Principal Researcher	Yoshitaka Nakajima	Number ofResearchers	6
Research Institution · Department · Title	Professor, Department of Acoustic Design, Kyushu Institute ofDesign	Location of Institution	Fukuoka

Title ofProject	Auditory Grammar:Organization of Speechand Nonspeech
Abstract of ResearchProject	Auditoryorganizationseemstobegovernedbyasimplegrammarthatdetermineshow'auditorysubevents',i.e.,onsets, terminations,fillings, and silences, are connected to make auditory events andauditorystreams,whichare fundamental units ofauditorypercepts.Ourhypothesis,whichisthebasisofthisresearchproject,isthatthisauditorygrammarserves as the universal framework of phonological systems. We are particularly interestedin whetheritispossibletointroduce the ideasoftheSwisslinguistFerdinanddeSaussure,whomadeit clear thatanyphonological system isbasedonour auditory perception. What he calls 'syllables' areveryclose to what wecall'auditoryevents', and a prototype of our auditorygrammar seemstobedescribedinoneofhischapters.Ourultimategoalistofindacorrespondencebetweenthe principles of auditory organization and phonological and linguistic grammars. Gestalt principles in general should be examinedand modifiedtocoverlinguisticmaterials.Inordertoinvestigatethenatureoftheauditorygrammar,wetake up an auditory illusion that wecall the 'gap transfer illusion'. Yoshitaka Nakajima and Takayuki Sasaki, who areboth workingonthepresentresearchproject,reportedthisillusionin1993.Inatypicalsituation,anascendingfrequencyglide of2500mswithatemporalgapof100msinthemiddleandacontinuouslydescendingfrequencyglideof500mscross eachotherattheirtemporalcenters. Thegapinthelongglideisperceivedasifitwereintheshortglide. The same kind ofillusionalso takes place whenthis stimulus patternisreversedin time.Theillusorytransferofthetemporalgap can beexplained if weassumethatanonset and a terminationof different sounds can be recoupled subjectively when theyareinthisorderintimeandclosetoeachotherintimeandfrequency.Thiswasthestartingpointforestablishing ourbasicideaoftheauditorygrammar. Nowweareplanningtogenerate some variations of these stimuluspatterns utilizing speech-like sounds so thattheperceptual detectionof a temporal gapcanberelatedtotheperceptionofstop consonants.Weareinterested in whethertheorganizationprinciplesintheperceptionofvarious typesofconsonantsare reflectedinthephonologicalconstraintsonspeechcommunication.
References	Nakajima, Y., Sasaki, T., Kanafuka, K.,etal. (2000). Illusory recouplings of onsets and terminations of glide tone components. Perception & Psychophysics, 62, 1413-1425. Sasaki, T., Suetomi, D., Nakajima, Y.,andtenHoopen,G. (in press). Time-shrinking, its propagation, and Gestalt principles. Perception & Psychophysics.
Term of Project	Fiscal years 2002-2006. (5years)

Budget Allocation (inthousandofyen)	FY2002	FY2003	FY2004	FY2005	FY2006	TOTAL
	40,000	5,900	10,300	5,900	8,300	70,400

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