

The Effect of Discourse Signaling Cues on Foreign Language Listening Comprehension of Iranian EFL Students

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Abstract

A review of previous research on receptive skills among EFL learners reveals that in contrast to extensive research in reading, fewer studies have focused on the process of listening comprehension in EFL contexts. The current study examines the effects of discourse signaling cues on Iranian EFL students' listening comprehension in academic lectures and also investigates the effect of teaching Iranian EFL students about the role and function of discourse signaling cues on successful listening comprehension of lectures. A total of 77 Iranian EFL students were divided into three groups. The first group did not receive any training on the role of discourse signaling cues and only listened to signaled lectures. The second group listened to the non-signaled text and did not get any training on the role of discourse cues. The third group, however, listened to the signaled text and also received training on the role of discourse cues. The analysis of data on recall tasks shows that discourse signaling cues play an important role in EFL students' listening comprehension. The findings also indicate that training the students about the role and function of discourse signaling cues has significant effect on the students' EFL listening comprehension.

Keywords: discourse signaling cues; information unit; discourse markers; proposition

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Introduction

For many years, the scholars thought that listening was a passive skill because it is not an observable behavior. Recently, in a number of the theoretical learning and teaching models, listening has been considered an active skill, in which the learners are involved actively by using their background knowledge of the world and of language to process the incoming data and to recreate the speaker's messages. Therefore the emphasis on oral language skills gave listening a boost and it became fashionable in 1980s, when Krashen's idea about comprehensible input gained prominence (Nunan, 2002).

Some important and potentially useful insights are gained about the numerous factors inside and outside the head of the listener that impact comprehension of message. The factors that affect listening comprehension are factors internal to the listener (e.g. memory, language, proficiency) and factors external to the listener (e.g. discourse markers in the text, communicative interaction). However, the speculations concerning the influence of these factors have rarely been derived from empirical investigations. Most of the time, they have sprung from logico-deductive speculation, and were fueled by professional intuition. We are, as a result, in need of empirical investigations that assess the validity of our assumptions regarding the interactive effects certain factors have on second/foreign language listening comprehension.

Lots of research has been done on listening comprehension to help the listeners improve their listening, but many of language learners have problems when they try to listen to a text to get its meaning. Iranian teachers try to teach their students different strategies to help them overcome their listening problems, but despite all of these efforts, students still have problems, some of which lead to incomprehensibility. William (1992) refers to problems with discourse marking which cause incomprehensibility, to which the students can't adjust themselves easily.

In every comprehensible text, there are some markers which create cohesion in the text and lead to coherence in the learner's mind and at the same time make the text comprehensible. These markers are called "discourse signaling cues". These cues create inter-sentential relationships and links among the meanings of utterances in a discourse. Jung (2003) refers to the definition which is presented by Tyler (1994) on discourse signaling cues: "discourse signaling cues are metalinguistic devices that function as directional guides to signal how readers and listeners should interpret the incoming information" (p. 563). Jung (2003) mentions that these markers show the organization of a discourse by,

1. signaling relationships between ideas,

2. indicating the relative importance of ideas, and
3. evaluating the given ideas.

She classified the cues into four groups,

1. Previews (e.g. *there are four stages of this culture shock*),
2. Summarizers (e.g. *to sum up so far*),
3. Emphasis markers (e.g. *this is the key*), and
4. Logical connectives (e.g. *and, or, first, and second*).

These cues indicate the organization of a text. As a result, teaching the students about the function of these cues may help them with their listening comprehension.

Some work have been done on the role of discourse signaling cues in reading comprehension, but little attention has been thus far paid to their role in listening comprehension, especially in EFL listening comprehension. Most of the Iranian students have difficulty in comprehending academic lectures and fail to grasp the main ideas of the lectures. Most of these listeners fail to recognize how the lecture discourse is structured and fail to identify the relationship between the ideas. Lots of them aren't aware of the role and function of discourse signaling cues in a text and the help these cues can give them in comprehending lectures.

Recognizing the critical role of text organization in the learners' discourse comprehension, the present research aims at investigating if presence of these discourse signaling cues will help the listeners' comprehension and also aims at finding out the effect of training the students on the role and function of discourse markers on their listening comprehension.

This research is going to find out answers to the following research questions,

1. Do discourse signaling cues affect significantly Iranian EFL university students' listening comprehension of a lecture positively?
2. Does teaching Iranian EFL university students about the role and function of discourse signaling cues have any significant effect on their success in listening comprehension of a lecture?

2. Review of Literature

Different factors affect listening comprehension, which should be considered with more care and attention.

Dunkel (1991) believes that the current theories of second language learning, such as the information processing model, monitor model, the intake model, and the interaction model, all emphasize the key role listening plays in a learner's second/ foreign language development.

Jung (2003) mentions that: "text processing is an interactive process, which involves top-down and bottom-up processing" (p. 563).

Comprehension is viewed as a combination of both bottom-up and top-down processing. Top-down and bottom-up processing should be used at all levels of analysis simultaneously. According to Nunan (2002), in bottom-up processing decoding happens in a linear fashion and it starts from the smallest meaningful units to complete texts. In top-down view, the listener, according to the topic, activates his background knowledge to get the meaning of the listening text.

Schematic knowledge is one of the information sources in top-down processing, and it is the organized background knowledge which leads us to expect or predict messages in our interpretation of discourse. Richards (1983) presents two types of schemata: textual schemata and content schemata. Textual schema is the reader or listener's linguistic knowledge which helps them understand the text, for example they use their grammar knowledge, knowledge of cohesive devices and discourse markers to understand a text. Content schema is the reader or listener's knowledge of the world.

There is an assumption on making use of these psychological processings. When the learner doesn't have enough background knowledge to use top-down processing to understand the incoming data, he can resort to bottom-up processing and pay attention to those discourse markers which show the relationships among the ideas in the text and facilitate coherent interpretation of the discourse.

Some studies have been done on the effect of discourse signaling cues on the learners' listening comprehension:

Rubin (1994) refers to a research by Hron (1985) on the role of discourse signaling cues. Hron et al. (1985) compared listening comprehension of German science students of two versions of a lengthy English text with and without discourse markers. He concluded that listeners who listened to the text with the additional discourse markers reproduced significantly more macro-propositions than those who listened to the non-marked version.

In 1986, Chaudron and Richards did a research on the effect of discourse signaling cues on L2 listening comprehension. The results showed that macro-markers (those which give information about the global structure of the discourse) significantly helped the learners' comprehension of the lectures, but beneficial effects were not found for micro-markers (those which give information concerning more local, inter-sentential relations).

Jung (2003) refers to a research by Dunkel and Davis (1994) on the effect of discourse signaling cues on L2 listening comprehension, in which they

didn't find any significant effect of cues on learner's comprehension of a lecture.

Jung (2003) also refers to Flowerdew and Tauroza's (1995) research on the effect of micro-markers on L2 listening comprehension. The findings showed that learners listening to a lecture with micro-markers performed better than those listening to the lecture without them.

In another research Allison and Tauroza (1995) investigated the effect of discourse organization on lecture comprehension. They wanted to know how discourse structure related to the comprehension of the main points in a lecture. The findings showed that L1 subjects have the same difficulties as L2 subjects and their language background isn't a beneficial factor here. The structure and organization of information within a lecture has been assumed to be an essential aspect of its comprehensibility and absence or misuse of discourse signaling cues in the speaking of Non-Native Speaking Teaching Assistants (NNS TA) caused incomprehensibility.

The results of Jung's (2003) research on the effect of discourse signaling cues on L2 listening comprehension demonstrated that compared to the non-signaled group, the signaled group recalled significantly more high- and low-level information from the lecture accurately. She concluded that discourse signaling cues play important role in L2 listening comprehension.

With respect to the second research question, it should be mentioned that the amount of attention the learner pays to form may influence the extent to which second/ foreign language input and interaction actually produce second/ foreign language intake. Some researchers are optimistic about the contribution of attention and consciousness raising to language learning (Mitchell & Myles, 2004, p. 184).

Allison and Tauroza (1994) refer to a research by Tudor and Tuffs (1991) who illustrated how awareness of formal discourse structures affected the comprehension of academic-style listening input. They found that the participants who were given training regarding the patterns of discourse organization comprehended more than those who were given background knowledge prior to listening, although the difference was not significant.

Studies have shown that cues are helpful in L1 and L2 reading comprehension and in L1 listening and text processing (Dunkel, 1991; Long, 1989; Morley, 1995). This research investigates the effect of the presence of discourse signaling cues on Iranian EFL students' listening comprehension as well as the effect of training these learners on the role and function of these cues in the text on their successful comprehension of the academic lectures.

3. Method

3.1. Participants

77 students were selected among 94 EFL students from Islamic Azad University and Azerbaijan Shahid Madani University in Tabriz, by means of a pretest on their listening proficiency. The pretest was completed 50 days prior to the main test. It was the listening comprehension section of a TOEFL test, selected from *Longman Complete Course for the TOEFL Test*, by Deborah Phillips (2001). All of the participants were juniors or seniors, ranging from 21-25 years old. 45 of them were female and 32 were male. The first language of 84% of them was Turkish and that of the rest was Persian.

The participants were randomly divided into three groups:

1. Group A, the control group, consisted of 27 students, with the mean score of 26.44 from 50 in the pretest;
2. Group B, the experimental group, consisted of 25 students, with the mean score of 27.08 in the pretest; and
3. Group C, the experimental group, consisted of 25 students, with the mean score of 26.68 in the pretest.

3.2. Instruments

Two types of listening comprehension materials were used in the present research,

The first was the listening section of a TOEFL test which was used as the pretest to help the researcher choose subjects who had homogeneous listening proficiency. It was composed of 50 multiple choice questions.

The second was the main test which was composed of two audio-taped academic lectures which were selected from *Longman Complete Course for the TOEFL Test* (2001).

The lectures were selected according to the following criteria:

- a. Quantity of discourse signaling cues in the lectures (moderate),
- b. Lecture speed rate (moderate),
- c. Complexity of text structure in the lecture (neither too simple, nor too complex),
- d. Transparency of ideas related in the lecture (moderate),
- e. Absence of strong schema, assumed logic, or reasoning in the lectures,
- f. Length of the lecture,
- g. L2 learners' familiarity with the lecture topic, and

h. Complexity of concepts in the lectures (moderate) (Jung, 2003).

The researcher was careful that the subjects of the lectures weren't familiar for the students. This obliged the students to use discourse signaling cues to understand the text. The results of the recall tasks (appendix C) and the questionnaires (Appendices A and B) showed that these criteria were present in the lectures.

The first lecture was about Phyllotaxy (different types of arrangement of leaves on the stem of a plant) and had about 298 words, 57 discourse markers, and 20 propositions.

The second lecture was about Washington D.C., which gave a background about its name and some unnatural points about its history. It was composed of 447 words, 62 discourse markers, and 28 propositions. The number of discourse markers and propositions in each lecture were agreed upon by the researcher and the students' professors.

According to a topic familiarity survey, which is present in Appendix A, 72 of the subjects selected choice A in the questionnaire, "I had not heard of the topic. I had no previous knowledge of the topic at all." 5 subjects selected choice B, "I had heard of the topic, but did not have specific knowledge about it. I had vague knowledge of the topic."

The researcher also edited the original lectures by deleting discourse signaling cues from the texts. She was careful not to distort the pronunciation of adjacent words.

3.3. Data Collection Procedure and Data Analysis

The 77 participants were divided into three groups. The participants in group A, the control group, didn't get any training on the role of discourse signaling cues in listening comprehension texts. They listened to the text with discourse signaling cues. The participants in group B also didn't get any training on the role of discourse signaling cues in listening comprehension texts but they listened to the text from which the signals were omitted. The participants in group C listened to the lectures with discourse signaling cues. They got training on the role and function of discourse signaling cues in a text. The characteristics of the groups are summarized in Table 3.1.

Table 3.1

Characteristics of the Groups

	N	Signal	Training	Type of the group
Group A	27	+	–	Control
Group B	25	–	–	Experimental
Group C	25	+	+	Experimental

In the present research, at first the students' general proficiency in listening comprehension was tested by administering the pretest. During 50 days between the pretest and the main test on the lectures, participants in group C were trained in 5 sessions. Each session lasted for 40 minutes. In these sessions, the researcher taught the subjects about the role and function of discourse signaling cues and different types of them and told them how they could get help from these cues to understand a text better, especially when they didn't have enough background knowledge about the topic of the text. In each session the researcher introduced some discourse markers and explained their grammatical and functional role in a text. To make her explanation more clear, she used examples of discourse markers in full texts. Then, the participants listened to a short lecture and did exercises and discussed the different types of discourse signaling cues which were present in the lecture and how these signals could help them in successful understanding of the lectures. Before administering the main test, the students received enough instructions in Persian. The subjects weren't aware of the purpose of the research. The main test was composed of two recall tasks. Each participant received (a) two response sheets with general questions on each lecture (Appendix C); (b) a topic familiarity survey sheet (Appendix A); and (c) a personal information and English education background questionnaire (Appendix B).

The participants listened to each lecture once. In each group during listening to each lecture, the participants could take notes in any form and language they preferred. Examination of the participants' notes revealed that their notes were composed of key words and short phrases. They could use those notes when they were performing the recall tasks. Jung (2003) believes that: "taking notes and referring to them are the natural part of academic lecture listening comprehension" (p. 567). After listening to each lecture, the subjects performed a recall task by using their notes. They wrote everything they understood and remembered from the lecture.

Immediately after finishing the recall tasks, the participants answered the survey sheet concerning their topic familiarity and then they answered the

questionnaire about their personal information and their English education background.

The students' recall tasks were scored on the number of propositions they had written correctly in their recall tasks. Spelling errors were ignored unless it distorted the meaning of the propositions. Each paper was scored two times, first by the researcher and then by the students' professor.

After scoring the recall tasks of the participants, the raw scores were analyzed by SPSS software with three two-way analyses of variances (ANOVA).

4. Results and Discussions

4.1. Comparison of the Groups with Reference to the First Text

According to table 4. 1, the mean score of group A in text 1 (Phyllotaxy) was 12.96 with the standard deviation of 1.28. The mean score of group B in the first text was 8.92 and the standard deviation was 1.28. The mean score of group C was 15.04 and the standard deviation was 1.20. Group C has got the greatest mean score in the first text.

Table 4. 1

ANOVA for Comparing the Performance of Groups in Reference to the 1st Text

groups	N	Mean	Std. Deviation	Std. Error
A	27	12.96	1.28	.247
B	25	8.92	1.28	.257
C	25	15.04	1.20	.241
Total	77	12.32	2.81	.320

The mean and standard deviation of each group is compared with those of the other two groups. The mean difference of the groups is significant at the .05 level.

4.2. Comparison of the Groups with Reference to the Second Text

According to table 4.2, the mean score of group A in the second text (Washington D.C.) is 17.62 with standard deviation of 1.62. The mean score of group B in this text is 12.52 and the standard deviation is 1.78. The mean score of group C is 21.12 and the standard deviation is 2.26. Group C in the second text has got the greatest mean score in comparison to groups A and B.

Table 4.2

ANOVA for Comparing the Performance of Groups in Reference to the 2nd Text

Groups	N	Mean	Std. Deviation	Std. Error
A	27	17.62	1.62	.311
B	25	12.52	1.78	.356
C	25	21.12	2.26	.452
Total	77	17.10	3.97	.453

The mean and standard deviation of each group are compared with those of the other two groups. The mean difference is significant at .05 level.

The purpose of the present research was to find out the effect of discourse signaling cues on Iranian EFL students' listening comprehension. Two independent variables were studied in this research: the effect of the presence of the discourse signaling cues in a text and the effect of consciousness raising on the role and effect of discourse signaling cues. The students' listening comprehension was the dependant variable. According to Table 4.2, in text 1 the mean score of group C, which listened to the signaled text and got training on the role and function of discourse signaling cues, is higher than the other two groups (A and B). Group A, which listened to signaled text but didn't receive training, got the second high score among the groups. That is, the mean score of group A is lower than that of group C, but higher than the mean score of group B. The mean score of group B, which listened to non-signaled text and didn't get training, is the lowest one.

According to Table 4.2, in the second text, group C, which listened to the signaled text and got training on the role and function of discourse signaling cues in the text, got the highest score among the groups. The mean score of group A, that listened to the signaled text but got no training, is higher than that of group B. Again group B, which listened to the non-signaled text and got no training, has the lowest mean score among the groups.

The ANOVA revealed a significant effect for the presence of cues on learners' listening comprehension of the lectures. By comparing the mean scores of groups in both of the texts, we concluded that groups C and A, which listened to the signaled texts got higher mean scores than group B, that listened to the non-signaled texts. This means that there is statistically significant interaction between the presence of cues and the participants' listening comprehension of the lectures. As a result, the answer to the first research question, "Do discourse signaling cues affect Iranian EFL university students' listening comprehension of a lecture positively?" is YES. The presence of discourse signaling cues in a text can affect the listening comprehension of

the Iranian EFL listeners positively. The current findings that the signaled groups recalled significantly more propositions from the lecture in an accurate manner than the non-signaled group extended previous empirical researches documenting the beneficial effects of cues on listening comprehension (Jung, 2003). But this study yields different findings from Chaudron and Richards (1986) and Dunkel and Davis (1994) concerning the effects of cues on listening comprehension. Neither Chaudron and Richards nor Dunkel and Davis found significant effects of cues on listening comprehension.

With reference to the second research question group C, which got training on the role and function of discourse signaling cues and the kind of help they could get from them, got higher mean scores in both of the texts than group A, so it is concluded that the answer to the second research question: "Is teaching the students about the role and function of discourse signaling cues beneficial for their success in listening comprehension of a lecture?", is YES. The results show that the difference between the scores of groups A and C is significant. This shows that consciousness raising about the role and function of discourse signaling cues which was the only difference of group C from group A, is beneficial for the students' successful listening comprehension of a lecture.

An important point that should be mentioned about the participants' scores on the recall tasks is that in the present research the participants got low scores in the recall tasks. This may have some reasons.

First it may be because Iranian EFL students are not accustomed to doing such recall tasks in listening comprehension. Second, since they listened to each lecture once, it is related to the low amount of time available for processing the incoming data. Third, the texts were recorded and the subjects weren't exposed to a live presentation of the texts. The recorded texts lacked pausing and hesitation of a conversational type of lecturing, so the subjects didn't have much time for processing the data while listening to the lectures.

5. Conclusions

The data analysis showed that the groups which listened to the signaled texts (groups A and C) performed significantly better than the group which listened to the non-signaled texts (group B). This indicates that discourse signaling cues play a significant role in EFL listening comprehension. The data analysis showed that group C got the highest mean scores in both of the lectures. Because group C was the only group that received training on the role and function of discourse signaling cues in lectures, it is concluded that consciousness raising on the role and function of discourse signaling cues in a

text has significant effect on Iranian EFL students' success in listening comprehension of a lecture.

The results of this study are of ultimate importance not only for the language teacher who trains EFL learners in listening comprehension skills, the curriculum developer who devises an educational program, and the material developers, but also for teachers and lecturers who teach content subjects to non-native learners. The results points to the need for developing teaching materials and techniques which train EFL listeners how to use discourse signaling cues in different texts. The most immediate implications of this study are for those EFL students who want to improve their listening comprehension skills, especially in understanding the lectures on unfamiliar topics. Getting help from the discourse signaling cues of a text in understanding that text will help the students significantly get the meaning of the texts on the topic of which they have little or no background knowledge.

References

- Allison, D. & Tauroza, S. (1995). The effect of discourse organization on lecture Comprehension. *English for Specific Purposes*, 14 (2), 157-73.
- Bachman, L. F. & Palmer, A. S. (1996). *Language testing in practice*. Oxford: Oxford University Press.
- Barry, S. & Lazarte, A. A. (1998). Evidence for mental models: How do prior Knowledge, syntactic complexity, and reading topic affect inference generation in a recall task for non-native readers of Spanish? *Modern Language Journal*, 82 (2), 176-93.
- Benson, M. J. (1989). The academic listening task: A case study. *TESOL Quarterly*, 23 (3), 421-45.
- Brown, H. D. (1994). *Principles of language learning and teaching*. White Plains, New York: Prentice Hall Regents.
- Brown, J. D. (1988). *Understanding research in second language learning*. Cambridge: Cambridge University Press.
- Brownell, J. (1996). *Listening: Attitudes, principles, and skills*. Boston: Allyn and Bacon.
- Chastain, K. (1988). *Developing second-language skills: Theory and practice*. San Diego: Harcourt Brace Jovanovich.
- Chaudron, C. & Richards, J. C. (1986). The effect of discourse markers on Comprehension of lectures. *Applied linguistics*, 7 (2), 113-27.
- Dunkel, P. (1991). Listening in the native and second/foreign language: Toward An integration of research and practice. *TESOL Quarterly*, 25 (3), 431-57.
- Ferris, D. & Tagg, T. (1996). Academic oral communication needs of EAP Learners: What subject-matter instructors actually require. *TESOL Quarterly*, 30 (1), 31-58.

- Field, J. (2002). The changing face of listening. In J. C. Richards & W. A. Renandya (eds.), *Methodology in Language Teaching: An Anthology of Current Practice* (pp. 242-7). Cambridge: Cambridge University Press.
- Flowerdew, J. & Miller, L. (1997). The teaching of academic listening Comprehension and the question of authenticity. *English for Specific Purposes*, 16 (1), 27-46.
- Flowerdew, J. & Miller, L. (2005). *Second language listening: Theory and Practice*. Cambridge: Cambridge University Press.
- Hedge, T. (2000). *Teaching and learning in the language classroom*. Oxford: Oxford University Press.
- Jung, E. H. (2003). The role of discourse signaling cues in second language Listening comprehension. *Modern Language Journal*, 87 (4), 562-77.
- Lam, W. Y. K. (2002). Raising students' awareness of the features of real-world Listening input. In J. C. Richards & W. A. Renandya (eds.), *Methodology in Language Teaching: An Anthology of Current Practice* (pp. 248-53). Cambridge: Cambridge University Press.
- Long, D. R. (1989). Second language listening comprehension: A schema theoretic perspective. *Modern Language Journal*, 73 (1), 32-40.
- Mitchell, R. & Myles, F. (2004). *Second language learning theories*. New York: Hodder Arnold.
- Morley, J. (2001). Aural comprehension instruction: Principles and practices. In M. Celce-Murcia (ed.), *Teaching English as a second or foreign language* (pp. 69-85). Boston: Heinle & Heinle.
- Nunan, D. (1999). *Second language teaching and learning*. Boston: Heinle & Heinle.
- Nunan, D. (2002). Listening in language learning. In J. C. Richards & W. A. Renandya (eds.), *Methodology in Language Teaching: An Anthology of Current Practice* (pp. 238-51). Cambridge: Cambridge University Press.
- Phillips, D. (2001). *Longman complete course for the TOEFL test*. New York: Longman.
- Richards, J. C. (1983). Listening comprehension: Approach, design, procedure. *TESOL Quarterly*, 17 (2), 219-40.
- Richards, J. C. & Schmidt, R. (1992). *Dictionary of language teaching and applied linguistics*. London: Longman.
- Rost, M. (1990). *Listening in language learning*. New York: Longman.
- Rounds, P. L. (1987). Characterizing successful classroom discourse for NNS Teaching assistant training. *TESOL Quarterly*, 21 (4), 643-72.
- Rubin, J. (1994). A review of second language listening comprehension research. *Modern Language Journal*, 78 (2), 199-221.
- Schmidt-Rinehart, B. C. (1994). The effects of topic familiarity on second Language listening comprehension. *Modern Language Journal*, 78 (2), 179-89.
- Tyler, A. (1992). Discourse structure and the perception of incoherence in International teaching assistants' spoken discourse. *TESOL Quarterly*, 26

(4), 713-29.

Williams, J. (1992). Planning, discourse marking, and the comprehensibility of International teaching assistants. *TESOL Quarterly*, 26 (4), 693-711.

Yule, G. (1996). *The study of language*. Cambridge: Cambridge University Press.

Appendix A

Topic Familiarity Survey

Mark the statement that best characterizes your familiarity with the topic of the lectures that you have heard.

- A. I had not heard of the topic. I had no previous knowledge of the topic at all.
- B. I had heard of the topic, but did not have specific knowledge about it. I had vague knowledge of the topic.
- C. I had in-depth knowledge of the topic.

Appendix B

Personal Information Questionnaire

Answer the following questions about your personal characteristics.

- 1. name:
- 2. gender: male female
- 3. year in university: 1 2 3 4
- 4. your age:
- 5. years of studying English:
- 6. Do you have any experience of studying English in institutions other than your school and university? If yes, how many terms?
- 7. Have you ever been in an English speaking country? If yes, how long?

Appendix C

Answer Sheets

What is phyllotaxy? What's the justification for it? How many types of phyllotaxy are mentioned in the lecture? Can you describe each one of them?

What is mentioned in the lecture about the name of Washington D.C? What are the major and unusual points about Washington? Explain them.