A Study of Pragmatics applied to Teacher – Parent Communication

*Ching-Feng CHEN [a], Cong-Xun XIE[a], Shein-Yung CHENG[a], Wen-Yi Zeng[a], Wei-Fu Huang[a] & Jia-Sheng HEH[a]

[a]*Department of Information and Computer Engineering,*
Chung Yuan Christian University*, Taiwan*

*cloudly@cloudly.tw

Abstract: With progress society and increased information, parents cloud participate their children's learning become easier. And parents' educational backgrounds are increasing, so they have more and more different opinions on the method of disciplining their children by teacher in school. It is pressing that try to create a efficacious approach of teacher – parents (abbr. as T - P)communication, and how to cause parents participate their children's learning more willing, and how to cause parents interactive with teacher more active is a important question. This study researched the theory of the pragmatics and speech act theory, classified the dialogue between teacher and parents, used the method of association rules in data mining, tried to find a active module of T - P communication, to use helpful in general teaching placement, provide teacher to increase parents participate their children's learning. In this study, we found out 28 rules of association rules from the T - P dialogue on the student homebook in the last year, and checked these rules by the new T - P dialogue in this year. We found the precision form 40% to 100%, and the recall from 4.35% to 69.57%. The result shows the association rules is in line with the different T - P communication, it can be provided to teacher as reference. We proved if the association rules were true, teachers were not soliloquizing any more, and parents reply willing, T - P communication was frequently.

Keywords: *teacher – parent communication, speech act theory, association rules*

1. Introduction

1.1 Study background

There are situation in the traditional educational placement that parents send their children to school and are indifferent to their own children's learning. And teacher served the role of discipline resolutely, alone, closed as an ivory tower. But society is progress and open, information spread more and more convenient, and the universal of the national education promote the parents educational background, furthermore the government pursue the "opened education" policy that encourage parents in participating school affairs. Many parent's attitude on participating become positive from Indifference, and provided their opinions for teacher teaching method, teacher discipline method, school affairs.

Therefore, the basic ability teacher required establishes a good communication approach and makes an effective T - P communication. The specific method of teacher and parents included use the student homebook, class periodical, school Parents' day, telephone contacts, home visit, website, etc. In generally, the most common and most easily way to establish T - P communication is use the student homebook. Parents could understand their own children's learning at school by the contact matters teacher noted. And parents could put forward their opinion for children discipline on the homebook to make communication with teacher. Some teacher requires students recorded their own sport, housework, et cetera for improving student's character.

1.2 Motivation

The study cause parents to participate their own children's learning more activity understand children's requirement and provide it, known teacher teaching method and teacher discipline method, make effectible in T - P commutation. Make parents and teacher become student's suppliers on learning.

Use speech act theory and data mining, we expect find out effectible module of T - P communication. It could be referenced for teacher use to communicate with parents, not only make parents dialogue more activity, but also teacher and parents could share their ideas each other in intensive dialogue. Upgrade relationship between teacher and parents.

2. Problem Formulation

2.1 Teacher - parent communication

In the educational environment, parents participate in their own children's learning are more and more easy and important. Because of parents' attendance of school activities, open-school nights, and parent–teacher conferences, are related positively to elementary-school-aged children's learning performance (Becker & Epstein, 1982). And Cochran and Dean presented that if parent were empower will have positive impacts on T – P relationships and on children's school performance (Cochran & Dean, 1991). But from the different concept between teacher and parents in teaching and discipline student, it might be cause the mistake from each other. T – P communication was required in the classroom and family.

T – P communication is one of kind concept included in T – P interactive, and it's interwovennes with "T – P cooperation" and "parent involvement". Communication is one of kind social mentally progress, and people share information, ideas, emotion with others through communicating each other. Teacher and parents always communicate in student affairs like (Tomlinson, 1996):

- How teacher and parents urge student make advances in learning.
- Explain the study progress in classroom.
- Question of student activity at school.
- Tell parents what they could do at home.
- Hold up the activity that could support student learning.
- Discuss the affairs of school and class it round the corner.
- Recruit volunteer to help school and class dispose chore about study.

Thus, T – P communication could help teacher in teaching affair and improve their own children learning. Teacher and parents communicate through any method to exchange opinions each other, understand concept both side, could be positive on student learning. It is important to create an efficient T – P communication with parents for teacher in their own class.

2.2 Pragmatics

Pragmatics is a functional overview of all aspects of the language, it researches acknowledge, social and culture of language in human life. From the perspective of the speaker, it researches meanings that speaker said, and researches how people use language to accomplish social intercourse. From the listener's point of view it, it research the different between people knows in social activity and in listening, and research people dedicate to reach agreement by language (George Yule, 1996).

Pragmatics could explain simple the study that researches some specific behaviors in human life. It not only includes content of dialogue, but includes purpose, deep thinking, etc... By combining several speech behaviors into a specific combination that language means.

The speech act theory could present as "speech is ding". If speakers said meaningful and listener could understand, the behavior could be called speech act (Austin, 1962). Austin presented the three layers of the speech act, when speak, we just implement the one of three speech act layers, the three layers as follow:

- Locutionary act: speaker said a sentence has specific meaning and point out someone, and listener could understand the behavior in the speech act.

- Illocutionary act: speaker implement specific social purpose and specific function through speech act.
- Perlocutionary act: listener were influenced from the speech aroused effect and result.

Searle think the speech act is "Illocutionary act", all of the language that speaker said before sent purpose and objective through speech act (Searle, 1969). Searle has classified speech acts like this (Owen Eriksson, 1999):

- verdictives: the speech act of verdictives is to commit the speaker of the truth to the expressed proposition.
- exercitives: the speech act of exercitives is an attempt from the speaker to make the listener to perform an act.
- commissives: The speech act of commissives is that the speaker commits himself to perform an act.
- behabitives: The speech act of behabitives is to express the speakers psychological state about the state of affairs presented in the propositional content of the speech act.
- expositives: The speech act of expositives is that their successful performance guarantees that the propositional content of the speech act corresponds to the world. Declarations bring about alteration in the status of the referred objects. This feature distinguishes them from other classes.

The speech act theory will be used to analysis the dialogues on the student homebook in this study, those dialogue will be classified from the classification. From these dialogues, we expect the potential T – P communication model would be found. Following these model, T – P communication could be improved, T – P relation would be tied deeply.

3. Analysis

3.1 Analysis of study goal

Previous research reported that if teachers had effective communication with parents, the parents would promote their participation to help children learn, thus the teachers' teaching skills could be improved, the parents' educational knowledge could be increased, and the relationship between teachers and parents and school could be established. Many kinds of T – P communication methods can be applied, such as students' homebooks, telephone, e-mail, home visit, and website. Amongst these T-P communications, students' homebooks are the most general and the most convenient.

From T-P dialogs from real students' homebooks, this study tries to analyze these conversations to look into the embedded regularities. Speech act theory in pragmatics is introduced and the association rules within the dialogs are then obtained. In order to find the application powers of the obtained association rules, their precisions and recalls will be calculated in a series of experiments. With careful check for the precisions and recalls of the association rules, a satisfactory T – P communication can be conveniently obtained and the T-P misunderstanding can be greatly decreased.

3.2 Process of study

In order to find the association rules in T – P communications, the dialogues between teacher and parents left last year in the student homebook were collected into files. then the dialogues were classified into 7 classifications we defined by speech act theory. The implicative association rules in these dialogues were found by using data mining theory with Apriori algorithm. The second step is to test and verify how the association rules fits to the actual teaching environment, so the degree of exactitude were check by using precisions and recalls.

In this step, the dialogues between teacher and parents left in the student homebook were collected again, but last semester, parents of the dialogues were different with the parents when association rules found. And use the same classification method to classify the dialogues into 7 types. Finally use the precisions and recalls calculation method to calculate the precisions and recalls value of each association rules.

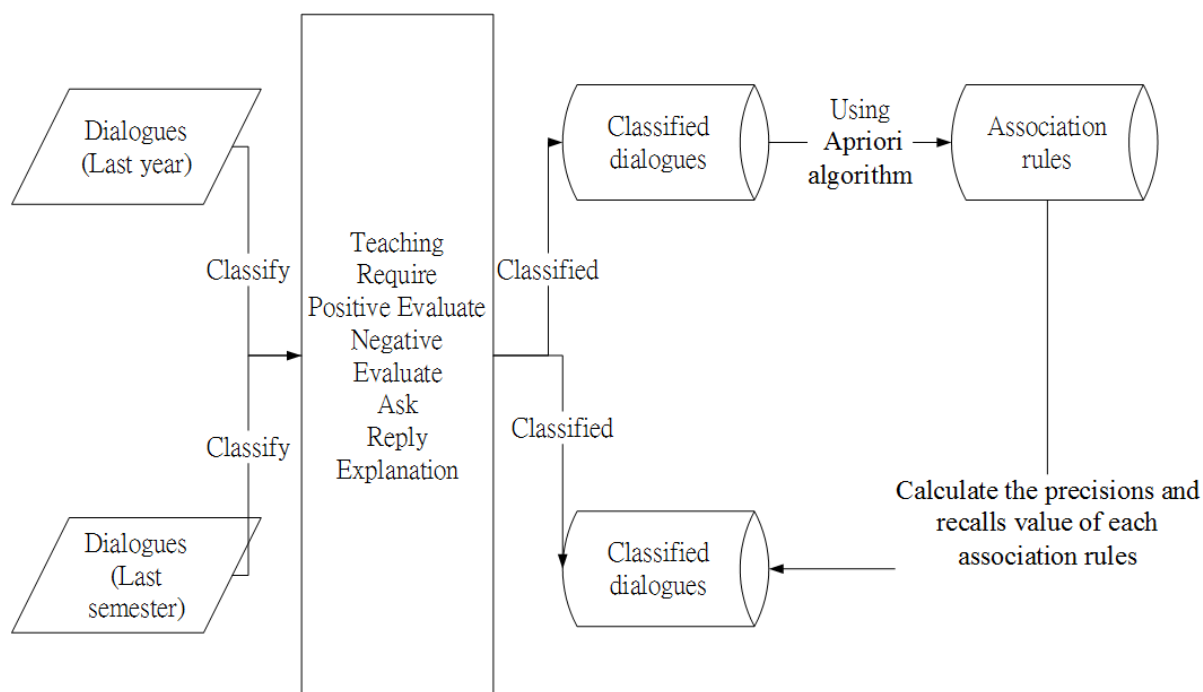The flow chart of total process of study is figure 1:

Figure 1. The flow chart of total process of study

3.3 Coding method

In chapter 2 shows the speech act theory has three layers: locutionary act; illocutionary act; perlocutionary act, the illocutionary act would be focused in this study. And Searle divide the illocutionary act into five types: verdictives; exercitives; commissives; behabitives; expositives. Bales research the conversation and divide the illocutionary act, too. And Hoope used finite state machine to divide the illocutionary act

The first step is to analysis the illocutionary act in T - P communication dialogue and classfy it into several types, in order to understand the interactive of teacher and parents. From the represented theory by Searle, Bales and Hoope, seven types of illocutionary act in this study were be defined. Each classification represents a behavior of dialogue that teacher or parents used. And these classifications are different from each other scholar, the comparative statement shows in table 1:

Table 10 The different classification of this study and the other scholar's

Our classification	Searle's	Bales's	Hoppe's
Teaching	Exercitives	N/A	Assert Offer
Require			Request
Positive Evaluate	N/A	Positive	Evaluate
Negative Evaluate		Negative	
Ask	Exercitives	Question	Request
Reply	Commissives	N/A	Promise Accept
Explanation	Behabitives Expositives	Information	Inform

The illocutionary act could be analyzed in T - P communication dialogue and divide them into 7 types according to the classification above. Use the method of association rule to find rules with highly support and highly confidence

The approach and step were listed as follow:

a. Collected 2 studentbooks and type into a file, the number of dialogues by teacher is 40, the number of dialogues by parent is 25, the number add up to 65.

b. Arrange the data in table by date, users, and contents. All dialogues were sequenced by date and grouped the dialogues at the same time, in order to match the association rules we found.

c. Use the classification and illocutionary act divide the dialogues to 7 types, if the illocutionary act of the dialogues was fuzzy, and we used the Chinese grammar to be an aid judgment. The classification of dialogues in table 2:

Table 11 The classification of dialogues

classification of illocutionary act	Basis of classification	illocutionary act language	Example
Teaching	Teacher and parents give guiding for student's learning, how to do and expect the performance they have.	是、還是、使、才能、才可、才是、才可以、如此才能、才不會、才不因、就不容易、愈…愈…、希望能、一定更佳、加油	多寬心才能事事順心，學習才可有更多空間！
Require	Teacher and parents require student to have some behavior, usually used when student had bad behavior	要、要多、要有、要確實、要認真、要懂得、要注意、要更努力、勿、不可、不要積累、不要草率、還要、需…、需把、仍需、需注意、也要、也不要、請注意、多看書、就趕快、盡責完成。	也不要只想著怎麼作比較快，要認真完成！
Positive Evaluate	Teacher and parents commend student for good learning behavior , by praise encourage student to have more excellent performance.	進步了、有盡責、有進步、能聽勸、會改進、會主動、很認真、錯誤較少、愈…愈好	※※有進步，能聽勸，會改進
Negative Evaluate	Teacher and parents blame student for bad learning behavior, hope student understand than change their mistake.	不用心、未確實、未完成、有點混、真的很愛	國習書寫不用心
Ask	Teacher and parents need support by each other used.	嗎？、為了什麼？、請※※、請老師、請家長、麻煩老師、麻煩媽媽、老師麻煩跟你拿、你要再、老師要跟你借	不瞭解請老師教導
Reply	Teacher and parents reply request by each other , but usually use "thanks" instead.	ok、謝謝、感恩、我會、瞭解、知道了、已收到	謝謝 OO 的體貼
Explanation	Teacher and parents explain status for student. This sentence include more situation especially the sentence include "cause and effect", but there are not "please" include.	故、但、且、像、因、由、將、仍、已、因為、但因、不過、只不過、所以、忘了、有為、如有、不如、好了、讓她、好感動、遇到了、未寫完、有提到、明天不上、無法參與、訂正完成、沒帶回來、明天不上	※※因為昨天人不舒服（頭痛想吐），所以功課還有一樣沒寫完

d. For reaching the independence of association rules required, we classify the term just fit the classification.

e. In addition to the classification, we distinguish the term between teacher and parents used by adding preposition as "T" and "P", like "T- Teaching" or "P- Require".

4. Design

4.1 Data mining and association rules

In order to assist human in extracting useful information (knowledge) from rapidly growing volumes of digital data, there is an urgent need for a new generation of computational theories and tools, those theories and tools are the subject of the emerging field of knowledge discovery in databases (KDD) (Fayyad, Piatetsky-Shapiro & Smyth, 1997). Data mining is one of the analysis steps of the KDD.

Data mining is the nontrivial extraction of implicit, previously unknown, and potentially useful information from data (Frawley, Piatetsky-Shapiro & Matheus, 1992). And Data mining is the analysis of (often large) observational data sets to find unsuspected relationships and to summarize the data in novel ways that are both understandable and useful to the data owner (Hand, Mannila & Smyth, 2001). Data mining generally use six common classes of tasks to excavate the potentially information. The six tasks is Anomaly detection, Association rule, Clustering, Classification, Regression, Summarization, Sequential pattern mining.

In this study, the Association rules were used to find the potential communication model. Association rules are found from a large database, all of the rules are presented interesting relations between variables. It is intended to identify strong rules discovered in databases using different measures of interestingness (Piatetsky-Shapiro, 1991). Such information can be used as the basis for decisions about marketing activities such as, e.g., promotional pricing or product placements.

For example, there is a set I contain three items X, Y, Z, the set {X, Y} is the subset of I, and the set {Z} is the subset of I too. There is an association rule that{X, Y} $\rightarrow$ {Z}, the set of items X and Y are called antecedent (left-hand-side or LHS) and consequent (right-hand-side or RHS) of the rule respectively. The association rule means if item X and item Y are found, the item Z would found too. Before analysis, the minimum support and minimum confidence were be set up, the support is the ratio of items of association rule to the data, the confidence is the ratio of the RHS of association rule to the LHS in the data. The association rules are effective when the support and confidence of association rules are over than the minimum support and minimum confidence.

In association rule, there a best – known algorithm to mine association rules, it is Apriori algorithm. In this study, Apriori algorithm was used to find the association rules in T – P dialogue data. It is used in finding the maximum item set in the data by identifying the frequent individual items and extending them to larger and larger item sets as long as those item sets appear sufficiently in the data.

4.2 Finding association rules

In finding association rules we should set parameter for minimum support and minimum confidence, we set the minimum support as "11.90%" and minimum confidence as "50%". In Taiwan, parents' works becalmed double-income families from single- income families so that parents sent their children to daycare and reduce the careful degree. Parents make the communication with teacher weakly. To avoid there were not any association rule be found, so the minimum support were set as "11.90%" by experiment several times.

There were total 28 association rules founded as table 3:

Table 12 The association rules

Association rule		Consequent item	Support (%)	Confidence (%)
Antecedent item set				
1 P-Ask T-Reply		$\rightarrow$ P-Reply	14.29	50.00
2 P-Explanation P-Ask T-Reply		$\rightarrow$ P-Reply	11.90	60.00
3 P-Explanation T-Reply		$\rightarrow$ P-Reply	14.29	50.00
4 T-Teaching T-Require		$\rightarrow$ P-Reply	16.67	57.14

5	T-Explanation		→	P-Reply	28.57	50.00
6	P-Explanation	T-Reply	→	P-Ask	14.29	83.33
7	T-Reply	P-Reply	→	P-Ask	11.90	60.00
8	T-Reply		→	P-Ask	26.19	54.55
9	P-Ask	T-Reply	→	P-Explanation	14.29	83.33
10	T-Reply	P-Reply	→	P-Explanation	11.90	60.00
11	T-Reply		→	P-Explanation	26.19	54.55

In order to check does it fit the actual teaching environment, there were several experiment could be used to check it.

    a.   Collect several student homebook that was used in last semester, there were integral dialogue by teacher and parents. By the classification classify the dialogue and compare with the association rules to check its confidence.

    b.   Experiment actually with student and parents, teacher send the dialogue based on association rules to check does the dialogue by parents fit the association rules or not.

The experiment A was used to check the confidence of association rules because the data of whole class students are more complete than experiment B. The dialogues are more real and fit the actual teacher and T - P communication.

4.3 Precision and recall

The "Precision" and "Recall" were used to check the confidence of association rules. The meaning of "Precision" is the fraction of retrieved instances that are relevant, and the meaning of "Recall" is the fraction of relevant instances that are retrieved.

In the field of this study, "Precision" is the fraction of item set in the association rules that matched to the experiment data:

$$\text{Precision} = \frac{\text{The number of the association rule found}}{\text{The number of the antecedent item set found}}$$

In the field of this study, "Recall" is the fraction of consequent item in the association rules that matched to the experiment data:

$$\text{Recall} = \frac{\text{The number of the association rule found}}{\text{The number of the consequent item found}}$$

5. Experiment & Discussion
5.1 Experiment environment

The experiment data came from a school that placed at remote country in New-Taipei city. The amount of student in a class were just 16, there are 9 boys and 7 girls. Their parents almost works in factory as an office worker, works in their own farm as a farmer and stay home take care their children as a housewife. Parents' educational backgrounds were lower than the parents lived in city. But parents care for their own children well, and replied the notes teacher left actively.

In the class, there 2 students are more special than the other students, they are served special education. One of them, parents take care student actively more than other parents, interact with teacher on student homebook and using telephone. The other one parent were restricted by her education environment and body defect, so they cloud not care for their own children as the other parents, but they take care as well.

The totally student homebooks were collected to check the precision and recall, all of the dialogues on them were typed into files as when the resource data of association rules collected. Then the dialogues were classified into 7 types by the same classification that were defined before. The illocutionary speech acts were listed by each dialogue sheets.

5.2 Experiment step

The illocutionary speech act of teacher and parents were compared with the association rules to calculate the value of precision and recall, the result is table 4:

Table 13 The result of the precision and recall

	Antecedent item set				Consequent item	Precision (%)	Recall (%)
1	T-Reply	P-Ask		→	P-Reply	40	17.39
2	T-Reply	P-Explanation	P-Ask	→	P-Reply	42.86	13.04
3	T-Reply	P-Explanation		→	P-Reply	45.45	21.74
4	T-Teaching	T-Require		→	P-Reply	50	4.35
5	T-Explanation			→	P-Reply	69.57	69.57
6	T-Reply	P-Explanation		→	P-Ask	63.64	43.75
7	T-Reply	P-Reply		→	P-Ask	57.14	25
8	T-Reply			→	P-Ask	66.67	62.5
9	T-Reply	P-Ask		→	P-Explanation	70	29.17
10	T-Reply	P-Reply		→	P-Explanation	71.43	20.83
11	T-Reply			→	P-Explanation	73.33	45.83

5.3 Discuss

From the result of the precision and recall, the values of precision is from 40% to 73.33% that proved the association rules is fit to the actual T – P communication in educational environments. If teacher communicate with parents and follow the association rules, it would be expect that parents will active in replying and communicate with teacher happily. From the communication, the good relation of teacher with parents will be built, and teacher and parents will be partner cooperation in student's learning.

Teacher could leave messages with the antecedent item set of association rules for increasing the dialogue sheet when communicated. For example, the rule No.5 it would own highly Precision and Recall, when teacher use the speech act "T-Explanation" to explanation affairs about student, it could be predictable that parents would reply with the speech act "P-Reply". And teacher could follow the rule No.7 or No.10 to reply with the speech act "T-Reply" to reply, perhaps parents will reply with the association rules, thus the communication could be modified and improved.

The values of recall are from 4.35% to 69.57% that shows parents replied monotonously and used the same speech act frequently. The type of speech act "P-Reply" were used almost in the communications. One of the reasons perhaps that Chinese talks with high politeness, parents replied with politeness language like "thanks". The other one reason that parents replied with meaning of understanding, when teacher taught student and informed parents, parents replied language like "yes" or "I know" to present their understanding. Teacher could try to use more speech act or another speech act word to cause parents to reply with more different speech act types.

6. Conclusion
6.1 Summary

Many method were put forward to improve the frequently of T – P communication, promote the relation between teacher and parents, to make high performance on student's study. The method were presented in this study that use Pragmatics theory and Association rules to find some potential rules in T – P communications, create a model fit to the generally T – P communications. In this model, it shows the frequently communication of T – P speech act theory, it could be referenced to teacher use in T – P communication.

The association rules found in this study could help teacher to create a high frequency when communicate with parents because of the high precision in the result of this experiment. When the communication contains these association rules, teacher would not soliloquize anymore, and parents would reply the communication more willing. They could discuss the opinion in their student's education method and how to bring up their student.

But it shows that when parents replied were pure and monotonous, so that the reply always belong to the classification of Reply with polite formula. So it could be the future works that teacher how to encourage parents to participate in different kind communications.

6.2 Future Works

In this study, the association rules have several items as follows were restricted by environment could not experiment, expect them could be strengthened in the future work.

- The amount of experiment data could be increased: this study just only has 16 students when the experiment proceeds because of the school were located in a remote place, so the experiment data were few there. Not only looking for the association rule were restricted, but also the careful check for the precisions/recalls of the association rules were influenced.
- The collection of experiment data could be easier: in this study the paper student homebook were used to collect all of the data, but it wasted time so much. If the internet student homebook could be used in experiment to collect the data, the procedure of typing words into files could be skipped over. And we could use association rules to all of parents to implement the effect at once.

References

Fayyad, U., Piatetsky-Shapiro, G., & Smyth, P. (1996). From Data Mining to Knowledge Discovery in Databases. *American Association for Artificial Intelligence, 17(3), 37-54.*

William J. Frawley, Gregory Piatetsky-Shapiro & Christopher J. Matheus. (1992). Knowledge Discovery in Databases: An Overview. *AI Magazine, 13(3), 57-70.*

Hand, D., Mannila, H., & Smyth, P. (2001). Principles of Data Mining.

Piatetsky-Shapiro, G. (1991). Discovery, analysis, and presentation of strong rules. *Knowledge Discovery in Databases, AAAI Press, 229-248*

Cochran, M., & Dean, C. (1991). Home-school relations and the empowerment process. *The Elementary School Journal, 91(3), 261-269.*

Becker, H. J., & Epstein, J. L. (1982). Parent involvement: A study of teacher practices. *The Elementary School Journal, 83(2), 85–102*

Tomlinson, S. G. (1996). Welcoming parents at your school: Strategies that work. *Office of Educational Research and Improvement (ED), Washington, DC. ERIC Document Reproduction Service No. ED404703.*

George Yule. (1996). Pragmatics. *Oxford University Press, Oxford.*

Austin, J.L. (1962). How to Do Things with Words. *Oxford University Press, Oxford.*

Searle, J. R. (1969). Speech Acts - an Essay in the Philosophy of Language. *Cambridge University Press, London, pp.203.*

Eriksson, O. (1999). A generic communication model based on Habermas and Searle's versions of Speech act Theory. *Proceedings of the fourth International Workshop on the Language Action Perspective on Communication Modelling (LAP'99), Copenhagen, September 12-13, 43-58.*