

# Personal Pronouns and Verb Person Inflections: Relations with Linguistic Development and Social Understanding

Anna Chromá and Filip Smolík

## 1. Introduction

Toddlers often avoid using pronouns when they refer to themselves or their conversational partners, replacing pronouns with names or kinship terms. Pronoun reversals also occur, i.e. using first person pronoun for the addressee and second person pronoun for oneself (mother as *I*, child as *you*). Typical toddlers also imitate pronouns with lower rate than content words (but with higher rate than grammatical segments: Brown & Fraser, 1964). Difficulties with pronouns were first observed in children with autism spectrum disorders. Especially pronoun reversals are considered as symptoms of ASD (American Psychiatric Association, 2013). Various causes were proposed for this symptom, among others mainly the lack of the self-concept or self-other differentiation (Kanner, 1943, 1946, 1949; Bettelheim, 1967; for an overview see Brehme, 2014). Since ASD is conceptualized as a social deficit, and difficulties with personal pronouns are linked with ASD, the connection of I/you pronouns with the social development has often been examined and emphasized. However, it is possible that the role of linguistic development during the acquisition of I/you pronouns is of importance as well.

Many studies have shown that pronoun reversals are generally rare and inconsistent (occurring alongside the correct usage) and occurring in typically developing children as well (e.g. Chiat 1986; Dale & Crain-Thoreson, 1993; Evans & Demuth, 2011; Cheng, 2012; Naigles et al. 2016), and that they may not be so prevalent in autistic individuals (Jordan, 1989). Researchers have suggested various factors other than social development as affecting the appropriate acquisition of speaker and addressee pronouns. One of them is the character of the input children are exposed to, particularly the number of speakers in child's environment (Oshima-Takane, 1988, 1999; Oshima-Takane & Benaroya, 1989), as well as the appropriate combination of I/you pronouns and nominal reference in the input (Smiley et al., 2011). There is also a suggestion that the occurrence of pronoun reversals may be boosted by syntactically complex context (Dale & Crain-Thoreson, 1993).

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One factor that has been largely overlooked, or perhaps taken for granted, in research on the early use of pronouns, is the level of general language development in children. There were a number of suggestions linking pronominal acquisition and general language development: Bloom et al. (1975) pointed out that the correct use of I/you pronouns is linked to the MLU of 2.5 morphemes in English children. Some researchers also looked at the acquisition of personal pronouns (1st, 2nd and 3rd person pronoun singular and plural) through the perspective of semantic complexity (Brown, 1973; Deutsch & Pechmann, 1978; for critique see Chiat, 1986). Bellugi & Klima (1982, as reported in Dale & Crain-Thoreson, 1993) articulated a hypothesis suggesting that children need to deal with general semantic principles of the language before they master I/you pronouns. The meaning of pronouns is deictic, i.e. it depends on the context in which they are used, Bellugi & Klima claim that since linguistic expressions with deictic meaning are not marked in any special way, it may be challenging for children to discover how the deictic meaning works and which expressions in their language have this context-bound nature.

However, these suggestions did not take into account the socio-cognitive aspects of development. These aspects must be considered as important correlates of pronoun acquisition in typically developing children. Acquisition of personal and possessive pronouns for speaker and addressee in English were studied in relation with self-recognition in mirror (Lewis & Ramsey 2004; Courage et al., 2004), with cooperation (Brownell et al., 2006), pretend play (Lewis & Ramsey, 2004), mental state language (Markova & Smolík, 2014), and visual-perspective taking (Loveland, 1984; Ricard et al., 1999). Ricard et al. (1999) found similar correlation between pronoun acquisition and performance in visual-perspective tasks in French children as well. However, most of these studies did not take into account the general level of children's linguistic development.

There are several potential reasons why the acquisition of I and you might relate to the socio-cognitive development of the individual. Often, the referent-switching nature of pronouns is considered in this respect, i.e. the fact that the listener always needs to take the perspective of the speaker in his/her mind when interpreting the pronouns. However, it is also possible that the very focus on persons is a part of the challenge children face: the ability to differentiate self from others is an important precondition of pronoun use, and this is only achieved during the second half of the second year of life, as evidenced by the mirror self-recognition tasks (Lewis & Brooks-Gunn, 1979). The later idea is probably closely related to the assumption that the pronoun difficulties in ASD individuals originate in the lack of the notion of self. If this is the case, the relation to the social development should not concern only I/you pronouns but also the nominal reference to speaker and addressee because the two reference forms share their focus on persons.

We argue that (1) we should study the pronominal and nominal reference to speaker and addressee together, and (2) we should study the effects of social cognition (and its precursors) as well as language development on the early use of person reference. Previous research rarely combined these two factors into one

model. Markova and Smolík (2014) suggested that the existing studies of the relation between I/you pronouns with socio-cognitive development did not take into account the level of linguistic development in children. The present study aims to do this. More specifically, we aim to explore the possibility that the referent-switching nature of I/you pronouns, which is often seen as the socio-cognitive challenge in pronoun acquisition, may present a difficulty for the children's developing linguistic system.

Markova and Smolík (2014) examined Czech-speaking children, which allowed them to take into consideration the verb inflections for speaker and addressee, too. They used parent-report questionnaires to examine children's production of all the possible forms of personal and possessive pronouns *já-můj* 'I-my' and *ty-tvůj* 'you-your' as well as some verbs in 1st and 2nd person singular forms (*mám* 'I have', *máš* 'you have'; *piju* 'I drink', *piješ* 'you drink'). In Czech, the subject and thus the pronoun in the utterance is not obligatory, making the verb inflection often the only means of expressing the person. The authors got a measure of children's production of mental state language (MSL) and of the level of their general linguistic development. Based on regression modelling, they found effects of both MSL and language on measures of pronoun and verb-inflection production. Similar results were found by Bláhová and Smolík (submitted) with a different sample using language transcript data. Recently, Naigles et al. (2016) published a study that focused on the occurrence of pronoun reversals in ASD and typically-developing children and analyzed its relation to a set of linguistic as well as socio-cognitive (joint attention) measures. They combined spontaneous production scores for the pronoun-reversal and the joint-attention measure and scores from standardized tests for the other measures and found effects of linguistic and social predictors above and beyond each other, at least for the ASD group of children.

The focus of the present study is on the joint effects of social and linguistic development on the acquisition of person reference. We pointed out that many studies examined one of the two factors but disregarded the other. We mentioned three recent studies we would like to follow up in our work: Markova and Smolík (2014), Naigles et al. (2016) and Bláhová and Smolík (submitted) identified both the socio-cognitive and the linguistic effect on the area of person reference above and beyond each other. Naigles et al. (2016) were oriented on the occurrence of pronoun reversals. Markova and Smolík (2014) got all their measures from parental reports, and Bláhová and Smolík (submitted) did their analyses with measures taken from children's spontaneous speech samples recorded in a laboratory. In the present study, we used controlled laboratory tasks for measuring typical children's socio-cognitive and linguistic development as well as their production and comprehension of speaker and addressee reference. We did not specifically search for pronoun reversals. We intended to find out if we can support the previous results with the laboratory measures.

## 2. Method

### 2.1. Participants

The sample included 66 monolingual Czech-speaking children (27 boys) aged 28 to 32 months ( $M=29.09$ ) with no reported developmental disorders. They were all recruited by an advertisement announced at a server offering part-time jobs and at some toddler clubs in Prague, Czech Republic.

### 2.2. Procedure and Measures

**General Procedure.** Participants with their parents participated in two laboratory sessions within a week. The following tasks and procedures were administered during the sessions:

First session: 15-minute-long free play (not analyzed in the present paper) → Intention-understanding task → Photo task → Lexical task → Hiding task

Second session: Grammatical task → Kissing-production task → Kissing-comprehension task → Pretend Play → Visual-perspective task

In the following paragraphs, the tasks are divided into three groups, depending on their target variable.

**Person Reference Measures.** Our dependent variable – speaker and addressee reference – was measured by two tasks in production and three tasks in comprehension. Production of person reference included the *Photo* task and the *Kissing* task. In the *Photo* task (original task), the second examiner took two pictures – of the child alone, and of the child together with the parent and the first examiner. The pictures were successively presented to the child on a screen and the first examiner asked the child ‘Who is this?’ while pointing to the target person at the screen. The produced forms (or silence) were recorded.

In the production part of the *Kissing* task (adapted from Jordan, 1989), three toy animals were placed on the table between the examiner and the child. The examiner then enacted a short action with a chosen toy oriented either towards herself or towards the child. After each action, the child was asked e.g. *Komu dala kočička pusinku?* ‘Who(m) did the kitty kiss?’ There were eight items, four eliciting the speaker (self) reference and four eliciting the addressee (examiner) reference.

In the comprehension part of the *Kissing* task children should follow the verbal instructions of the examiner about what the toy animals were supposed to do. There were eight items, four with reference to the speaker (examiner) (e.g. *Ukaž, jak pejsek dá pusinku mně* ‘Make the doggie kiss me’) and four referring to the addressee (child) (e.g. *Ukaž, jak kočička pohládí tebe* ‘Make the kitty stroke you’). All the instructions contained either an accusative or a dative stressed pronoun form at the end of the utterance.

The *Hiding* task (adapted from Girouard et al., 1997) tested comprehension of nominative forms of I/you pronouns. Both examiners and the child sat around a table. In front of the child, a board was placed to which printed photos of the three of them were attached. Examiners explained to the child that they will hide a

sticker under a photo and then will give clues to her/him about where the sticker is hidden. The child should find the sticker (point to the right photo) and then she/he may take it. After a partition was placed between the child and the photo board, one sticker was hidden under one of the pictures, the partition was removed and an instruction was given by one of the examiners: e.g. *Samolepka je pod obrázkem, na kterém jsem já* 'The sticker is under the picture in which I am' (literally). There were eight items: two referring to the addressee (child), two referring to the addressee (the other examiner) and four referring to the speaker (one of the examiners).

The *Pointing* task (adapted from Girouard et al., 1997) addressed comprehension of verbal suffixes for speaker and addressee. While sitting opposite to the child, the examiner gave her/him instructions e.g. *Ukaž, kde máš ruku* 'Show me where you have your arm' (literally). Again, there were four items referring to the speaker (examiner) a four referring to the addressee (child). In Czech, the relevant information is marked by the verb inflection and subject is not obligatory.

**Linguistic Measures.** General linguistic development was measured by a lexical and a grammatical comprehension task. The *Lexical* task was a 30-item picture-selection task with format similar to the Peabody Picture Vocabulary Test (Dunn and Dunn, 2007). The *Grammatical* task was based on the Test of Reception of Grammar (TROG, Bishop, 2003). It comprised 18 items (3 items from 6 blocks of TROG).

**Socio-cognitive Measures.** The second independent variable, socio-cognitive development, was assessed by three measures: *Intention-understanding* task, *Pretend-play* task and *Visual-perspective* task.

Right after the free-play session, the task on *Intention Understanding* was presented (adapted from Warneken & Tomasello, 2006 and Herrmann et al., 2007). There were four items in which the child should demonstrate how she/he understands nonverbally expressed intentions. First, the examiner entered the playroom with several boxes in her arms and let one of the boxes fall. She then tried to reach the fallen box by stretching her hand towards it but she failed. She prompted the child to help her by looking at the child and addressing her/him with her/his name. Child's understanding of the intention demonstrated by her/his helping behavior was evaluated. Three similarly arranged situations followed.

In the *Pretend-play* task (adapted from Bosco et al., 2006), the examiner first pretended to fill one of two plates with cookies and then ate them up. After that she filled the other plate and invited the child to eat. The child should choose the 'now-full' plate or at least point at it on a request. Second, the examiner pretended to fill one of two cups with water, drank it up, filled the other cup, and brought a puppet to the scene which was thirsty. The child was asked to give the puppet a drink. She/he should choose the 'now-full' cup or point at it on request.

In the *Visual-perspective* task (adapted from Loveland, 1984), the child and the mother sat opposite each other. The examiner sat next to the child and showed her/him cards depicting animals. Each time, the child was asked to show the picture to the mother while the orientation of the card was evaluated. There were

six cards, three of them with an animal on one side and with the other side blank; three cards had animals on both sides. The child was shown both the animals but she/he was asked to show only one of them to the mother.

### 3. Results

Descriptive statistics on individual tasks are reprinted in Tables 1 and 2. This shows that the tasks provided sufficient variability, and that the scores for most tasks are not at the floor or ceiling. Except for the *Intention-understanding* task (in which all the items were administered to all the participants and no reaction was always counted as unsuccessful performance), there are some missing data in all remaining tasks because some children refused to cooperate in these. Thus, all 66 participants were never included in the regression analyses.

The main analyses were performed with aggregate person-reference scores as dependent variables. These aggregate scores were calculated by summing the z-scores of each variable included in the aggregate. The predictors were entered block-wise, with one block formed by the language measures (lexicon and grammar), the other by the measures of social understanding and its proxies (intention, pretense, and perspective-taking). Separate analyses for different person-reference aggregates are summarized in Table 3. The table reports unique

**Table 1: Descriptive statistics for the measures of person reference.**

|              | Photo Production |        | Kissing Production |        | Kissing Pron Comp | Hiding Pron Comp | Pointing Verb Comp |
|--------------|------------------|--------|--------------------|--------|-------------------|------------------|--------------------|
|              | Pron             | Name   | Pron               | Name   |                   |                  |                    |
| Possible Max | 3                | 3      | 8                  | 8      | 8                 | 8                | 8                  |
| Mean         | 0.50             | 1.62   | 1.79               | 2.23   | 4.81              | 5.84             | 5.33               |
| (SD)         | (0.89)           | (1.15) | (2.64)             | (2.85) | (2.58)            | (2.57)           | (2.39)             |
| N            | 64               |        | 57                 |        | 54                | 63               | 60                 |

Note: Children were scored 1 for correct response and 0 for incorrect or no response for each item. Pron=Pronoun; Comp=Comprehension.

**Table 2: Descriptive statistics for the measures of linguistic and socio-cognitive development.**

|              | Lexicon | Grammar | Intention | Pretense | Perspective |
|--------------|---------|---------|-----------|----------|-------------|
| Possible Max | 30      | 18      | 4         | 4        | 6           |
| Mean         | 18.91   | 8.19    | 2.36      | 2.80     | 3.80        |
| (SD)         | (3.99)  | (2.82)  | (1.48)    | (1.23)   | (2.07)      |
| N            | 64      | 63      | 66        | 65       | 59          |

Note: In the Pretense task, children were scored 2 or 1 for correct or partially correct response (see Method) for each item. Otherwise, the same pattern was followed as in the person-reference measures.

variance explained by the language and social cognition variables, i.e. the change in  $R^2$  when the block is entered last.

The first analysis aggregated all person reference measures, both production and comprehension (Table 3, Model A). In the production scores, it included person reference using pronouns (I, you) as well as nouns (Annie, mommy). The effects of both language and social cognition were highly significant in this analysis. In a model that only included measures of person reference comprehension using pronouns and verb forms, the effects of each block were also significant (see Table 3, Model B). For the production of person-referring expressions, two separate models were fit, one including only pronominal references, and the other only nominal references. The model for pronominal reference (Table 3, Model C) showed no significant unique effect of either language or social cognition; both blocks of predictors had roughly similar unique effect that did not reach the significance threshold. However, the overall effect of all predictors on the dependent variable was significant ( $p=0.008$ ). This means that both language and social cognition are related to pronominal person reference but their effects overlap, i.e. none of the predictors contributes to the pronominal reference above and beyond the other. Finally, the model for nominal reference showed a clear asymmetry between language and social cognition, with a significant effect of social cognition on person reference, but no effect of language.

**Table 3: Results for models with different aggregate scores for person reference, with unique contributions of language and social cognition.**

|                  | Model A  |        | Model B  |        |
|------------------|--|--------|--|--------|
|                  | All person reference measures, comprehension and production (N=51) |        | Person reference comprehension (verbs and pronouns) (N=51) |        |
|                  | Adjusted $R^2=0.716$ , $p<0.001$                                   |        | Adjusted $R^2=0.516$ , $p<0.001$                           |        |
|                  | Unique $\Delta R^2$  | p      | Unique $\Delta R^2$  | p      |
| Language         | 0.214  | <0.001 | 0.264  | <0.001 |
| Social cognition | 0.332  | <0.001 | 0.201  | <0.001 |
|                  | Model C  |        | Model D  |        |
|                  | Pronominal person reference in production (N=51)                   |        | Nominal person reference in production (N=51)              |        |
|                  | Adjusted $R^2=0.208$ , $p=0.008$                                   |        | Adjusted $R^2=0.203$ , $p<0.001$                           |        |
|                  | Unique $\Delta R^2$  | p      | Unique $\Delta R^2$  | p      |
| Language         | 0.105  | 0.08   | 0.004  | 0.91   |
| Social cognition | 0.122  | 0.12   | 0.263  | 0.003  |

**Table 4:  $\beta$ -values for individual predictors in the overall models from Table 2. \*\*\*  $p < .001$ , \*  $p < .05$ , +  $p < .1$**

|                         | A      | B      | C    | D      |
|-------------------------|--------|--------|------|--------|
| Grammar comprehension   | -.05   | -.01   | -.09 | -.03   |
| Lexical comprehension   | .51*** | .59*** | .26+ | .06    |
| Pretense                | .45*** | .45*** | .21  | .16    |
| Perspective taking      | .06    | -.08   | .22  | .03    |
| Intention understanding | .38*** | .22*   | -.03 | .48*** |

Table 4 shows the beta weights for the overall models from Table 3. These estimates suggest that lexical comprehension is more strongly related to person reference than grammatical comprehension. Of the social cognition variables, it is in particular the pretense task that shows some relations with person reference, both in production and in comprehension. To some extent, this is true for intention understanding as well, but the perspective-taking task seems to be unrelated to person reference. The pattern of results, however, shows that different modes and types of person reference (comprehension, pronominal production, nominal production) may be related to different aspects of social cognition.

#### 4. Discussion

This study investigated the relation between the early person reference in Czech toddlers, and their linguistic and socio-cognitive development. These two aspects of child development were examined in various previous studies that focused on their separate effects on speaker/addressee reference, but studies of their joint influence are only recent and still rare. There are two major findings of our study. First, we found joint effects of social cognition and language above and beyond each other, which supports the previous studies that pursued similar analyses using parent-report and transcript data (Markova & Smolík, 2014; Smolík & Bláhová, submitted) or focusing on pronoun reversals (Naigles et al., 2016). Second, the effects of socio-cognitive and linguistic development were different depending on the form and means of person reference. Overall, the findings suggest that any studies of early pronouns and other person reference devices should always examine both linguistic and socio-cognitive development of children. Clearly significant unique effects of social cognition and language development were found for the omnibus measure of speaker/addressee reference (the aggregate of all the production and comprehension scores) and for the measure of comprehension (the aggregate of all the measures of pronoun and verb-inflection comprehension). In both cases, the effects of social cognition and language have comparable size. Person reference production showed a different pattern. Since the use of nouns and proper names (Annie, aunt, ...) was usual in our participants when referring to self or the addressee (alongside the use of

pronouns), we did separate analyses for the two modes of person reference. For pronoun production (which was rather rare), the joint influence of social cognition and language (the whole model) was significant, but none of the two factors had unique contribution beyond and above the other. For the nominal reference, a clear effect of socio-cognitive development but no effect of language development was found.

Relations between speaker/addressee reference using pronouns and nominal expressions have rarely been examined (but see Smiley et al., 2011). So, little is known about the causes and correlates of early nominal reference to self and to the addressee. Usually, this is just evaluated from the perspective of the target system of adults as a sign of immaturity. However, it is not clear whether this immaturity is due to limitations in socio-cognitive aspects of person reference, or rather to the limited understanding of the unstable, deictic reference in pronouns. Given the findings relating early pronoun use to social development (Loveland, 1984; Ricard et al., 1999; Courage et al., 2004; Lewis & Ramsey 2004; Brownell et al., 2006; Markova & Smolik, 2014), it might seem that the socio-cognitive challenges are related specifically to pronouns. Our results, however, suggest that the nominal reference requires similar level of social advancement as the reference by pronouns. This result supports the view that the social aspect in first/second person pronoun mastery is the general fact that they refer to persons and require clear differentiation between self and others. The additional complexity of pronouns, i.e. the fact that they function deictically and highlight the speaker perspective, appears to be more related to general linguistic development.

In conclusion, the study has revealed positive effects of both socio-cognitive and linguistic development on the acquisition of speaker/addressee reference. The study has also pointed out that there are differences between the effects of social cognition and linguistic development on production and comprehension, which deserves more detailed analysis in the future research. The links between nominal reference and socio-cognitive development shown in our data offer a new interesting perspective on the relation between linguistic and social development.

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