The title

The title

## Warning: package 'dplyr' was built under R version 3.6.2

## Warning: package 'tidyr' was built under R version 3.6.2

## Warning: package 'purrr' was built under R version 3.6.2

## Warning: package 'ggplot2' was built under R version 3.6.2

## Warning: package 'broom' was built under R version 3.6.2

## Warning: package 'broom.mixed' was built under R version 3.6.2

## Warning in checkMatrixPackageVersion(): Package version inconsistency detected.  
## TMB was built with Matrix version 1.2.18  
## Current Matrix version is 1.2.17  
## Please re-install 'TMB' from source using install.packages('TMB', type = 'source') or ask CRAN for a binary version of 'TMB' matching CRAN's 'Matrix' package

## Warning: package 'TMB' was built under R version 3.6.2

## Warning: package 'lme4' was built under R version 3.6.2

## Warning: package 'AICcmodavg' was built under R version 3.6.2

## Warning: package 'patchwork' was built under R version 3.6.2

# Cognition article (stress, natives and late advanced and intermediate EN y Ma Ch,

# movement anticipation through vision and visuospatial WM

## Overview

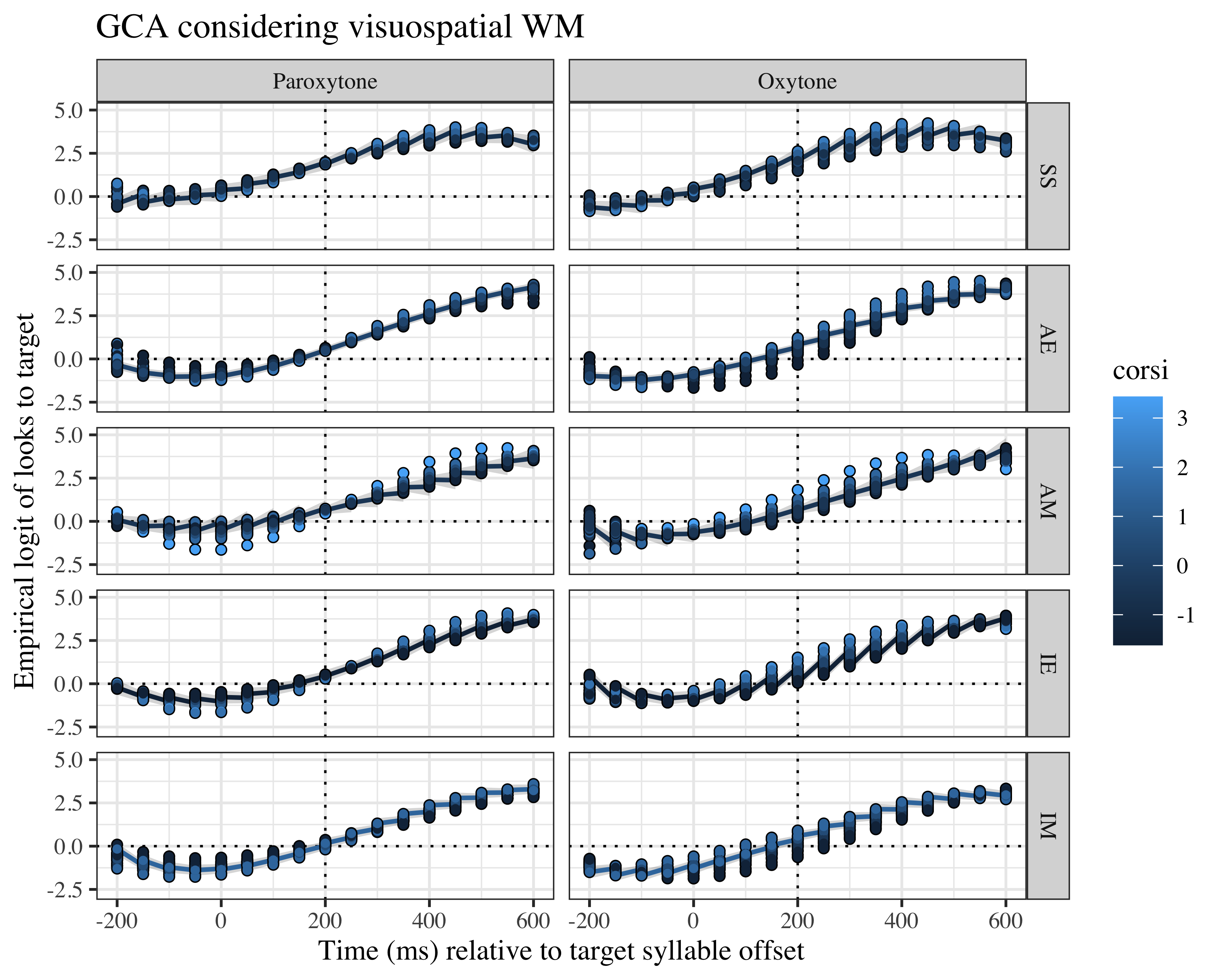
This document contains updates to the statistical analysis for vision experiment. Last updated on 2020-12-03. The results section can be copied and pasted into the corresponding google doc. The tables can also be copy and pasted where appropriate.

## Main changes

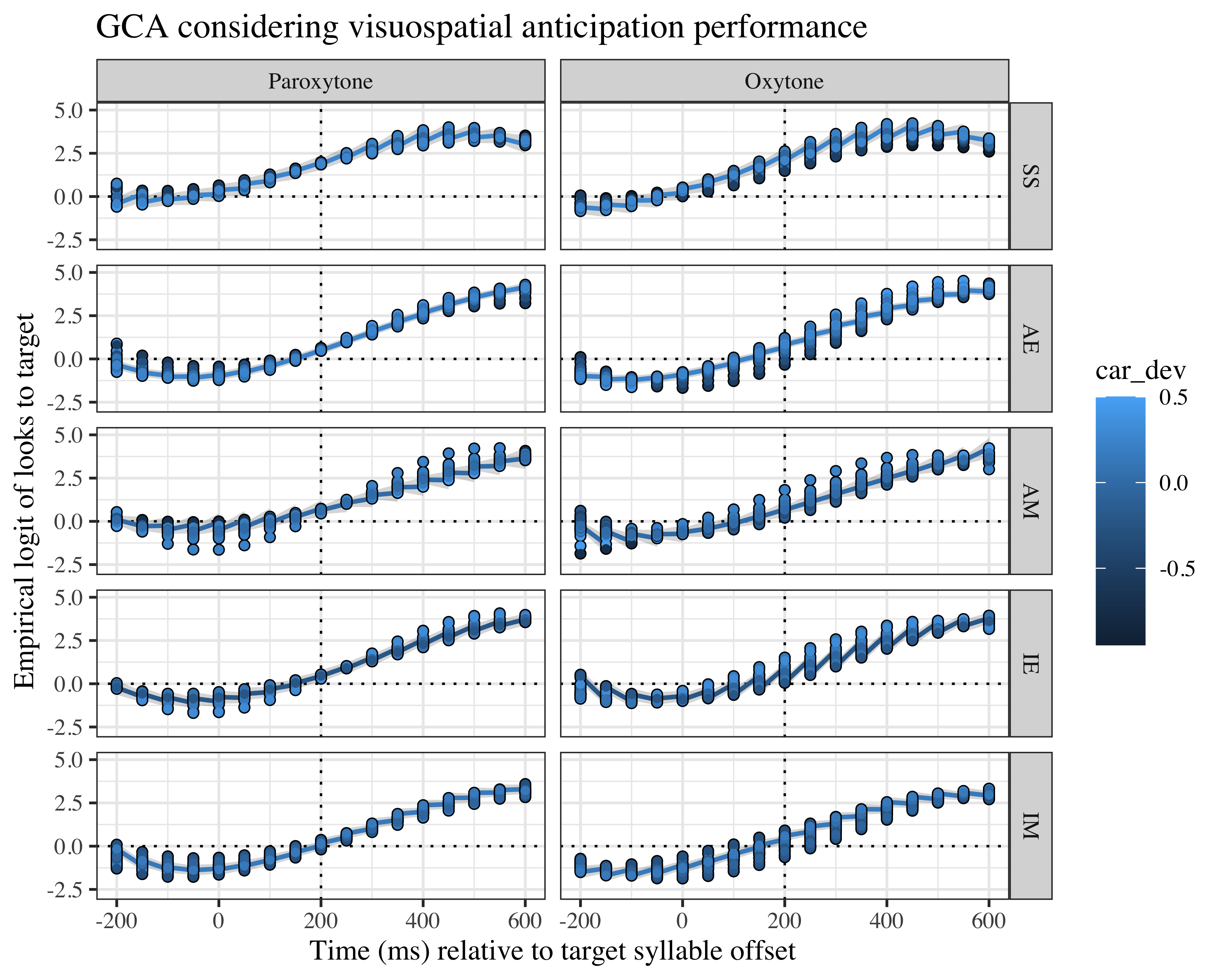
**Participants**

**Analyses**

# Plots



*Figure* *1:*. Growth curve estimates of target fixations as a function of visuospatial WM for each group and lexical stress pattern during the analysis window. Symbols and lines represent model estimates, and the transparent ribbons represents ±SE. Empirical logit values on y-axis correspond to proportions of 0.12, 0.50, 0.88, and 0.98. The horizontal dotted line represents the 50% probability of fixating on the target. The vertical dotted line indicates 200 ms after the offset of the target syllable.



*Figure* *2:*. Growth curve estimates of target fixations as a function of visuospatial anticipatory abilities for each group and lexical stress pattern during the analysis window. Symbols and lines represent model estimates, and the transparent ribbons represents ±SE. Empirical logit values on y-axis correspond to proportions of 0.12, 0.50, 0.88, and 0.98. The horizontal dotted line represents the 50% probability of fixating on the target. The vertical dotted line indicates 200 ms after the offset of the target syllable.

# Tables

## Model estimates at target syllable offset

Table 1:

| Group | Lexical stress | Visual pred. | Visuospatial WM | Probability | LB | UB |
| --- | --- | --- | --- | --- | --- | --- |
| AM | paroxytone | -0.2227241915 | -1.4705882 | 0.6545375 | 0.5770562 | 0.7245989 |
|  | paroxytone | -0.1167591509 | -1.4705882 | 0.6577553 | 0.5908377 | 0.7189348 |
|  | paroxytone | -0.0192732711 | -1.4705882 | 0.6607028 | 0.5982931 | 0.7179867 |
|  | paroxytone | 0.1765968254 | -1.4705882 | 0.6665872 | 0.5957667 | 0.7306106 |
|  | paroxytone | 0.4674001817 | -1.4705882 | 0.6752285 | 0.5639941 | 0.7696738 |
|  | paroxytone | -0.4360777680 | -0.4901961 | 0.6526122 | 0.5814809 | 0.7175270 |
|  | paroxytone | -0.2935026084 | -0.4901961 | 0.6536058 | 0.5919647 | 0.7104890 |
|  | paroxytone | -0.2849874686 | -0.4901961 | 0.6536651 | 0.5924994 | 0.7101412 |
|  | paroxytone | -0.1912532275 | -0.4901961 | 0.6543175 | 0.5975543 | 0.7070001 |
|  | paroxytone | -0.1337108184 | -0.4901961 | 0.6547177 | 0.5998142 | 0.7057834 |
|  | paroxytone | -0.1032471901 | -0.4901961 | 0.6549295 | 0.6007234 | 0.7053857 |
|  | paroxytone | -0.0118563050 | -0.4901961 | 0.6555645 | 0.6021823 | 0.7052892 |
|  | paroxytone | 0.0110344909 | -0.4901961 | 0.6557235 | 0.6022433 | 0.7055289 |
|  | paroxytone | 0.0808364445 | -0.4901961 | 0.6562080 | 0.6016853 | 0.7069030 |
|  | paroxytone | 0.1827808662 | -0.4901961 | 0.6569150 | 0.5989844 | 0.7105215 |
|  | paroxytone | 0.1877253148 | -0.4901961 | 0.6569493 | 0.5988013 | 0.7107407 |
|  | paroxytone | 0.4528233836 | -0.4901961 | 0.6587846 | 0.5836356 | 0.7267209 |
|  | paroxytone | -0.2441089246 | 0.4901961 | 0.6540129 | 0.5947616 | 0.7088418 |
|  | paroxytone | -0.2300487884 | 0.4901961 | 0.6537803 | 0.5951552 | 0.7080801 |
|  | paroxytone | -0.2297884155 | 0.4901961 | 0.6537760 | 0.5951622 | 0.7080662 |
|  | paroxytone | -0.1756308540 | 0.4901961 | 0.6528797 | 0.5963773 | 0.7053800 |
|  | paroxytone | 0.0529779496 | 0.4901961 | 0.6490842 | 0.5954068 | 0.6992375 |
|  | paroxytone | 0.0574028842 | 0.4901961 | 0.6490105 | 0.5952827 | 0.6992098 |
|  | paroxytone | 0.4115493727 | 0.4901961 | 0.6430930 | 0.5740291 | 0.7066811 |
|  | paroxytone | -0.7330763466 | 1.4705882 | 0.6733786 | 0.5155954 | 0.7997304 |
|  | paroxytone | -0.0410180689 | 1.4705882 | 0.6459026 | 0.5824170 | 0.7046312 |
|  | paroxytone | 0.0261867775 | 1.4705882 | 0.6431788 | 0.5809701 | 0.7009066 |
|  | paroxytone | 0.1208119741 | 1.4705882 | 0.6393279 | 0.5744908 | 0.6994538 |
|  | paroxytone | 0.1632693508 | 1.4705882 | 0.6375941 | 0.5699905 | 0.7001604 |
|  | paroxytone | 0.2329733848 | 3.4313725 | 0.6116116 | 0.4826803 | 0.7266099 |
|  | oxytone | -0.2227241915 | -1.4705882 | 0.5527161 | 0.4743178 | 0.6285781 |
|  | oxytone | -0.1167591509 | -1.4705882 | 0.5708472 | 0.5026393 | 0.6364664 |
|  | oxytone | -0.0192732711 | -1.4705882 | 0.5873624 | 0.5237842 | 0.6481542 |
|  | oxytone | 0.1765968254 | -1.4705882 | 0.6199235 | 0.5493698 | 0.6857496 |
|  | oxytone | 0.4674001817 | -1.4705882 | 0.6662704 | 0.5603847 | 0.7576806 |
|  | oxytone | -0.4360777680 | -0.4901961 | 0.6016907 | 0.5307140 | 0.6686350 |
|  | oxytone | -0.2935026084 | -0.4901961 | 0.6205802 | 0.5591972 | 0.6783325 |
|  | oxytone | -0.2849874686 | -0.4901961 | 0.6216975 | 0.5608043 | 0.6789809 |
|  | oxytone | -0.1912532275 | -0.4901961 | 0.6339091 | 0.5776491 | 0.6867391 |
|  | oxytone | -0.1337108184 | -0.4901961 | 0.6413224 | 0.5871431 | 0.6921201 |
|  | oxytone | -0.1032471901 | -0.4901961 | 0.6452202 | 0.5918853 | 0.6951747 |
|  | oxytone | -0.0118563050 | -0.4901961 | 0.6567969 | 0.6048781 | 0.7052183 |
|  | oxytone | 0.0110344909 | -0.4901961 | 0.6596682 | 0.6078395 | 0.7079383 |
|  | oxytone | 0.0808364445 | -0.4901961 | 0.6683509 | 0.6161620 | 0.7167064 |
|  | oxytone | 0.1827808662 | -0.4901961 | 0.6808277 | 0.6265370 | 0.7306194 |
|  | oxytone | 0.1877253148 | -0.4901961 | 0.6814265 | 0.6269914 | 0.7313218 |
|  | oxytone | 0.4528233836 | -0.4901961 | 0.7126212 | 0.6463717 | 0.7708592 |
|  | oxytone | -0.2441089246 | 0.4901961 | 0.6989534 | 0.6451142 | 0.7478177 |
|  | oxytone | -0.2300487884 | 0.4901961 | 0.7001947 | 0.6470088 | 0.7484821 |
|  | oxytone | -0.2297884155 | 0.4901961 | 0.7002176 | 0.6470436 | 0.7484946 |
|  | oxytone | -0.1756308540 | 0.4901961 | 0.7049711 | 0.6540391 | 0.7512565 |
|  | oxytone | 0.0529779496 | 0.4901961 | 0.7245432 | 0.6778354 | 0.7668089 |
|  | oxytone | 0.0574028842 | 0.4901961 | 0.7249140 | 0.6782019 | 0.7671731 |
|  | oxytone | 0.4115493727 | 0.4901961 | 0.7535671 | 0.6980665 | 0.8017629 |
|  | oxytone | -0.7330763466 | 1.4705882 | 0.7363227 | 0.5992959 | 0.8390737 |
|  | oxytone | -0.0410180689 | 1.4705882 | 0.7724966 | 0.7238806 | 0.8147435 |
|  | oxytone | 0.0261867775 | 1.4705882 | 0.7758162 | 0.7286616 | 0.8168359 |
|  | oxytone | 0.1208119741 | 1.4705882 | 0.7804315 | 0.7320282 | 0.8222152 |
|  | oxytone | 0.1632693508 | 1.4705882 | 0.7824800 | 0.7323648 | 0.8254477 |
|  | oxytone | 0.2329733848 | 3.4313725 | 0.8598659 | 0.7886037 | 0.9098516 |
| SS | paroxytone | -0.0508796412 | -1.6153846 | 0.8763143 | 0.8388418 | 0.9060496 |
|  | paroxytone | 0.1042261914 | -1.6153846 | 0.8704584 | 0.8296119 | 0.9026618 |
|  | paroxytone | 0.1581907386 | -1.6153846 | 0.8683663 | 0.8229682 | 0.9034878 |
|  | paroxytone | -0.5057592969 | -0.6538462 | 0.8799856 | 0.8311815 | 0.9161049 |
|  | paroxytone | -0.0036157821 | -0.6538462 | 0.8717552 | 0.8394862 | 0.8983227 |
|  | paroxytone | 0.2614363127 | -0.6538462 | 0.8672196 | 0.8271802 | 0.8991140 |
|  | paroxytone | 0.4079965825 | -0.6538462 | 0.8646539 | 0.8157655 | 0.9021257 |
|  | paroxytone | -0.9476364783 | 0.3076923 | 0.8645575 | 0.7984470 | 0.9113899 |
|  | paroxytone | -0.4818293748 | 0.3076923 | 0.8667166 | 0.8243548 | 0.9000999 |
|  | paroxytone | -0.3542466578 | 0.3076923 | 0.8673029 | 0.8295389 | 0.8977321 |
|  | paroxytone | -0.2438211497 | 0.3076923 | 0.8678086 | 0.8330957 | 0.8962014 |
|  | paroxytone | -0.1136001837 | 0.3076923 | 0.8684028 | 0.8359721 | 0.8952251 |
|  | paroxytone | 0.0553230911 | 0.3076923 | 0.8691702 | 0.8373036 | 0.8955738 |
|  | paroxytone | 0.0917721059 | 0.3076923 | 0.8693353 | 0.8372258 | 0.8958984 |
|  | paroxytone | 0.1212674786 | 0.3076923 | 0.8694688 | 0.8370708 | 0.8962232 |
|  | paroxytone | 0.1543839024 | 0.3076923 | 0.8696185 | 0.8368012 | 0.8966517 |
|  | paroxytone | -0.0477877641 | 1.2692308 | 0.8648109 | 0.8277400 | 0.8949169 |
|  | paroxytone | 0.1663709040 | 1.2692308 | 0.8704793 | 0.8318673 | 0.9012763 |
|  | paroxytone | 0.3675517358 | 1.2692308 | 0.8756186 | 0.8225934 | 0.9144435 |
|  | paroxytone | 0.2199009453 | 2.2307692 | 0.8737890 | 0.8168077 | 0.9148932 |
|  | oxytone | -0.0508796412 | -1.6153846 | 0.8220412 | 0.7742545 | 0.8615215 |
|  | oxytone | 0.1042261914 | -1.6153846 | 0.8477966 | 0.8032287 | 0.8837312 |
|  | oxytone | 0.1581907386 | -1.6153846 | 0.8560112 | 0.8092034 | 0.8928562 |
|  | oxytone | -0.5057592969 | -0.6538462 | 0.8147337 | 0.7496620 | 0.8659163 |
|  | oxytone | -0.0036157821 | -0.6538462 | 0.8667421 | 0.8342791 | 0.8936566 |
|  | oxytone | 0.2614363127 | -0.6538462 | 0.8888498 | 0.8554171 | 0.9153170 |
|  | oxytone | 0.4079965825 | -0.6538462 | 0.8996444 | 0.8629162 | 0.9273606 |
|  | oxytone | -0.9476364783 | 0.3076923 | 0.8611993 | 0.7977090 | 0.9070838 |
|  | oxytone | -0.4818293748 | 0.3076923 | 0.8796665 | 0.8422251 | 0.9091809 |
|  | oxytone | -0.3542466578 | 0.3076923 | 0.8843406 | 0.8517139 | 0.9105425 |
|  | oxytone | -0.2438211497 | 0.3076923 | 0.8882578 | 0.8588694 | 0.9121525 |
|  | oxytone | -0.1136001837 | 0.3076923 | 0.8927278 | 0.8659758 | 0.9146662 |
|  | oxytone | 0.0553230911 | 0.3076923 | 0.8982914 | 0.8730265 | 0.9189956 |
|  | oxytone | 0.0917721059 | 0.3076923 | 0.8994578 | 0.8742423 | 0.9200796 |
|  | oxytone | 0.1212674786 | 0.3076923 | 0.9003930 | 0.8751525 | 0.9209913 |
|  | oxytone | 0.1543839024 | 0.3076923 | 0.9014337 | 0.8760993 | 0.9220488 |
|  | oxytone | -0.0477877641 | 1.2692308 | 0.9202786 | 0.8973380 | 0.9384446 |
|  | oxytone | 0.1663709040 | 1.2692308 | 0.9190870 | 0.8939726 | 0.9386608 |
|  | oxytone | 0.3675517358 | 1.2692308 | 0.9179529 | 0.8818080 | 0.9437492 |
|  | oxytone | 0.2199009453 | 2.2307692 | 0.9318604 | 0.8993285 | 0.9544126 |
| IM | paroxytone | -0.2753536716 | -1.4705882 | 0.5899896 | 0.4927391 | 0.6806783 |
|  | paroxytone | -0.1935965835 | -1.4705882 | 0.5730263 | 0.4907115 | 0.6514858 |
|  | paroxytone | -0.0711839350 | -1.4705882 | 0.5473153 | 0.4797897 | 0.6131432 |
|  | paroxytone | 0.1057320762 | -1.4705882 | 0.5097425 | 0.4373223 | 0.5817561 |
|  | paroxytone | 0.1241045092 | -1.4705882 | 0.5058270 | 0.4311753 | 0.5802197 |
|  | paroxytone | -0.3972081849 | -0.4901961 | 0.5554128 | 0.4808388 | 0.6275717 |
|  | paroxytone | -0.2240602119 | -0.4901961 | 0.5426237 | 0.4805555 | 0.6033962 |
|  | paroxytone | -0.1583553285 | -0.4901961 | 0.5377549 | 0.4788217 | 0.5956515 |
|  | paroxytone | -0.1285121719 | -0.4901961 | 0.5355410 | 0.4776628 | 0.5924774 |
|  | paroxytone | -0.1097565124 | -0.4901961 | 0.5341489 | 0.4768067 | 0.5906027 |
|  | paroxytone | 0.0014227125 | -0.4901961 | 0.5258869 | 0.4695771 | 0.5815458 |
|  | paroxytone | 0.0829194276 | -0.4901961 | 0.5198213 | 0.4619052 | 0.5772095 |
|  | paroxytone | 0.1059271362 | -0.4901961 | 0.5181078 | 0.4593961 | 0.5763237 |
|  | paroxytone | 0.2289886200 | -0.4901961 | 0.5089364 | 0.4437798 | 0.5737908 |
|  | paroxytone | 0.3397413472 | -0.4901961 | 0.5006770 | 0.4272797 | 0.5740451 |
|  | paroxytone | -0.3154510969 | 0.4901961 | 0.4995590 | 0.4307382 | 0.5683964 |
|  | paroxytone | -0.2654595017 | 0.4901961 | 0.5027586 | 0.4372534 | 0.5681693 |
|  | paroxytone | -0.2053133637 | 0.4901961 | 0.5066079 | 0.4445338 | 0.5684790 |
|  | paroxytone | -0.1901149178 | 0.4901961 | 0.5075805 | 0.4462634 | 0.5686704 |
|  | paroxytone | -0.1050330650 | 0.4901961 | 0.5130238 | 0.4549989 | 0.5706997 |
|  | paroxytone | -0.0278332879 | 0.4901961 | 0.5179602 | 0.4613604 | 0.5741028 |
|  | paroxytone | 0.0161333691 | 0.4901961 | 0.5207700 | 0.4642597 | 0.5767537 |
|  | paroxytone | 0.0335927092 | 0.4901961 | 0.5218855 | 0.4652626 | 0.5779515 |
|  | paroxytone | 0.0738063764 | 0.4901961 | 0.5244538 | 0.4672541 | 0.5810190 |
|  | paroxytone | 0.1225627930 | 0.4901961 | 0.5275660 | 0.4690904 | 0.5852949 |
|  | paroxytone | 0.2370601796 | 0.4901961 | 0.5348657 | 0.4711539 | 0.5974597 |
|  | paroxytone | 0.2566755353 | 0.4901961 | 0.5361148 | 0.4712301 | 0.5997995 |
|  | paroxytone | 0.3572608748 | 0.4901961 | 0.5425129 | 0.4705915 | 0.6127048 |
|  | paroxytone | -0.2995683505 | 1.4705882 | 0.4529318 | 0.3519121 | 0.5579833 |
|  | paroxytone | -0.1855250239 | 1.4705882 | 0.4759151 | 0.3936100 | 0.5595497 |
|  | paroxytone | 0.1418897194 | 1.4705882 | 0.5421284 | 0.4673543 | 0.6150516 |
|  | oxytone | -0.2753536716 | -1.4705882 | 0.3459990 | 0.2658174 | 0.4360033 |
|  | oxytone | -0.1935965835 | -1.4705882 | 0.3777461 | 0.3060109 | 0.4552659 |
|  | oxytone | -0.0711839350 | -1.4705882 | 0.4272255 | 0.3648896 | 0.4919617 |
|  | oxytone | 0.1057320762 | -1.4705882 | 0.5011155 | 0.4313936 | 0.5707940 |
|  | oxytone | 0.1241045092 | -1.4705882 | 0.5088419 | 0.4367642 | 0.5805539 |
|  | oxytone | -0.3972081849 | -0.4901961 | 0.4411685 | 0.3715227 | 0.5132089 |
|  | oxytone | -0.2240602119 | -0.4901961 | 0.4792881 | 0.4193891 | 0.5397885 |
|  | oxytone | -0.1583553285 | -0.4901961 | 0.4938412 | 0.4365168 | 0.5513280 |
|  | oxytone | -0.1285121719 | -0.4901961 | 0.5004562 | 0.4440098 | 0.5568910 |
|  | oxytone | -0.1097565124 | -0.4901961 | 0.5046136 | 0.4486156 | 0.5604961 |
|  | oxytone | 0.0014227125 | -0.4901961 | 0.5292253 | 0.4740937 | 0.5836529 |
|  | oxytone | 0.0829194276 | -0.4901961 | 0.5471831 | 0.4906702 | 0.6025052 |
|  | oxytone | 0.1059271362 | -0.4901961 | 0.5522327 | 0.4950344 | 0.6080815 |
|  | oxytone | 0.2289886200 | -0.4901961 | 0.5790346 | 0.5162747 | 0.6393401 |
|  | oxytone | 0.3397413472 | -0.4901961 | 0.6027683 | 0.5329147 | 0.6686701 |
|  | oxytone | -0.3154510969 | 0.4901961 | 0.5929742 | 0.5268750 | 0.6558705 |
|  | oxytone | -0.2654595017 | 0.4901961 | 0.5940713 | 0.5311682 | 0.6540317 |
|  | oxytone | -0.2053133637 | 0.4901961 | 0.5953898 | 0.5357687 | 0.6523228 |
|  | oxytone | -0.1901149178 | 0.4901961 | 0.5957228 | 0.5368226 | 0.6519887 |
|  | oxytone | -0.1050330650 | 0.4901961 | 0.5975852 | 0.5418110 | 0.6509441 |
|  | oxytone | -0.0278332879 | 0.4901961 | 0.5992727 | 0.5448635 | 0.6513397 |
|  | oxytone | 0.0161333691 | 0.4901961 | 0.6002326 | 0.5459317 | 0.6521771 |
|  | oxytone | 0.0335927092 | 0.4901961 | 0.6006136 | 0.5462193 | 0.6526343 |
|  | oxytone | 0.0738063764 | 0.4901961 | 0.6014907 | 0.5465897 | 0.6539528 |
|  | oxytone | 0.1225627930 | 0.4901961 | 0.6025532 | 0.5465082 | 0.6560313 |
|  | oxytone | 0.2370601796 | 0.4901961 | 0.6050446 | 0.5442464 | 0.6627580 |
|  | oxytone | 0.2566755353 | 0.4901961 | 0.6054709 | 0.5436017 | 0.6641350 |
|  | oxytone | 0.3572608748 | 0.4901961 | 0.6076542 | 0.5393291 | 0.6720084 |
|  | oxytone | -0.2995683505 | 1.4705882 | 0.7120343 | 0.6220763 | 0.7878809 |
|  | oxytone | -0.1855250239 | 1.4705882 | 0.6952779 | 0.6226706 | 0.7593144 |
|  | oxytone | 0.1418897194 | 1.4705882 | 0.6443197 | 0.5749940 | 0.7080784 |
| IE | paroxytone | -0.2448900432 | -1.5258621 | 0.6080284 | 0.5205453 | 0.6890832 |
|  | paroxytone | -0.2230187203 | -1.5258621 | 0.6095224 | 0.5259643 | 0.6871135 |
|  | paroxytone | -0.1948984480 | -1.5258621 | 0.6114402 | 0.5325894 | 0.6848600 |
|  | paroxytone | -0.0835271545 | -1.5258621 | 0.6190013 | 0.5536838 | 0.6802796 |
|  | paroxytone | -0.0275172015 | -1.5258621 | 0.6227825 | 0.5601608 | 0.6815569 |
|  | paroxytone | 0.0904120051 | -1.5258621 | 0.6306946 | 0.5632636 | 0.6933819 |
|  | paroxytone | 0.0911294018 | -1.5258621 | 0.6307426 | 0.5632422 | 0.6934879 |
|  | paroxytone | -0.2383338005 | -0.6637931 | 0.6130944 | 0.5509258 | 0.6717839 |
|  | paroxytone | -0.2339543818 | -0.6637931 | 0.6132116 | 0.5513483 | 0.6716252 |
|  | paroxytone | -0.1519369208 | -0.6637931 | 0.6154039 | 0.5582533 | 0.6695375 |
|  | paroxytone | -0.0566404424 | -0.6637931 | 0.6179453 | 0.5634984 | 0.6695830 |
|  | paroxytone | -0.0524133979 | -0.6637931 | 0.6180578 | 0.5636547 | 0.6696534 |
|  | paroxytone | 0.0368334257 | -0.6637931 | 0.6204317 | 0.5653968 | 0.6725339 |
|  | paroxytone | 0.2096627054 | -0.6637931 | 0.6250124 | 0.5611384 | 0.6848117 |
|  | paroxytone | -0.3283722035 | 0.1982759 | 0.6189921 | 0.5555679 | 0.6786012 |
|  | paroxytone | -0.2829044854 | 0.1982759 | 0.6183359 | 0.5572181 | 0.6759239 |
|  | paroxytone | -0.1457035285 | 0.1982759 | 0.6163531 | 0.5605644 | 0.6692383 |
|  | paroxytone | -0.1042130213 | 0.1982759 | 0.6157528 | 0.5610178 | 0.6677054 |
|  | paroxytone | -0.0531184080 | 0.1982759 | 0.6150129 | 0.5611766 | 0.6661734 |
|  | paroxytone | -0.0511726117 | 0.1982759 | 0.6149848 | 0.5611737 | 0.6661232 |
|  | paroxytone | -0.0261421578 | 0.1982759 | 0.6146221 | 0.5610754 | 0.6655305 |
|  | paroxytone | 0.0022038311 | 0.1982759 | 0.6142113 | 0.5608278 | 0.6649821 |
|  | paroxytone | 0.0757003774 | 0.1982759 | 0.6131454 | 0.5595048 | 0.6641746 |
|  | paroxytone | 0.1735291939 | 0.1982759 | 0.6117249 | 0.5562485 | 0.6644495 |
|  | paroxytone | 0.4948453619 | 0.1982759 | 0.6070459 | 0.5358210 | 0.6739915 |
|  | paroxytone | 0.5002961553 | 0.1982759 | 0.6069664 | 0.5353786 | 0.6742357 |
|  | paroxytone | -0.0509122388 | 1.0603448 | 0.6118547 | 0.5499206 | 0.6703748 |
|  | paroxytone | 0.0066301703 | 1.0603448 | 0.6086362 | 0.5489048 | 0.6652814 |
|  | paroxytone | 0.1259710505 | 1.0603448 | 0.6019312 | 0.5407925 | 0.6600469 |
|  | paroxytone | 0.1795177705 | 1.0603448 | 0.5989102 | 0.5345904 | 0.6599944 |
|  | paroxytone | 0.2097585350 | 1.0603448 | 0.5972006 | 0.5304775 | 0.6605100 |
|  | paroxytone | 0.3136801896 | 1.9224138 | 0.5726710 | 0.4610991 | 0.6773091 |
|  | paroxytone | 0.1479753639 | 2.7844828 | 0.5775608 | 0.4770975 | 0.6719924 |
|  | oxytone | -0.2448900432 | -1.5258621 | 0.5131756 | 0.4288903 | 0.5967182 |
|  | oxytone | -0.2230187203 | -1.5258621 | 0.5162158 | 0.4354819 | 0.5961121 |
|  | oxytone | -0.1948984480 | -1.5258621 | 0.5201229 | 0.4436600 | 0.5956546 |
|  | oxytone | -0.0835271545 | -1.5258621 | 0.5355683 | 0.4712668 | 0.5987087 |
|  | oxytone | -0.0275172015 | -1.5258621 | 0.5433121 | 0.4811575 | 0.6041467 |
|  | oxytone | 0.0904120051 | -1.5258621 | 0.5595441 | 0.4917307 | 0.6252060 |
|  | oxytone | 0.0911294018 | -1.5258621 | 0.5596425 | 0.4917562 | 0.6253691 |
|  | oxytone | -0.2383338005 | -0.6637931 | 0.5792680 | 0.5184393 | 0.6377813 |
|  | oxytone | -0.2339543818 | -0.6637931 | 0.5798210 | 0.5192784 | 0.6380535 |
|  | oxytone | -0.1519369208 | -0.6637931 | 0.5901403 | 0.5340026 | 0.6440234 |
|  | oxytone | -0.0566404424 | -0.6637931 | 0.6020308 | 0.5484108 | 0.6533089 |
|  | oxytone | -0.0524133979 | -0.6637931 | 0.6025555 | 0.5489767 | 0.6537836 |
|  | oxytone | 0.0368334257 | -0.6637931 | 0.6135781 | 0.5594503 | 0.6650374 |
|  | oxytone | 0.2096627054 | -0.6637931 | 0.6345876 | 0.5726287 | 0.6923894 |
|  | oxytone | -0.3283722035 | 0.1982759 | 0.6318019 | 0.5704689 | 0.6891492 |
|  | oxytone | -0.2829044854 | 0.1982759 | 0.6368643 | 0.5779363 | 0.6919502 |
|  | oxytone | -0.1457035285 | 0.1982759 | 0.6519540 | 0.5988250 | 0.7015536 |
|  | oxytone | -0.1042130213 | 0.1982759 | 0.6564594 | 0.6045956 | 0.7048414 |
|  | oxytone | -0.0531184080 | 0.1982759 | 0.6619692 | 0.6113220 | 0.7091566 |
|  | oxytone | -0.0511726117 | 0.1982759 | 0.6621781 | 0.6115697 | 0.7093268 |
|  | oxytone | -0.0261421578 | 0.1982759 | 0.6648606 | 0.6146994 | 0.7115559 |
|  | oxytone | 0.0022038311 | 0.1982759 | 0.6678857 | 0.6181168 | 0.7141677 |
|  | oxytone | 0.0757003774 | 0.1982759 | 0.6756643 | 0.6263499 | 0.7213656 |
|  | oxytone | 0.1735291939 | 0.1982759 | 0.6858691 | 0.6359436 | 0.7318351 |
|  | oxytone | 0.4948453619 | 0.1982759 | 0.7181119 | 0.6586295 | 0.7708360 |
|  | oxytone | 0.5002961553 | 0.1982759 | 0.7186413 | 0.6589273 | 0.7715256 |
|  | oxytone | -0.0509122388 | 1.0603448 | 0.7169493 | 0.6636319 | 0.7648106 |
|  | oxytone | 0.0066301703 | 1.0603448 | 0.7220795 | 0.6715212 | 0.7675497 |
|  | oxytone | 0.1259710505 | 1.0603448 | 0.7325349 | 0.6826269 | 0.7771568 |
|  | oxytone | 0.1795177705 | 1.0603448 | 0.7371442 | 0.6854067 | 0.7830660 |
|  | oxytone | 0.2097585350 | 1.0603448 | 0.7397246 | 0.6864559 | 0.7867546 |
|  | oxytone | 0.3136801896 | 1.9224138 | 0.7912939 | 0.7118159 | 0.8533681 |
|  | oxytone | 0.1479753639 | 2.7844828 | 0.8197282 | 0.7559292 | 0.8697246 |
| AE | paroxytone | -0.5357382917 | -1.5258621 | 0.6544375 | 0.5233253 | 0.7656369 |
|  | paroxytone | -0.2977457403 | -1.5258621 | 0.6443231 | 0.5554242 | 0.7242702 |
|  | paroxytone | 0.0334485781 | -1.5258621 | 0.6300321 | 0.5652918 | 0.6904111 |
|  | paroxytone | -0.2891534348 | -0.6637931 | 0.6326248 | 0.5674080 | 0.6933236 |
|  | paroxytone | -0.1420005627 | -0.6637931 | 0.6294330 | 0.5720001 | 0.6834244 |
|  | paroxytone | -0.1399597678 | -0.6637931 | 0.6293887 | 0.5720264 | 0.6833189 |
|  | paroxytone | -0.0818158577 | -0.6637931 | 0.6281243 | 0.5722826 | 0.6807426 |
|  | paroxytone | 0.0504977558 | -0.6637931 | 0.6252406 | 0.5690978 | 0.6782046 |
|  | paroxytone | 0.0827997895 | -0.6637931 | 0.6245352 | 0.5675209 | 0.6782939 |
|  | paroxytone | 0.2195222500 | -0.6637931 | 0.6215438 | 0.5577710 | 0.6813736 |
|  | paroxytone | 0.2700510049 | -0.6637931 | 0.6204359 | 0.5530992 | 0.6834338 |
|  | paroxytone | -0.4097060838 | 0.1982759 | 0.6211358 | 0.5511259 | 0.6864389 |
|  | paroxytone | -0.1398404992 | 0.1982759 | 0.6211579 | 0.5644964 | 0.6746958 |
|  | paroxytone | -0.1245977672 | 0.1982759 | 0.6211592 | 0.5649760 | 0.6742698 |
|  | paroxytone | 0.0006415938 | 0.1982759 | 0.6211695 | 0.5675110 | 0.6720181 |
|  | paroxytone | 0.0029849498 | 0.1982759 | 0.6211697 | 0.5675333 | 0.6719985 |
|  | paroxytone | 0.0102753908 | 0.1982759 | 0.6211703 | 0.5675965 | 0.6719428 |
|  | paroxytone | 0.1579068204 | 0.1982759 | 0.6211824 | 0.5668761 | 0.6726121 |
|  | paroxytone | 0.2416477708 | 0.1982759 | 0.6211893 | 0.5648288 | 0.6744574 |
|  | paroxytone | 0.2550832071 | 0.1982759 | 0.6211904 | 0.5643984 | 0.6748437 |
|  | paroxytone | 0.3185355180 | 0.1982759 | 0.6211956 | 0.5620161 | 0.6769748 |
|  | paroxytone | 0.3320082132 | 0.1982759 | 0.6211967 | 0.5614399 | 0.6774885 |
|  | paroxytone | 0.4388311533 | 0.1982759 | 0.6212055 | 0.5561031 | 0.6822160 |
|  | paroxytone | 0.4525697285 | 0.1982759 | 0.6212066 | 0.5553272 | 0.6828990 |
|  | paroxytone | 0.4649976324 | 0.1982759 | 0.6212076 | 0.5546096 | 0.6835298 |
|  | paroxytone | -0.0779910196 | 1.0603448 | 0.6142359 | 0.5509440 | 0.6738875 |
|  | paroxytone | -0.0230523394 | 1.0603448 | 0.6154570 | 0.5551529 | 0.6724102 |
|  | paroxytone | 0.0184612913 | 1.0603448 | 0.6163787 | 0.5575209 | 0.6720133 |
|  | paroxytone | 0.1084099092 | 1.0603448 | 0.6183730 | 0.5600365 | 0.6734842 |
|  | paroxytone | 0.1017889971 | 1.9224138 | 0.6152661 | 0.5451750 | 0.6808785 |
|  | paroxytone | 0.2745942594 | 1.9224138 | 0.6229012 | 0.5338535 | 0.7043585 |
|  | paroxytone | 0.4474458455 | 1.9224138 | 0.6304778 | 0.5078177 | 0.7383211 |
|  | oxytone | -0.5357382917 | -1.5258621 | 0.4173967 | 0.2996606 | 0.5453687 |
|  | oxytone | -0.2977457403 | -1.5258621 | 0.4779286 | 0.3915975 | 0.5655988 |
|  | oxytone | 0.0334485781 | -1.5258621 | 0.5628605 | 0.4981430 | 0.6255064 |
|  | oxytone | -0.2891534348 | -0.6637931 | 0.5654238 | 0.5003338 | 0.6283333 |
|  | oxytone | -0.1420005627 | -0.6637931 | 0.5914052 | 0.5341579 | 0.6462761 |
|  | oxytone | -0.1399597678 | -0.6637931 | 0.5917623 | 0.5345906 | 0.6465543 |
|  | oxytone | -0.0818158577 | -0.6637931 | 0.6018946 | 0.5464368 | 0.6548544 |
|  | oxytone | 0.0504977558 | -0.6637931 | 0.6246169 | 0.5697720 | 0.6764406 |
|  | oxytone | 0.0827997895 | -0.6637931 | 0.6300860 | 0.5747102 | 0.6822382 |
|  | oxytone | 0.2195222500 | -0.6637931 | 0.6528533 | 0.5927284 | 0.7084678 |
|  | oxytone | 0.2700510049 | -0.6637931 | 0.6611000 | 0.5983906 | 0.7186219 |
|  | oxytone | -0.4097060838 | 0.1982759 | 0.6353992 | 0.5681551 | 0.6977430 |
|  | oxytone | -0.1398404992 | 0.1982759 | 0.6611421 | 0.6076560 | 0.7108068 |
|  | oxytone | -0.1245977672 | 0.1982759 | 0.6625697 | 0.6096157 | 0.7117374 |
|  | oxytone | 0.0006415938 | 0.1982759 | 0.6741859 | 0.6243984 | 0.7203299 |
|  | oxytone | 0.0029849498 | 0.1982759 | 0.6744013 | 0.6246517 | 0.7205073 |
|  | oxytone | 0.0102753908 | 0.1982759 | 0.6750709 | 0.6254344 | 0.7210633 |
|  | oxytone | 0.1579068204 | 0.1982759 | 0.6884738 | 0.6394697 | 0.7335920 |
|  | oxytone | 0.2416477708 | 0.1982759 | 0.6959401 | 0.6459584 | 0.7416874 |
|  | oxytone | 0.2550832071 | 0.1982759 | 0.6971286 | 0.6469083 | 0.7430433 |
|  | oxytone | 0.3185355180 | 0.1982759 | 0.7027058 | 0.6510810 | 0.7496297 |
|  | oxytone | 0.3320082132 | 0.1982759 | 0.7038824 | 0.6519040 | 0.7510631 |
|  | oxytone | 0.4388311533 | 0.1982759 | 0.7131146 | 0.6577406 | 0.7627611 |
|  | oxytone | 0.4525697285 | 0.1982759 | 0.7142894 | 0.6584109 | 0.7642993 |
|  | oxytone | 0.4649976324 | 0.1982759 | 0.7153497 | 0.6590032 | 0.7656958 |
|  | oxytone | -0.0779910196 | 1.0603448 | 0.7255992 | 0.6721106 | 0.7733052 |
|  | oxytone | -0.0230523394 | 1.0603448 | 0.7268308 | 0.6760684 | 0.7723174 |
|  | oxytone | 0.0184612913 | 1.0603448 | 0.7277592 | 0.6783847 | 0.7721002 |
|  | oxytone | 0.1084099092 | 1.0603448 | 0.7297640 | 0.6812431 | 0.7733563 |
|  | oxytone | 0.1017889971 | 1.9224138 | 0.7713323 | 0.7190404 | 0.8163770 |
|  | oxytone | 0.2745942594 | 1.9224138 | 0.7653971 | 0.6971918 | 0.8221583 |
|  | oxytone | 0.4474458455 | 1.9224138 | 0.7593542 | 0.6616576 | 0.8358399 |

*Table 1*: Model estimates for probability of target fixations ±SE at 200 ms after the target syllable offset.

## Fixed effects

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| effect | Parameter | Estimate | SE | *t* | *p* |
| fixed | Intercept (γ00) | 1.784 | 0.177 | 10.096 | < .001 |
| fixed | stress\_sum (γ10) | −0.000 | 0.076 | −0.004 | .996 |
| fixed | car\_dev (γ20) | 0.098 | 0.245 | 0.398 | .691 |
| fixed | corsi (γ30) | 0.072 | 0.061 | 1.179 | .238 |
| fixed | Time1 (γ01) | 5.751 | 0.506 | 11.356 | < .001 |
| fixed | Time2 (γ11) | −0.733 | 0.382 | −1.916 | .055 |
| fixed | Time3 (γ21) | −1.219 | 0.181 | −6.733 | < .001 |
| fixed | GroupAE (γ31) | −0.770 | 0.204 | −3.784 | < .001 |
| fixed | GroupAM (γ02) | −0.666 | 0.203 | −3.273 | .001 |
| fixed | GroupIE (γ12) | −0.815 | 0.202 | −4.045 | < .001 |
| fixed | GroupIM (γ22) | −1.252 | 0.202 | −6.188 | < .001 |
| fixed | stress\_sum × car\_dev (γ32) | −0.177 | 0.182 | −0.976 | .329 |
| fixed | stress\_sum × corsi (γ03) | −0.052 | 0.046 | −1.122 | .262 |
| fixed | car\_dev × corsi (γ13) | 0.050 | 0.266 | 0.188 | .851 |
| fixed | stress\_sum × Time1 (γ23) | −0.195 | 0.185 | −1.052 | .293 |
| fixed | stress\_sum × Time2 (γ33) | 0.308 | 0.121 | 2.557 | .011 |
| fixed | stress\_sum × Time3 (γ04) | −0.027 | 0.146 | −0.185 | .854 |
| fixed | car\_dev × Time1 (γ14) | 0.918 | 0.827 | 1.109 | .267 |
| fixed | car\_dev × Time2 (γ24) | −0.500 | 0.565 | −0.886 | .376 |
| fixed | car\_dev × Time3 (γ34) | −0.099 | 0.437 | −0.226 | .821 |
| fixed | corsi × Time1 (γ05) | 0.287 | 0.205 | 1.396 | .163 |
| fixed | corsi × Time2 (γ15) | −0.232 | 0.140 | −1.653 | .098 |
| fixed | corsi × Time3 (γ25) | −0.215 | 0.109 | −1.976 | .048 |
| fixed | Time1 × GroupAE (γ35) | 1.491 | 0.582 | 2.563 | .010 |
| fixed | Time1 × GroupAM (γ06) | 0.374 | 0.582 | 0.643 | .520 |
| fixed | Time1 × GroupIE (γ16) | 0.751 | 0.576 | 1.303 | .193 |
| fixed | Time1 × GroupIM (γ26) | 0.702 | 0.578 | 1.214 | .225 |
| fixed | Time2 × GroupAE (γ36) | 2.309 | 0.471 | 4.898 | < .001 |
| fixed | Time2 × GroupAM (γ00) | 2.208 | 0.471 | 4.683 | < .001 |
| fixed | Time2 × GroupIE (γ10) | 2.252 | 0.467 | 4.825 | < .001 |
| fixed | Time2 × GroupIM (γ20) | 2.039 | 0.469 | 4.351 | < .001 |
| fixed | stress\_sum × car\_dev:corsi (γ30) | 0.200 | 0.557 | 0.359 | .720 |
| fixed | stress\_sum × car\_dev:Time1 (γ01) | −0.354 | 0.328 | −1.077 | .281 |
| fixed | stress\_sum × car\_dev:Time2 (γ11) | 0.285 | 0.327 | 0.870 | .384 |
| fixed | stress\_sum × car\_dev:Time3 (γ21) | −0.141 | 0.327 | −0.431 | .666 |
| fixed | stress\_sum × corsi:Time1 (γ31) | 0.084 | 0.084 | 0.996 | .319 |
| fixed | stress\_sum × corsi:Time2 (γ02) | 0.397 | 0.082 | 4.860 | < .001 |
| fixed | stress\_sum × corsi:Time3 (γ12) | −0.091 | 0.082 | −1.114 | .265 |
| fixed | car\_dev × corsi:Time1 (γ22) | −0.230 | 0.896 | −0.257 | .797 |
| fixed | car\_dev × corsi:Time2 (γ32) | 0.635 | 0.614 | 1.035 | .301 |
| fixed | car\_dev × corsi:Time3 (γ03) | −1.045 | 0.469 | −2.228 | .026 |
| fixed | stress\_sum × car\_dev:corsi:Time1 (γ13) | −1.045 | 1.010 | −1.035 | .301 |
| fixed | stress\_sum × car\_dev:corsi:Time2 (γ23) | −0.446 | 0.352 | −1.269 | .204 |
| fixed | stress\_sum × car\_dev:corsi:Time3 (γ33) | −0.122 | 0.352 | −0.347 | .729 |
| fixed | stress\_sum × car\_dev:corsi:GroupAE (γ04) | −0.090 | 0.662 | −0.136 | .892 |
| fixed | stress\_sum × car\_dev:corsi:GroupAM (γ14) | −0.304 | 0.632 | −0.481 | .630 |
| fixed | stress\_sum × car\_dev:corsi:GroupIE (γ24) | −0.400 | 0.742 | −0.540 | .590 |
| fixed | stress\_sum × car\_dev:corsi:GroupIM (γ34) | 0.367 | 0.813 | 0.451 | .652 |
| fixed | stress\_sum × car\_dev:corsi:Time1:GroupAE (γ05) | −0.345 | 1.200 | −0.287 | .774 |
| fixed | stress\_sum × car\_dev:corsi:Time1:GroupAM (γ15) | 2.146 | 1.147 | 1.872 | .061 |
| fixed | stress\_sum × car\_dev:corsi:Time1:GroupIE (γ25) | 2.554 | 1.348 | 1.895 | .058 |
| fixed | stress\_sum × car\_dev:corsi:Time1:GroupIM (γ35) | −0.521 | 1.478 | −0.352 | .725 |

Appendix 1: Growth curve model fixed effects

## Random effects

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Group | Parameter | Variance | SD | Correlations |  |  |  |  |
| Participant | Intercept | 0.449 | 0.670 | 1.00 |  |  |  |  |
|  | stress\_sum | 0.226 | 0.476 | .11 |  |  |  | 1.00 |
|  | Time1 | 4.852 | 2.203 | .11 | 1.00 |  |  | .01 |
|  | Time2 | 1.758 | 1.326 | −.30 | −.10 | 1.00 |  | −.05 |
|  | Time3 | 0.713 | 0.844 | −.07 | −.89 | −.05 | 1.00 | .06 |
| Item | Intercept | 0.200 | 0.447 | 1.00 |  |  |  |  |
|  | Time1 | 1.300 | 1.140 | −.41 | 1.00 |  |  |  |
|  | Time2 | 0.395 | 0.628 | −.89 | .09 | 1.00 |  |  |
|  | Time3 | 0.678 | 0.823 | .33 | −.95 | −.12 | 1.00 |  |
| Residual |  | 14.568 | 3.817 |  |  |  |  |  |

Appendix 2: Growth curve model random effects

## Pairwise comparisons

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| effect | Parameter | Estimate | SE | *t* | *p* |
| fixed | GroupIE (γ08) | −0.045 | 0.176 | −0.255 | .799 |
| fixed | Time1 × GroupIE (γ18) | −0.740 | 0.503 | −1.472 | .141 |
| fixed | Time2 × GroupIE (γ28) | −0.057 | 0.407 | −0.139 | .889 |
| fixed | stress\_sum × car\_dev:corsi:GroupIE (γ09) | −0.310 | 0.612 | −0.507 | .612 |
| fixed | stress\_sum × car\_dev:corsi:Time1:GroupIE (γ19) | 2.899 | 1.112 | 2.606 | .009 |

Appendix 3: Pairwise comparisons between EN learner groups.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| effect | Parameter | Estimate | SE | *t* | *p* |
| fixed | GroupIM (γ08) | −0.586 | 0.181 | −3.244 | .001 |
| fixed | Time1 × GroupIM (γ18) | 0.328 | 0.517 | 0.635 | .525 |
| fixed | Time2 × GroupIM (γ28) | −0.169 | 0.419 | −0.404 | .686 |
| fixed | stress\_sum × car\_dev:corsi:GroupIM (γ09) | 0.671 | 0.660 | 1.018 | .309 |
| fixed | stress\_sum × car\_dev:corsi:Time1:GroupIM (γ19) | −2.667 | 1.198 | −2.225 | .026 |

Appendix 4: Pairwise comparisons between MA learner groups.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| effect | Parameter | Estimate | SE | *t* | *p* |
| fixed | GroupAM (γ08) | 0.104 | 0.182 | 0.571 | .568 |
| fixed | Time1 × GroupAM (γ18) | −1.117 | 0.522 | −2.141 | .032 |
| fixed | Time2 × GroupAM (γ28) | −0.101 | 0.423 | −0.239 | .811 |
| fixed | stress\_sum × car\_dev:corsi:GroupAM (γ09) | −0.214 | 0.484 | −0.443 | .658 |
| fixed | stress\_sum × car\_dev:corsi:Time1:GroupAM (γ19) | 2.491 | 0.879 | 2.836 | .005 |

Appendix 5: Pairwise comparisons between advanced learner groups.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| effect | Parameter | Estimate | SE | *t* | *p* |
| fixed | GroupIM (γ08) | −0.437 | 0.178 | −2.456 | .014 |
| fixed | Time1 × GroupIM (γ18) | −0.048 | 0.509 | −0.095 | .924 |
| fixed | Time2 × GroupIM (γ28) | −0.214 | 0.412 | −0.518 | .605 |
| fixed | stress\_sum × car\_dev:corsi:GroupIM (γ09) | 0.767 | 0.773 | 0.993 | .321 |
| fixed | stress\_sum × car\_dev:corsi:Time1:GroupIM (γ19) | −3.075 | 1.405 | −2.188 | .029 |

Appendix 6: Pairwise comparisons between intermediate learner groups.

# Results

Figure 1 plots the model estimates from the GCA and the full model summary is available in Appendices 1 and 2. We report the results for the M group and then provide comparisons with and between the learner groups. The model intercept estimates the log odds of M fixating on the target, averaging over the time course and lexical stress. The log odds were *γ*00 = 1.78 (proportion: .86). The linear, quadratic, and cubic polynomial time terms captured the sigmoid shape of the time course and were retained in the model (γ10 = −0.00; SE = 0.08; *t* = −0.00; *p* = .996; γ20 = 0.10; SE = 0.24; *t* = 0.40; *p* = .691; γ30 = 0.07; SE = 0.06; *t* = 1.18; *p* = .238).