

# Field Study News

## DuoPhone

### Improving speech understanding on the telephone

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#### Summary

For wearers of hearing instruments, using the telephone is often a major challenge. In addition to the known benefits of the CORE Platform and SoundRecover, Naída IX and Exélica Art, the new top-end hearing instruments, now offer DuoPhone with DirectTouch. For the first time DuoPhone enables binaural phone use without additional tools, thus improving speech understanding over the phone compared to conventional, monaural use. Using a speech test, this study compared speech understanding of a telephone call with DuoPhone, hearing the call with both hearing instruments, to speech understanding when hearing the call with only one instrument. The results show an improvement in speech understanding of 10-15% with DuoPhone for test persons who understand fewer than 90% of the words on the telephone monaurally.

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#### Introduction

Naída IX and Exélica Art, Phonak's new top-end hearing instruments for mild to severe hearing loss, offer DuoPhone with DirectTouch in addition to the known benefits of the CORE platform and SoundRecover. DuoPhone supports the hearing instrument wearer using both conventional wireless and cordless telephones. For phone use with CORE hearing instruments (HI) there is not only DuoPhone, but also iCom and Click'nTalk (Field Study News Click'nTalk, April 09; Field Study News iCom, July 09). DuoPhone makes using the phone much easier, because the call is heard in both ears, not just in one, as before. With DuoPhone, the wireless connection transmits the telephone signal from one HI to the other. DuoPhone is an option for an EasyPhone program or for a manual telephone program with or without DirectTouch. EasyPhone automatically activates the desired telephone program when the phone receiver is positioned near the HI and sends the signal to the opposite instrument. DirectTouch defines direction-oriented audio transmission between the HIs when program activation occurs via the tac-tronic switch.

#### DuoPhone with DirectTouch

DuoPhone is an option for any manual telephone program, definable and adjustable in iPFG. DirectTouch is an additional option which allows streaming both right and left with just one manual program with DuoPhone. Streaming direction is determined by activating the program via the instrument to

which the user holds the phone, and the signal is sent to the opposite ear.

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#### Study objective

The objective of the study is to prove that binaural telephone use with the help of DuoPhone improves speech understanding over the previous monaural method.

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#### Method

Speech understanding on the telephone was measured in quiet using various word lists that were presented over the telephone. A questionnaire was used to determine spontaneous and subjective acceptance of the feature in daily life.

#### Speech test in quiet on the telephone

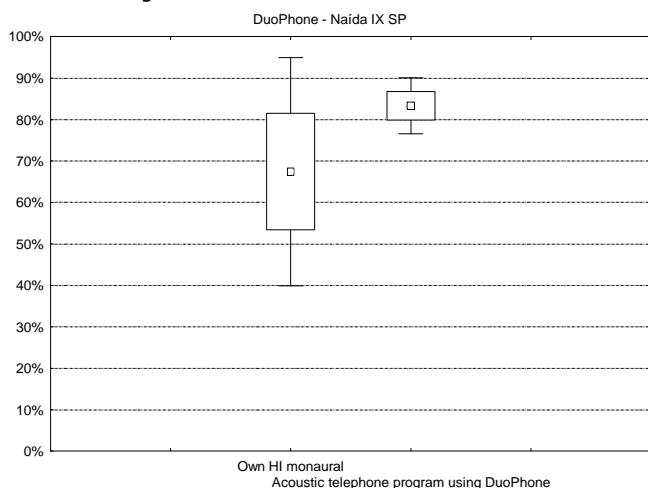
The speech test consisted of three lists, each with 22 two-syllable words, which were presented via the receiver of a conventional landline phone or via a cell phone. A PBX telephone system with the "Call Pilot" integrated voice mail system was used for this purpose. This enabled each list of the speech test to be accessed via a separate telephone number, which all the Naída IX test persons called from the same landline and all Exélica Art test persons called from the same cell phone (Sony Ericsson W760). The volume of the telephone was held constant for all measurements. Before each test list, there was a short introduction instructing the listener to repeat the words presented, and should they not understand a word, that they should simply concentrate on the next one. The introduction also gave the listener the opportunity to position the receiver for optimal speech understanding. In this study, the test was conducted with Naída IX in the acoustic telephone program using DuoPhone (binaural) and with the user's own HI in the telephone program (monaural) on a landline. The Exélica Art test persons compared the acoustic telephone program with DuoPhone to the acoustic telephone program monaurally on the cell phone.

## Test persons and hearing instruments

Twenty-six individuals took part in the study. Seven of them were equipped binaurally with Naída IX SP or UP. Nineteen were fitted binaurally with Exéla Art micro with SlimTip or ITC P. All the test persons tested DuoPhone with DirectTouch in laboratory tests and in everyday life.

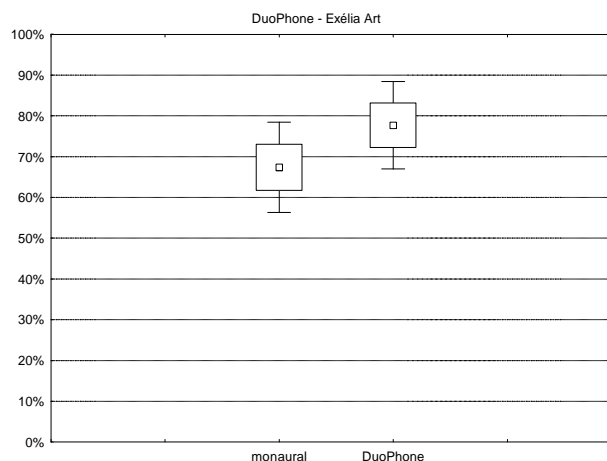
## Results

The results of the telephone speech test with Naída IX (Fig. 1) compared to the testers' own HIs showed an average of 16% improvement in speech understanding by listening with two ears using DuoPhone. In a questionnaire on their personal HIs filled out prior to the start of the study, all the test persons expressed satisfaction with their HI during telephone use. This demonstrated that in spite of their satisfaction with monaural hearing using their own HI while on the phone, binaural hearing with Naída IX and DuoPhone improved speech understanding.



**Fig. 1:** Mean values of speech understanding in % in the telephone speech test using the participant's personal hearing instrument (monaural) and Naída IX with DuoPhone (binaural). The difference in the medians showed an improvement in speech understanding with binaural hearing. The squares show the mean values, the rectangles the 25-75% confidence intervals and the bars show the ranges without measurement outliers.

The results of the telephone speech test for the persons fitted with the Exéla Art and whose monaural speech understanding over the telephone was less than 90% (n=11) showed an average improvement of 10.33% (Fig. 2) when listening binaurally with DuoPhone in quiet. The slightly lower speech understanding of the Exéla Art individuals with DuoPhone versus the Naída test persons was due to the type of telephone. Compared to the cell phone, the landline phone produces better sound quality due to its larger speaker, and the size of its receiver makes it easier to position with a Behind-the-Ear (BTE) HI.



**Fig. 2:** Mean values of speech understanding in % in the telephone speech test with the acoustic telephone program (monaural) and the acoustic telephone program with DuoPhone (binaural) with Exéla Art hearing instruments (n=11, where speech understanding < 90%). The squares show the mean values, the rectangles the 25-75% confidence intervals and the bars show the ranges without measurement outliers.

Additionally, test persons completed questionnaires on using DuoPhone in daily life. For 90% of the test persons, the sound and volume with DuoPhone was comfortable in daily use. All test persons indicated they understood everything or almost everything using DuoPhone in quiet during a telephone conversation. 75% of the test persons noticed a marked improvement with binaural telephone use with DuoPhone vs. previous telephone use with only one ear. 25% of the test persons reported no substantial difference, as their understanding on the phone with one ear was already very good (telephone test results > 90%).

## Conclusion

Particularly for persons with moderate to severe hearing loss, using the telephone has been a considerable challenge until now. With the new DuoPhone functions in the Naída IX and Exéla Art, an improvement in speech understanding while on the phone was shown. Test persons with monaural speech understanding > 90% did not report a major benefit using DuoPhone. This study addressed using the telephone in quiet only. Using the phone in a noisy environment is a far greater problem for HI wearers. Further investigation will determine if DuoPhone could prove to be beneficial under these conditions as well.

## References

- Field Study News April 09 – Click'nTalk; Phonak, M. Nyffeler
- Field Study News July 09 – iCom, Phonak, M. Nyffeler

For more information, please contact:  
bettina.stuermann@phonak.com