

The Role of Chunk Strength and Grammaticality in Affecting Learning of an Artificial Grammar

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The artificial grammar learning (AGL) paradigm has been used for decades to investigate the ability to implicitly learn structured patterns in the environment (Reber, 1967). Two types of information are known to influence learning: grammaticality (the extent that sequences are consistent with the rules of the grammar) and chunk strength (surface similarity to previously observed exemplars). To further investigate the role of these two types of information on learning, we administered the AGL task to eighteen participants (18–33 years old). During *Training*, participants were instructed to reproduce symbol sequences generated from an artificial grammar; during *Test*, participants had to decide whether new sequences followed the grammar or not. Apart from *grammatical*, sequences could also have high or low *chunk strength* (CS; a measure of a test item's surface similarity to training sequences). Thus, sequences fell into four conditions: Grammatical – High chunk strength (**GH**), Grammatical – Low chunk strength (**GL**), Non-Grammatical – High chunk strength (**NGH**), and Non-Grammatical – Low chunk strength (**NGL**). Findings revealed a statistically significant main effect for grammaticality [$F(1,17)=23.777$; $p<.001$; $\eta^2=.583$] and CS [$F(1,17)=6.026$; $p=.025$; $\eta^2=.262$]. This was qualified by a significant interaction of grammaticality x CS [$F(1,17)=28.504$; $p<.001$; $\eta^2=.626$]. For the main effect of grammaticality, there was a statistically significant difference [$t(17) = 5.315$; $p <.001$] between NGH ($M=19.61$; $SD=5.393$) and NGL ($M=13.44$; $SD=3.823$); but the difference between GH ($M=19.61$; $SD=4.767$) and GL ($M=21.89$; $SD=4.600$) was non-significant [$t(17) = -2.195$; $p =.042$]. Additionally, for CS the difference between GL and NGL was statistically significant [$t(17) = 6.251$; $p<.001$]; but the difference between GH and NGH was not [$t(17) = .172$; $p =.865$]. Consistent with previous research, both grammaticality and CS influenced participants' learning. *Test* endorsements were higher for items high in CS or grammaticality (or both) and lower for items that were both non-grammatical and low in CS.