What preschool teachers (need to) know about language

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1. Introduction

High quality preschool education is important, in particular, for children from families with a low economic status or a migrant background. For these children kindergarten or preschool, possibly, is the only place where they receive relevant input and support to develop academic language skills. These are essential for a successful schooling career (Esser 2006; Henrichs 2010). Recently, policy makers and practitioners all over Europe started initiatives that support early development of language and literacy in order to prepare children for their entry to primary school (Halle et al. 2003; Droge et al. 2010).

Germany developed and implemented many language-training programs (Jampert et al. 2007). Yet, evaluations show no or only minor effects of these efforts on the overall language competence of preschool children (Schöler & Roos 2010; Wolf et al. 2011). Crucially, it remains unclear what constitutes effective language training for this age group.

Research in primary and secondary school settings has shown that quality of instruction and students' performance highly depend on the knowledge and abilities of the teacher (Darling-Hammond 2000; Lipowsky 2007). This suggests that preschool teachers' competence may be important for the effectiveness of early language interventions, too. To date, evaluation studies of preschool education did not systematically include this factor, notwithstanding its importance (Fried 2008).

In Germany it is questionable whether preschool teachers are well equipped for their task as a language trainer (Rothweiler et al. 2009, see also Droge et al. 2010 who raised similar concerns for the Dutch context). First, language and its acquisition only play a minor role at vocational school. Second, expertise on language and language intervention methods are often taught in on-the-job specialist trainings which are heterogeneous in content and quality. Third, these trainings typically certify attendance but do not systematically assess learning outcomes. In contrast, researchers consider knowledge about linguistic concepts and language acquisition to be essential for language-training competence (Fillmore & Snow 2002; Tracy 2008; Hopp et al. 2010; List 2010).

Earlier work in the German context assessed this knowledge by means of interviews and self-evaluations. The preschool teachers in Fried (2008) report that they need more education on language, particularly, regarding assessment procedures. Similarly, qualitative research by Knopp (2009) has shown that preschool teachers lack knowledge about language, its acquisition and assessment and, therefore, rely on their everyday knowledge and experiences.

In the present study we examine preschool teachers' expertise directly with a newly developed standardized instrument (*SprachKoPF*), which reflects the model of language-training competence by Hopp et al. (2010, cf. Figure 1). We assessed the language-training competence of 151 preschool teachers. In summary, we found that they showed limited knowledge and abilities in the relevant areas and performed particularly poorly in choosing appropriate language intervention methods.

The next section first describes the underlying model. The subsequent sections report our study and results. Finally, we consider limitations of this work and discuss implications for future research and practice.

2. Measuring language-training competence in early childhood education – a linguistic model

The model of language-training competence by Hopp et al. (2010, cf. Figure 1) is based on research into language acquisition and multilingualism. The authors define effective language training as any specific situation a caregiver creates purposefully in order to provide a child with relevant linguistic input. In line with the natural language acquisition process, an intervention takes the current linguistic ability of the child in his/her language learning environment as point of departure (Hopp et al. 2010: 613).
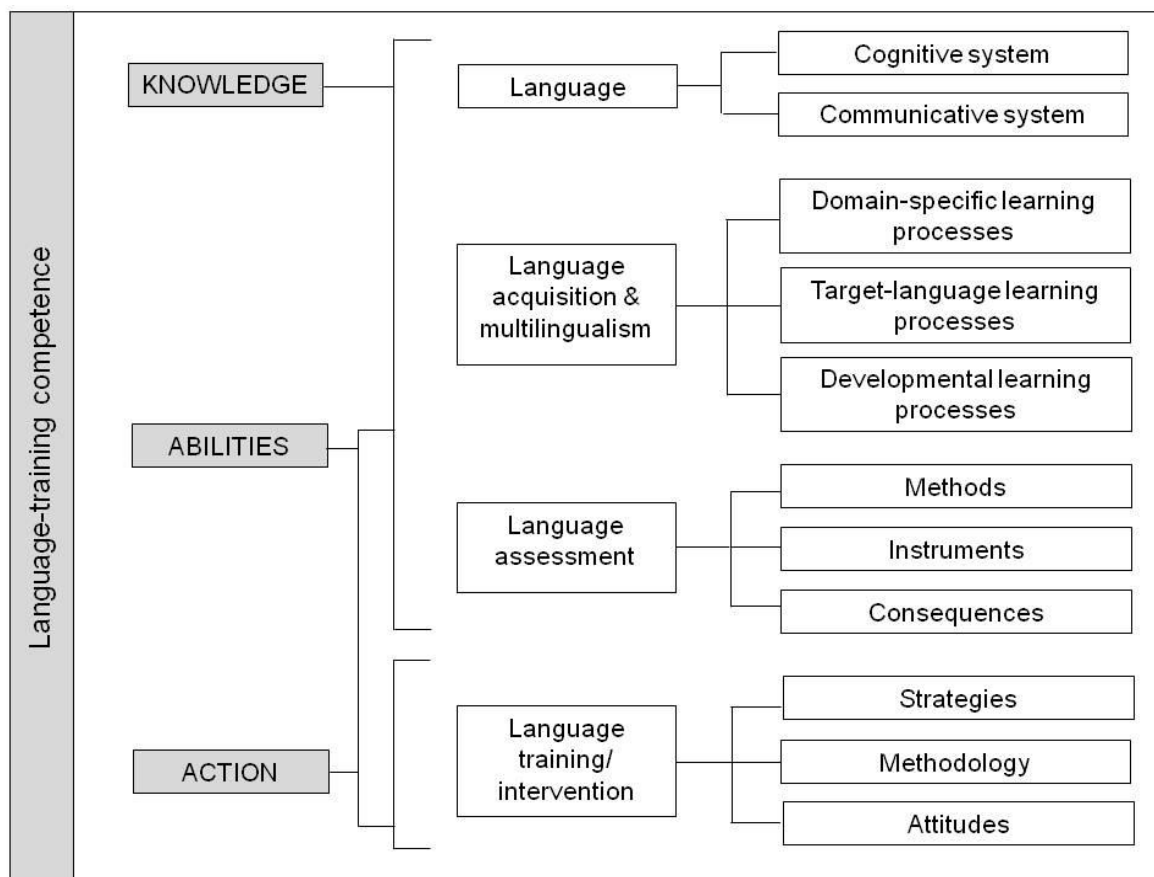

Figure 1: Language-training competence adapted from Hopp et al. (2010: 614)

Hopp et al. (2010) distinguish three main components of language-training competence: (1) domain-specific *knowledge* (content knowledge), (2) *abilities* (pedagogical content knowledge), and (3) *actions*. They thereby follow general competence models for primary and secondary school settings (Shulman 1986; Baumert & Kunter 2006).

The first component refers to *knowledge* about language as a cognitive system including basic linguistic terminology (e.g., phonology, morphosyntax) and different concepts like production versus comprehension, as well as knowledge about language as a communicative system addressing, e.g., dialectal and social variation. In addition, it refers to knowledge

about language acquisition and multilingualism including the characteristics of domain-specific, target-language related and developmental learning processes, respectively. Furthermore, it refers to knowledge about the usefulness and purpose of different assessment tools, e.g., how to implement them and interpret results in order to make informed decisions for or against an intervention method. The second component consists of the *ability* to apply that knowledge, e.g., the strategic competence to choose and implement diagnostic tools or to plan and reflect on language supporting behaviour. Third, *actions* are the skills to put theory into practice, that is, to implement effective means of language intervention in real life situations, e.g., a preschool. Actions are closely related to knowledge and abilities, including the ability to monitor one's own language performance, the ability to adapt a language intervention to the child's linguistic and cognitive developmental stage, and the ability to choose appropriate methods and materials for specific language domains. Finally, actions are influenced by motivation and attitudes towards language and multilingualism.

According to Hopp et al. (2010), all these components are relevant for language-training competence and preschool teachers, who are able to support child development in the target language effectively, need the knowledge, abilities, and actions named in the model. Our goal is to investigate the match between expected and actual language-training competence of preschool teachers in Germany.

3. The present study

This study assesses preschool teachers' *knowledge* and *abilities* and interrelations between these constructs with questions and tasks that represent the aforementioned dimensions of language-training competence. The *action* component is not part of this paper. We ask the following research questions:
  (1) What do preschool teachers *know* about language, language acquisition and language assessment and intervention?
  (2) How does their theoretical *knowledge* correlate with their ability to assess children's language performance (*observing ability*) and their ability to select appropriate language intervention means (*intervention ability*)?
  (3) Do background variables, such as secondary education, job position or specialist training predict a preschool teacher's language–training competence?

3.1 Method and design

3.1.1 Participants
151 preschool teachers from four different areas in South Germany volunteered to participate in the study and were paid 80 Euros. Two datasets were lost due to technical problems. Four other participants were defined as outliers based on their time on task (outside mean ±2 SD) or because they gave 50% or more unclassifiable answers to open questions. We excluded one non-native German participant as *ability* scores were extremely low. Data of the remaining 144 participants form the basis for the current analysis. Table 1 summarizes their biographical information.

3.1.2 Materials and procedure
All preschool teachers performed on a computer-based version of the newly developed instrument *SprachKoPF* (Thoma et al. 2011). Eighty multiple-choice questions targeted language-related *knowledge* addressing, e.g., syntax, sociolinguistics, (multilingual) language acquisition, language training and assessment. Furthermore, participants demonstrated their

observing abilities by answering 29 questions based on videotaped authentic child-preschool teacher interactions. For example, they were asked to decide whether a child used main or subordinate clauses. Finally, five items tested *intervention ability*. These required them to select two (out of 21) language intervention methods that are specifically appropriate (as defined by linguistic experts) for a given situation. In addition, the participants answered 79 questions on their personal and professional background, motivation, and attitudes. Average time on task was 3h 14min (SD 33 min). Two example items are given in the appendix.

Table 1: Biographical information of preschool teachers

Age		Gender (n)		Language biography (n)	
Mean	38.69	female	137	monolingual	72
SD	10.42	male	7	fair knowledge of school languages	45
Secondary education [a] (n)				advanced knowledge of extra languages	15
HRA	64	FHR	40	HSR	39	early bilingual	12
Job position (n)				Quantity of specialist training (n)	
head of preschool/language trainer			53	none	62
preschool teacher			57	short (1 – 4 days)	31
extra/substitute teacher			34	middle (5 – 10 days)	25
				intensive (10 days or more)	26

Note: n = number of preschool teachers out of 144, [a] Level of secondary education (Dutch equivalents of the German levels): HRA=Haupt-/Realschulabschluss ($\approx$ mavo/vmbo); FHR=Fachhochschulreife ($\approx$ havo); HSR=Hochschulreife/Abitur ($\approx$ vwo), one participant's answer is missing.

3.1.3 Item selection and scoring
Scores on *knowledge* items represent correct responses. Items which did not discriminate well enough or were too easy ($M_{score} > 85\%$) were excluded, which led to a fair internal consistency (Cronbach's $\alpha = .76$). Finally, fifty-one questions (corrected for chance) formed the *knowledge* score.

We double scored the answers to the ability items (a) based on the correctness of the answer that was ticked by the participant and (b) related to the accuracy of a comment justifying that answer. Two raters independently classified all comments and 10% were screened by three raters. In case of mismatches, we discussed the classification until agreement. Only when both the ticked answer and the comment were correct, an item received full credits. An item analysis identified items that were too easy (Mscore > 85%), yielded low discriminatory power or too many mismatches between ticked answer and comment. In the end, twelve items contributed to the observing ability score.

We classified answers to all five intervention ability items as correct, wrong or irrelevant. Totals include correct answers only.

3.2 Results
Figure 2 displays the scores on *knowledge, observing* and *intervention ability* of all preschool teachers (N=144). Accordingly, they answered correctly 56% (SD = 14%) on the *knowledge* component, gave 58% (SD = 12%) correct answers on *observing ability* but reached only 29% (SD = 17%) appropriateness on *intervention ability*.
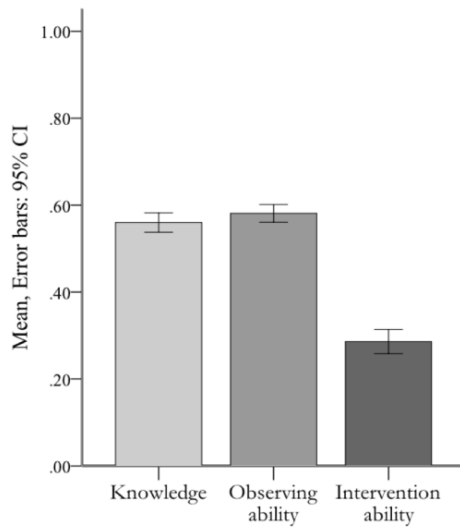
Figure 2: Scores and confidence intervals on main components

Preschool teachers' mean scores of correctly answered questions ranged between 28% and 85% for the *knowledge* component, between 25% and 90% for *observing ability*, and between 0% and 70% for *intervention ability*, respectively.

Correlational analyses displayed a medium and significant relation between *knowledge* and *observing ability*, whereas *intervention ability* yielded only small, though significant, correlations with either of the other two components (cf. Table 2). Regarding background information of preschool teachers, the correlations between *knowledge* and language biography, level of secondary education, and job position were intermediate. Job position correlated moderately with *intervention ability,* too. *Observing ability* yielded small correlations with language biography, secondary education, and job position. Specialist training correlated mildly with *intervention ability* only.

Table 2: Pearson's correlations of main components and Spearman's rho correlations of background information with knowledge and ability components respectively

Pearson's correlation	Knowledge	Observing ability	
Observing ability	.49[**]		
Intervention ability	.28[**]	.22[*]	
Spearman's ρ correlation	Knowledge	Observing ability	Intervention ability
Language biography	.35[**]	.20[*]	.09
Secondary education	.44[**]	.29[**]	.06
Specialist training (quantity)	.10	-.01	.19[*]
Job position	.30[**]	.20[*]	.30[**]

Note: [**] p < .001, [*] p < .05, medium correlations in bold

A multivariate analysis of covariance (MANCOVA) tested for the statistical value of any differences in the three main components (*knowledge*, *observing*, and *intervention ability*) based on background information. Age was included as a covariate. Neither the covariate nor the factors language biography and specialist training yielded a significant multivariate effect.

Secondary education   Specialist training

Note: Dutch equivalents of the German levels:
HRA = Haupt-/ Realschulabschluss (≈ mavo/ vmbo); FHR = Fachhochschulreife (≈ havo);
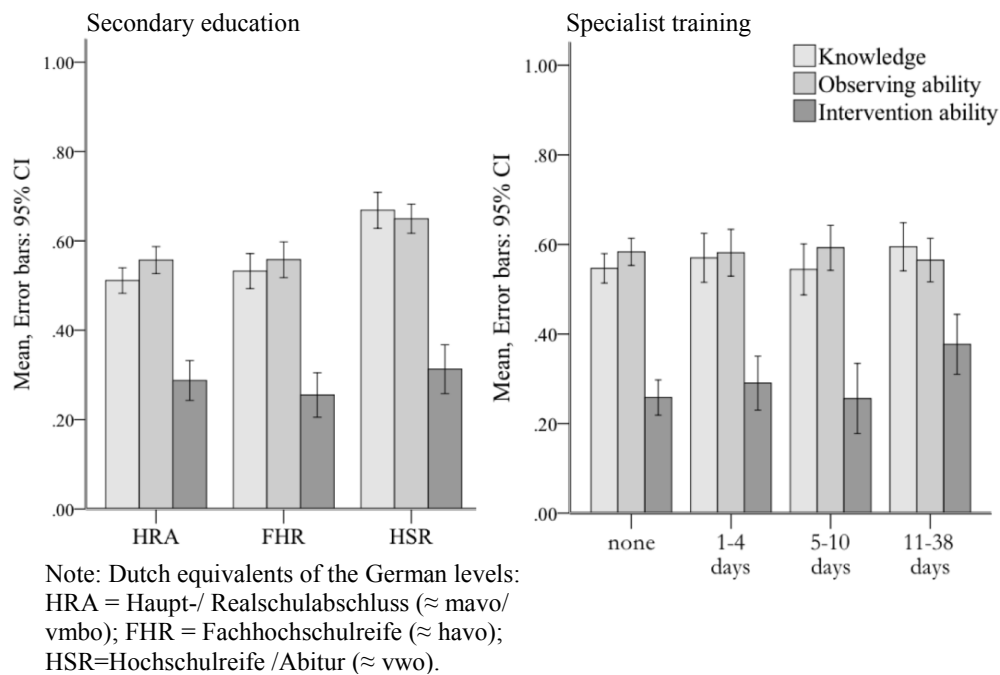HSR=Hochschulreife /Abitur (≈ vwo).

Figure 3: Group differences between knowledge, observing and intervention ability based on secondary education (left) and quantity of specialist training (right).

Only secondary education and job position resulted in substantial differences, both with moderate effect sizes (secondary education: $F_{(6, 136)} = 3.186$, $p < .01$, $\eta^2 = .12$; job position: $F_{(6, 136)} = 2.786$, $p < .02$, $\eta^2 = .11$). None of the interactions reached significance.

Between-subject effects showed that secondary education largely affected *knowledge* and *observing ability* (knowledge: $F_{(2, 69)} = 5.729$, $p < .01$, $\eta^2 = .14$; observing ability: $F_{(2, 69)} = 5.933$, $p < .01$, $\eta^2 = .14$). Job position significantly influenced *knowledge* and *intervention ability* (knowledge: $F_{(2, 69)} = 3.160$, $p < .05$, $\eta^2 = .08$; intervention ability: $F_{(2, 69)} = 6.779$, $p < .01$, $\eta^2 = .16$). In planned pairwise comparisons secondary school education showed a significant difference between preschool teachers who had passed Abitur (highest level of secondary education) and the two lower educated groups regarding *knowledge* and *observing ability* (all $p < .01$), but not for *intervention ability*.

Looking at job position, the heads of preschools and language trainers scored significantly better than ordinary preschool teachers on all three components. They also significantly outperformed extra/substitute teachers with respect to *knowledge* and *intervention ability* (all significant differences $p < .01$) but showed no difference with this group regarding *observing ability*.

Even though we did not expect large differences regarding the factor specialist training (cf. no main effect in the MANCOVA), we conducted planned pairwise comparisons according to our third research question. Only *intervention ability* was significantly affected ($p < .01$) when comparing those preschool teachers who had followed no specialist training at all ($M_{score} = 26\%$, SD = 16%) to those who had attended an intensive training of more than ten days ($M_{score} = 38\%$, SD = 17%).
Figure 3 shows group differences for secondary education and specialist training, respectively, regarding *knowledge*, *observing,* and *intervention ability*[2].

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[2] As the factor job position created a very similar picture as secondary education, i.e., those with the highest position outperformed the other two groups, we refrain from displaying another figure.

4. Discussion

This study focuses on preschool teachers' language-training competence as defined in the model by Hopp et al. (2010, cf. Figure 1). We assessed *knowledge*, *observing ability*, and *intervention ability* in the areas of language, language acquisition and language support of 151 preschool teachers by means of a newly developed computer-based instrument (*SprachKoPF*). As a summary of our findings, we answer the research questions as follows:

(1) Preschool teachers seem to lack essential knowledge and abilities that are theoretically relevant for language training. With respect to *knowledge* and *observing ability* they answered slightly more than half of the questions correctly. Concerning *intervention ability*, i.e., the ability to choose an appropriate intervention method, they performed substantially below chance level.
(2) The theoretical *knowledge* of preschool teachers correlates moderately with their ability to assess child language performance (*observing ability*) and it is only mildly related to their ability to select an appropriate intervention method (*intervention ability*).
(3) Preschool teachers at the highest level of secondary education and leading or language-specific job positions outperform others at all levels of assessment. Quantity of specialist training on language shows weak effects only.

In the following, we discuss two important issues regarding our results: (a) the role of secondary school level and specialist training, and (b) the construct validity of the model of language-training competence by Hopp et al. (2010). Furthermore, we provide some directions for future research.

First, our data suggest that the level of education of preschool teachers is an important factor regarding language-training competence. In the Dutch context Droge et al. (2010) came to a similar conclusion as they showed that even one extra year of vocational training in the Netherlands (4 vs. 3 years of mbo) led to significant differences in language competence of preschool teachers. In Germany (like in the Netherlands) the average preschool teacher attends three years of vocational training after secondary school. Yet, our results support policy makers of education who call for a (more) academic preparation of preschool teachers as is common in other European countries, e.g., Denmark or Sweden (OECD 2006). Currently, efforts in this direction are under way such that in the future probably more preschool teachers can profit from job education at university level (Gerstberger et al. 2008).

A striking result of our study is that the quantity of on-the-job specialist training of preschool teachers – contrary to our expectations – is barely related to their knowledge and abilities. Only intensive additional training (longer than ten days) affected *intervention ability*. In contrast, level of secondary education and job position showed more and stronger effects on all three main components. Yet, currently we do not have enough information about the exact content and quality of the specialist trainings our sample participated in. In order to come to more reliable and trustworthy conclusions, future investigations may use a pre-/post-test design with preschool teachers who attend specific language-focused trainings.

Second, based on the model of language-training competence (Hopp et al. 2010), we constructed an instrument, which differentiates between preschool teachers at various levels of competence (scores on the three main components range roughly from 25% to 90% for *knowledge* and *observing ability* and from 0% to 70% for *intervention ability*). The positive correlations between the first two components, on the one hand, support the theoretical assumption that knowledge is a prerequisite for the ability to make relevant observations. On the other hand, they probably are related to a limitation of the *SprachKoPF* instrument itself: to date it is a challenge to assess the abilities of a preschool teacher independent of the

terminology measured in the knowledge component. Future versions of the instrument will try to attenuate this interdependency.

In addition, *knowledge* and *observing ability* showed only small (though significant) correlations with the competence to select appropriate intervention methods (*intervention ability*). Accordingly, *intervention ability* does not seem to be a necessary consequence of *knowledge* or *observing ability*. A closer look at the data, however, reveals that rather than choosing an intervention method that was wrong, more than 50% of the answers were classified as irrelevant or too unspecific for the given context, e.g., 'I encourage the child to speak.' Those with intensive specialist training and heads of preschools/language trainers more often selected a correct specific option, e.g., 'I practice the position of finite verbs in main clauses.' Therefore, we suggest that preschool teachers need more training in selecting specific intervention methods relevant to a given language-training situation in order to improve their current practice, that is, giving general linguistic support.

There are some further issues related to the construct validity of the model of language-training competence and the SprachKoPF instrument. First, in contrast to Droge et al. (2010) we investigated language-training competence on a meta-level and refrained from testing preschool teachers' own language competence[3]. It is an empirical question how each of these two aspects contributes to a child's early development of academic language skills such that future studies could include both. Second, we do not know whether preschool teachers who score highly on the instrument actually provide children with high-quality language training because we did not assess the *action* component. Finally, it is unclear whether there is any indirect effect of language-training competence of a preschool teacher on a child's language competence. We aim at including these aspects in our future work.

5. Conclusion

The aim of the present study was to assess preschool teachers' language-training competence. Based on the model that was proposed by Hopp et al. (2010), we developed a computer-based instrument that successfully discriminates preschool teachers' *knowledge*, *observing*, and *intervention abilities*. Thus, this tool can be used to assess language-training competence as a background factor. For example, intervention studies interested in effects of language training for children can include scores on SprachKoPF as a control variable for differences in preschool teachers' language-training competence.

Finally, our data support the call for a (more) linguistic education of preschool teachers, as this presumably equips them with important knowledge and enables them to make relevant observations in child-adult interactions. These seem to be the foundations for the construction of effective language-training situations in educational settings for children from families with a low economic status or a migrant background.

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[3] In our data 95.2 % of the preschool teachers were German natives, including 5.6 % early bilinguals, such that we assumed their own language competence to be at a high level.

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> Welche Wörter im untenstehenden Satz sind Pronomen?
>
> „Der soll dem Frosch doch nichts schenken", rief sie und schmollte.
>
> Bitte wählen Sie alle zutreffenden Antworten aus.
>
> ☐ Der
> ☐ soll
> ☐ dem
> ☐ Frosch
> ☐ doch
> ☐ nichts
> ☐ schenken
> ☐ rief
> ☐ sie
> ☐ und
> ☐ schmollte
>
> ❓ Im Test verwendeter grammatischer Begriff:
>
> Pronomen = Fürwort

English translation: Which words in the following sentence are pronouns? "He was not supposed to give anything to the frog", she exclaimed and sulked.

Figure 5. Example item knowledge (lexicon)

> Inwieweit stimmen Sie den Aussagen zu? Kreuzen Sie an und begründen Sie.
>
> Das Kind bildet nur Hauptsätze.
>
> ○ trifft zu
> ○ trifft nicht zu
>
> Bitte geben Sie hier Ihren Kommentar ein.:

English translation: Do you agree with the following statement? Please tick and motivate your choice. The child uses main clauses exclusively. ☐ True   ☐False

Figure 6. Example video item observing ability