

Supplementary material:

Auditory Stimuli Degrade Visual Performance in Virtual Reality

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This document offers additional information and details on the following topic:

- Additional details on the statistical analysis (Results Section in the paper).

A Additional details on the statistical analysis

In the following section we provide additional information about the generalized linear mixed models (GLMM) used to analyze the statistical influence of the studied factors (target shape, sound type, sound location, target location as fixed-effects; subject ID as a random-effect) in the collected data from our experiments (two response variables, detection and recognition, binary and categorical respectively). We used Matlab `fitglm` function with the `logit` link function.

Baseline detection

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Fixed effects coefficients (95% CIs):									
Name	Estimate	SE	tStat	DF	pValue	Lower	Upper		
'(Intercept)'	1.9717	0.327	6.0295	334	4.3555e-09	1.3284	2.6149		
'target shape'	-0.058613	0.11778	-0.49763	334	0.61907	-0.2903	0.17308		
'target position'	0.12855	0.20748	0.61959	334	0.53595	-0.27957	0.53667		
Random effects covariance parameters:									
Group: userID (7 Levels)									
Name1	Name2	Type	Estimate						
'(Intercept)'	'(Intercept)'	'std'	8.5405e-05						
Group: Error									
Name	Estimate								
'sqrt(Dispersion)'	1								

Baseline recognition

Fixed effects coefficients (95% CIs):

Name	Estimate	SE	tStat	DF	pValue	Lower	Upper
'(Intercept)'	1.4481	0.27554	5.2556	293	2.8465e-07	0.90583	1.9904
'target shape'	-0.31148	0.093721	-3.3235	293	0.0010019	-0.49593	-0.12703
'target location'	0.070501	0.16242	0.43407	293	0.66456	-0.24915	0.39015

Random effects covariance parameters:

Group: userID (7 Levels)

Name1	Name2	Type	Estimate
'(Intercept)'	'(Intercept)'	'std'	5.3984e-13

Group: Error

Name	Estimate
'sqrt(Dispersion)'	1

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visCond detection

Fixed effects coefficients (95% CIs):
Name      Estimate    SE      tStat    DF      pValue    Lower    Upper
'(Intercept)'  1.4908  0.22253  6.6992  787    3.9913e-11  1.054    1.9276
'target shape' -0.020626  0.06605 -0.31228 787    0.75491    -0.15028  0.10903
'target location' 0.021187  0.11443  0.18516 787    0.85315    -0.20343  0.2458

Random effects covariance parameters:
Group: userID (44 Levels)
Name1      Name2      Type      Estimate
'(Intercept)' '(Intercept)' 'std'      0.77266

Group: Error
Name      Estimate
'sqrt(Dispersion)' 1
  
```

visCond recognition

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Fixed effects coefficients (95% CIs):							
Name	Estimate	SE	tStat	DF	pValue	Lower	Upper
'(Intercept)'	0.29588	0.23095	1.2811	787	0.20052	-0.15747	0.74923
'target shape'	-0.2487	0.058297	-4.2662	787	2.2307e-05	-0.36314	-0.13427
'target location'	-0.068519	0.10075	-0.68011	787	0.49663	-0.26628	0.12925
Random effects covariance parameters:							
Group: userID (44 Levels)							
Name1	Name2	Type	Estimate				
'(Intercept)'	'(Intercept)'	'std'	1.0773				
Group: Error							
Name	Estimate						
'sqrt(Dispersion)'	1						

biCond detection

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Fixed effects coefficients (95% CIs):							
Name	Estimate	SE	tStat	DF	pValue	Lower	Upper
'(Intercept)'	-1.4579	0.27886	-5.228	787	2.1003e-07	-2.0052	-0.91066
'target shape'	0.0011929	0.060857	0.019601	787	0.98437	-0.11823	0.12062
'sound type'	0.070458	0.051477	-1.3687	787	0.1714	-0.17148	0.030561
'sound location'	0.12425	0.1084	1.1462	787	0.25201	-0.088484	0.33698
'target location'	-0.12446	0.10836	-1.1485	787	0.25103	-0.33711	0.088195
Random effects covariance parameters:							
Group: userID (44 Levels)							
Name1	Name2	Type	Estimate				
'(Intercept)'	'(Intercept)'	'std'	0.09101				
Group: Error							
Name	Estimate						
'sqrt(Dispersion)'	1						

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biCond recognition

Fixed effects coefficients (95% CIs):							
Name	Estimate	SE	tStat	DF	pValue	Lower	Upper
'(Intercept)'	-4.5449	0.86972	-5.2257	613	2.3814e-07	-6.2529	-2.8369
'target shape'	-0.31147	0.26125	-1.1922	613	0.23364	-0.82453	0.20159
'sound type'	0.65811	0.4836	1.481	613	0.04813	0.08524	1.3215
'sound location'	0.16714	0.17433	0.95874	613	0.33807	-0.17522	0.5095
'target location'	-0.081096	0.35234	-0.23017	613	0.81804	-0.77303	0.61084
Random effects covariance parameters:							
Group: userID (44 Levels)							
Name1	Name2	Type	Estimate				
'(Intercept)'	'(Intercept)'	'std'	0.00012517				
Group: Error							
Name	Estimate						
'sqrt(Dispersion)'	1						