addition to the sum score of the three MeLA Tests, a correlation analysis was carried out again using Spearman's Rank Order Correlation (Table 4a). The analysis revealed significant, medium, positive correlations between the books-at-home measure and MeLA sum scores, $r(57) = .492$, $p < .001$.

[7] Three participants with a migration background not included.

	T2 MeLA MKT	T2 MeLA TAM	T2 MeLA MAT	T2 MeLA SUM
Books-at-home	.439**, $p < .001$ [.199, .630]	.478**, $p < .001$ [.246, .659]	.464**, $p < .001$ [.229, .648]	.492**, $p < .001$ [.263, .669]

Table 4a
Correlation between the MeLA Test scores and books-at-home.

n = 59 (1 participant out of 60: no information provided on the number of books)

** Correlation is significant at the 0.01 level (2-tailed)
[,] 95% CI = confidence interval
Strength of relationship (Cohen, 1988, pp 79-81): small *r/rho*= .10 to .29; medium *r/rho*= .30 to .49; large *r/rho*= .50 to 1

As can be deduced from Table 4b, when the three participants with a migration background were taken out of the analysis, the correlations between the T2 MeLA scores and the books-at-home measure became again stronger. In this case, the analysis found highly significant, large, positive correlations between the books-at-home measure and T2 MeLA sum scores, $r(54) = .602$, $p < .001$.

	T2 MeLA MKT	T2 MeLA TAM	T2 MeLA MAT	T2 MeLA SUM
Books-at-home	.532**, $p < .001$ [.306, .702]	.578**, $p < .001$ [.365, .734]	.601**, $p < .001$ [.395, .749]	.602**, $p < .001$ [.396, .750]

Table 4b
Correlation between the MeLA Test scores and books-at-home.[8]

n = 56 (1 participant out of 60: no information provided)

** Correlation is significant at the 0.01 level (2-tailed)
[,] 95% CI = confidence interval
Strength of relationship (Cohen, 1988, pp 79-81): small *r/rho*= .10 to .29; medium *r/rho*= .30 to .49; large *r/rho*= .50 to 1

6.4. Teachers' perceptions

To answer the second research question regarding teachers' perceptions of the relationship between MeLA development and the socioeconomic backgrounds of their multilingual learners and the perceived influence of the educational setting on linguistic-cognitive development, teachers' responses were categorised into the above-mentioned core categories (see Section 4.3). As can be deduced from Table 5, data analysis revealed that five teachers perceive family SES as a relevant factor with regard to MeLA skills among their learners. They argue that children from high SES families often have more access to cultural and educational activities and that the environment in such households is more stimulating for children. Four teachers acknowledge a connection between these two factors but believe that family SES is only partly decisive because children, as social beings, also interact with their environment, which impacts MeLA development. In contrast, two teachers express the belief that family SES has no real influence on such linguistic-cognitive development. They argue that, in a society with numerous educational opportunities, such inequalities can be compensated for.
The analysis of the school's influence on MeLA development indicates that six teachers suppose instructional settings play an essential role in adolescents' MeLA development by

[8] Three participants with a migration background not included

fostering analytical thinking and conscious reflection. Three teachers consider the influence of the school to be given to a certain extent, emphasising that the socioeconomic background also might shape the learners' development. Conversely, two teachers perceive the school's influence as very limited, despite all the efforts to support all children equally. According to these teachers, SES factors often pre-determine cognitive development at an early stage, leading to diverse prerequisites among students before they even enter school. This circumstance poses challenges for narrowing the disparity, especially in lower secondary schools, where achieving specific developmental levels becomes increasingly demanding.

Concerning the teachers' explanation for the high to medium MeLA values of the three participants with a migration background in the first study (T2 MeLA sum scores: 69; 53; 69) (see Spechtenhauser 2022 for more details) but considerably low to modest ISEI-08 total values and low ISCED values in the current study, the findings revealed that eight teachers assume that the knowledge of additional languages contributes to the development of heightened levels of multilingual awareness. Within this group of eight teachers, four explicitly point out that they can observe cross-linguistic thinking and frequent cross-linguistic consultations among these learners in class. Two other teachers posit a possible explanation for this development, suggesting that these learners are often more motivated and willing to perform, recognising at a certain age that educational opportunities present a chance for them. One teacher, however, is unable to discern a logical explanation for the discrepancy between the low SES values of these respondents and their high or medium MeLA scores.

A Teacher-perceived relationship between MeLA and SES	**Cat 1**	**Cat 2**	**Cat 3**
n	5	4	2
B Teachers' perceived extent of the school's influence on learners' metacognitive development	**Cat 1**	**Cat 2**	**Cat 3**
n	6	3	2
C Teachers' explanations for low SES values and high to medium MeLA levels among adolescents with a migration background	**Cat 1**	**Cat 2**	**Cat 3**
n	8	2	1

Table 5
Teachers' perceptions on MeLA – SES relationship.

n = 11

A Teacher-perceived relationship between MeLA and SES
Cat 1 Drawing on experience from everyday work a relationship between the learners' SES and their MeLA development can be noted
Cat 2 Based on the experience of everyday professional life, a connection between the SES and the development of learners' MeLA can only be partially recognized
Cat 3 Building on the everyday teaching experience, no relevant correlation can be affirmed

B Teachers' perceived extent of the school's influence on learners' metacognitive development
Cat 1 The influence of the educational setting on the learners' metacognitive development is very strong and significant
Cat 2 The influence of the educational setting on metacognitive development of the learner is considered possible to a certain extent
Cat 3 The influence of the educational setting on metacognitive development of the learner is considered to be very limited

C Teachers' explanation for low SES values and high to medium MeLA levels among adolescents with a migration background
Cat 1 The knowledge of additional languages helps them to develop higher degrees of awareness
Cat 2 Devotedness and readiness to perform lead to heightened (meta)cognitive - linguistic skills
Cat 3 No clear connection or reason for this can be seen/identified

7. Discussion

As previously discussed, MeLA can be considered an emergent property of multiple interacting language systems. The aim of the present investigation was to investigate whether family SES can be identified as an additional significant variable that substantially influences the multilingual development of MeLA as an emergent property of multilingual systems. For this purpose, the correlation between the parents' occupational status, their educational level, and the number of books at home (as a marker for home literacy environment) with the various MeLA sum scores, achieved by the participants in the longitudinal study, was analysed. It should be noted here that all correlation analyses were carried out both inclusive and exclusive of the three participants with a migration background. This approach was taken as it was striking that two of these participants could be assigned to the HighMeLA group and one to the MediumMeLA group in the longitudinal study, while the family SES data for all three participants in the MeLA-SES study were clearly in the low range. In addition to analysing the correlations between the different MeLA scores and SES values, teachers were also queried about their observations and perceptions regarding a potential connection between their multiple language learners' MeLA skills and family SES in their daily teaching practice.

Regarding the correlation analyses between the different MeLA scores and the parental occupational status, small, significant, positive correlations were found. However, the correlations between the mothers' occupational status and MeLA scores were slightly stronger than the correlations between the fathers' occupational status and MeLA scores, which could indicate a potentially greater influence of the mother on the adolescent's MeLA development (but see also the note on the ISEI scale and some paternal occupations below). The correlation strength between occupational status and the various MeLA scores (and their sum) increased when the participants with a migration background were not included in the correlation analysis. As a result, medium, significant, positive correlations between occupational status and MeLA scores with regard to maternal ISEI-08 could be found but still small, significant, positive correlations with regard to paternal ISEI-08, supporting the significance of maternal occupational status in this context. The influence of the maternal occupational status on monolingual children's cognitive abilities has also been addressed in a recent study by Barg and Klein's (2024). The authors confirm positive associations, particularly between mothers' occupations that require verbal skills and their children's verbal development, whereas the influence on other non-verbal skills was comparatively modest. However, there is a lack of research on the extent to which the maternal occupational status and the learning of multiple languages influence metacognitive development, and consequently on the interplay between these two multifaceted factors.

Small, significant, positive correlations were also found between the parental educational attainment and the MeLA sum scores. Notably, the significance of the correlations between maternal educational levels and MeLA sum scores, as well as paternal educational levels and MeLA sum scores again increased when the analysis was carried out without the participants with a migration background. This underlines the generally favourable influence of the parents' educational attainment on the adolescents'

levels of MeLA. In the current study it was also found that both proxy measures, ISCED and ISEI-08, generally correlate significantly, which implies that in the majority of cases there is a strong link between the parents' educational attainment, occupation, and income (but see again considerations on some fathers' education level, occupational status, and income detailed below). The correlations between MeLA and parents' occupational status as well as educational attainment of the present study, also corroborate findings on negative effects on children's executive functions (which form an individual's metacognitive supervisory system) when these SES factors are low. As discussed above, Calvo and Bialystok 2014 report a negative influence of lower SES on these functions for both monolingual (English speaking) and bilingual (Spanish and English speaking) learners. However, bilingualism had a positive effect on the children's executive functioning, as the authors highlight. Findings of the present investigation, in this sense, confirm the negative impact of low ISEI and ISCED factors on metacognitive aspects also in learners of multiple languages and the counterbalancing effect of additional languages as it was the case in participants with a migration background (see also discussion on this participants below).

The analysis of a possible correlation between the books-at-home measure and the MeLA scores on the different MeLA Tests, revealed highly significant, positive correlations in both analyses – the one with and the one without the participants with a migration background. However, the correlation analysis, excluding these three participants, strengthened the significance again, revealing large, highly significant, positive correlations between the families' home reading environments and the participants' MeLA scores. This provides further evidence that there is a relationship between this SES factor, which reflects a stimulating reading environment and the possibility of cultural enrichment (as indicated in the aforementioned PISA report by Haider 2000), and the development of MeLA. Children from low social status families therefore often have less access to experiences that promote basic reading skills and stimulating learning materials such as books, as also reported by Buckingham *et al.* (2013), and accordingly, as the present study implies, also show different developmental trajectories on a metacognitive level. In the current study, home literacy environment was found to be strongly correlated with the other two proxy measures of parental education and parental occupational status, further supporting the assumption that families with higher socioeconomic status tend to have higher quality home literacy environments.

The findings of the present investigation also suggest that multiple interacting language systems may have, as previously indicated, a compensatory effect on MeLA development that would otherwise likely be more negatively affected by low SES values. In the current study, especially the three participants with a migration background were found, as noted above, to have particularly low SES scores, which even caused the correlation strength between all SES measures and MeLA scores to change for the entire test population in the analyses. On the other hand, data analysis of the longitudinal study revealed that these participants were all able to achieve medium to high MeLA total scores on all MeLA Tests (see Spechtenhauser 2022; Spechtenhauser, Jessner 2024 for more details). Consequently, these participants were quite often able to carry out pertinent and exhaustive analyses in the three MeLA Tests, as well as to disambiguate the problems and demonstrate higher order thinking skills, which were most likely also influenced by their use of additional languages from which they were able to benefit. These findings are consistent with research reporting advantage of bilingual children with a migration background in this regard. Mezzacappa (2004), who administered the ANT flanker test (which tests the attentional networks including executive control) to socially advantaged and socially more disadvantaged children, found in his study that while children with high

family SES had significant advantages overall, Hispanic children with low family SES performed better than all other participants on the incongruent trials (which requires the highest level of involvement of executive functions). The author credited the advantage in this task to the fact that the majority of the Hispanic children was exposed to two languages (see also Calvo, Bialystok 2014 for similar results). Hence, while in the present investigation the three adolescents with a migration background may also not be considered particularly privileged in terms of family SES background, their development on the metacognitive level, reflected in the MeLA scores, was clearly evident. Such a development provides further evidence, that emerging properties from several interacting language systems can have, as stated by Jessner (2023) (see also Hofer *et al*., submitted), beneficial effects on further development of the system. Studies such as those by Dahm (2015), Jessner and Török (2017), and Spechtenhauser and Jessner (2024) also corroborate the positive effect of prior language experiences on language learning and the use of metalinguistic strategies. At the same time, though, there is certainly a lack of data from a bigger test population with a similar background (i.e. a cohort that includes children with a migration background who have more than three languages systems in mind), which could shed more light on the SES factor and MeLA development in this regard.

In the present study it was also striking that the correlations between the parental educational level and, in particular, between the paternal occupational status and the respondents' MeLA sum scores were not as significant as those between the home literacy environment and MeLA sum scores. This deviation could probably be attributed to the fact that some fathers work as craft workers. Despite being entrepreneurial, with some families owning relatively large businesses and doing well economically, these fathers could not be consistently assigned high ISEI-08 and ISCED scores due to lower educational attainment and moderately classified occupational categories. On the other hand, scales focusing solely on employer-employee status, would not have yielded more comprehensive results either. In essence, it can be assumed that a SES scale like the ISEI-08, which apart from economic capital, also includes cultural resources, effectively captures the average status values of an incumbent in an occupational category. However, exploring individual nuances would require extensive single-case studies, given the current lack of scales that encompass educational attainment, income, occupation, prestige related to occupation, employer-employee status (and new forms of contract/employment), including the growing number of female labour that transforms occupational structures and the potentially increasing AI-related jobs.

The evaluation of the teachers' perception of the relationship between MeLA development and SES factors revealed that the majority of the teachers believe that there is a relationship between these two factors and state that they observe that learners coming from high SES families usually have better starting conditions and are in this sense more privileged. However, some teachers also point out that the broader social environment also has an impact on the adolescent's development in this regard and thus may reduce the influence of the SES of the family. The majority of the teachers also think that the influence of the instructional setting on their learners' metacognitive development is quite important, or at least relevant to a certain extent. These perceptions, based on teachers' experiences, align with research findings on MeLA and the relevance of formal instruction. Studies into MeLA development in bi- and multilingual learners underline that literacy and instruction in educational settings in this context play an important role (see Thomas 1988; Bialystok 2001; Sanz 2007). The relevance of this factor, however, may not be uniform since variables such as teaching methods and the teachers' own awareness of MeLA (see Haukås 2016; Jessner 2018) are likely to further affect the development of multiple language users in this regard. With regard to medium to high MeLA scores

(despite low family SES) of participants with a migration background, most of the teachers surveyed assume that these are due to more language experience and knowledge they can rely on.

8. Concluding remarks

The analysis of the relationship between multiple language learners' MeLA development and the multifaceted SES factor within dynamic multilingual systems has provided insights into this complex interplay. Recapitulating, it can be stated that the findings suggest that, in addition to the effect of interacting language systems, the family SES, as an additional variable influencing the system, affects the multiple language learners' MeLA development. In the present study, it was found that certain SES factors may have different significance in this context, but clear tendencies could be identified that indicate a correlation between MeLA development and family SES.

The question now arises regarding the extent to which such findings can also have an impact at an instructional level in multilingual contexts such as in South Tyrol. Given that multilingual metalinguistic skills have been identified as a driving force in multilingual systems (Hofer 2017; Spechtenhauser, Jessner 2024) and SES can be seen as a further determinant influencing the development of metacognitive skills in multilingual systems, it is essential to consider this aspect in institutional contexts. Research has demonstrated a connection between the development of reading competences and a stimulating home reading environment (see Buckingham *et al.* 2013; Bergen *et al.* 2016), which in turn often contributes to the development of metalinguistic skills (see Bialystok, Craik 2010). Since the present study also revealed a correlation between SES factors such as home reading environment and multiple language learners' MeLA, there is a crucial need to sensitise teachers to these relationships. The study also revealed, as discussed above, that the books-at-home measure strongly correlates with the parents' educational attainment and occupational status, which further emphasises the link between the home literacy environment and other SES factors. In this regard, institutional settings can be made more aware of their role in compensating for low SES contexts. As this study has shown for participants with a migration background, additional languages in the multilingual system can also have a balancing effect on the otherwise generally low MeLA levels in the case of SES values. In view of the increase in complex multilingual constellations, attributed not only to the presence of autochthonous languages in South Tyrol but also to recent migration movements, this aspect can provide additional impetus to recognise the benefits stemming from various language systems in the learners' minds. Hence, the presence of multiple languages in the mind should not be seen as an obstacle or from a deficit oriented perspective – nor as a threat to the development of a majority language in a given region, as has been the case in recent educational policy debates in South Tyrol (and certainly also in other similar multilingual contexts), but rather as a catalyst, as discussed above, since multiple language learners can profit from their multilingual systems when learning additional languages also due to the change in the quality of MeLA (see Hofer 2017; Jessner 2023; Spechtenhauser, Jessner 2024). The (meta)cognitive benefits of multiple language learning should therefore be better recognised and supported, with more attention being paid to the interplay with SES factors in this context at the educational governance level. Ultimately, only if there is greater sensitivity at the policy level to the essential factors in the linguistic-(meta)cognitive development of young multilingual learners, can teacher-training programs be adapted accordingly and, finally, broad-based changes be implemented at the institutional level and

more targeted curricular measures be taken. In this sense, as also Vetter (2013b) emphasizes, transitioning from hegemonic language ideologies and monoglossic policies towards more multilingual teaching approaches – which include comparing and reflecting on different language systems and thereby promote metacognitive abilities – could be envisaged as a forward-looking step.

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Annexes

Fragebogen – Schüler (SES QUESTIONNAIRE) Kodex (ID): _____

1) Was ist der höchste Bildungsabschluss deiner Mutter?

a) Grundschule
b) Mittelschule
c) Lehre/Berufsschule
d) Meisterabschluss
e) Oberschule
f) Universitätsabschluss
g) Sonstige Hochschule

2) Was ist der höchste Bildungsabschluss deines Vaters?

a) Grundschule
b) Mittelschule
c) Lehre/Berufsschule
d) Meisterabschluss
e) Oberschule
f) Universitätsabschluss
g) Sonstige Hochschule

h) Was ist die derzeitige berufliche Position der Mutter? (bitte ankreuzen und den Beruf angeben)

a) Freiberuflich Tätige/r
b) Selbständig in Land- und Forstwirtschaft
c) Selbständig ohne Angestellte
d) Selbständig mit weniger als 5 Angestellten
e) Selbständig mit 6-20 Angestellten
f) Selbständig mit mehr als 20 Angestellten
g) Beamter / Beamtin, Vertragsbedienstete/r im öffentlichen Dienst
h) Facharbeiter im öffentlichen Dienst
i) Führungskraft im öffentlichen Dienst
j) Angestellte/r / im privaten Sektor
k) Führungskraft im privaten Sektor
l) Facharbeiter/in nicht im öffentlichen Dienst
m) Sonstige/r Arbeiter/in nicht im öffentlichen Dienst
n) Haushalt
o) Nicht erwerbstätig

p) Bezeichnung des Berufs: _____

6) Was ist die derzeitige berufliche Position des Vaters? (bitte ankreuzen und den Beruf angeben)

a) Freiberuflich Tätige/r
b) Selbständig in Land- und Forstwirtschaft
c) Selbständig ohne Angestellte
d) Selbständig mit weniger als 5 Angestellten
e) Selbständig mit 6-20 Angestellten
f) Selbständig mit mehr als 20 Angestellten
g) Beamter / Beamtin, Vertragsbedienstete/r im öffentlichen Dienst
h) Facharbeiter im öffentlichen Dienst
i) Führungskraft im öffentlichen Dienst
j) Angestellte/r / im privaten Sektor
k) Führungskraft im privaten Sektor
l) Facharbeiter/in nicht im öffentlichen Dienst
m) Sonstige/r Arbeiter/in nicht im öffentlichen Dienst
n) Haushalt
o) Nicht erwerbstätig
p) Bezeichnung des Berufs: _____

7) Wie viele Bücher habt ihr schätzungsweiße zu Hause? (Alle Bücher zusammengenommen, also auch deine und jener deiner Eltern/evtl. Geschwiste; auch eventuelle E-Books zählen)

a) 0-10 Bücher
b) 11-25 Bücher
c) 26-100 Bücher
d) 101-200 Bücher
e) 201-500 Bücher
f) mehr als 500 Bücher

Lehrerfragebogen (Questionnaire on teachers' perceptions)

1. Sehen Sie, wenn Sie sich an Ihre Erfahrungen anlehnen, einen Zusammenhang zwischen den MeLA*-Werten der Lerner und den SES*-Werten? Glauben Sie persönlich somit, dass der sozioökonomische Hintergrund bei der Entwicklung der Heranwachsenden auf der sprachlich-kognitiven Ebene eine Rolle spielt?

2. Inwieweit glauben Sie, dass Bildungseinrichtungen wie Schulen in der Lage sind, sozioökonomische Unterschiede der Lernenden abzufangen? Sind Sie der Meinung, dass der Einfluss der Schule auf die Entwicklung im metakognitiven Bereich erheblich ist (und somit eine sehr große Rolle spielt) oder dass bei dieser Entwicklung der sozioökonomische Hintergrund trotz allem besonders ins Gewicht fällt und somit dieser Faktor eine größere Rolle spielt?

3. In der Untersuchung können einige junge Lernende mit durchschnittlich tendenziell eher niedrigen SES Werten und aus Familien mit Migrationshintergrund stammen, trotzdem tendenziell durchschnittlich mittlere bis hohe MeLA Werte vorweisen. Wie erklären Sie persönlich sich das?

Vielen herzlichen Dank für Ihre wertvolle Mitarbeit!

Coding scheme for teachers' perceptions

Question/ Main issue	Core category Variable	Encoding rule *& anchor sample* *[Translated transcription: Germ.-Engl.]*
A Teacher-perceived relationship between developmental aspects regarding MeLA and SES	**1** Drawing on experience from everyday work a relationship between the learners' SES and their MeLA development can be noted	The respondent clearly affirms in his/her statement that he/she believes that there is a link between the learners' linguistic - cognitive development and their socioeconomic background "..parents *with a higher level of education are better able to support/ foster their children at home"*; "*..often the environment in these households is better/more stimulating for the children"*; "*..often children from these families have also more access to educational and cultural activities"*
	2 Based on the experience of everyday professional life, a connection between the SES and the development of learners' MeLA can only be partially recognized	The respondent emphasizes in his/her utterance that he/she can only see a partial connection between the linguistic - cognitive development of the learners and their respective socioeconomic backgrounds *"..the way children/adolescents develop on this level certainly has to do with the socioeconomic background of the families, but other factors will also play a role"; "..children who come from families with a lower level of education can be disadvantaged in this regard, but they are also social beings and interact with other children, adults and are thus also fostered/supported in this way"*
	3 Building on the everyday teaching experience, no relevant correlation can be affirmed between the learners' socioeconomic background and their development on a linguistic-cognitive level	The respondent in his/her statement clearly points out that he/she cannot see any link between the learners' linguistic - cognitive development and their socioeconomic background *"I believe that in our society (i.e. in our affluent society) all children are supported to a similar extent [..] our society already offers a lot of support here – in our country and above all in our region education is affordable for everyone – so also children from 'poorer households'.."*
B Teachers' perceived extent of the school's influence on learners' metacognitive development	**1** The influence of the educational setting on the learners' metacognitive development is very strong and significant	The respondent clearly believes that educational institutions, irrespective of the socioeconomic background of the learners, have a significant influence on the learners' development in this cognitive - linguistic domain *"I think that especially school plays a significant role here and can have a*

	major influence on the linguistic - cognitive development of children"; "..it is precisely conscious reflection, as well as critical and analytical thinking, that are particularly encouraged at school - I therefore believe that school plays a very important role regarding the development of adolescents in this context"; "..metalinguistic thinking is very complex, as we have seen, so I think that school has a big influence on how children learn to think consciously about different aspects"
2 The influence of the educational setting on metacognitive development of the learner is considered possible to a certain extent	The respondent emphasizes that although the educational setting has an (in some cases considerable) influence on the learners' linguistic-cognitive development, the learners' socio-economic and sociocultural background also plays a considerable role and therefore the school's influence has limits *"..the educational setting certainly plays a role in this development, but the parental home and thus the socioeconomic background also shape th development of a young person - I think that both factors play a role"; "..school can contribute a lot to the linguistic - cognitive development; nevertheless, the family background is crucial and very formative here"*
3 The influence of the educational setting on metacognitive development of the learner is considered to be very limited	The respondent is of the opinion that educational institutions as a whole cannot have a very significant influence on learners' linguistic - cognitive development and that this development is mainly shaped by socioeconomic and sociocultural factors *"..school as an institution can of course try very hard to support all children equally, but in spite of everything we kno of course that the socioeconomic background of the children already shapes their further development very much; "..they often do not start with the same preconditions as children from families with a higher income, a higher level of education, etc.- "School has not really an influence on this and it cannot eliminate the differences here.."*

C Teachers' explanation for low SES values and high to medium MeLA levels among adolescents with a migration background	**1** The knowledge of additional languages helps them to develop higher levels of awareness	The respondent underlines that the knowledge of other languages (in addition to those learned at school) helps these learners to develop a higher level of (meta)linguistic awareness and it can also be observed that these learners are better able to identify similarities and differences between the different languages *"Learners who speak more than one language at home often develop a different 'feeling' - or yes, awareness for languages and are often quicker to recognize connections between languages"; "..these pupils sometimes understand new words more quickly [..] they sometimes try to see if there is a similar word in another language.."; "..there are learners who benefit from multilingualism resulting from the languages of the parental home and can compare languages quite well"; "..they are often also able to refer to other languages.."*
	2 Devotedness and readiness to perform lead to heightened (meta)cognitive - linguistic skills	The respondent suggests as a possible reason more commitment/high degree of eagerness to learn/higher motivation on the part of these learners, as they see school as an opportunity for social advancement *"..sometimes these children are also more motivated overall, because at a certain age they often also understand that learning the language of instruction and the educational offer represent an opportunity for them"*
	3 No clear connection or reason for this can be seen/identified	The respondent cannot really think of a possible reason why these subjects have a low SES value and yet show high or medium MeLA values / no reasons are provided *"I find it difficult to see a logical connection here. I don't see any plausible reason for it to be able to give a reasonable answer."*