Effects of wide dynamic-range compression on the perceived clarity of individual musical instruments - DTU Orbit (17/12/2018)

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The effects of wide-dynamic-range compression (WDRC) on the ability of hearing-impaired subjects to hear out individual instruments or voices (called "sources") in a mixture were explored. On each trial, the subjects were asked to judge the relative clarity of the target in two repetitions of the same music excerpt (mixture of sources) that were processed in different ways. The stimuli were processed via a five-channel simulated WDRC hearing aid, using individual insertion gains and compression ratios recommended by the CAM2 fitting procedure. Both fast- and slow-acting WDRC and a condition with linear amplification and frequency-response shaping were used. To investigate the role of cross-modulation (the partial correlation of the envelopes of different sources caused by the time-varying gain applied by the compressor), conditions were included where the sounds from different sources were compressed before being added together and where the sounds were added together before being compressed. The results showed no effect of cross-modulation, lower clarity with WDRC than with linear amplification, and no significant overall effect of compression speed, although some subjects consistently rated clarity as greater with slow compression. The deleterious effect of WDRC may be related to changes in temporal-envelope shape or reduced spectral contrast produced by WDRC.

General information
State: Published
Organisations: University of Cambridge, Starkey Hearing Technologies
Contributors: Madsen, S. M. K., Stone, M. A., McKinney, M. F., Fitz, K., Moore, B. C. J.
Pages: 1867–1876
Publication date: 2015
Peer-reviewed: Yes

Publication information
Journal: Journal of the Acoustical Society of America
Volume: 137
Issue number: 4
ISSN (Print): 0001-4966
Ratings:
BFI (2018): BFI-level 2
Web of Science (2018): Indexed yes
BFI (2017): BFI-level 2
Scopus rating (2017): CiteScore 1.77 SJR 0.695 SNIP 1.224
Web of Science (2017): Impact factor 1.605
Web of Science (2017): Indexed yes
BFI (2016): BFI-level 2
Scopus rating (2016): CiteScore 1.83 SJR 0.819 SNIP 1.271
Web of Science (2016): Impact factor 1.547
Web of Science (2016): Indexed yes
BFI (2015): BFI-level 2
Scopus rating (2015): CiteScore 1.77 SJR 0.854 SNIP 1.416
Web of Science (2015): Impact factor 1.572
Web of Science (2015): Indexed yes
BFI (2014): BFI-level 2
Scopus rating (2014): CiteScore 1.8 SJR 0.887 SNIP 1.402
Web of Science (2014): Impact factor 1.503
Web of Science (2014): Indexed yes
BFI (2013): BFI-level 2
Scopus rating (2013): CiteScore 2 SJR 0.707 SNIP 1.937
Web of Science (2013): Impact factor 1.555
ISI indexed (2013): ISI indexed yes
Web of Science (2013): Indexed yes
BFI (2012): BFI-level 2
Scopus rating (2012): CiteScore 1.75 SJR 0.771 SNIP 1.619
Web of Science (2012): Impact factor 1.646
ISI indexed (2012): ISI indexed yes
Web of Science (2012): Indexed yes