

# Interventions for early language development in monolingual and bilingual children with autism spectrum disorders: Two case studies

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## Abstract

The present study aimed to address monolingual and bilingual language development of two pre-school children with autism spectrum disorders. Bilingual families of children with autism spectrum disorders are often advised to speak and communicate with their child in only one of the two languages, since as common view was that bilingualism burdens language development. Nevertheless, research data confirm the opposite and claim that bilingualism is not a deterrent factor to language development of children with autism spectrum disorders. To this aim, we tested a monolingual and a bilingual child with autism spectrum disorders, aged 4 years; 2 months and 4 years; 4 months, respectively. They received speech and language therapy sessions twice a week for 7 months in order to communicate more widely and to enhance their linguistic abilities. Appropriate speech therapy material was used to improve their cognitive and linguistic abilities. The results of study showed that the bilingual child developed quicker his phonological abilities, his receptive and expressive vocabulary, his verbal and non-verbal pragmatic abilities and his cognitive abilities, compared to the monolingual child. These outcomes confirm previous research data, suggesting that bilingualism has a positive effect on autism spectrum disorders.

**Keywords:** bilingualism; autism spectrum disorders; early language development; language interventions

## **Interventions for early language development in monolingual and bilingual children with autism spectrum disorders: Two case studies**

### **1. Introduction**

Autism spectrum disorders (ASD) have received recently a lot of attention, since researchers try to find the etiology of the disorder and what the most appropriate treatment can be. In addition, due to the increasing international migration and the creation of a mosaic of language communities in many countries, there is a growing need for understanding of multilingual individuals with developmental disorders. Switching to monolingualism can deprive children's significant opportunities to gain new experiences both within the family and in the framework of the community. Moreover, it can hamper the development of multicultural consciousness and multilingual identity, which is very important for children with ASD (Howard, Katsos, & Gibson, 2019). In the past, it was often suggested by experts that bilingual families speak only one language to the child with ASD, since it was believed that both languages were an extra burden for language development of children with ASD (Kremer-Saldik, 2005). However, nowadays, many studies have shown a positive effect of bilingualism on language development of children with ASD (Seung, Siddiqi, & Elder, 2006; Baldimtsi, Peristeri, Tsimpli, & Nicolopoulou, 2016).

Previous studies have shown that early language development in monolingual children with ASD can be delayed (Lennard-Brown, 2004; Tager-Flusberg, Paul, & Lord, 2005) and quite echolalic (Roth & Worthington, 2000). Happe (2003) states that there is a large variety in linguistic profiles of children with ASD; extending from the completely dumb child who does not even use gestures, the echolalic child of the same group who parrots whole sentences which do not seem to have any relation to the context, or the child whose language is fluent but paradoxical with discrepancies in semantics and pragmatics. Moreover, they may encounter difficulties in morphosyntax and language comprehension (Kelley, 2011; Boucher, 2012). These children also struggle to express – either verbally or non-verbally– their own feelings and emotions, due to the lack in development of theory of mind (Dawson, Hill, Spencer, Galpert, & Watson, 1990). Apart from their cognitive inability to understand others' beliefs, desires and intentions, individuals with ASD face problems with other cognitive abilities, such as joint attention, flexibility, planning and inhibition (Eigsti, 2011; Bean & Eigsti, 2012).

In their early development of mental lexicon, they often make mistakes in using words with similar meanings (e.g. they may say spoon instead of fork, sheep instead of goat, blouse instead of shirt). Due to the deficits in cognitive abilities, it is hard for children with ASD to understand abstract terms; despite that they may memorize and repeat them, albeit not always with the same meaning. In relation to typically developing children, they use less words than they understand, while they also use words that they do not understand (Stamatis, 1987). They often parrot words or phrases, although they do not understand their meaning. According to Roth and Worthington (2000), echolalia decreases significantly as the child with ASD acquires greater perceptual and expressive skills. In addition, children with ASD face difficulties with the processing of new information which implies a weakness in the organization of new data, in abstract thinking and in conceptual categorization (Williams & Minshew, 2010). Moreover, due to their impaired attention and flexibility, they focus on details rather than the whole object and, subsequently, it is hard to map the word with the correct object. The aforementioned issues hamper the development of the receptive and expressive vocabulary.

The semantic development of bilingual children is normally different from those of monolingual children, since bilingual speakers have two lexica. Nevertheless, according to previous studies (Pearson, Fernández, & Oller, 1993; Kan & Kohnert, 2005) conceptual vocabulary (i.e. all the words the bilingual speaker knows in both languages) is comparable to that of a monolingual speaker. Studies on monolingual and bilingual children with ASD aged 24-52 months, found that there were no statistically significant differences between the two groups in terms of vocabulary (Ohashi, Mirenda, Marinova-Todd, Hambly, Fombonne, Szatmari, Bryson, et al., 2012). The

findings of Petersen, Marinova-Todd, and Mirenda (2012) exhibited that bilingual children with ASD have greater overall receptive and expressive vocabulary production than their monolingual peers with ASD. Regarding the relationship between language proficiency and bilingualism, research has shown that bilingual children with ASD can learn two languages in a similar manner to their monolingual peers with ASD (Kohnert, 2007; Park, 2014). Moreover, Park (2014) stated that bilinguals with ASD have a larger overall expressive vocabulary compared to monolinguals. She also noted that bilinguals with ASD developed gestures more easily, pointing to desired objects and be engaged in pretend play. She also suggested that bilingualism boosts the development of both languages. In a similar vein in a case study of Seung et al. (2006), a 3 years; 6 months old Korean-American bilingual child with ASD attended speech and language therapies for almost two years. The therapist was also Korean-American bilingual. For the first 12 months the treatment focused exclusively on Korean, in the first language of the child, in the next 6 months the intervention gradually introduced the English language. The intervention aimed to develop both linguistic and non-linguistic semantic and pragmatic abilities and was based on the connection of pre-linguistic and linguistic development including training of inhibition, joint attention, the use of gestures and pretend play. At the same time, child's parents were trained in the use of intervention methods at home in order to extend these practices in all environments. The basic vocabulary was learnt. In addition, the intervention brought to light remarkable positive findings regarding the production of language and the development of understanding of both languages. Inappropriate behaviors were also reduced. The results support the view that the intervention which supports first language establishes a linguistic base to learn the second language (Seung et al., 2006).

Pragmatic abilities are impaired in children with ASD, even though they are high-functioning individuals. According to Eales (1993) monolingual children with ASD have difficulties in switching listener-speaker roles, adhering to social rules during discussion and distinguishing between old and new information. They often get off-topic or they use irrelevant information and cannot give feedback (Flack, Harris, Jordan, & Wimpory, 1996; Vogindroukas, 2005). Their lack of empathy (Theory of Mind) hamper the successful interaction with others. Along these lines, narrative skills of these children are affected (Chen & Lei, 2013). According to Tager-Flusberg (1995), children with ASD have significantly shorter and less complex narratives compared to typically developing children. Also, in their narratives, children with ASD do not feel the need to explain the causal relationships of the events of a story to the listener and this is due to lack of empathy. Kenan, Zachor, Watson, and Ben-Itzhak (2019) have shown the difficulty of monolingual children with ASD in maintaining coherence and cohesion, errors in the use of pronouns, lower syntax complexity, use of irrelevant information and inability to refer to causal relationships and aspects of story.

An 'advantage' of bilingualism is often detected in cognitive and pragmatic abilities. Hence, bilingual children's pragmatic abilities are better (Valicenti-McDermott, Tarshis, Schouls, Galdston, Hottinger, Seijo, & Shinnar, 2013). More specifically, in a study of Valicenti-McDermott and colleagues (2013) which compared monolingual English-speaking infants and English-Spanish bilingual infants with ASD, they found that bilingual infants were more likely to play, point to objects, make gestures, and be engaged in pretend play. Thus, bilingual children with ASD are more interactive than monolinguals and hence, they are more exposed to language and interactive social experiences. In addition, higher scores in pretend play may indicate that they are paying more attention to their peers and thus can imitate them (Stephens & Matthews, 2014). In terms of narrative abilities of bilingual children with ASD, they are also more well-developed (Chen & Lei, 2013). Bilingual children with ASD have found to manifested better skills both in terms of microstructure (i.e. accurate use of definite and indefinite articles, see Chen & Lei, 2013) and macrostructure (Baldimtsi et al., 2016). The most plausible explanation is that bilinguals, because they have to learn two ways to express the same meaning, this may lead them to a better understanding of language as a system and also help them to develop metalinguistic skills (Goetz, 2003). Another reason may be that bilingual children need to decide which language is more appropriate to use based on their listener's needs and perspective (Goetz, 2003). In other words, empathy is required and more often needed and therefore, bilingual children with ASD have higher scores in Theory of Mind compared to monolingual aged-match children with ASD (Nguyen & Astington, 2014). From the outcomes of all the

previous studies, we understand that when both languages are equally supported in bilingualism, the one language boosts the other. By contrast, avoiding bilingualism can be harmful to linguistic, cognitive, emotional and social development of children with ASD.

To our knowledge, few studies have investigated Greek-speaking children with ASD (Vogindroukas, 2005; Terzi, Marinis, Kotsopoulou, & Francis, 2014; Baldimtsi et al., 2016) and most of them focused on school-aged children. In addition, they have studied part of their language abilities (i.e. morphosyntactic abilities and narrative skills) and not all the aspects of language development; moreover, they mainly focused on language production and not comprehension. The contribution of the present study is that many aspects of early language development (phonetics/phonology, semantics, pragmatics and morphosyntax), cognitive abilities of children with ASD are depicted. At the same time, comparing the language and cognitive development of a monolingual and an aged-matched bilingual child with ASD, we attempt to answer to the issue of the positive effect of bilingualism on ASD.

## 2. The present study

### 2.1 Aims and hypotheses

The current study was an empirical case study that aimed to (a) investigate the early language development of two children – a monolingual and a bilingual – with ASD by means of a 7-month intervention and (b) detect any effect of bilingualism in language development of children with ASD. Our first hypothesis was that many issues would initially arise in all linguistic areas, such as phonetics/phonology, semantics, pragmatics and morphosyntax (Tager-Flusberg et al., 2005). Nevertheless, we expected that the language development of the two children would be improved after the completion of the intervention plan (Sussman, 1999). Our second hypothesis was that bilingualism would have a positive effect on pragmatic and cognitive abilities and thus it would positively affect the overall language development (Ohashi et al., 2012; Hambly & Fombonne, 2012).

### 2.2 Method

The current study used a multi-method approach, since before the intervention standardized and non-standardized tests (quantitative measurements) were used in order to measure participants' language development and questionnaire on autism spectrum disorder (qualitative measurements), while during the intervention qualitative measurements were used (such as observation and note taking). After the completion of intervention the same tests were administered in order to show the progress of the intervention. The research paradigm of the present study is positivist, since we set and tested our hypotheses based on previous studies and we drew inferences (following Stake, 1995; Yin, 2002).

**Participants** - Two children took part in the present study; a monolingual child with ASD (henceforth ML child) and a bilingual child with ASD (henceforth BL child). The sampling method followed was *purposive sampling*, since specific criteria must be met. More specifically, our participants have to be (either monolingual or bilingual) preschool children with ASD and they must have any absence of other disorders (absence of comorbidity). In addition, they should be willing to attend a 7-month intervention program and they should have a similar (non-)linguistic profile by the time of testing. The only participants who met our criteria were two children born in 2014 and by the time of testing they were 4 years; 2 months and 4 years; 4 months old, respectively. Both children were diagnosed with F84.0. They were recruited by a speech and language therapist in Northern Greece. They started speech and language therapies in October 2018 and their intervention program lasted 7 months. Once both children started the sessions, they did not speak.

The BL child was born in Greece and was a simultaneous bilingual. He came from a Greek-Russian bilingual family, in which the parents were dominant in Russian. The BL child had also an older brother, who was more dominant in Greek and who spoke to the BL child only in Greek. On the other hand, the ML child was

an only child. Their linguistic profiles were quite similar; however, some differences were detected. Both children did not have eye contact and social interaction with other people. They had difficulties not only in expressive language, but also in receptive one. Hence their receptive vocabulary was very limited; the vocabulary of the ML child was even scander. Both children did not respond to commands and requests. The BL child used more gestures than the ML child. Finally, the BL child was tested only in Greek and not in Russian, in order to have a clearer picture about his difficulties in both languages. Any information we had about Russian was based on his mother reports, who noted that his difficulties also persisted in Russian.

**Material** - Before the intervention plan some evaluation, tests were administered, such as a questionnaire about the history of language development of the children, interviews with the parents, standardized and non-standardized tests of receptive and expressive vocabulary, assessment questionnaire on autism spectrum disorder, which included detailed questions on children's pragmatic abilities. The intervention plan lasted 7 months. Both children received private speech and language therapies. Each session took place 45 minutes, two time per week (i.e. 90 minutes per week). The intervention plan followed the holistic approach; thus, the aim was to enhance both linguistic and cognitive abilities. As long-term goal was set to improve the language development and general communication, while the short-term goal was to work on the improvement of all linguistic levels (predominately on phonetics, semantics and pragmatics). The material used in the interventions consisted of oral motor exercise picture cards, flashcards with words (nouns) and actions (verbs) for the enhancement of vocabulary, activities for the improvement of attention, memory and concentration and, finally, activities for the development of interaction and social skills. The language used during the sessions was simple and clear in order to avoid any linguistic and cognitive overload.

**Procedure** - In this study standardized and non-standardized tests were initially administered to the participants in order to measure their language development and their general difficulties by means of a questionnaire on autism spectrum disorder. After this informal assessment, an intervention program was designed based on their needs, which were similar. The plan was flexible in readjustment if participants met the goal earlier or if they had difficulties and they need to work more on the achievement of a goal. The meetings were observed by an experienced researcher, who recorded the session and kept notes. After the session, the researcher and the speech and language therapist discussed on the progress of the participant and planned the content of the next session by setting new goals or reforming the existing ones. After the completion of the 7-month intervention the same tests were given to the participants in order to detect their progress.

### 2.3 Data analysis

We followed a multi-method approach; however, the focus of our study was mainly the qualitative data analysis, since our sample was small. During the intervention, were used constant comparative analysis (based on Glaser & Strauss, 1999); hence, we compared the monthly progress of our participants. Moreover, we used a deductive approach (see Azungah 2018), since we organized the data by month and looked for similarities and differences between the participants. The researcher observed the intervention and kept notes and together with the speech and language therapist they discussed the progress of each child after the session. Since there are time and space restrictions, we would present the progress of our participants by month.

### 2.4 Reliability and validity

In an empirical study, it is hard to ensure reliability and validity. A good practice to follow is a multi-method approach (for a review see Bashir, Afzal, & Azeem, 2008). In order to lessen researcher's biases, we have chosen a well-trained researcher who performed different data collection methods. In addition, our speech and language therapist was also experienced. Furthermore, triangulation method was followed in order to increase the reliability and validity of the study (McMillan & Schumacher, 2006; Seale, 1999; Stenbacka, 2001). By triangulation, we mean the recording and note-taking performed but also the afterwards discussion with the speech and language therapist about participants' progress. Finally, the (non-)standardized tests used increased

both reliability and validity. For issues of reliability and validity, we used standardized tests. However, when there was no standardized test, we administered non-standardized tests. Notwithstanding, we have to mention that our aim was not to compare the two children with their typically developing peers, but to detect the effect of bilingualism within the disorder.

### 3. Results

As mentioned previously, the two children had similar linguistic profiles. By the time of testing they did not have speech. In addition, their receptive skills were lower than their typically developing peers. In terms of their non-verbal abilities, both did not respond to simple requests and commands. Interestingly, the BL child gestured more than the ML child.

In respect to intervention the following milestones were reached each month. Even by the end of the first month some progress was detected, especially for the BL child. Both children were trained to one-syllable utterances. Both children faced difficulties; however, the ML child faced more problems. Moreover, the BL child could produce some sounds of animals (onomatopoeia), while the ML child failed to produce those sounds. Receptive vocabulary of common nouns was improved and the enhancement was more evident in the BL child. In terms of pragmatic abilities, eye contact was not ameliorated in both children. Both children did not show pretend play. The BL child was able to start an activity but not in functional way, whereas the ML child could not start an activity on his own. He used non-verbal signs to show his rejection, while the ML child did not show any (non-)verbal rejection signs. Furthermore, often use of gestures was detected in the BL, but not in the ML, child. Both children struggled at following an order; however, the difficulty was more persistent in the BL child. Moreover, the BL child was more willing to interact with the therapist. Discrepancies were also detected in their cognitive abilities, such as attention, which were improved in the BL child, while no changes were found in the ML child.

By the end of the second month both children could utter the bilabial consonants /m/, /p/ and /b/. In addition, the BL child could utter the velar /k/ with all combination of vowels, except for /i/. Receptive vocabulary further increased; however, the development was quicker in the BL child. With respect to pragmatics, the ML child showed limited improvement. The only progress detected in this month related to his successful understanding of the orders and his compliance to the rules, which was also detected in the BL child. In addition, the BL child to use more gestures. Occasionally he showed role play (i.e., truck driver) and more interaction with the therapist.

At the end of the third month, both children showed improvement in phonology acquisition; thus, they uttered alveolar /t/ and /d/. The ML child also produced velar /k/, which the BL child had successfully produced one month earlier. The BL child articulated more phonemes this month, such as /n/, /s/, /z/ and the vowel /i/. Both children produced their first words during this month. Receptive vocabulary increased for both children; however, BL child's pace was higher. In addition, the BL child showed some preliminary evidence of mental lexicon organization. Similar evidence was not observed in the ML child.

In the fourth month the ML child acquired all the velar and labiodental consonants. The BL child faced problems with the fricative consonants /f/, /v/ and /θ/, /ð/, which do not exist in Russian language. This difficulty possibly arose due to cross-linguistic transfer. Both children uttered two- and three-syllable words. Nevertheless, the ML child showed echolalia, which was rarely detected in the BL child. Additionally, both children increased their attention span, but still the BL child had a higher rate. Moreover, the BL child manifested some evidence of collaboration during the play, which was not equally observed in the ML child.

By the end of the fifth month, the receptive vocabulary of both children was further enhanced. The ML child could follow simple orders (e.g. "give me the ball"), whereas the BL child could follow more complex ones (e.g. "give me the ball and then take the marker"). The BL child used the context in order to understand simple sentences; practice which was not used by the ML child. In terms of pragmatic abilities, the ML child showed higher rates of eye-contact. He also showed evidence of understanding some simple gestures and his attention

increased. However, he did not exhibit still pretend play or start of an activity. The aforementioned skills have been already acquired by the BL child in the previous months. Interestingly, he exhibited successful sequencing of simple events (beginning, middle and end of a story) in this month, which was not developed in the ML child. The BL child could also wait for his turn, up to some extent, which indicated some evidence of inhibitory control.

Before the end of sixth month, both children produced two-word phrases using the a subject and a verb. They usually preferred to use pronouns in the first person singular (“I”). Both had difficulties discriminating the function of pronouns in first and third singular (“I” and “he”); however, the difficulty was more persistent in the ML child. In addition, both children showed some evidence of using three-word phrases. However, the BL used them more spontaneously, while the ML child utter them after encouragement and feedback. Additionally, in the BL child, cross-linguistic transfer issues were detected from Russian to Greek. For instance, he omitted the verb ‘be’.

At the end of the last month of the intervention, both children showed a higher rate of expressive vocabulary. The ML child needed some boost and guidance to use it, while the BL child successfully used everyday nouns, verbs and adjectives without any prompting. Both children were more communicative; the BL child to a greater extent, though. Moreover, the BL child exhibited enhancement of his cognitive abilities and abstract thinking.

By the end of intervention, the administration of the (non-)standardized tests given in the beginning, showed noticeable progress of both children in all linguistic levels and in terms of their cognitive abilities, as well. Parents also reported the obvious progress of their children during and after the completion of the intervention.

#### **4. Discussion**

The aim of the present study was twofold: (a) to examine the early language development of a monolingual and a bilingual child with ASD by means of a 7-month intervention plan and (b) to investigate possible effects of bilingualism in language development of children with ASD.

Our main findings suggested that those preschool children did not utter any word when they started the intervention, but at the end of the intervention both produced two- or three-word phrases and used some basic vocabulary. Important to note that due to intervention both children’s receptive and expressive vocabularies were improved. Additionally, the BL child showed greater and quicker improvement than the ML child in many aspects of language. More specifically, receptive and expressive vocabulary of the BL child increased quicker. He could use more abstract words, such as verbs and adjectives, which was not observed in the ML child. From the first month onomatopoeia was detected only in the BL child. Both children uttered simple two-word phrases, but the BL child could also spontaneously produce three-word phrases and profit from the context. The BL child also showed greater attention span, inhibitory control and could follow more complex commands. In addition, he showed some more evidence of pretend play compared to the ML child.

The results provided positive answers to both our research hypotheses. More specifically, our first hypothesis was confirmed since, many issues arose in all linguistic areas; thus, difficulties were detected in phonetics/phonology, semantics, pragmatics and morphosyntax (Tager-Flusberg et al., 2005). However, both children’s receptive and expressive abilities were enhanced after the 7-month intervention program, similar to the findings of previous studies (Sussman, 1999; Parsons, Cordier, Munro, Joosten, & Speyer, 2017). Hence, both children had higher receptive and expressive vocabulary, uttered most of the Greek phonemes, considering their age, and could produce two-word phrases and occasionally three-word phrases. They could also pronouns, mainly in the first person singular and both struggled with the appropriate use of first and third person singular, which is in line with previous studies (Terzi et al., 2014). Their attention was also enhanced after the intervention (Murza, Schwartz, Hahs-Vaughn, & Nye, 2016). The positive effect of intervention was evident in both children. Nevertheless, it was more obvious in the BL child.

This outcome also confirms our second hypothesis, which was related to the positive impact of bilingualism on language development of children with autism spectrum disorder. Our hypothesis was verified, since the BL child showed greater and quicker (non-)linguistic development (Ohashi et al., 2012; Hambly & Fombonne, 2012). More specifically, he uttered quicker most of the phonemes; however, some issues of transfer from Russian to Greek were detected (Olson, 2016) in the fricatives /f/, /v/ and /θ/, /ð/. Transfers were also detected in morphosyntax, where he often omitted the copula verb 'be' (Hulk & Müller, 2000). Moreover, both his receptive and expressive vocabulary were higher compared to the ML child; and in addition, he could organize better his vocabulary to categories (Goetz, 2003). He also exhibited greater morphosyntactic abilities, since he used three-word phrases without any boost. He also used context to understand more complex sentences. In addition, his pragmatic abilities were better, since he could order simple episodes of a story, depicting some evidence of Theory of Mind (Nguyen & Astington, 2014; Stephens & Matthews, 2014; Baldimtsi et al., 2016). Moreover, some evidence of pretend play, social and emotional interaction was detected (Stephens & Matthews, 2014). Furthermore, more well-developed non-linguistic abilities were observed in the BL child. Thus, he had higher rate of eye-contact and he pointed out more often in order to fulfil his need/willing (Stephens & Matthews, 2014). Finally, the BL child had better cognitive abilities compared to the ML child, since he could wait longer for his turn, pay more attention to the therapist and exhibiting more abstract thinking in terms of the acquisition of verbs and adjectives in comparison to the ML child. Finally, he could follow more complex orders.

The major contribution of the present study is that many aspects of early language development – both of comprehension and of production –, as well as, aspects of cognitive development (i.e. Theory of Mind, inhibition and pretend play) of two children with ASD were depicted. In comparison to previous studies on Greek-speaking children with ASD, the current study gave a general picture of development of preschool children with ASD and the differences between monolingual and bilingual children with ASD were highlighted.

This holistic picture would help teachers, speech pathologists and parents to have a clearer picture of the early language development of ASD and become more aware of the positive effects of bilingualism on language and cognitive development and the importance of early intervention practices. In other words, an important contribution of the study and a significant take-home message is that the 'advantage' of bilingual speakers in cognitive and pragmatic abilities can positively affect the difficulties that accompany ASD. Important to note that the bilingual advantage emerges when the two languages are equally supported.

In conclusion, we should acknowledge some limitations of the study and address suggestions for future research. One limitation was that the intervention was not long-lasting. Possibly, a longer intervention could have led to better and more robust evidence. Another issue was that the assessment and the intervention of the BL child did not take place in his other language (Russian), in order to have a clearer picture of his language development in Russian and compare his linguistic abilities in both languages. Moreover, it would be interesting for the future studies to measure, by means of standardized tests, the linguistic and cognitive abilities of the children with autism spectrum disorder and find possible interactions. Finally, we should recognize that our study was a case study and thus reliability and validity were affected; thus, our findings cannot be overgeneralized, but follow-up studies could have a larger cohort in order to avoid such issues.

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