

## 음성의 음향 스펙트로그램 분석

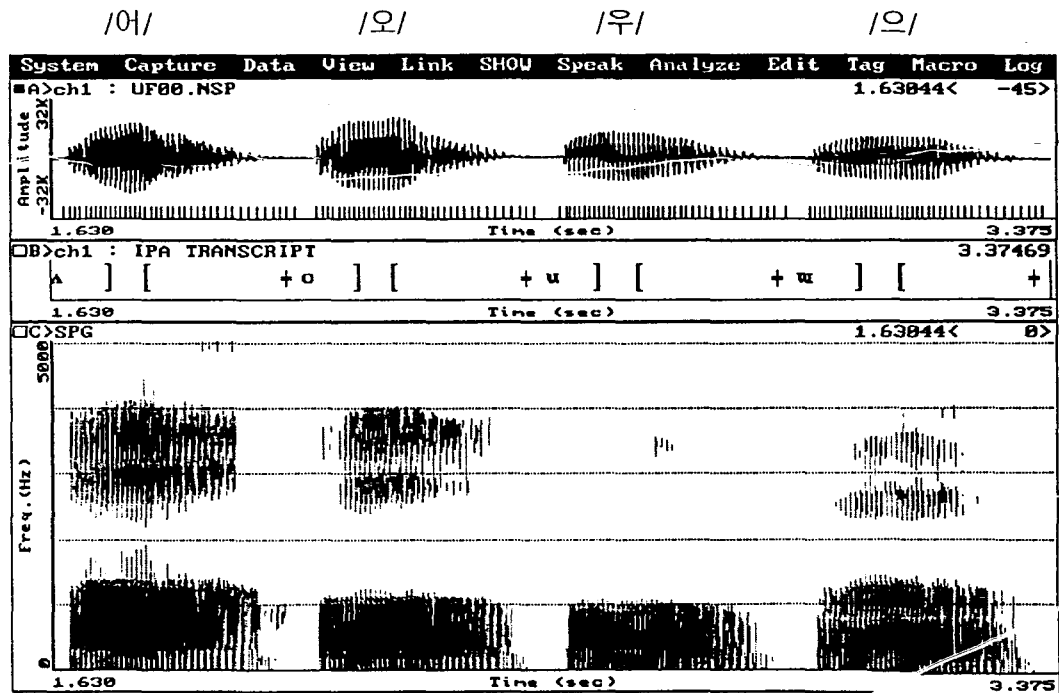
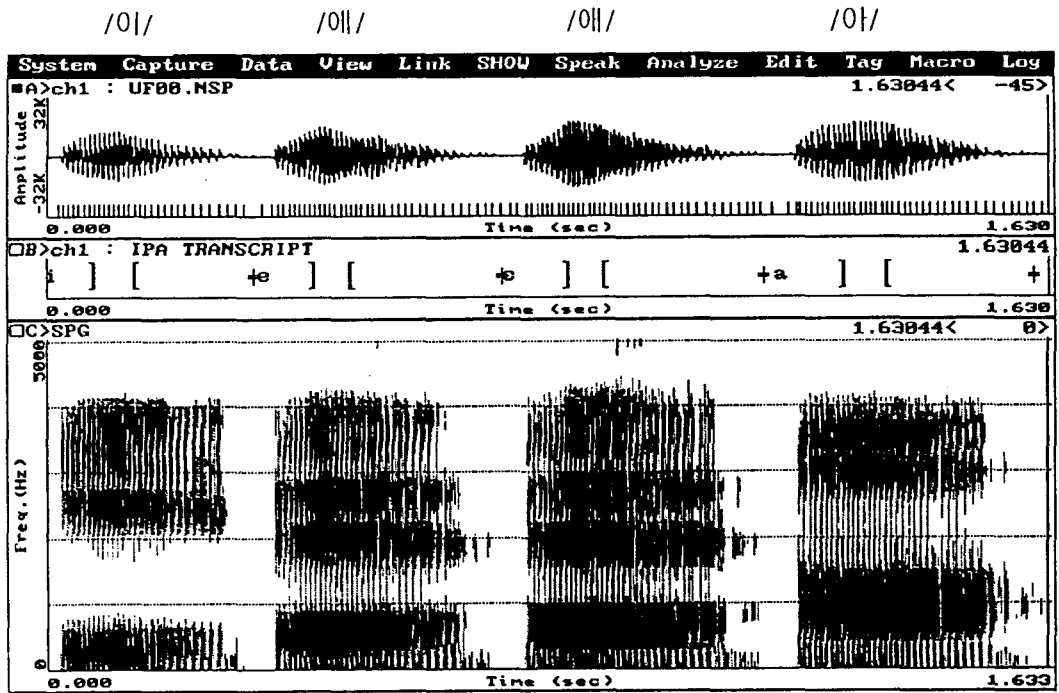
한국전자통신연구소, 세종 Speech Tech  
지 민 제

### 개 요

한국어 모음과 자음의 파형, 스펙트로그램을 통해  
다음 사항을 증점적으로 다룬다.

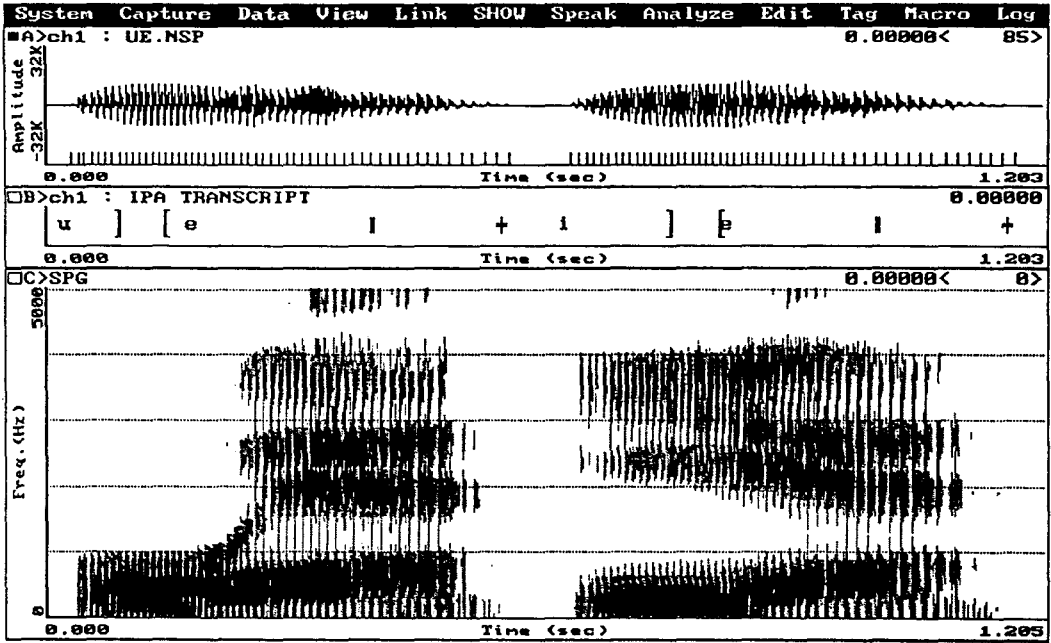
- 모음과 자음의 조음 및 음향적 특성
- 모음의 좁힘점과 음향적 특성
- /모음+모음/과 /반모음+모음/의 차이
- 자음의 조음 방법 및 조음장소에 따른 음향적 특성
- 음성환경에 따른 음향적 특성
- 유/무성에 따른 음향적 특성
- 연/경성에 따른 음향적 특성
- 동시조음에 따른 음향적 특성
- 소리의 길이

1. 모음의 파형과 스펙트로그램



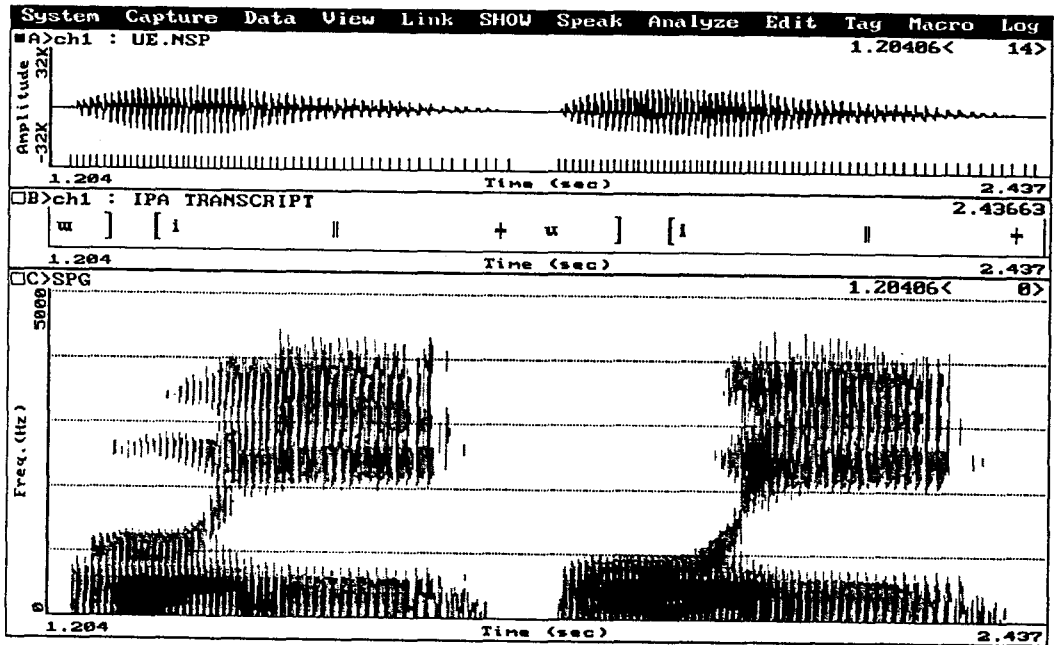
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/이에/



/으이/

/우이/

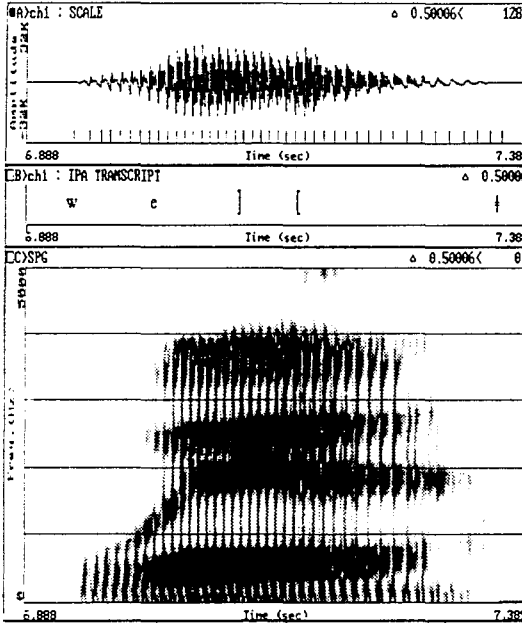


2. 다음의 파형과 스펙트로그램

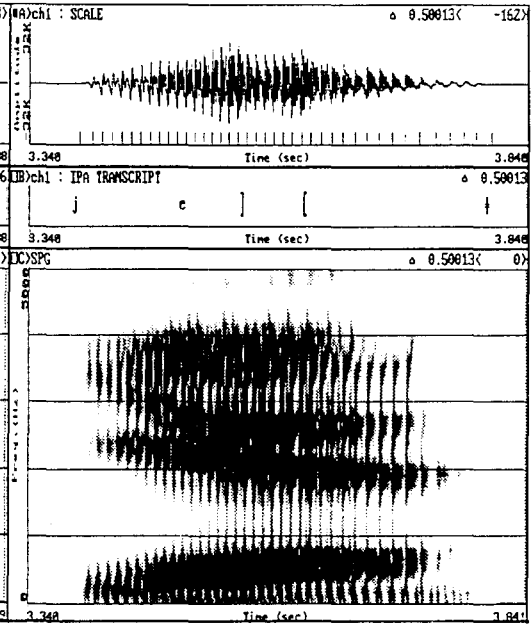
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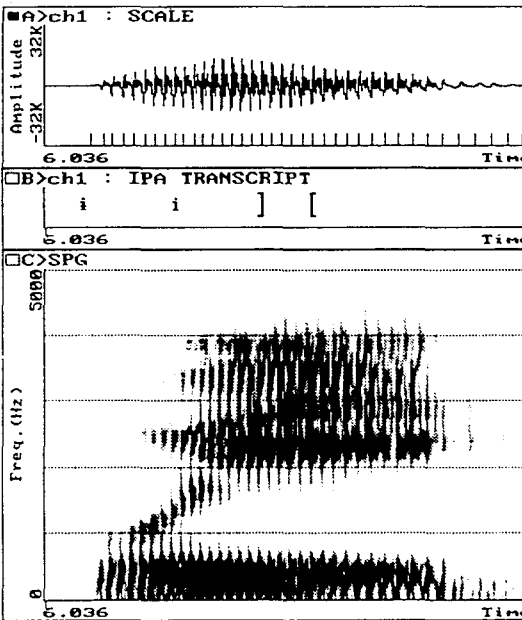
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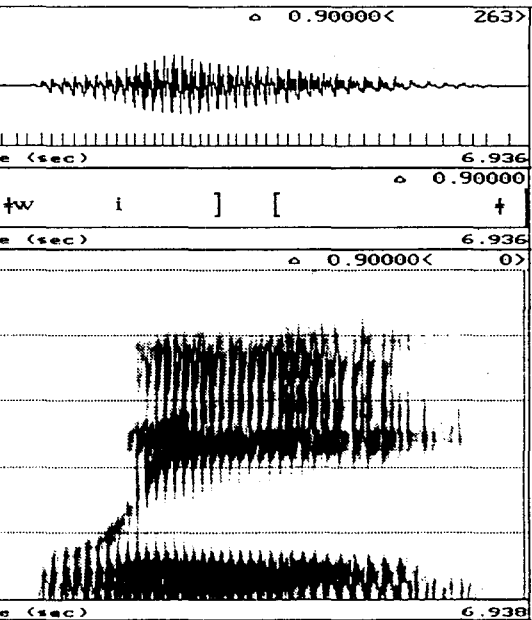
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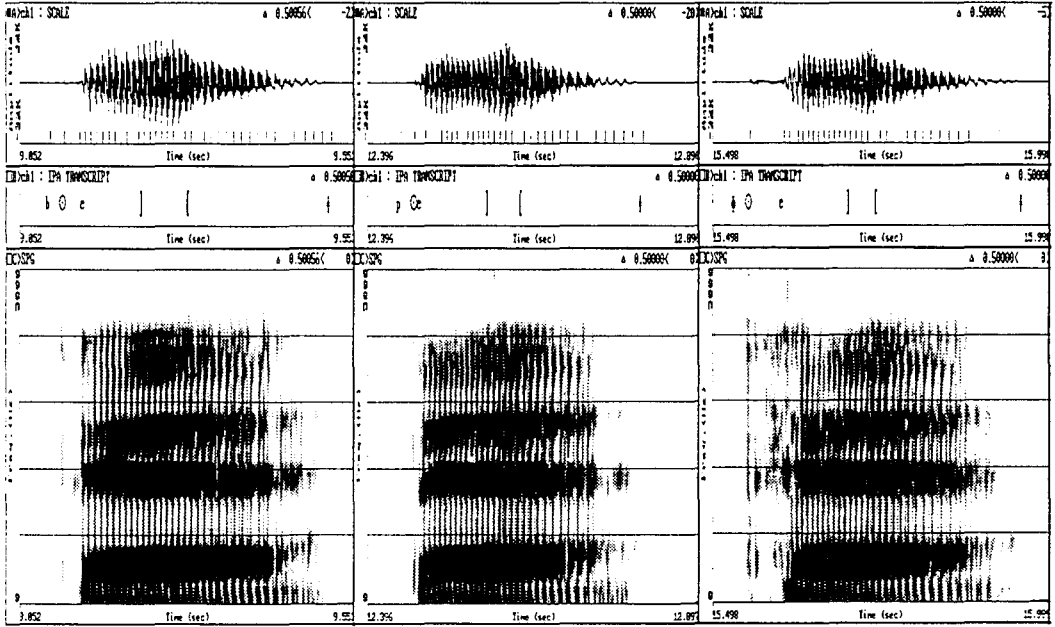


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- 양순음 /베/

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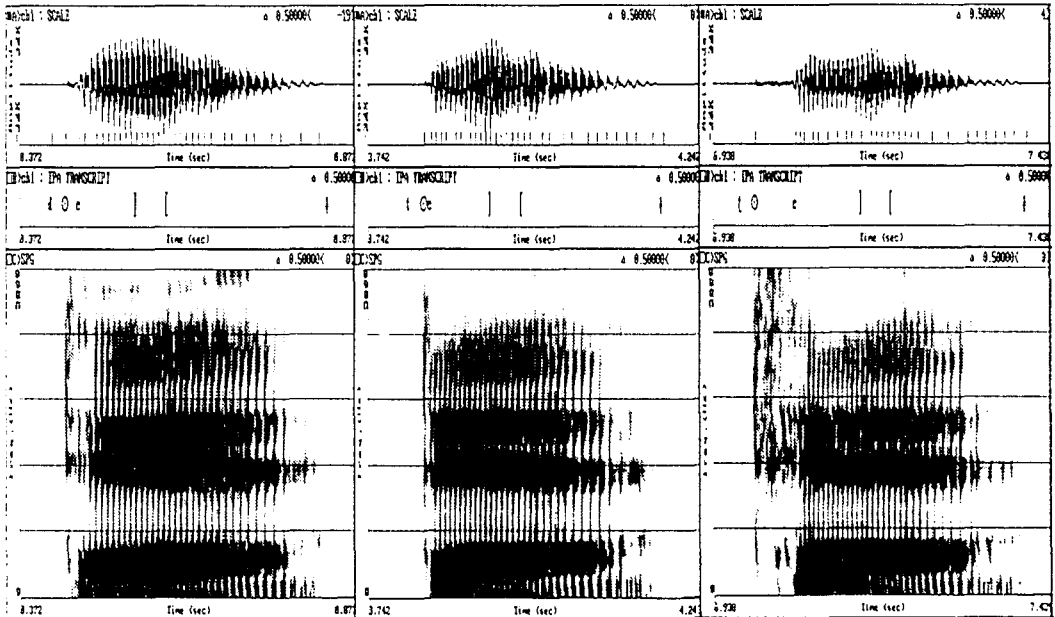
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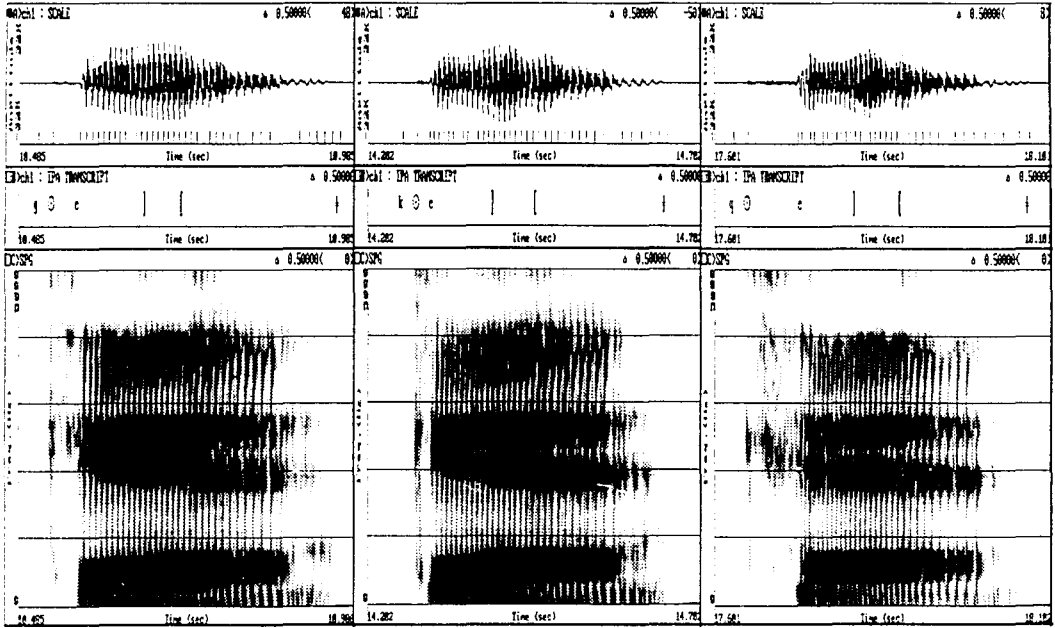
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- 연구개음 /게/

/개/

/케/

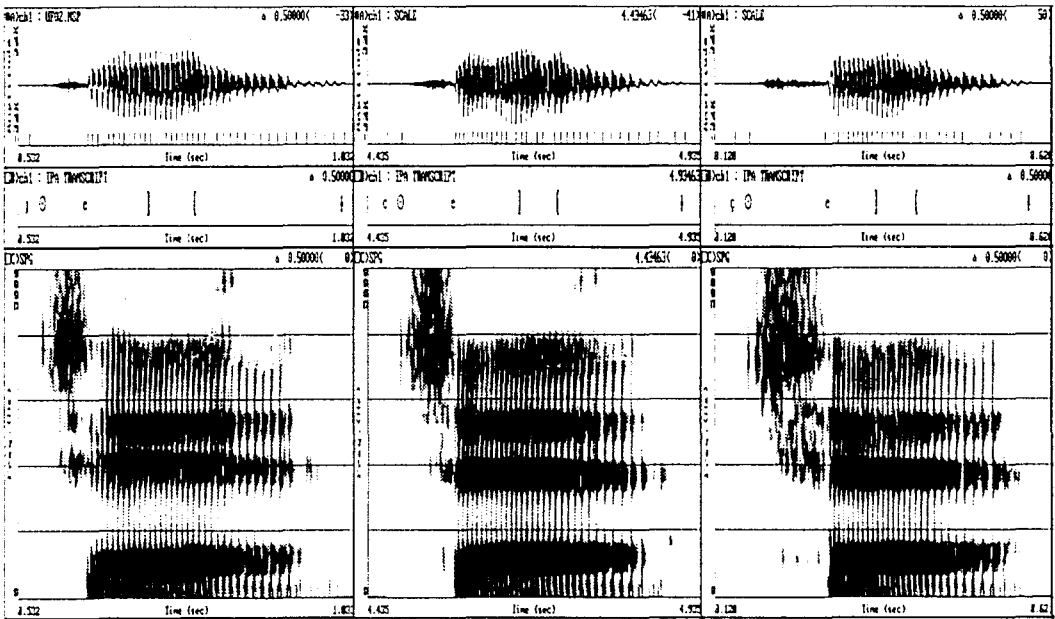


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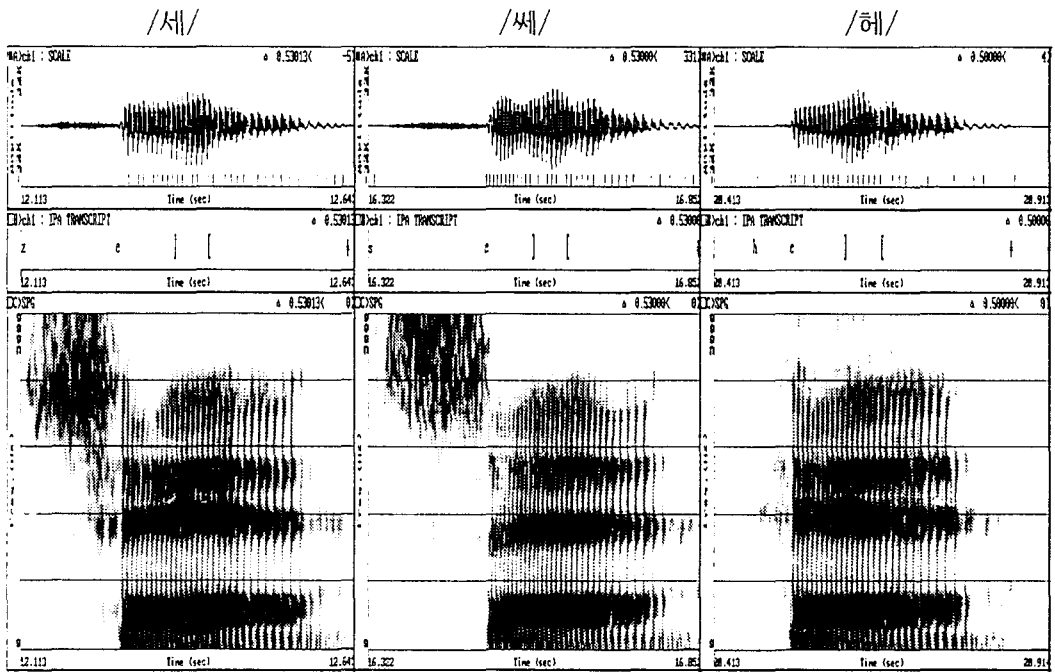
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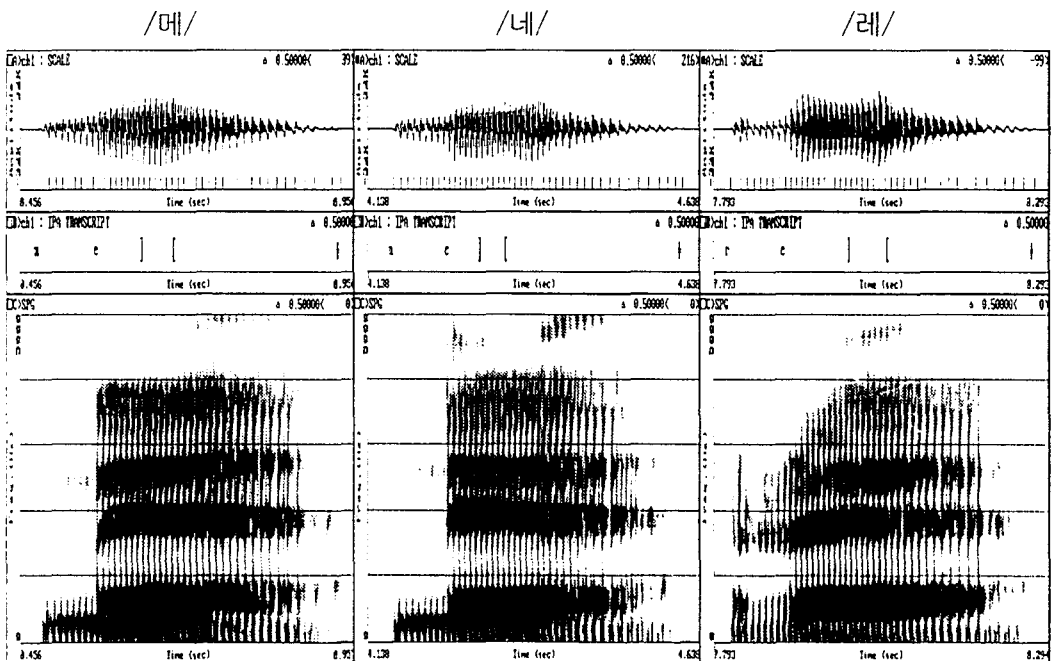
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<마찰음>



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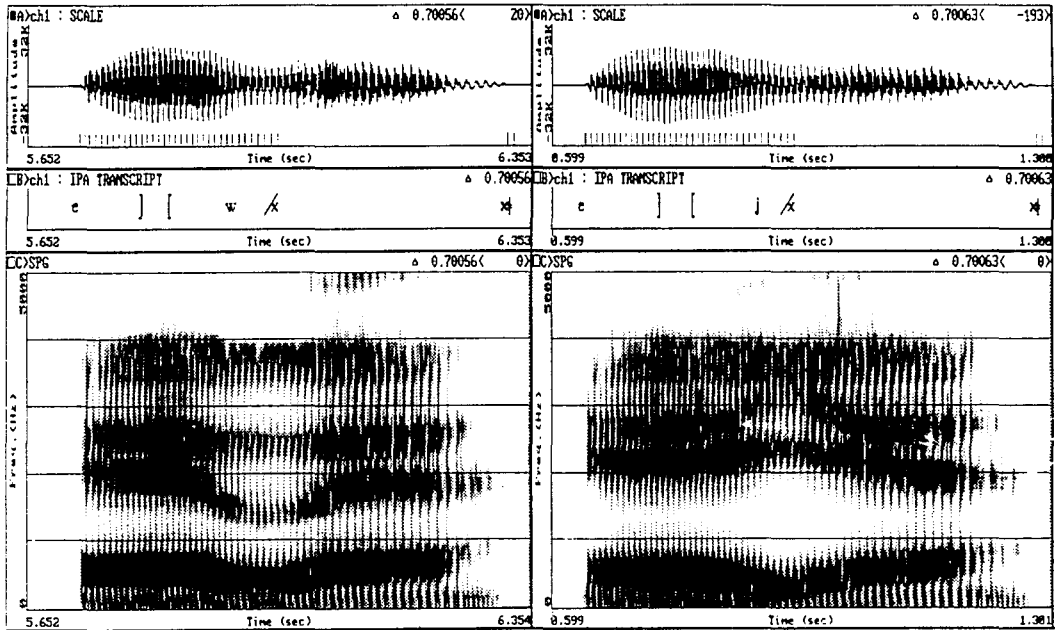


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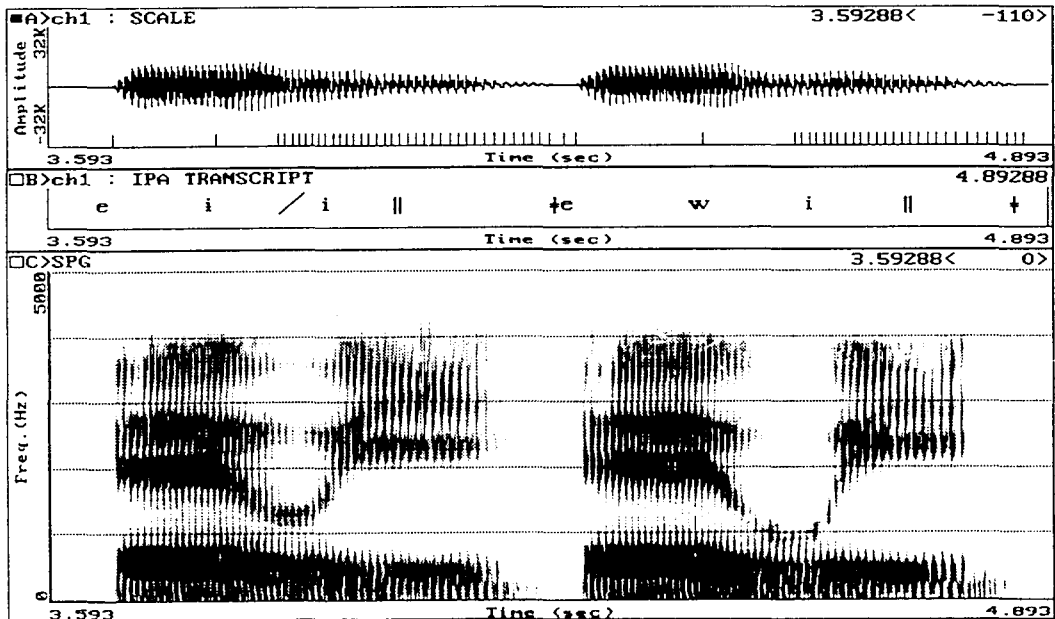
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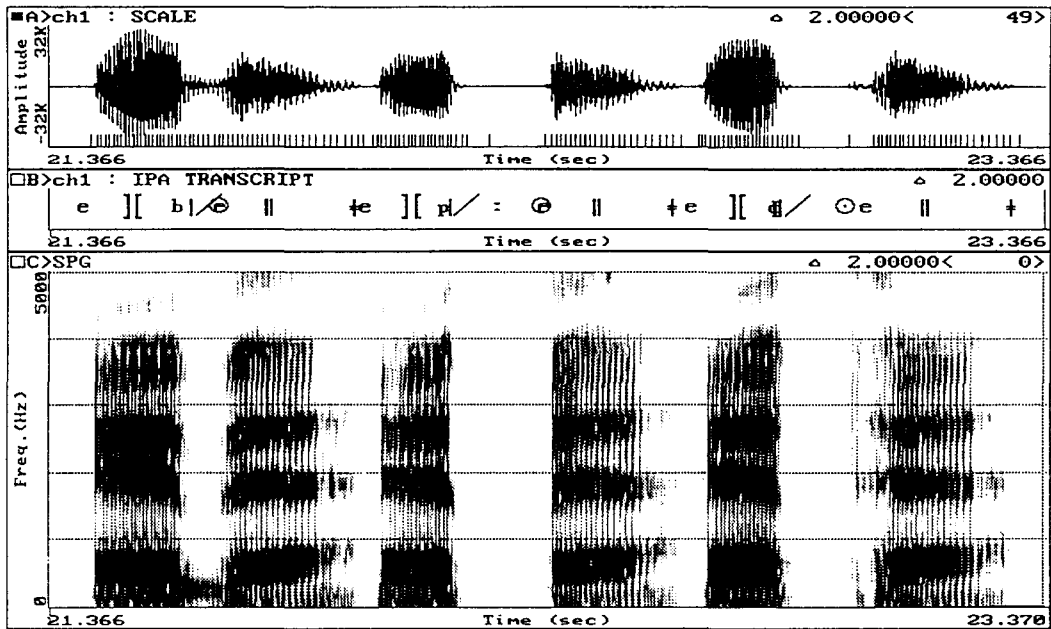
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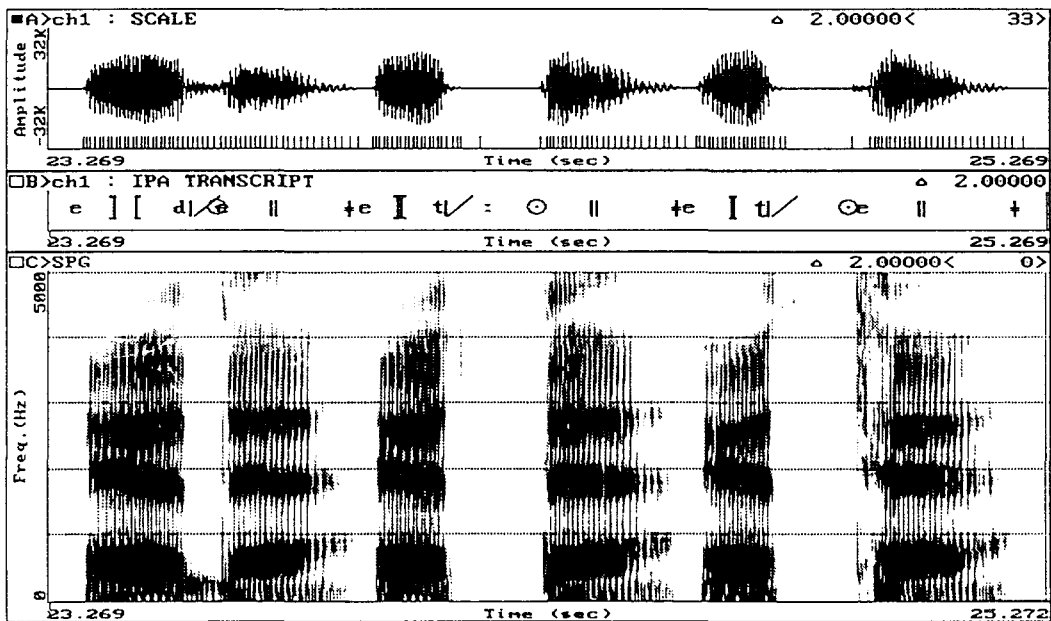


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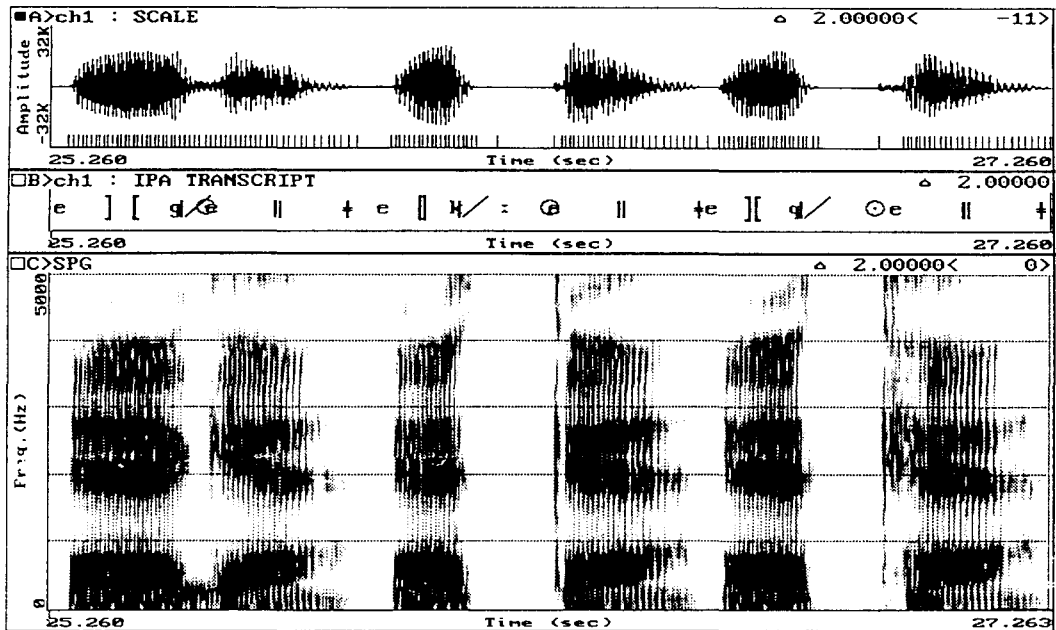
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- 치경음 /에데/ /에뎨/ /에테/

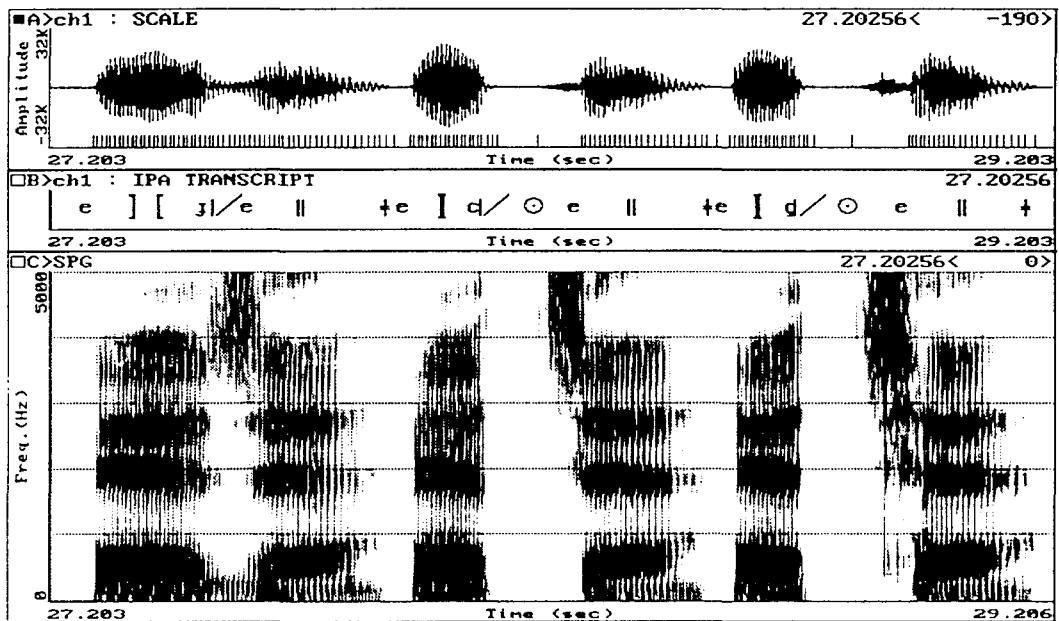


- 연구개음 /에게/ /에게/ /에게/



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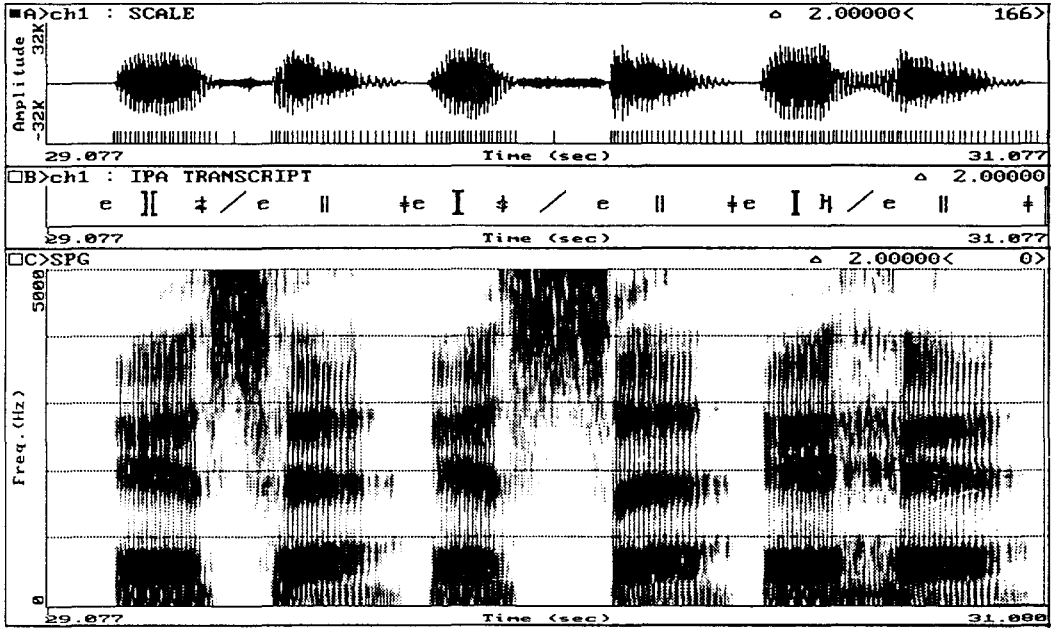


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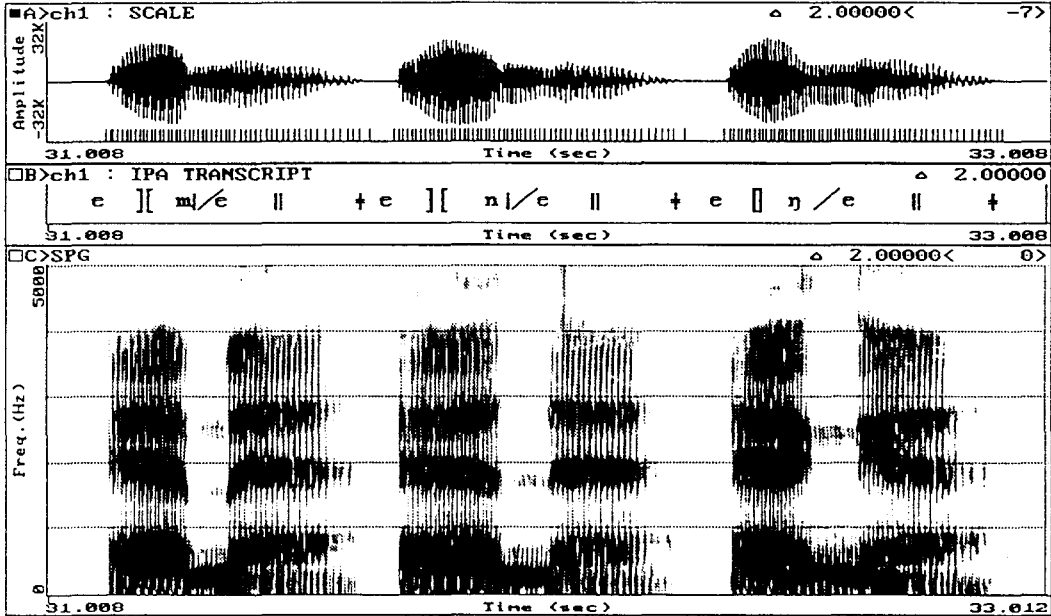


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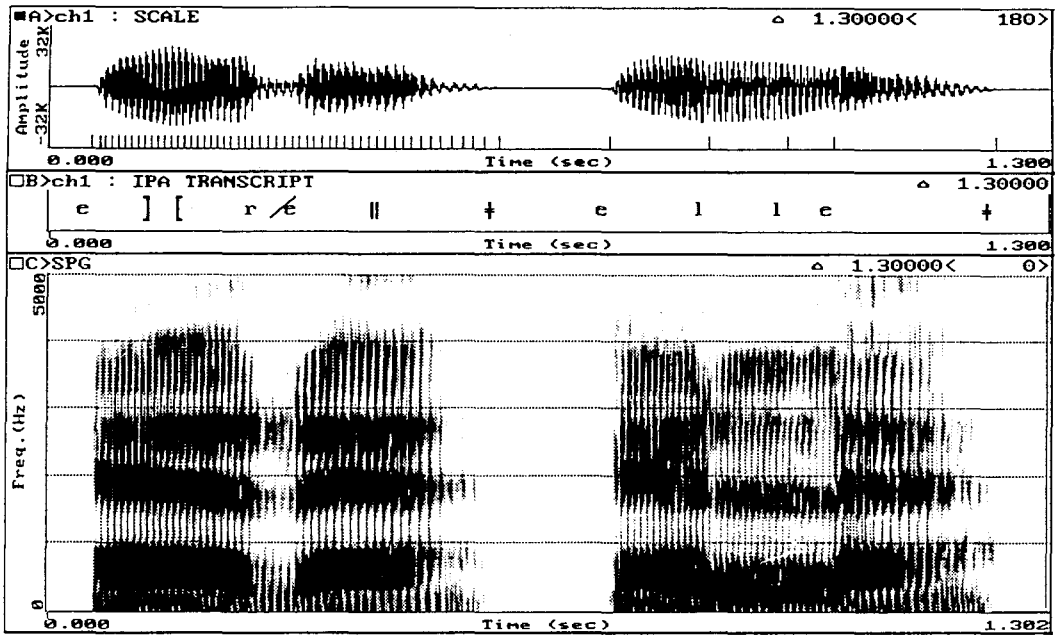
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/엘레/



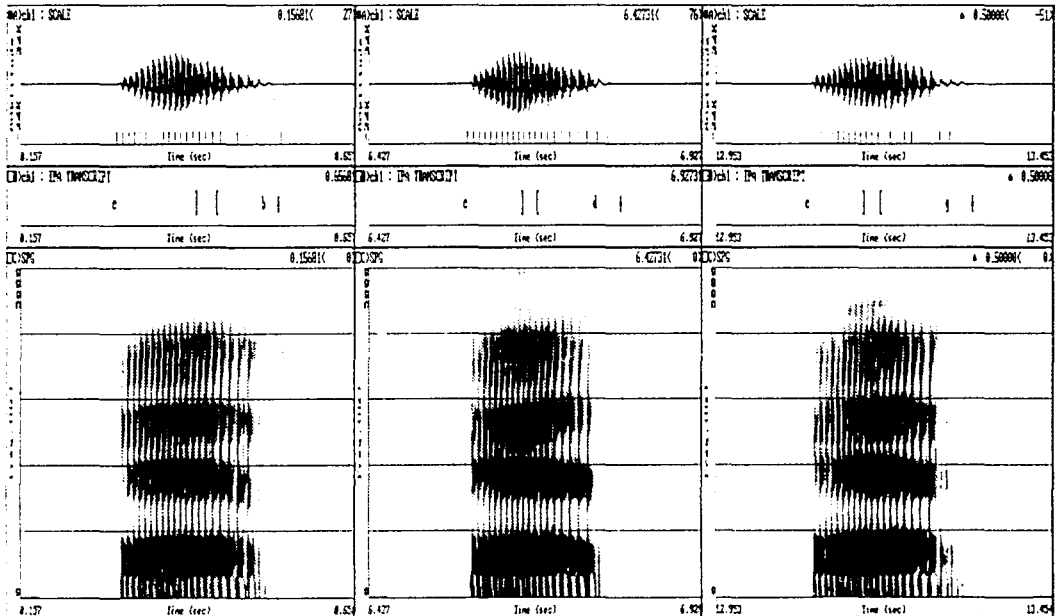
3) /모음+자음/

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/업/

/에드/

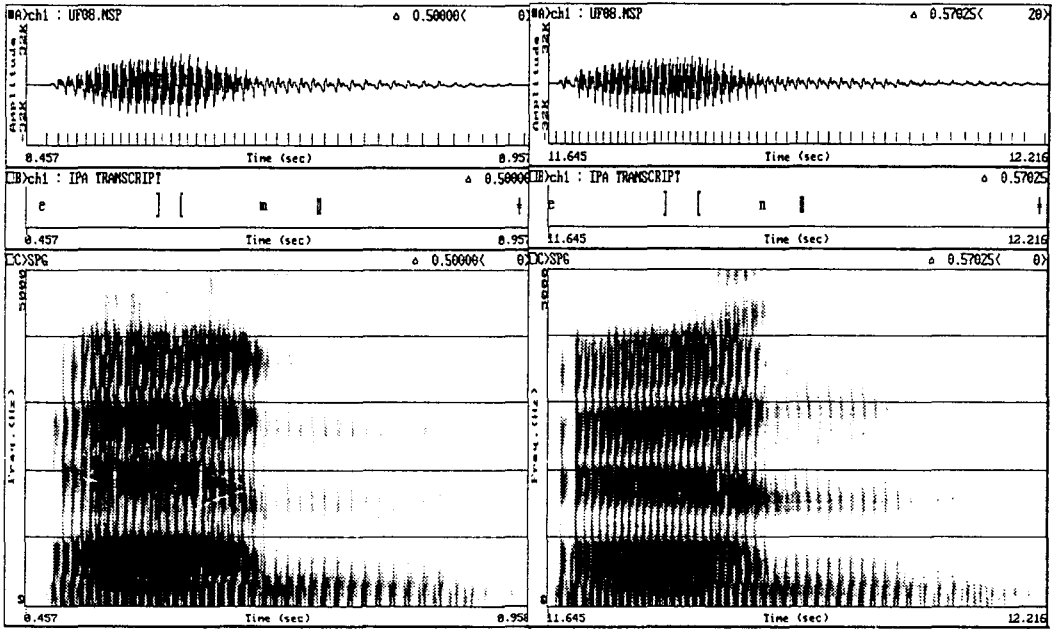
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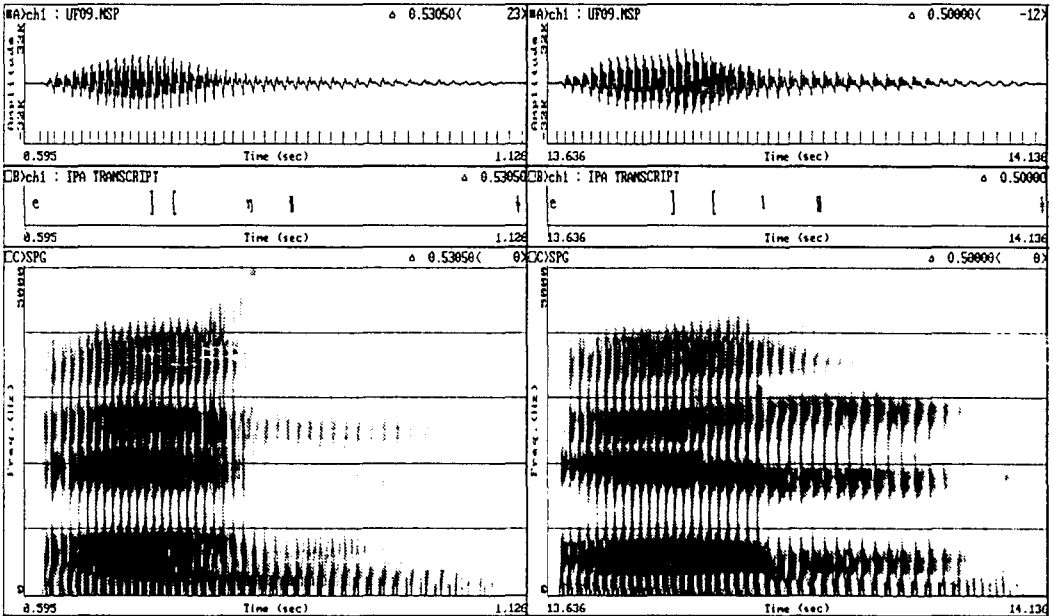
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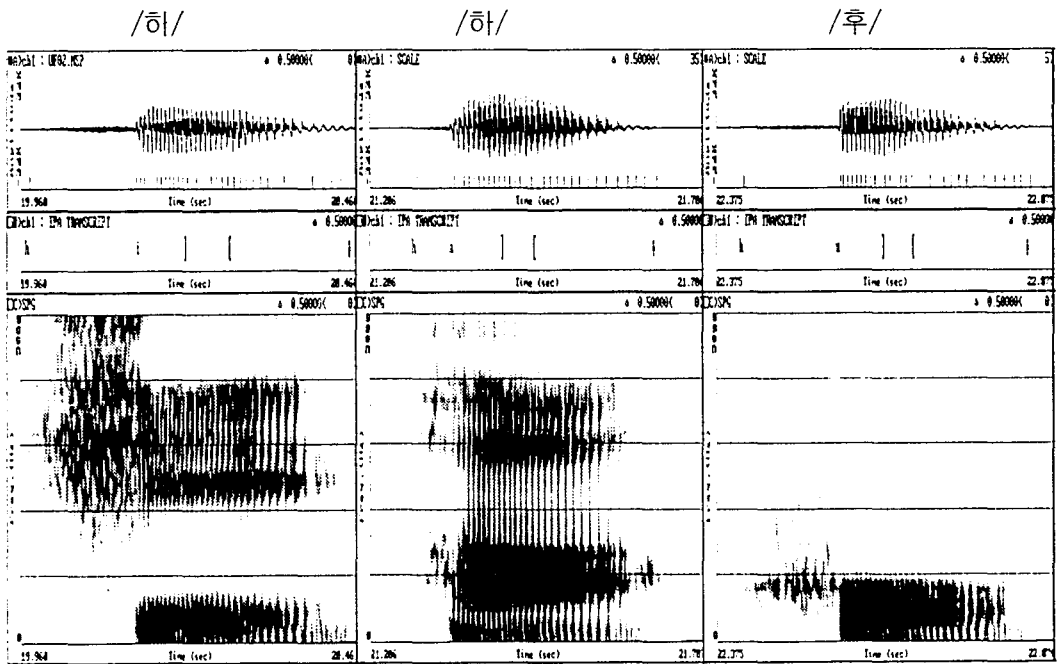
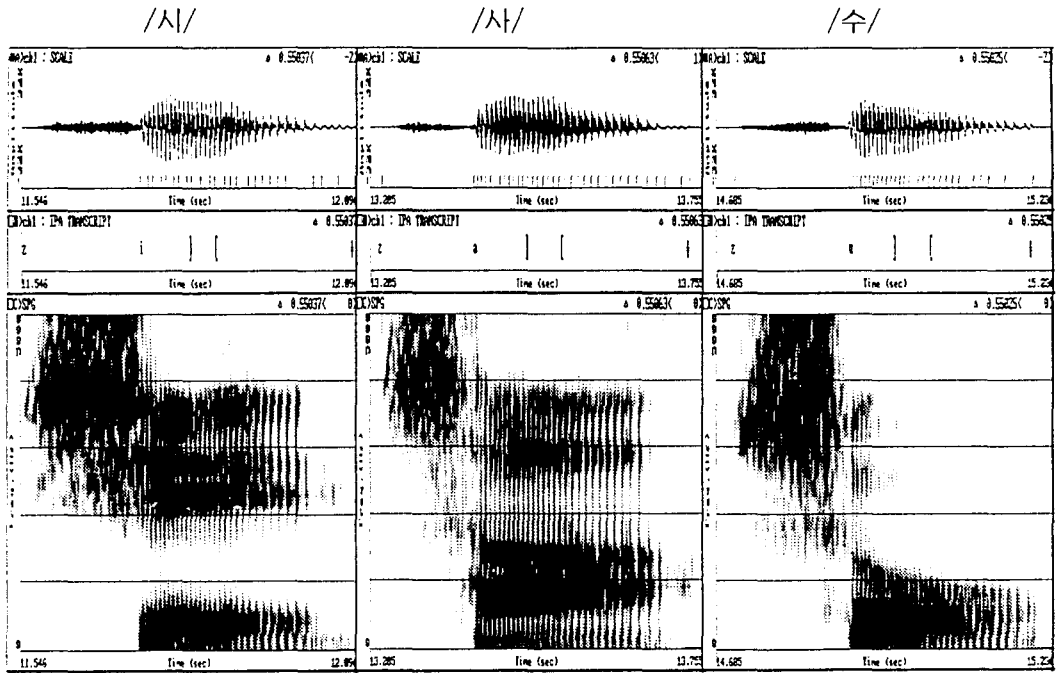


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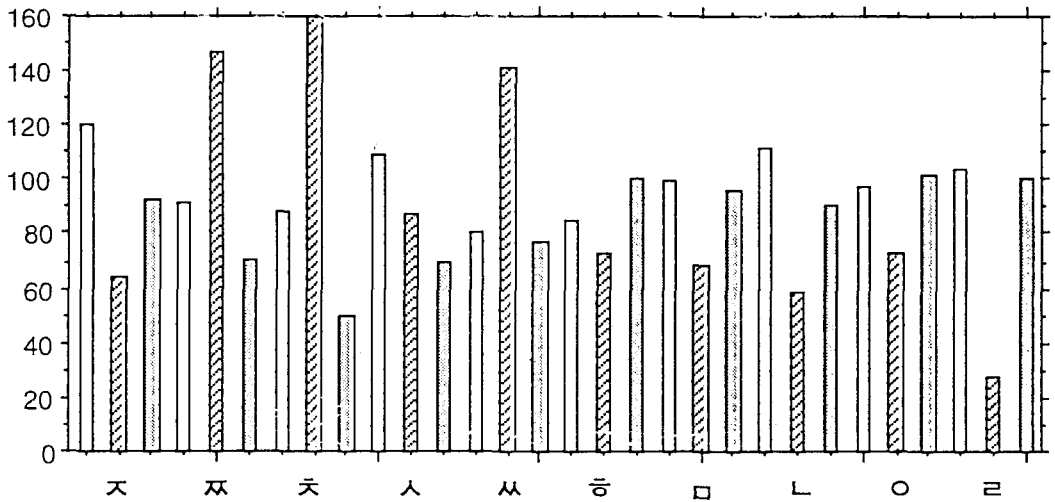
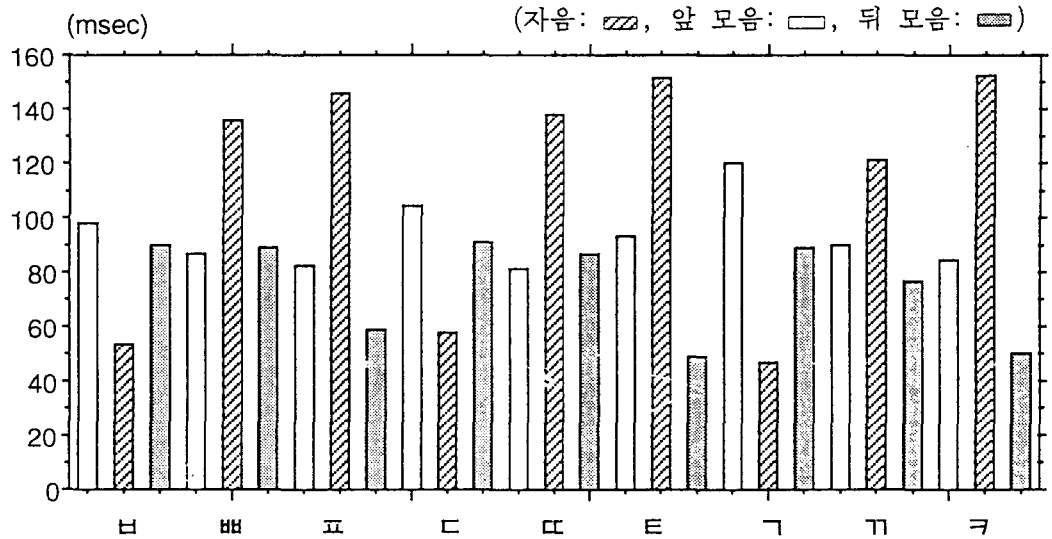
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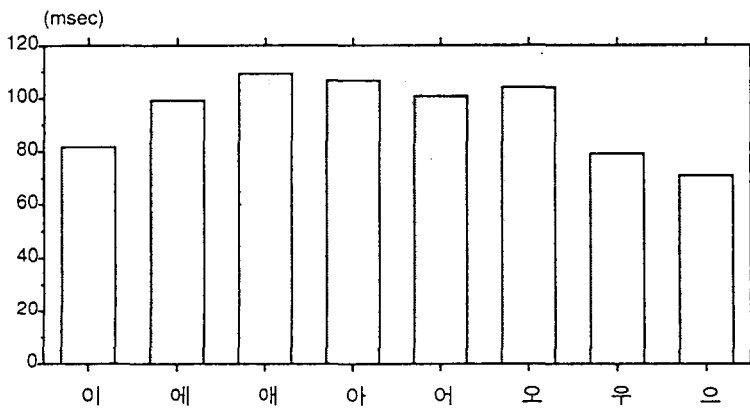
4) 동시조음



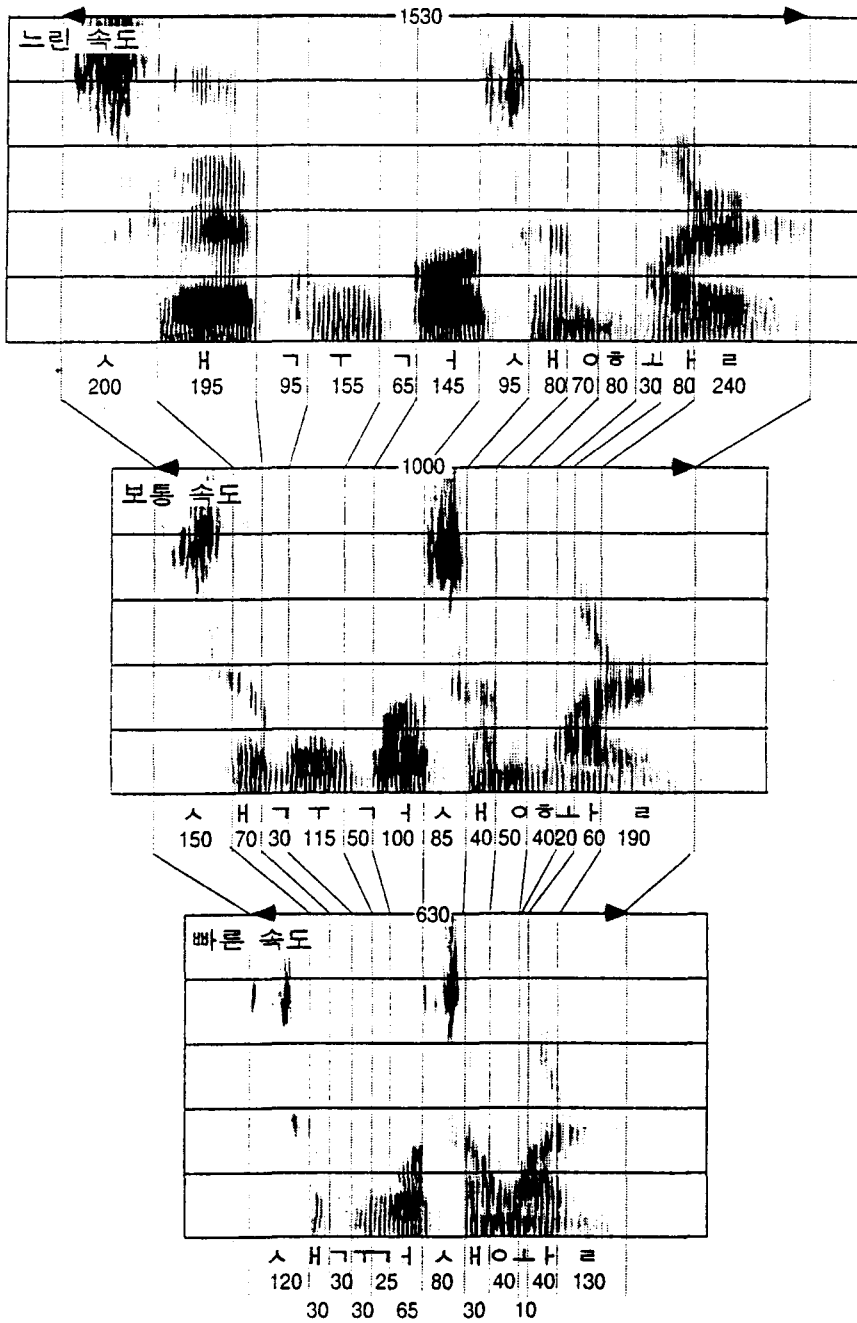
3. /모음+자음+모음/ 환경에서 우리말 자음과 앞뒤 모음의 길이



우리말 모음의 길이



발화 속도에 따른 말소리의 길이 변화



	새	국어	생활	전체
느린 속도	+ 80%	+ 23%	+ 39%	+ 53%
빠른 속도	- 41%	- 60%	- 32%	- 37%



## References

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- 2) Borden, GJ & Harris, KS : *Speech science primer*, Williams & Wilkins : Baltimore/London. 1980
- 3) Catford JC : *A practical introduction to phonetics*, Clarendon Press : Oxford. 1988
- 4) Pickett JM : *The sounds of Speech communication : A primer of acoustic phonetics and speech perception*, University Park Press ; Baltimore. 1980
- 5) Zhi M : *Studies on the Phonetic Properties of Korean Ostruents, Essay No. 10, Dept. of Phonetics, Umea Univ.* 1982
- 6) Zhi, M & Leem HB : *A Spectrographical study of Korean vowel*, Korea Journal 27-2, Korean National Commission for UNESCO. 1987
- 7) Zhi M, Leem YJ & Leem HB : *Temporal structure of Korean Plosives in/VCV/, Proceedings of SICONLP '90, Seoul. 1990*