

THESES OF DOCTORAL (PHD) DISSERTATION

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**COGNITIVE, LINGUISTIC AND METAPRAGMATIC RELATIONS
BETWEEN COMPREHENSION OF HINTS, METAPHORS AND IRONY
IN PRESCHOOL CHILDREN**

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1. Background of the research

1.1. Thesis topic and research goals

Studying nonliteral language use is a current topic in the international developmental pragmatics literature. A great number of studies have been conducted to research the conception and the development of understanding metaphors and irony, as well as some aspects of their linguistic and cognitive factors (Ackerman 1982, 1986, Winner and Leekam 1991, Happé 1993, Winner 1997, Sullivan et al. 1995, 2003, Norbury 2005, Creusere 2007, Filippova and Astington 2008, Whalen 2013, Angeleri and Airenti 2014). There is, however, less research directed at understanding hints (Bernicot et al. 2007, De Mulder 2011, Huls and Wijk 2012).

As far as the Hungarian pragmatics and psycholinguistic research is concerned, there are numerous and more systematic research results available in the field of understanding nonliteral pathological language use (see for example Györi 2009, 2014, Györi et al. 2004, 2007 for studies involving autists), while there are less empirical data available for subjects with typical development (Schnell 2006, Balázs 2010, Szücs 2011, 2012). Considering the national and the international background, it seems that elaborating on the topic would definitely be valuable in the Hungarian linguistic and developmental pragmatics literature.

The primary aim of the present thesis is to present the results of a research series, in which I have examined the cognitive, linguistic and metapragmatic relations of understanding hints, metaphors and irony among typically developing 4–7-year-old children. My research had two main objectives. On the one hand, I examined the connection between the development in the understanding of the three forms of language use and the individual developmental factors of the children that is their attribution of intentionality, linguistic development and differences in the verbal working-memory capacity. On the other hand, I investigated whether a conscious development of metapragmatic awareness may play a role on the development of understanding irony in the target age group.

1.2. The theoretical issues of nonliteral language use

In everyday communication the simplest way of communication is when the speaker utters a sentence and means what he or she said and exactly the way they said it. It is, however, frequently the case that people do not (only) intend to convey what they verbally utter. Their utterances have an additional or different meaning compared to the literal meaning of their

utterances. If a speaker uses hints (1), metaphors (2) or irony (3), the intended meaning of the utterance diverts from the meaning of the uttered sentence to some degree.

(1) A boy and a girl are walking at a lake. The girl says:

– How chilly the weather has become! (the intention of the girl is to be embraced by the boy)

(2) Life is but a race.

(3) Two friends are talking when one of them says:

– Vow, this is a real family nest. (passing a house in ruins)

In order to label, to provide accurate terminological definitions for and to describe the specific characteristics and connections of the types of meaning that are conventionally called literal and nonliteral meaning, several pragmatics theories have been developed (Searle 1979, Grice 1975/1989, Sperber and Wilson 1986/1995, etc.). These theories are basically focussed on two main issues. On the one hand, they aim to find out what relationship the two terms have as regards their linguistic representation and how they can be described with the help of our semantic and pragmatics terminology. On the other hand, the question regarding the process of interpretation is whether the literal meaning has a role when conceiving and interpreting the nonliteral meaning, and if so, in what way (Gibbs and Colston 2012: 19).

In the first larger section of my dissertation I introduce the pragmatics theoretical conceptions that deal with the issues of the linguistic representations of the literal and the non-literal meaning. The chapter on theory represents the terminological versatility of the international literature, since, alongside with (or instead of) the literal meaning, we can find the following terms: *linguistic meaning*, *conventional meaning*, *coded meaning*, *logical form*, and *explicature*, while to refer to the nonliteral meaning, we can find terms such as *implicature*, *figurative meaning*, *indirect meaning*, *non-conventional* and *implicated meaning*. After the introduction on the pragmatics theory, I present the most significant pragmatics theoretical viewpoints on the terms of hint, metaphor and irony (Searle 1979, Grice 1975/1989, Sperber and Wilson 1986/1995) and then I go on to present those comprehensive interpretation models that describe the interpretation mechanisms of the individual meaning types based on empirical data, starting with the traditional standard pragmatics model (Searle 1979, Grice 1975/1989), through the direct access view (Gibbs (1994, 2002) and Giora's (2003) graded salient meaning theory finishing with the description of the relevance theory (Sperber and Wilson 1986/1995). I have considered this latter one to be the starting point for my language development research because of its psychological underpinnings and its suppositions

regarding the relationship between metaphor and irony understanding and the ability to attributing intentions.

1.3. Issues concerning nonliteral language use

In the third chapter of my dissertation I present the usage-based language acquisition model (Tomasello 2002, 2003) and its factors, delineating the role of socio-pragmatic cues in the early stages of language development when recognising communicative intention. In the same chapter I also describe the relationship between the theory of mind, its precursors and the language use in certain periods of language development, and furthermore I present viewpoints and results relating to the direction of interactions (see also Astington and Jenkins 1999, Ruffmann et al. 2003, Slade and Ruffman 2005).

There is a divergence in the results related to the relationship between children's theory of mind development and understanding hints, metaphor and irony. The results of false-belief tests in the case of hints predicts future understanding, its role, however, taking linguistic factors also into account, are marginal (De Mulder 2011). As regards metaphors, first-order false belief tests supported the relationship (Happé 1993) in the case of typical development (Schnell 2006), while it was not the case when examining atypical development (Norbury 2005). The relationship between second-order false belief and irony understanding was neither proved unambiguously in the case of typically developing, nor in the case of atypically developing children (Karmiloff-Smith et al. 1995, Sullivan et al. 1995, 2003).

As regards the role of children's linguistic development, there is evidence in the literature that understanding hints correlates with the development of grammatical understanding (De Mulder 2011), although there are only few empirical data available. In the case of metaphors, the most significant factors appear to be the development of the semantic skills, especially the vocabulary (Norbury 2005, Blasko-Kazmerski 2006). There is a controversy in connection with understanding irony. While some of the results support the influencing power of the vocabulary (Filippova and Astington 2008, Angeleri et al. 2014), others argue that the development of vocabulary has no significant effect on the development of irony understanding (Sullivan et al. 2003, Whalen 2013). At the same time, there is a hiatus in data regarding the role of grammatical development in understanding metaphors and irony.

As far as the working memory capacity is concerned, we can see that verbal working memory capacity has an impact on linguistic development, both in processing simple and more complex linguistic forms (Vos and Friederici 2003, Bornkessel et al. 2004, Turi et al. 2010, 2014). There are, however only few data referring to connections with hints, metaphors and

irony (Jagodics et al. 2013, Blasko 1999, Blasko and Kazmerski 2006, Filippova and Astington 2008).

Metapragmatic awareness that is the reflexive relation of discourse participants to the language use is of central importance in verbal communication according to Verschuren (1999, 2000). Bernicot and colleagues' (2007) results in connection with the relationship of irony understanding and metapragmatic awareness indicate that when the understanding of sarcastic utterances appears, which happens only later, it is supplemented by metapragmatic knowledge. This may lead us to believe that in order to be able to fully interpret irony, there is a need for irony, as well as the metapragmatic knowledge related to the social function of irony.

As can be seen from data in the fields of pragmatics theory as well as developmental and other empirical studies, we do not have a clear picture of what role children's individual and cognitive developmental factors have in the process of acquiring these three types of nonliteral language use. When devising the research questions for my own study, I have taken the above uncertainties, divergences and hiatuses in consideration.

1.4. Research questions

1. What are the connections between the theory of mind level and understanding hints?
2. Will the results of the present research provide evidence for previous research results regarding typically developing children (Happé 1993), according to which understanding metaphors requires first-order theory of mind abilities?
3. Will the results of the present research provide evidence for previous research results regarding typically developing children (Happé 1993), according to which understanding irony requires second-order theory of mind abilities?
4. What relationship exists between the age of children and their understanding of hints, metaphors and irony? Is there a difference in understanding between the different age groups (4, 5 and 6–7-years-old) and the adult control group? What developmental factors can the impact of age development refer to?
5. What is the connection between the indicators of linguistic development, that is between grammatical understanding, receptive vocabulary and hints, metaphors and irony comprehension?
6. What is the connection between understanding hints, metaphors and irony and children's verbal working memory capacity?

7. To what degree does the development of understanding hints, metaphors and irony in the case of 4–7-year-old children differ? What patterns can be observed between understanding hints, metaphors and irony and the development of as well as individual differences in the researched individual cognitive and linguistic indicators?
8. To what degree does developing metapragmatic awareness influence the level of interpretation of irony in the case of 4–7-year-old children?
9. What impact might children’s individual developmental factors have on the results of the metapragmatic development?

Considering the controversies and uncertainties contained in previous empirical research, but at the same time presuming that connections do exist, I propose the following hypotheses.

1.5. Hypotheses

- H1. The theory of mind development of children correlates with the understanding of certain nonliteral constructions in the case of typically developing 4–7-year old children:
- a) In the (alternative) model representing the development of the repertoire of requests (Huls and Wijk 2012) one of the sources of the development of indirectness is seen in the social maturity of children. This means that according to this model, the appearance of indirect requests in the speech of children is connected (among others) to what extent the child is able to consider the speaker’s point of view. Using this theory as a starting point, we believe that in order for children to be able to understand the most indirect form of request, that is the hint, they need to be able to recognise the other person’s intentions, that is they need to apply their theory of mind abilities. Thus we hypothesise that children who already have first-order theory of mind perform better at understanding hints than those without first-order theory of mind, since they are already able to comprehend the beliefs and intentions of another person that may be different from their own beliefs and intentions.
 - b) According to the relevance theory (Sperber and Wilson 1986/1995), a first-order theory of mind ability is presupposed when understanding metaphors, thus we hypothesise that children with first-order theory of mind perform better at understanding metaphors than those without it.

c) Irony understanding is expected to be significantly better in the case of the group having second-order theory of mind ability compared to the groups with or without explicit first-order theory of mind ability. That is, based on the relevance theory (Sperber and Wilson 1986/1995), it is hypothesised that having a second-order theory of mind is a precondition for understanding irony, since – according to the theory – the listener does not only have to identify the propositional form of the utterance, but also the connected speaker's attitude.

H2. We hypothesise that there is a strong connection between the children's age and understanding hints, metaphors and irony in accordance with the normal pace of general development. We also hypothesise that – as we have hypothesised above – younger children perform better at understanding hints and metaphors compared to understanding irony, since the first-order theory of mind level appears at approximately the age of 4, while the second-order theory of mind level appears only after the age of 6.

H3. In the relevance theory (Sperber and Wilson 1986/1995), the starting point for pragmatic inferences is the decoding of the logical form of the utterances. That means that the premise of inferences is the logical form that is the logical, encyclopaedic and lexical entries. Thus, on the basis of the theory, we hypothesise that children's linguistic abilities regarding decoding the linguistic forms – the grammatical understanding and the receptive vocabulary – are connected to understanding implicatures that are based on inferential procedures, such as hints, metaphors and irony.

H4. According to the capacity theory (Just and Carpenter 1992), individuals having a larger working capacity are in the possession of more resources, thus they perform better in more complex linguistic processing procedures (complex sentence comprehension processes, semantic ambiguities) than their counterparts with a smaller working capacity. Based on the theory we hypothesise that differences between the children's working memory capacity correlate with understanding hints, metaphors and irony, because in the case of understanding these aforementioned nonliteral forms there could be individual differences in the amount of resources necessary for the full interpretation of implicatures starting from the logical form of the utterance and understood as the result of the inferencing procedure.

H5. We hypothesise that the level of understanding hints, metaphors and irony correlates to the individual developmental differences among 4–7-year old children, that is we expect different patterns between understanding hints, metaphors and irony and the developmental level of the individual cognitive and linguistic factors and their individual deviations.

HM1. Metapragmatic awareness instruction procedure influences the level of understanding to a great extent, since children access explicit information about linguistic and contextual information that is necessary for interpreting irony in the appropriate, that is, in the ironic way.

HM2. We hypothesise that children's individual differences can be observed in understanding irony as the result of metapragmatic awareness instruction procedure. We hypothesise that children who have second-order theory of mind ability and who have better linguistic skills and larger memory capacity indicators benefit from the metapragmatic awareness instruction procedure as regards the understanding of irony.

2. Methodology

2.1. Participants

Seventy-one typically developing Hungarian speaking preschool children (39 boys and 32 girls, age range 4;0 to 7;2, mean age 5;8) from two kindergartens in two university towns participated in the experiments (the majority of the children attended Szeged SZTE Gyakorló Óvodája [Training Nursery school of the Szeged University], while a smaller number of children attended the Napsugár Óvoda [Napsugár Nursery School] in Piliscsaba). I used the data provided by 60 participants in Szeged and 11 in Piliscsaba. In order to get comparable results, I applied the test directed at the understanding of nonliteral forms among a control group of 14 adult participants (8 women and 6 men).

2.2. Materials and procedures

2.2.1. The hint, metaphor and irony comprehension test (NemSzósz test)

Since we have not found any existing tests in the Hungarian psycholinguistic or pragmatics research, we have developed our own multiple choice test (NemSzósz Test, cf. Szücs 2014), which aims at examining the understanding of expressions containing hints, metaphors and irony (five of each) embedded into short everyday texts supported by visual stimuli. We applied Happé's (1993) methods to create the structure of the test, we have, however, made several changes.

2.2.2. The false belief tasks

In the experiments the Hungarian translations of two well-known first order false belief tasks, such as the Smarties test (Hogrefe, Wimmer and Perner 1986) and the Sally-Anne test (Baron-Cohen et al. 1986), and of two second-order false belief tasks, namely the Birthday test (Herold 2005), and the Robot test (Coull, Leekam and Bennett 2006) were used.

2.2.3. Tests examining linguistic development

The Hungarian standardised adaptation (Lukács et al. 2012) of the original TROG test (Test for Reception of Grammar, Bishop 1983), devised to examine the understanding of grammatical structures among 4–12-year-old children, was used to assess the comprehension of grammatical constructions.

The receptive vocabulary of the children was assessed by the (non-standardised) Hungarian version (Csányi 1974) of the (standardised) Peabody Picture Vocabulary Test (PPVT, Dunn and Dunn 1959).

2.2.4. Phonological short-term memory tests

The forward digit-span task (Jacobs, 1887; Hungarian adaptation Racsmány et al. 2005) is used to measure working memory's number storage capacity. Participants are presented with a series of digits and must immediately repeat them in the given order.

In the non-word repetition test (Gathercole and Adams 1994, Racsmány et al. 2005), the participants listen to non-words (words without any meaning) uttered by the tester, and then repeat each item immediately after hearing it.

2.2.5. Metapragmatic awareness instruction procedure

The metapragmatic awareness instruction procedure contained new irony stories similar in content and structure to the irony test in NemSzósz test. The metapragmatic awareness training sessions were held three times, when children were explicitly taught about ironic statements and intentions. During each session, the children were shown new irony stories. There were three short stories illustrated by pictures, which represented natural dialogues between a child and an adult and each included an ironic utterance. The sessions were led by an investigator, who gradually reduced the amount of help given to the child: during the first session, the stories were fully explained and interpreted, at the second session only leading questions were asked from the children, and at the third session only feedback was provided to the child's answers.

6-8 weeks after the instruction procedure both the MPA instruction group (T) and the control group (K) were tested again using the original irony comprehension test (NemSzósz test), and the differences between the first and the second test results were compared in the case of both groups.

3. Results

3.1. The role of the theory of mind development in understanding hints, metaphors and irony

There is no statistical difference ($X^2=4.333$; $p=0.115$) between the different theory of mind groups as regards understanding hints (noToM: unsuccessful first-order tests, 1st ToM: successful first-order tests, 2nd ToM: successful first- and second-order tests). Children in the different theory of mind groups perform similarly: noToM mean=0.83, 1st ToM mean=0.89; 2nd ToM mean=0.89. Based on the means we can observe a ceiling effect among children, since all the groups perform above 80 per cent. In understanding metaphors, there is no statistical difference between the different theory of mind groups ($X^2=3.562$; $p=0.168$), noToM mean=0.7, 1st ToM mean=0.75, 2nd ToM mean=0.82). At the same time, children perform weaker in understanding metaphors than in understanding hints, nonetheless, their performance is still around 70–80 per cent, which means that on the average they answered 4 questions out of five correctly. There is no statistical difference in understanding irony between the different theory of mind groups ($X^2=2.21$; $p=0.331$). Although there is some difference in the means of the different ToM groups, which can primarily be observed in the

case of the group not yet passing false-belief tests (mean=0.25) and the first-order theory of mind group (mean=0.4), this difference is not significant statistically (difference in the means=0.1517; $p=0.088$). Since the performance of all the three groups was low, and seemed to be close to chance level, we have compared the means of the different groups with the chance level. The statistical analysis revealed that the noToM group's level was significantly below chance level ($p=0.023$), but the other two groups' performance showed no statistically significant difference from the chance level in either direction.

3.2. The role of age in understanding hints, metaphors and irony

In the case of hints, four- and five-year-old children have similar means, while 6–7-year-olds differ from 5-year-olds to a great extent, but at the same time they do not differ much from the adults. This may indicate that there is a major improvement in understanding hints by the age of 6, the achievement performed at such age is almost like adults' performance. As far as the results related to metaphors are concerned, there is a gradual development: there is a major difference between four- and five-year-olds, and there is a gradual increase between the ages of 5 and 6–7, although the differences are not significant statistically. There is a greater increase in the performance between the 6–7-year-old children and the adults. In the case of irony we have found that four-year-olds perform better than their five-year-old counterparts, although the difference is not statistically significant. Owing to this, however, although the difference is not statistically significant between the four- and five-year-olds, neither is it statistically significant between four and 6–7-year-olds, the difference between the five- and 6–7-year old children is significant statistically ($p=0.048$). We can, furthermore, observe that there is also a significant difference between 6–7-year-old children and adults ($p<0.001$), which is not surprising, since 6–7-year-olds performed about 40 percent compared to the 100 per cent achieved by the adults. This means that all the different age groups perform at chance level and that their performance does not significantly differ from chance level.

3.3. The role of the linguistic development in understanding hints, metaphors and irony

As regards the correlations between the grammatical understanding and the understanding of the nonliteral expressions the correlational results are varied:

hints and TROG: $r_{\text{hints}}=0.300$; $p=0.011$

metaphors and TROG: $r_{\text{metaphor}}=0.350$; $p=0.003$

irony and TROG: $r_{\text{irony}}=-0.131$; ns.

Hints and metaphors correlate with the level of grammatical understanding significantly, while irony does not show any correlation in the age groups that I examined.

As regards the correlations between the receptive vocabulary and the understanding of nonliteral expressions, the results are similar to the correlational results obtained in connection with grammatical understanding:

hints and PPVT: $r_{\text{hints}}=0.287$; $p=0.02$

metaphors and PPVT: $r_{\text{metaphor}}=0.268$; $p=0.03$

irony and PPVT: $r_{\text{irony}}=-0.100$; ns.

The correlation is significant in the case of hints and metaphors, although the correlation is weaker than it is in the case of the grammatical understanding. Also, the correlation is only valid at $p<0.05$ significance level. As opposed to this, understanding irony does not reveal any significant correlation with the size of the receptive vocabulary in the age groups that I examined.

3.4. The role of the phonological short-term memory in understanding hints, metaphors and irony

There is no significant correlation between the results of either the forward digit-span task, or the non-word repetition task and the results of hints, metaphors and irony tests, therefore based on the correlational values we can conclude that the level of understanding hints, metaphors and irony measured in an off-line way are not influenced by the individual differences in the researched age group.

3.5. The role of metapragmatic instruction procedure in the development of understanding irony

The results of the study following the metapragmatic (MP) instruction procedure clearly show that the performance of the children in the control group hardly changed (18 per cent), while the performance of children participating in the MP instruction procedure increased massively (71 per cent). The results of the statistical tests confirm the assumption that the two groups also differ significantly as regards the two measurement means ($Z=-3.949$; $p<0.001$). This means that in the case of the children participating in the MP instruction procedure, the development after the procedure is significantly higher than that of the control group, thus we can conclude that the metapragmatic experiences related to ironic speech have a significant influence on children's understanding of irony. In connection with the correlations between

the metapragmatic awareness training and the theory of mind development we found that the group with second-order theory of mind level did not differ to a great extent from children having first-order theory of mind level regarding the success of the training. The results revealing the relationship between metapragmatic awareness instruction procedure and age indicate that although older children managed to interpret irony successfully when processing, interpreting and applying ironic utterances and their background- and contextual information, there did not seem to be a statistically significant difference regarding the studied children.

The differences in children's linguistic abilities do not influence the effectiveness of the metapragmatic instruction procedure, since we found correlation neither with the result of the grammatical comprehension test, nor with that of the receptive vocabulary test.

There is no significant correlation between the results of the forward digit-span task and the efficiency of the metapragmatic instruction procedure, however, the correlation between the non-word repetition task and the results of metapragmatic instruction procedure is significant, but has a negative direction. We have evaluated this to be a false positive result, since we consider a reversed correlation to contradicting the general tendencies of development.

4. Summary, the theoretical and practical relevance of the dissertation

Summarising the results of the series of studies briefly, I can find that understanding hints and metaphors strongly correlates with the indicators of linguistic development – understanding hints correlates with the receptive vocabulary, understanding metaphors correlates with grammatical comprehension – while individual developmental differences seemed to have no statistically significant effect in understanding irony, but metapragmatic awareness instruction procedure resulted in a great development in the studied age period.

The results presented in the present dissertation count as a valuable addition to Hungarian developmental pragmatics research, since in the case of hints and irony there had been no previous Hungarian research results, in the case of irony Hungarian language data had only been available in the field of attributing intentions (Schnell 2006, 2007). I also believe that my results in connection with the role of metapragmatic awareness are also innovative internationally, since they call for a new definition of irony within a socio-pragmatics framework.

Furthermore, my results may serve as a basis for comparison with international results as well as contribute to the creation of a comprehensive pragmatics model that also includes the notion of pragmatic development. My results also support the necessity of a developmental model that would be suited to describe cognitive, linguistic and non-linguistic (metapragmatic) aspects as well as the pragmatic peculiarities of nonliteral forms, since Relevance Theory – that serves as a basis for pragmatics theory (Sperber and Wilson 1986/1995) cannot explain the developmental relationships of nonliteral forms, that is the subject of the present study, on its own.

Bara's (2011) Cognitive Pragmatics model could serve as an appropriate starting point for a new developmental pragmatics model, however, in order to be carry out further research, a more exact definition is needed for the description of pragmatic phenomena in the model, including the pragmatic qualities of non-literal forms, the special features of the Hungarian language and children's individual developmental (cognitive, linguistic and metapragmatic) factors.

Both education and mother-tongue instruction can benefit from results of the research in practice, since it is relevant for pedagogues – when developing course materials and in the course of their everyday teaching practice – to understand children's linguistic comprehension, including the level of understanding nonliteral language use, how much they can build on this level and to what extent they need to develop children's linguistic and metapragmatic awareness.

Indirectly, the results may serve clinical purposes as well. Since the present research is based on typically developing children, the results may serve as a starting point for examining some linguistic symptoms of certain developmental disorders and may contribute to a linguistic diagnosis of atypically developing children and to creating more effective communication-centred therapies.

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A tudatelmélet és a célzások megértésének összefüggései óvodáskorban (poster)

Beszédkutatás 2013 Nyelvhasználat és alkalmazások konferencia, Budapest, MTA Nyelvtudományi Intézet, 14-15th November, 2013.

The role of theory of mind and reception of grammar in metaphor and irony comprehension in preschool children, Utterance Interpretation and Cognitive Models IV; Brussels, 02-03rd September, 2013

Theory of mind vs grammar skills in comprehension of metaphor and irony

Third Central European Conference in Linguistics for postgraduate students, Peter Pazmany Catholic University, Piliscsaba, 22-23rd August, 2013

A tudatelmélet és a nyelvtani megértés szerepe a metafora és az irónia megértésében óvodáskorban, Tavaszi Szél 2013 Konferencia, Sopron, 31th May-2nd June, 2013.

A metaforikus és ironikus megnyilatkozások megértésének összefüggései óvodáskorban, „Találkozások” Szegedi Alkalmazott Nyelvészeti Hallgatói Konferencia, Szeged, 26th April 2013.

Is Theory of Mind a predictor of comprehension of metaphor and irony?

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Irony comprehension in preschool children

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