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PEER INTERACTION: LINGUISTIC MEASURES AND SOCIAL RULES

Master's Thesis

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Running head: peer socialization

Tartu 2006

Abstract

The study investigated the linguistic measures, the communicative intents, the social rules used, and the equality of interaction of 73 children aged 4-7 years. Thirty-five boys and 38 girls were videotaped playing in triads for 20 minutes. CHILDES system was used for the language measures, the moral norms and the communicative intents were coded on separate occasions. Older children are more talkative and use more conversation-eliciting utterances; the children with better linguistic measures use more behavioral directives. Boys refer to moral rules more; age and talkativeness are the best predictors of the use of conventional rules. Interaction in the triad is imbalanced with the most talkative child being superior in language measures, behavioral directives and the conventional norms used.

Key words: peer interaction, social rules, communicative intents

Kokkuvõte

Laste omavaheline suhtlus: keelenäitajad ja sotsiaalsed normid

Uuriti 73 4-7 aastase lapse keelenäitajaid, suhtluseesmärke, nende poolt kasutatud sotsiaalseid norme ja nende omavahelise suhtluse tasakaalu. Filmiti 35 poissi ja 38 tüdrukut mängimas kolmeses grupis 20 minuti vältel. Keelenäitajate arvestamiseks kasutati CHILDES programmi, transkriptsioonidel kodeeriti suhtluseesmärgid ja sotsiaalsed normid. Vanemad lapsed on jutukamad ja kasutavad rohkem rääkima õhutavaid lausungeid; samas kui paremate keelenäitajatega lapsed kasutavad rohkem käitumuslikke direktiive. Poisid viitavad sagedamini moraalsetele normidele; vanus ja jutukus ennustavad konventsionaalsete reeglite kasutamist kõige paremini. Suhtlus grupis ei ole tasakaalus, kuna kõige jutukam laps kasutab ka oluliselt rohkem käitumuslikke direktiive ja konventsionaalseid reegleid.

Märksõnad: laste omavaheline suhtlus, sotsiaalsed reeglid, suhtluseesmärgid

Peer interaction: linguistic measures and social rules

The study aims to address the questions related to peer interaction from four different perspectives: in looking at the language measures (vocabulary and complexity of talk), the communicative measures (talkativeness and communicative intents), the social norms (moral and conventional rules), and the equality in peer interaction.

Language has an important part to play in socialization: Gleason (1988) has identified three ways in which language influences social development. She points out that first of all language is used to provide explicit instructions of what to do, feel and think. Secondly, children are provided with clear instructions of what to say on certain occasions, and thirdly, there are subtle and indirect socializing effects resulting from interaction (e.g. interrupting some children more than others).

Along with grown-ups, peers also provide an important socializing context (Nicolopoulou, 2002). Blum-Kulka and Snow (2004) have considered peer interaction important for the pragmatic and cognitive development for its more equal participation structure. Yet, as they point out, peer interaction has not received much attention in communication research.

As for the socialization of morality, Piaget has suggested that for the understanding of justice to develop, authority is not enough, and the best environment for moral development is the company of peers (Piaget, 1950:294). Turiel (1983) also points out that for the moral rules to develop, interaction between children is necessary. Considering the importance and the impact of peers, the study of the interaction of children and how much children refer to social norms in their peer-groups is of interest. The aim of the current study is to analyze peer interaction from four different aspects: the language used, and the communicative intents of the children, the social norms mentioned by children amongst themselves; and it also takes the equality of peer talk under analysis.

Communication analyses: communicative intents

The socialization of children via communication has been widely studied (e.g. Bhatia, 2000, see Schieffelin & Ochs, 1986, for review). As Schieffelin and Ochs (1986) point out one of the most prominent themes in language socialization is the notion that socialization is interactive. Different methods are used for analyzing the interaction. One common approach is to rate the behavior in interaction in terms of two underlying dimensions: interpersonal

affiliation and self-assertion (e.g. Leaper, 1991, Leaper, 1994, Leaper, 2000). The other common approach, also used in the current work, is the analyses of speech intents (e.g. Hoff-Ginberg, 1986, Hoff-Ginsberg 1994). The categories used are developed by McDonald and Pien (1982), who differentiated between the utterances that served the function of directing behavior and attention, and those that aimed at eliciting an verbal answer.

In socialization research, the mother's talk to their children is considered very important, and has therefore been widely studied with references to the mental state, social class and the setting (e.g. Pan, Rowe, Singer & Snow, 2005; Hoff-Ginsberg, 1991; Tulviste, 2003; Tulviste, Mizera & De Geer, 2004). Also fathers as more demanding communication partners have received some attention (e.g. Rowe, Coker & Pan, 2004). In general, some well established differences between the communication style of mothers and fathers seem to be apparent in different studies. In general, mothers tend to be slightly more talkative, and use more supportive and negative talk, while fathers use generally slightly more directive and informative talk (see Leaper, Anderson & Sanders, 1998, for review).

Along with parental talk, children's communication to their parents has also received some attention (e.g. Hoff-Ginsberg, 1994). Hoff-Ginsberg (1994) studied the predictors of mothers' talkativeness. She found that besides mother's language use, the participation of the children influence how much mothers talk to their children. Leaper and Gleason (1996) have found children's talk to be different depending on the fact whether he/she is talking to her/his mother or father.

Children as communication partners to their peers have been somewhat less studied: the exception being gender differences in children's interaction that have received a great deal of attention (e.g. Leaper, 1991, DeHart, 1996; see Leaper & Smith, 2004, for review). According to the meta-analyses by Leaper and Smith (2004) girls have been found in general to be slightly more talkative than boys, girls also tend to use slightly more affiliative speech than boys, while the boys tend to be slightly more assertive in their speech. The communicative intents studies are fewer. For example, Tulviste, Mizera, DeGeer, and Tryggvason (2005) have found Estonian boys to be use more behavioral directives than the girls. Yet, their data did not provide similar results for the Swedish and Finnish children.

In addition to the abovementioned gender differences in communication, the context of the interaction or the nature of the activity has been shown to have an effect on the nature of the talk (e.g. Leaper & Gleason, 1996; Caldera & Huston, 1989; Tulviste, Mizera, De Geer & Tryggvason, 2005). In general, gender-typical activities tend to bring about more gender

differences.

The current study sets out to study the communication of children in triads. Group interaction has been shown to differ from pair interaction (Michas, 2000), and to influence girls and boys differently (Benenson & Heath, 2006). Also, the gender differences tend to be more pronounced in pairs (Leaper & Smith, 2004). Therefore, the communication in triads is expected not to be highly gender-specific. But since the triads are mostly same-gender groups, some differences in the interaction among boys as compared to the communication among girls is expected.

Social rules

Turiel & Nucci (1978) have first distinguished between moral and conventional rules: *moral norms* are universal rules that determine what is fair and good, and they are valid regardless of whether they are explicit or not. *Conventional rules* are different norms and agreements that regulate social conduct; they apply only in certain circumstances and they can be changed by agreement. In order to understand these rules experience is needed – children create the understanding of the social system and the applicable conventional rules due to their belonging to different social groups (family, friends, class-mates). The differentiation between the moral and conventional rules provided by Turiel and Nucci (1978) has been widely utilized in research on the social development of the child (e.g. Siegal & McDonald Storey 1985; Smetana 1989; Smetana, Kochanska & Chuang, 2000). The ability to differentiate between moral and conventional rules is already apparent at the age of three, when children consider moral transgressions to be more severe than conventional transgressions (Smetana & Braeges, 1990; Helwig & Turiel, 2002).

Researchers have also paid attention to the social norms that parents mention while talking to the child (Piotrowski, 1997; Smetana et al 2000). Piotrowski's study (1997) showed that mothers and older peers refer to conventional rules more often than to moral rules while interacting with the child. Less attention has been paid to how the social rules are used in peer interaction. One of the few is the study by Tulviste and Koor (2005). They studied the social norms in peer interaction, and they discovered gender differences in the usage of social norms: in their study boys referred to moral norms more often than girls did and girls mentioned conventional rules more frequently.

As for the relationship between social rules and language skills, Smetana and Braeges (1990) have tried to find the connections between language skills and the understanding of

social norms in children aged 24-, 34-, and 42 months. They first checked if the language comprehension of a child is good enough to understand the questions about social norms in an interview and their study showed that the level of language development is important in differentiation between moral and conventional rules. Children with better language skills began to differentiate moral and conventional rules at a younger age. The use of social rules has not been studied from the perspective of language development or use.

Equality in peer interaction

Piaget (1950) was the first to claim that child-to-child interaction is not restricted by adult dominance and is therefore developmentally very important. Blum-Kulka and Snow (2004) have considered peer interaction important for the pragmatic and cognitive development for its more equal participation structure. They have also pointed out that peer talk is characterized by a collaborative and symmetrical participation structure. Elbers (2004) has stressed the asymmetry in adult-child interaction and the importance of studying both, adult-child and peer interaction. Gerrits, Goudena, and van Aken (2005) have compared child-parent and peer interaction of 7-year-old children and found significant differences. They found that, despite the fact that both types of interaction are characterized by the horizontal and the vertical qualities, the child-parent interaction to consists primarily of mutual responsiveness and total control, while the peer interaction was characterized by balance of control, shared positive emotions, simultaneous play, and discord.

Qi, Keiser, and Milan (2006) have discovered child-interaction to be accompanied by some negative qualities: they observed children with lower language abilities to have more disruptive behavior, more negative responses, fewer initiations and shorter durations of engagement than children with higher language abilities in child-directed unstructured activities as compared to adult-directed activity.

Since, in the current study children are playing in a triad and it is quite probable that the children in the same triad differ from each other in their language abilities. As the study of Qi, Keiser, and Milan (2006) indicates, the difference in language abilities may influence the course of the interaction. Therefore, despite the general symmetrical participation structure of peer interaction, they can also be expected to differ in their use of communicative intents and social rules as well. In addition, Hishikawa and Hay (2006) have found than although children as young as two-years are capable of triadic interaction, then most of the communication in the triad is still dyadic. This might enhance the difference between the

playing-partners even more.

Hypothesis

In general, and despite its importance, peer interaction has not been widely studied and there are very few studies looking at peer interaction in triads and in different age groups. The questions: what are the social rules used in triad interaction, how is behavior coordinated via the communicative intents, what are the variables characteristic to the child that influence child interaction, are to a large extent unanswered.

The current study set out with hypotheses to find age and gender differences in linguistic measures, communicative intents, and in the social rules mentioned in play. Girls and older children are expected to display better language measures and use more conventional rules, while boys are expected to use more behavioral directives and mention more moral norms. Age of child, gender of child, and linguistic measures are also expected to be the best predictors of communicative intents and the social rules used in play.

Children playing in a triad are expected to differ significantly in their language measures, and therefore also in their use of behavioral directives and conversation-eliciting utterances and social rules.

Method

Participants

Seventy three Estonian children in day-care (*M* age 5:6 years; range 3:8 to 7:5) participated in the study, 35 of them were boys (*M* = 5:7 years; range 3:8 to 7:5), and 38 girls (*M* = 5:5 years; range 3:10 to 7:1). The differences in age were in some cases remarkable, therefore children were divided into three age-groups. The first group consisted of children at the age of 3:8 – 4:11 ($n = 20$; $M = 4{:}4$, $SD = 4.77$). The second group consisted of children at the age of 5:0 – 5:11 ($n = 30$; $M = 5{:}6$, $SD = 3.7$). The third group consisted of children at the age of 6:0 – 7:6 ($n = 23$; $M = 6{:}6$, $SD = 5.22$). Children and their parents were informed of the aim of the study and their participation was voluntary. All data were collected in Tartu, Estonia.

Procedure

Children were explained that the researchers want to film them playing with peers, and they were asked to choose two friends to play with. A radio transmitter was attached to

the children and they were video-recorded playing for about 20 minutes (range 17:15 to 30:00 minutes; M = 20:30 minutes). Children played in groups of three in their usual play-room containing a doll-house, construction blocks and various board games. Children mostly preferred same-sex partners. All video recordings were transcribed using the CHAT transcription system (MacWhinney, 1991) to calculate the amount of speech. Originally 75 children participated, but two (1 boy and 1 girl) were excluded from further analyses since they left the group before 20 minutes was up. The most preferred game of the groups of girls and girl-dominated groups was house, a few also played board-games and others (ball-games, hide-and-seek etc); boys mostly opted for board games and construction games.

Linguistic and Conversational Features

Childes CLAN program (MacWhinney, 1991) (available at http://childes.psy.cmu.edu/clan/) was used for the linguistic analyses of the transcripts. The following measures were used:

1. The mean length of utterance in words (*MLU*).
2. The total number of word *roots* produced measuring the richness of vocabulary.
3. The number of *words* produced *per minute* measuring the child's talkativeness.

Childes CLAN program is created on the bases of English and therefore there are a number of shortcomings for analyzing Estonian. Argus (1998) has pointed out the main disadvantages: the analyzer for the frequency of words differentiates different cases of the same word and considers them separate words. Also, the program does not differentiate homonyms (e.g. the Estonian noun "*sai*", meaning "bread", and the past tense of the verb "*saama*", meaning "to get"), or the particles used separately or those in phrasal verbs. In the current study, different nonce-words, exclamations, and sounds used by children (*till-tall, ossa, mkm, noh, ohoh, ah, aa, vot,* etc.) were removed from the different word count. The same words in different cases or with different inflections were counted as one word; at the same time nouns and verbs using the same stem were considered two different words.

Coding: communicative intents

Children's response-eliciting utterances and behavioral directives were coded following the coding system by MacDonald and Pien (1984); explained in detail in Hoff-Ginsberg (1991); also used by Tulviste, Mizera, and de Geer (2004), Tulviste, Mizera, De Geer, and Tryggvason (2005). The following categories were used:

1. *Behavior directives* aimed at directing the other child's behavior (e.g. "*Võta oma mänguasjad sealt ära!*" "Take your toys away from there!"; "*Mis te karjute*!" "Why are you yelling!") or attention ("*Kuule!*", "Listen!" etc.).
2. *Conversation-eliciting utterances* intended to elicit verbal replies from others. (e.g. "*Miks mina ei tohi?*" "Why can't I do that?", "*Kas te midagi kuulete?*" "Do you hear that?"; "*Kelle kord?*" "Whose turn is it?" etc.)

A proportional measure was used i.e. all behavior directives and conversation-eliciting utterances were coded and a number of behavior differences and conversation-eliciting utterances as compared to the total number of utterances by a child was used in order to allow comparison of children.

Two observers coded part of the transcriptions. The results were in agreement 75% of the time. The disagreements were resolved in discussion.

Coding: Social Norms

A coding system introduced by Piotrowski (1997) was used: Piotrowski distinguishes four subcategories of moral norms and five subcategories of conventional norms. For the description of the categories and instances coded, see Tõugu 2004. For the detailed description of references to different moral and social-conventional rules by boys and girls see Tõugu and Tulviste (2006). In the current study the total number of moral rules and conventional rules mentioned are used for comparison.

The social norms and the communicative intents were coded separately (first the social norms and later the communicative intents), as the behavioral directives of the communicative intents and the social rules overlap to some extent. When a moral or a conventional rule is mentioned, it is often with an intent to change the behavior of the other ("*See pole aus!*", "This is not fair!"; "*Minu kord on!*", "It is my turn!"). At the same time not all behavioral directives are social rules, as children try to coordinate the behavior of others ("*Teeme nii, et sina tuled nüüd välja.*" "Let's do it this way that now you come out."; "*Pane talle see ilus kleit selga!*", "Dress her up in this pretty dress!").

Results

Age and Gender Differences in Linguistic Measures

The mean number of roots produced during one play session was 112.74 (range 20 to 249, *SD* = 51). The mean length of utterances (MLU) was 3.04 words (range 1.95 to 4.19, *SD* = 0.53). The mean number of words per minute was 19.68 (range 2.88 to 58.1, *SD* = 0.55). The mean linguistic measures in different age groups are presented in Table 1.

The General Linear Models (GLM) two-way MANCOVA for Child gender (boys vs girls) on the linguistic measures (MLU, roots, words per minute) with age in months of the child as co-variable, showed significant effect of the age of child, Wilks' Lambda (3, 68) = 6.17 ($p < .001$). The follow up ANCOVA showed that the effect of age was significant on the number of words per minute, F (1, 70) = 7.04, $p < .01$. There was no interaction of age and child gender. All the correlations among the linguistic measures were statistically significant (see Table 2).

Correlations of Variables

The correlations between different variables are presented in Table 2 with references to their statistical significance. The correlations between the different linguistic measures were all statistically significant. The age of children was significantly correlated with the words per minute and the number of the conventional rules mentioned. In addition, the conventional rules were significantly correlated with all of the linguistic measures. Behavioral directives were significantly correlated with the roots and the words per minute, as well as, with the moral and conventional rules mentioned. The correlation of behavioral directives with the social rules can partially be accounted for by the overlap of those two. Conversation-eliciting utterances per utterances are correlated with the age of the child and negatively correlated to the use of moral rules.

Communicative Intents

The number of behavioral directives used by children during play was 0.22 (range 0.05 to 0.41, *SD* = 0.09) per the total number of utterances and the number of conversation-eliciting utterances per utterances was 0.09 (range 0.00 to 0.25, *SD* = 0.05). The measures per age groups are presented in Table 1.

In order to study the relationship GLM MANCOVA analyses were used. Since all the

linguistic measures were strongly correlated among each other (see Table 2) and, in addition, the words per minute were also correlated with the age of the child, only the age of the child was treated as a co-variable in the later analyses. The language measures were treated as a categorical variable: the children were divided into two groups according to their language measures (MLU and roots). One group was composed of children with language measures above the group average (n = 35, 15 boys, 20 girls), and the other was made up of children beyond the average (n = 38, 20 boys, 18 girls).

In order to study the communicative intents a GLM three-way MANCOVA analyses for Gender x Language level (children with higher vs those with lower linguistic measures) x Communicative intents (behavioral directives vs conversation-eliciting utterances) were used, with the age of the children as a co-variable. The analyses revealed that the variables influenced the communicative intents differently: Wilks' Lambda (2, 67) = 3.81, $p < .05$. The age of children also had an effect: Wilks' Lambda (2, 67) = 4.04, $p < .05$. There was no interaction between the gender of child and language level.

A two-way MANCOVA analyses with gender of child, and language level as categorical variables and the age of the child as a co-variable, revealed a significant effect of language level on the behavioral directives: F (1, 68) = 5.58, $p < .05$, with the children with higher language measures using more behavioral directives (M = 0.25, range 0.11 to 0.4, SD = 0.08) than children with lower language measures (M = 0.2, range 0.06 to 0.41, SD = 0.1).

A two-way MANCOVA analyses with gender of child, and language level as categorical variables and the age of the child as a co-variable, revealed a significant effect of the age of child on the conversation-eliciting utterances F(1, 68) = 5.73, $p < .05$.

Use of Moral or Social-Conventional Rules

The mean number of references children made to moral rules during play was 4.49 (range 1 to 17, SD = 3.7) and the number of references to social-conventional rules was 12.44 (range 1 to 43, SD = 9.2). The means per different age groups are presented in Table 1.

GLM MANCOVA analyses for Child gender x Language level was performed on the Social Rules (Moral rules vs. Conventional rules) with the age of children as a co-variable. The analyses yielded a significant effect of Child gender, Wilks's lambda (2, 56) = 3.34, $p < .05$, of the Language level, Wilks's lambda (2, 56) = 5.86, $p < .01$ and the age of child, Wilks's lambda (2, 56) = 9.79, $p < .001$, and of on how many moral and conventional rules

were mentioned. No interaction was found between the Child Gender and Language level.

The ANCOVA analyses on moral rules revealed an effect of Child gender, $F(1, 58) = 5.75$, $p < .05$, due to the fact that boys were more likely than girls to refer to moral rules ($M = 5.71$, range 1 to 17, $SD = 4.59$; and $M = 3.51$, range 1 to 10, $SD = 2.45$, for boys and girls respectively). There was no effect of Language level or age of child. For the conventional rules the analyses revealed an effect of Language level $F(1, 67) = 17.61$, $p < .001$, and the age of child $F(1, 67) = 13.53$, $p < .001$. There was no effect of Child gender on using conventional rules. The mean linguistic measures and the mean numbers of social rules mentioned for age groups are presented in Table 1.

Table 1. The Mean Linguistic and Conversational Features, and Social Rules for Different Age Groups

	4-year-olds (*n* = 20)			**5-year-olds (*n* = 30)**			**6-year-olds (*n* = 23)**		
	Mean	***Range***	***SD***	***Mean***	***Range***	***SD***	***Mean***	***Range***	***SD***
MLU	2.93	1.95-3.97	0.5	3.19	2.16-4.11	0.53	2.93	2.09-4.19	0.58
Word roots	98.8	27-218	51.55	121.37	28-249	47.73	113.61	20-236	54.11
Words per minute*	14.37	4.39-33.87	8.52	21.62	6.67-52.63	10.98	21.77	2.88-58.1	13.21
Behavioral directives per utterances	0.21	0.07-0.39	0.09	0.22	0.09-0.4	0.09	0.24	0.07-0.41	0.1
Conversation-eliciting utterances per utterances*	0.07	0.02-0.18	0.04	0.08	0.00-0.19	0.04	0.1	0.00-0.25	0.06
References to moral norms	3.95	1-17	3.92	4.77	1-16	3.49	4.63	1-12	3.95
References to conventional norms*	6.53	1-20	5.26	14.17	2-43	10.03	15.09	1-31	8.74

*variables show significant effect of age at $p < .05$ level.

Table 2. Correlations of Linguistic and Conversational Features and Social Norms

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
(1) Age in months							
(2) MLU	.17						
(3) Word roots	.20	.65**					
(4) Words per minute	.37**	.58**	.91**				
(5) Behavioral directives per utterances	.15	.05	.25*	.27*			
(6) Conversation-eliciting utterances per utterances	.26*	.13	-.03	.02	-.22		
(7) References to moral rules	.03	-.10	.19	.20	.37**	-.28*	
(8) References to conventional rules	.48**	.36**	.63**	.74**	.44**	.01	.22

*correlations are significant at p<.05 level; **correlations are significant at p<.01 level.

Predictability of social rules and communicative intents

In order to include words per minute as a variables into the analyses, stepwise multiple regression was used with the aim to study the influence of various variables on the use of moral norms, conventional norms, behavioral directives per utterances, and conversation-eliciting utterances per utterances. The following variables were included in the forward stepwise multiple regression model: gender, age in months, language level, and words per minute. The noteworthy β-values are presented in table 3.

Moral rules are best predicted by the gender of children (β = -.31). The variables account for 10,5% of the variance ($p < .05$).

Significant predictors of the *conventional rules* mentioned are the mean number of words per minute (β = .687) and the age of children (β = .180); this model accounts for 55% of the variance ($p < .001$). Thus, older and more talkative children mention conventional rules a lot.

The *behavioral directives* are best predicted by the language level (β = -.25). With the age of the child included, such a model accounts for 5% ($p < .07$) of the variance.

For *conversation-eliciting utterances*, the only significant predictor is the age of children (β = .296). Of the overall variance the age along with language level accounts for 8% ($p < .05$).

Table 3. Stepwise Multiple Regression: β-values of Different Variables as Predictors for Social Rules and Communicative Intents

	Moral rules	**Conventional rules**	**Behavioral directives**	**Conv.-eliciting utt.-s**
	p < .05	*p < .001*	*p not significant*	*p < .05*
	$AdjR^2$ = .10	*$AdjR^2$ = .55*	*$AdjR^2$ = .05*	*$AdjR^2$ = .08*
Gender	-.31*	-.10		
Age in months		.180*	.118	.296*
Language level			-.25*	.129
Words per minute	.213	.687*		

*values are significant at p < .05 level. Note: the β values retained in the model in the forward stepwise multiple regression analyses are included in the table.

Equality of child interaction

For the analysis of the equality in child interaction the language measures, the communicative intents, and the social rules mentioned by the children interacting in the same triad were compared using the *t-test* for dependent samples. For the comparison the children in each triad were rank ordered according to the measure of talkativeness (words per minute), with the 1st child being the most talkative and the 3rd child being the least talkative. The results with the references to their statistical significance are presented in table 4.

Table 4. Equality of Child Interaction in a Triad: the Comparison of the Children Playing Together in a Triad on the Social Norms, and the Linguistic and Communicative Measures

	1st child			**2nd child**			**3rd child**		
	Mean	*Range*	*SD*	*Mean*	*Range*	*SD*	*Mean*	*Range*	*SD*
Age in months	68.42[3]*	47-86	11.38	65.96	44-89	11.07	63.96[1]*	48-85	10.00
MLU	3.26[2]**[3]**	2.49-4.19	0.52	2.94[1]**	2.09-4.11	0.52	2.89[1]**	1.95-3.97	0.54
Word roots	150.80[2]**[3]**	52-249	52.33	106.72[1]**[3]**	28-179	36.19	77.91[1]**[2]**	20-155	33.66
Words per minute	29.18[2]**[3]**	9.5-58.1	12.04	18.18[1]**[3]**	6.67-32.37	7.41	10.98[1]**[2]**	2.88-23.4	5.43
Behavioral directives per utterances	0.27[2]*[3]**	0.09-0.41	0.09	0.21[1]*	0.06-0.39	0.09	0.19[1]**	0.07-0.36	0.09
Conversation-eliciting utterances per utterances	0.08	0.02-0.15	0.03	0.09	0.00-0.25	0.06	0.09	0.00-0.2	0.05
References to moral norms	4.88	1-12	3.71	4.36	1-16	0.06	4.12	1-17	4.17
References to conv. norms	18.68[2]**[3]**	4-43	9.1	11.96[1]**[3]*	1-39	8.69	6.17[1]**[2]*	1-16	4.31

*statistical significance in t-test at $p < 0.05$ level; **statistical significance in t-test at $p < 0.01$ level; [2, 3] signify the 2nd and the 3rd child that the difference applies to, respectively.

Discussion

The study set out to investigate peer interaction in triads. The emphasis was on the analyses of peer interaction from four different aspects: the linguistic measures, the communicative intents of children, the social rules mentioned in interaction; also, the equality of peer interaction was taken under analyses. In addition, the predictability of the communicative intents and social rules mentioned were of interest. The main hypothesis were that the analyses would yield gender and age differences in linguistic measures, the communicative intents, and the social rules; and that despite the implied equality of peer interaction, the linguistic and the communicative measures of the children playing together differ significantly. The results are discussed as follows.

Linguistic Measures

The MLU for the children who participated in the study was about 3 words. Earlier studies have found the MLU in words for Estonian 4-year-olds children to be 2.5 (Tulviste & Raudsepp, 1997), and for 6-year-old children at meals 2.73, and during puzzle solving 3.22 (Tulviste, 2001). All these studies concentrated on mother-child interaction, therefore the MLUs are not truly compatible with those of child-to-child interaction during free-play. The absence of the parent could account for the longer MLUs of the younger children in the current study. Such results would also support Piaget's (1950) idea that child-to-child interaction is not restricted by adult dominance and is therefore developmentally very important. Similarly Blum-Kulka and Snow (2004) have pointed out that peer talk is characterized by a collaborative and symmetrical participation structure to what this difference in the MLU can be ascribed. In addition, to be understood by the other child, the child should express him- or herself more explicitly than to be understood by adults.

The children playing in the same group also differed significantly in their linguistic measures. The most talkative and therefore the most dominating children used significantly more roots and had a longer MLU. This might indicate that similarly to adult-child interaction the peer interaction is dominated by the most talkative child in the group. The other two children had MLUs comparable to the MLU of 6-year-olds at meals in the study by Tulviste and Raudsepp (1997).

As for the gender differences in linguistic measures, the current study did not discover any. There was not any significant difference between the MLUs, the number of word roots

used, or the number of words per minute produced by boys and girls despite the fact that several studies have found a superiority of girls on these measures (see Leaper & Smith, 2004, for review). The superiority of girls has also been reported by Tulviste, Mizera, De Geer, and Tryggvason (2005) for Estonian preschool children in peer interaction. Interestingly, the same study did not report gender differences in language production for the Finnish and Swedish sample. In general, there have been controversial results in studies of gender differences in linguistic abilities and Maccoby (2002) has also concluded in a review article on gender differences that the difference in linguistic skills has virtually disappeared. Bornstein, Hahn, and Haynes (2004), in turn, have found that girls' language abilities outperform those of boys in the second through fifth years, but not before or after.

Similarly, there was no apparent effect of age on the use of word roots or MLU in the current study. Results of previous studies have also shown that the relationship between MLU and age is not consistent for children older than 3 years (see Hickey, 1991). The differences between the age groups were, nonetheless, apparent for the measure of talkativeness. The youngest group of children (under the age of 5) tended to talk less than the other children as their mean words per minute was significantly smaller that for the other two groups. Previous research has found that reticence means not just talking less. The performance of highly talkative preschool children have found to be significantly superior on all measures of their linguistic abilities (Evans, 1996; Landon & Sommers, 1979; Van Kleek & Street, 1982). In that light, the existent difference in talkativeness, but the absent differences in other language measures is quite surprising.

Communicative intents

During play children used 0.22 behavioral directives per utterance and 0.09 conversation-eliciting utterances per utterance. There were no gender differences in the general usage of the behavioral directives or conversation eliciting utterance despite the fact that the meta analyses of Leaper and Smith (2004) suggests that boys use more assertive language; especially so if the studies have used children interacting in triads and larger groups as compared to dyadic interaction. In addition, Leaper (1991) has found boys to be more dominating, especially in same-gender pairs, which in the context of the current study could suggest a larger number of behavioral directives from the boys. The same studies also show that girls are more cooperative, which in the context of the current study could suggest that they use more conversation-eliciting utterances to get information and confirmation from

their peers. Yet, this was not the case. Most of the groups used in this study were same-gender groups. And the results seem to suggest, that in a triad, both boys and girls need to coordinate and control their partners behavior. Similarly Leaper and Smith (2004) have shown in their meta-analyses that gender differences are all in all less pronounced in group interaction.

Also, the behavioral directives per utterances do not imply the context that it was used in: "Stop it, you are hurting me!", and "Let's pretend that you are sleeping" are both behavioral directives. So it seems that perhaps the communicative intents analysis is not a method precise enough to reveal subtle gender differences in peer interaction at preschool age. Ninio, Snow, Pan, and Rollins (1994) have also pointed out the inadequacy of many systems for communicative intents analyses and also called out for the development of a less limited system.

The amount of behavioral directives was significantly correlated with two of the three linguistic measures used and the use of them was influenced by the language level of children. The language level of the child is also the best predictor of the use of behavioral directives. This could be due to the fact that the social rules mentioned and the behavioral directives overlap to some extent, and the conventional rules that account for the social rules for the most part are influenced by the language level. Also, the behavioral directives per utterances are significantly correlated with both, the moral and the conventional rules mentioned.

As for the conversation-eliciting utterances, the analyses revealed the effect of age with the older children using more conversation-eliciting utterances than the younger. The same effect is also seen in the significant correlation between the conversation-eliciting utterances and the age of children in months ($r = .26$); and the fact that the only significant predictor of the conversation-eliciting utterances per utterances is the age of children. So it seems that older children tend to use conversation-eliciting utterances more. Interestingly, the conversation-eliciting utterances per the total number of utterances are negatively correlated with the moral rules mentioned. Perhaps conversation-eliciting utterances are characteristic of a more cooperative interaction and therefore the moral rules are less frequently referred to. Yet, based on the current data, the explanation is quite far-fetched.

Social Rules

Killen and Smetana (1999), and Smetana (1989) have studied the transgressions of social norms. They based the coding of the transgression among other thing on the reaction of the other children and they discovered that in free-play children have more moral transgressions than social-conventional transgressions. Despite these findings, it was discovered that during play children refer to social-conventional rules more often than to moral rules. The main difference with the abovementioned works is that the current research did not concentrate on transgressions alone, but also included rules that were verbalized by children in order to structure the play context. In general, children mention social-conventional rules almost three times as often as the moral rules. Similarly, Piotrowski (1997) has found that in the mother-child interaction, both parties refer to social-conventional rules more often than to moral rules.

The age of the children did not have an effect on the references to moral rules; at the same time age was an important factor when the references to social-conventional rules were taken into account: older children referred to social-conventional rules significantly more often than younger children. The same idea is also expressed by the significant predictive power of the age on children as far as the social-conventional rules are concerned. On the one hand, such results could be expected, since research has shown that older siblings and mothers refer to conventional rules more often (Piotrowski, 1997). On the other hand such results render support to the idea that moral rules are really universal: since there were no age differences in the references to moral rules, it seems that children of all ages acknowledge them and see that they are upheld. As for the social-conventional rules: this could indicate that older children have better knowledge of the different rules and/or authority in imposing them.

There was a gender difference in references to moral rules: boys mentioned moral rules more often than the girls. Gender was also one of the best predictors of the moral rules mentioned. Tulviste and Koor (2005) have also found in a similar study that boys mention moral rules more often. They explained the finding by the fact that their study addressed playing with the same-sex partner: there exists a gender-related preference as to what to play, and boys' play has been found to be rougher and boys have more conflicts. For an explanation of boys referring more to moral rules they suggested that girls might be more influenced by the presence of the observer and their behavior changes in a socially desirable way. This might mean that at the presence of the observer, girls break moral rules less often.

Even more so, when we consider that already small children consider moral transgressions more severe ones than conventional transgressions (Smetana & Braeges, 1990).

In Piotrowski's (1997) study, the references to moral rules are connected with conflicts and lack of harmony between the children. Studies have shown that boys are often physically more aggressive in play than girls (Ostrov & Keating, 2004), their play includes domination and competitiveness (Maccoby, 2002) and their games are also more active (Lewis & Phillipsen, 1998). Therefore, there might have been more moral transgressions in boy's play, which is why moral rules were also referred to more often. The fact that moral rules are best predicted by the gender of the child is well in line with the finding that boys are more likely to use moral norms in their play.

Studying the connection between moral and social-conventional rules and linguistic measures, the highly significant correlations of the social-conventional rules with all the language measures used in the study were found. This, on the one hand, supports the notion that moral rules are universal: they are valid in all situations (Turiel, 1983), the moral transgressions are felt as such and the references to moral rules are not dependent on how talkative the preschooler is, how rich is her/his vocabulary or how complex are his/her sentences. Since older children also used more social-conventional rules, then on the other hand, the implication may be that the understanding of conventional rules or the ability to impose them in a group develops with age, or it could be that the linguistic skills are important for imposing conventional rules and in interaction between equal partners, children with better linguistic skills are the ones to impose the rules of convention. Or it is that the more talkative children that, in fact, react to the breaking of conventional rules or simply state the rules in a playgroup. The difference between the group of children with linguistic measures above the average and of those below the average supports this idea: they differed in the amount of references to social-conventional rules. The same idea is also supported by the notion that along with the age of children the words per minute was a significant predictor of the social-conventional rules mentioned. Whether the difference is a developmental phenomenon, or has more to do with the dominance of older children or more talkative children in a group, has to be answered by future research using appropriate methods to make the distinction (e.g. interviewing the same children about their understanding of social rules in addition to analyzing their interaction).

In general, such results support the idea that children do not treat the moral and the social-conventional rules as equals. Previous research has studied children's understanding of

social norms with interviews; it has been discovered that children consider moral transgressions more severe and more worthy of punishment than social-conventional transgressions. The current research indicates that in their play children also use the different rules in a different manner and to a different extent. Moral rules could be considered universal among pre-school children and the amount of references to moral rules does not seem to depend on linguistic measures of the children or on their age. At the same time, for the social-conventional rules to be referred to linguistic measures and age of the child are important. The study found that children, who generally talk more, mention conventional rules more than the others.

Equality of peer interaction

In general, peer interaction has been considered an important socializing factor for its equal structure. As the results of the current research indicate, the equality is not always ideal, at least as far as the linguistic and communicative measures of children in interaction are concerned. The results reveal that the differences in the linguistic and communicative measures in a group are most pronounced in the comparison of the most talkative child with the other two. The differences between the other two children are not as large. This seems to indicate that in a triad the child that talks the most is also the most dominant in other language measures. There is also a significant age difference between the most dominant and the least dominant child. Yet, there is a difference in linguistic measures between the most dominant child and the other two; also in MLU the other less talkative children do not differ.

It is noteworthy, that despite large differences in the linguistic measures and the conventional rules, the three children did not differ in their references to moral rules. This once again seems to indicate that the moral rules are something considered very important and universal, so that even the least talkative children in a group see that they are upheld.

Conclusion

Though language development is an important factor in the social development of a child, the relationship between the linguistic skills and communicative intents of children and the acquisition and use of social norms has not been studied much. The current study proposes an interesting connection between the linguistic measures of children and their social development not studied before – the use of social norms and the interaction in a triad. The results indicate that children use moral and conventional rules differently in peer

interaction. The moral rules used in this age group are universal and the amount used seems to depend on the gender of the child, while the conventional rules are related to the linguistic measures, talkativeness, and the age of the child.

The drawback of such studies is the fact that the method used is very time and effort consuming and therefore the study is not easy to conduct. The related shortcoming is still quite a small number of participants that does not allow far-reaching conclusions to be drawn. Also, for the analyses of the equality of child interaction, the current study does not provide data to compare peer interaction to the interaction between adults and children, therefore again preventing conclusions about the difference of adult-child and peer interaction.

As for further considerations, the scope of such a study could be widened when increasing the number of participants and including variables that might provide good measures for comparison e.g. interviews with the same children about their understanding of social rules, or tests for their actual language development level. It would also be important to study if the imbalance in language use, the references to conventional rules or the use of behavioral directives is influenced by the composition of the group (e.g. if same-sex groups and mixed groups are affected differently etc).

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Acknowledgements

The study was possible due to the grant no 6511 of the Estonian Science Foundation and the technical devices used for recording belong to the Estonian Centre of Behavioral and Health Sciences.

The author would also like to thank her supervisor professor Tiia Tulviste for her support, Liina-Mai Tooding for her helpful comments on the statistical analyses, the children and the parents of the children participating in the study, and Marju Koor and Riina Tõugu for the help with the recording.