Tesis:

**Diferencias sexuales en la marcha espontánea modulada por estímulos rítmicos acústicos**

Ignacio García Madrid

**ANEXO**

|  |  |  |  |  |  |  |  |  |
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| **Tabla 9. Correlaciones altura/peso, altura/frecuencia de marcha (ppm) y peso/ppm mediante el coeficiente de Pearson.** | | | | | | | | |
| **Mujeres** (correlación altura/peso: R2 = 0.204) | | | | | | | | |
| **Modo** | **SM-SB** | **119-SB** | **140-SB** | **168-SB** | **SM-CB** | **119-CB** | **140-CB** | **168-CB** |
| **Altura** | -0.067 | 0.037 | -0.003 | 0.027 | 0.237 | 0.114 | 0.211 | 0.218 |
| **Peso** | 0.015 | 0.016 | 0 | 0 | 0.228 | 0.1 | 0.097 | 0.107 |
| **Hombres** (correlación altura/peso: R2 = 0.217) | | | | | | | | |
| **Modo** | **SM-SB** | **119-SB** | **140-SB** | **168-SB** | **SM-CB** | **119-CB** | **140-CB** | **168-CB** |
| **Altura** | -0.084 | -0.203 | -0.123 | -0.136 | -0.012 | -0.014 | -0.049 | 0 |
| **Peso** | -0.05 | -0.101 | -0.218 | -122 | -0.065 | -0.052 | -0.01 | 0 |

La tabla 10 muestra los reportes de los participantes sobre su percepción subjetiva respecto a cuál estímulo les pareció más o menos estimulante de su movimiento corporal, coincidiendo la mayoría en que el estímulo rápido (168 bpm) fue el más estimulante, mientras que algunos reportaron que el estímulo lento (119 bpm) fue el menos estimulante. Cinco mujeres que reportaron el estímulo rápido como el más estimulante en realidad tuvieron frecuencias de marcha muy similares en los cuatro modos de cada modalidad, mientras que en ocho hombres se observó esta misma situación.

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| **Tabla 10. Motivación de los estímulos para la marcha, según los reportes de los participantes.** | | |
| **MÁS ESTIMULANTE** | | |
| **Estímulo** | **Mujeres** | **Hombres** |
| Ninguno | 2 | 0 |
| 119 bpm | 0 | 1 |
| 140 bpm | 0 | 3 |
| **168 bpm** | **16** | **14** |
| Sin estímulo | 0 | 0 |
| **MENOS O NO ESTIMULANTE** | | |
| Ninguno | 10 | 4 |
| **119 bpm** | **5 y 1 CB** | **3 y 4 CB** |
| 140 bpm | 0 | 3 |
| 168 bpm | 2 | **2 y 1 CB** |
| Sin estímulo | 0 | 2 |
| Participante 32-AMJD: **“el rápido [168] fue más estimulante pero era difícil acoplarse… acoplado con el lento [119], era como mi ritmo natural”.** | | |

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| **Tabla 11. Datos generales del participante** |
| No. \_\_\_\_\_\_\_\_\_\_\_\_  Nombre \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  Mujer\_\_ Hombre\_\_  Edad \_\_\_\_ Altura \_\_\_\_\_\_ Peso \_\_\_\_\_ Diestro o zurdo \_\_\_  Experiencia en futbol**\***: Mucha\_\_\_ Poca\_\_\_ Nada\_\_\_  Experiencia danza**\***: Mucha\_\_\_ Poca\_\_\_ Nada\_\_\_  Nivel de estudios \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  Practica deporte: No\_\_\_ Sí\_\_\_ ¿Cuál(es)?\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  Horas de práctica a la semana\_\_\_\_\_  Fuma: Diariamente\_\_\_ De vez en cuando\_\_\_ Nunca o casi nunca\_\_\_  Ultima vez que fumó (días)\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Cigarrillos\_\_\_\_\_\_\_\_\_\_\_\_\_  Toma medicamentos \_\_\_\_  Toma bebidas con cafeína con frecuencia: No \_\_\_ Sí \_\_\_ Frecuencia\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  ¿Cuál(es)? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  Toma alcohol: Regularmente \_\_\_ Ocasionalmente \_\_\_ Nunca o casi nunca \_\_\_  Ultima ingesta de alcohol (días) \_\_\_\_\_\_\_\_\_\_ Mucho\_\_\_ Regular\_\_\_ Poco\_\_\_  Problemas de audición No\_\_ Sí\_\_ ¿qué tipo?\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  Calidad del sueño durante los tres días previos a la prueba: Buena\_\_ Regular\_\_ Mala\_\_  Horas de sueño (promedio) \_\_\_\_\_\_\_\_\_  Estado físico en este momento (relajado, tenso, algunas molestias, etc.) \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  Estado de ánimo en este momento (tranquilo, contento, triste, preocupado, enojado, etc.)\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  ¿Con qué estímulo se sintió más motivada(o) a moverse?  ¿Con qué estímulo se sintió menos motivada(o) a moverse?  En las pruebas con balón ¿éste le distrajo de escuchar el estímulo auditivo? Sí \_\_ No \_\_ ¿Por qué o cómo?  COMENTARIOS PARTICIPANTE:  OBSERVACIONES: |
| **\*Mucha**: más de 5 años de estudios en un centro exclusivamente dedicado a ello. **Poca**: de 2 a 4 años de estudios en un centro exclusivamente dedicado a ello. **Nada:** menos de 2 años de estudios (Montilla, 2001). |

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| **Tabla 12. Datos de todas las corridas de mujeres, en ambas modalidades y todos los modos.** | | | | | | | | |
| **No.** | **SIN BALÓN** | | | | **CON BALÓN** | | | |
| **SM-SB** | **119-SB** | **140-SB** | **168-SB** | **SM-CB** | **119-C** | **140-C** | **168-CB** |
| 1 | 99.4475138 | 101.288316 | 103.311258 | 103.539823 | 79.9059929 | 92.434663 | 95.27097 | 108.027007 |
| 2 | 102.317446 | 102.992958 | 105.168539 | 106.363636 | 90.9995027 | 94.3900267 | 103.783784 | 109.339408 |
| 3 | 102.372035 | 104.142012 | 105.697151 | 106.654512 | 94.4085417 | 95.0649351 | 107.210031 | 110.565111 |
| 4 | 103.270224 | 105.308219 | 107.428571 | 110.137672 | 100.570613 | 98.9247312 | 108.433735 | 111.439426 |
| 5 | 103.400093 | 105.452907 | 108.108108 | 110.57226 | 100.686499 | 100.92688 | 108.855292 | 111.504425 |
| 6 | 106.508876 | 106.791569 | 108.571429 | 110.894942 | 101.159115 | 102.564103 | 111.01083 | 112.359551 |
| 7 | 106.791569 | 106.796117 | 108.882521 | 111.685626 | 104.328524 | 105.820106 | 111.627907 | 112.762238 |
| 8 | 107.18358 | 108.333333 | 110.069303 | 111.72622 | 104.949758 | 109.867752 | 111.627907 | 114.311032 |
| 9 | 107.575078 | 109.305761 | 110.117647 | 111.754967 | 105.527638 | 110.65111 | 112.8 | 114.666667 |
| 10 | 108.221477 | 109.367089 | 110.833749 | 112.820513 | 109.543568 | 110.760919 | 112.95972 | 120.569967 |
| 11 | 108.274648 | 109.479306 | 111.389865 | 113.548387 | 110.267679 | 110.928513 | 113.11054 | 120.770878 |
| 12 | 108.390205 | 109.927567 | 111.642743 | 114 | 110.769231 | 111.153995 | 115.384615 | 122.241087 |
| 13 | 108.667529 | 110.264455 | 112.177868 | 114.197531 | 111.493462 | 113.459399 | 117.997616 | 124 |
| 14 | 108.942351 | 110.932476 | 112.482853 | 114.455278 | 117.272727 | 114.919355 | 120.879121 | 124.694377 |
| 15 | 109.280139 | 111.202636 | 112.919634 | 114.81976 | 117.515389 | 115.79482 | 121.643836 | 128.027682 |
| 16 | 109.422492 | 111.66591 | 113.207547 | 115.555556 | 118.022329 | 116.129032 | 121.794872 | 129.370629 |
| 17 | 109.787234 | 112.105878 | 113.411341 | 116.504854 | 118.097321 | 116.720704 | 122.524752 | 129.648241 |
| 18 | 110.57226 | 112.306972 | 114.171257 | 116.666667 | 121.021963 | 117.537313 | 123.53767 | 130.750605 |
| 19 | 110.798876 | 112.529928 | 114.309907 | 116.771608 | 123.800384 | 119.475474 | 127.5 | 133.770492 |
| 20 | 110.860748 | 113.842173 | 114.449213 | 117.175764 | 123.978856 | 120.335821 | 129.066107 | 133.960047 |
| 21 | 110.939908 | 113.955409 | 114.893617 | 117.302053 | 125.853659 | 122.261844 | 129.72973 | 133.971292 |
| 22 | 110.977081 | 114.578482 | 114.919355 | 118.122161 | 127.991675 | 122.511485 | 129.72973 | 136.659436 |
| 23 | 111.062142 | 115.145228 | 115.384615 | 118.343195 | 128.430296 | 123.53767 | 130.362117 | 137.432188 |
| 24 | 111.111111 | 115.163148 | 115.580737 | 118.443316 | 133.729569 | 125.137212 | 132.890365 | 138.248848 |
| 25 | 111.157895 | 115.2 | 116.004296 | 119.115145 | 138.550353 | 126.245847 | 136.666667 | 142.398974 |
| 26 | 111.564626 | 115.2 | 116.335434 | 119.507909 | 138.613861 | 126.857143 | 136.868064 | 148.19506 |
| 27 | 111.754967 | 115.276476 | 116.861436 | 119.521912 | 140.28777 | 128.15534 | 138.435566 | 148.270181 |
| 28 | 112.008073 | 115.438761 | 117.52888 | 119.72634 | 140.716612 | 128.571429 | 138.486312 | 150.208623 |
| 29 | 112.349532 | 115.830116 | 118.012422 | 120.194911 | 140.992167 | 130.09809 | 143.712575 | 150.366748 |
| 30 | 112.382934 | 116.071429 | 118.042226 | 120.253165 | 140.992167 | 132.422491 | 146.788991 | 153.191489 |
| 31 | 113.105925 | 116.475859 | 119.115145 | 120.670391 | 143.560873 | 135.396518 | 146.974063 | 155.970755 |
| 32 | 113.146552 | 116.567728 | 119.241192 | 120.762712 | 143.686502 | 135.686707 | 147.692308 | 157.119476 |
| 33 | 113.149847 | 116.666667 | 119.318182 | 120.992761 | 145.003266 | 138.461538 | 147.719044 | 158.043274 |
| 34 | 113.416321 | 117.212249 | 120 | 121.247113 | 147.347741 | 138.568129 | 147.761194 | 158.571429 |
| 35 | 113.475177 | 118.073537 | 120.200334 | 121.93851 | 148.282098 | 139.175258 | 148.148148 | 161.52019 |
| 36 | 113.798009 | 118.15562 | 120.556414 | 122.44898 | 148.993289 | 141.089109 | 149.359886 | 162.948594 |
| 37 | 114.197531 | 118.554217 | 120.560748 | 123.157895 | 149.595687 | 144.578313 | 149.517685 | 164.133739 |
| 38 | 114.628821 | 118.898018 | 121.28018 | 123.966942 | 151.376147 | 148.282098 | 152.159013 | 167.168675 |
| 39 | 114.87965 | 119.1067 | 121.28018 | 124.137931 | 155.325444 | 149.139579 | 154.048716 | 167.182663 |
| 40 | 115.093387 | 119.318182 | 121.93851 | 124.390244 | 155.631399 | 152.830189 | 155.660377 | 167.50179 |
| 41 | 115.555556 | 119.591638 | 122.278833 | 125.137212 | 156.521739 | 152.866242 | 158.940397 | 167.875648 |
| 42 | 116.048092 | 120 | 122.511485 | 125.538462 | 156.94165 | 153.191489 | 159.695817 | 168 |
| 43 | 116.809117 | 120 | 122.522523 | 125.565611 | 158.553547 | 153.583618 | 160 | 168.350168 |
| 44 | 116.923077 | 120 | 122.963741 | 125.625853 | 159.07208 | 153.846154 | 160.555005 | 168.768186 |
| 45 | 117.41683 | 120.44374 | 123.45679 | 126.550868 | 160.475483 | 154.166667 | 162 | 168.865435 |
| 46 | 117.515389 | 120.729995 | 123.499142 | 128.230616 | 160.760588 | 155.214228 | 163.558106 | 170.454545 |
| 47 | 118.518519 | 120.762712 | 124.369748 | 128.244275 | 160.93881 | 159.292035 | 167.364017 | 170.558376 |
| 48 | 118.811881 | 120.884521 | 124.8 | 130.509445 | 161.632653 | 162.313433 | 167.701863 | 172.54902 |
| 49 | 118.870728 | 121.566862 | 124.8 | 131.18527 | 165.137615 | 163.588391 | 168.103448 | 174.006445 |
| 50 | 120.992761 | 122.379603 | 126.472412 | 132.481116 | 165.70771 | 165.242165 | 168.709445 | 174.418605 |
| 51 | 122.227252 | 122.44898 | 129.449838 | 140.695915 | 166.219839 | 165.484634 | 170.526316 | 174.587779 |
| 52 | 122.844828 | 123.640527 | 136.615385 | 141.055046 | 166.501487 | 166.075231 | 179.372197 | 174.591909 |
| 53 | 122.844828 | 123.817713 | 141.918528 | 174.496644 | 172.340426 | 168.27853 | 188.764045 | 176.759411 |
| 54 | 123.231401 | 124.927704 | 156.666667 | 174.496644 | 177.676538 | 173.374613 | 190.854871 | 178.16092 |

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| **Tabla 13. Datos de todas las corridas de hombres, en ambas modalidades y todos los modos.** | | | | | | | | |
| No. | SIN BALÓN | | | | CON BALÓN | | | |
| SM-SB | 119-SB | 140-SB | 168-SB | SM-CB | 119-C | 140-C | 168-CB |
| 1 | 81.6326531 | 82.1417706 | 82.1917808 | 80.8672722 | 97.6578007 | 85.4700855 | 102.635229 | 101.423488 |
| 2 | 84.398977 | 86.1435726 | 84.6106683 | 85.0125945 | 97.8670013 | 97.5192472 | 102.710414 | 105.642257 |
| 3 | 90.712743 | 88.0503145 | 89.5211659 | 86.6062437 | 101.040119 | 98.4555985 | 105.166052 | 107.865169 |
| 4 | 97.1322849 | 95.5017301 | 99.6580362 | 100.393701 | 101.842871 | 98.7074031 | 105.882353 | 108.345534 |
| 5 | 98.5074627 | 96.9044415 | 101.071975 | 100.740741 | 103.852596 | 98.7370838 | 106.382979 | 110.204082 |
| 6 | 98.7415295 | 98.2630273 | 101.254868 | 101.071975 | 105.128205 | 98.9010989 | 109.042553 | 110.650069 |
| 7 | 102.236422 | 100.558659 | 101.694915 | 103.092784 | 106.508876 | 99.5744681 | 109.489051 | 115.79482 |
| 8 | 103.864734 | 101.543056 | 102.061856 | 106.800548 | 106.960951 | 99.8864926 | 112.123974 | 116.15245 |
| 9 | 103.882476 | 103.165299 | 102.841678 | 107.54717 | 107.294118 | 100.083403 | 112.707182 | 116.34349 |
| 10 | 104.046243 | 103.2 | 103.232534 | 107.725789 | 107.454017 | 101.538462 | 113.100848 | 116.657909 |
| 11 | 105.078809 | 103.291139 | 105.117566 | 108.043217 | 108.667529 | 102.299762 | 113.577023 | 117.927338 |
| 12 | 105.633803 | 103.908956 | 106.651376 | 109.625668 | 108.870968 | 103.281334 | 113.697888 | 119.815668 |
| 13 | 106.391753 | 104.304636 | 106.654512 | 109.807602 | 108.906712 | 103.75369 | 114.078769 | 120 |
| 14 | 106.788079 | 104.39826 | 107.286544 | 110.27027 | 110.005238 | 103.9411 | 114.602588 | 120 |
| 15 | 107.03043 | 105.590062 | 108.176101 | 110.586011 | 110.429448 | 104.242424 | 114.788004 | 120.731707 |
| 16 | 107.365793 | 106.129165 | 108.8 | 110.915493 | 110.623354 | 104.321908 | 115.384615 | 122.21515 |
| 17 | 107.623318 | 106.824926 | 108.8769 | 111.304348 | 111.157895 | 105.714286 | 115.662651 | 122.266402 |
| 18 | 107.949791 | 106.862232 | 108.989287 | 111.545988 | 111.464968 | 107.843137 | 115.956392 | 122.553191 |
| 19 | 108.131868 | 106.995885 | 109.190173 | 111.731844 | 111.818182 | 109.211252 | 117.200217 | 123.364486 |
| 20 | 108.131868 | 107.142857 | 109.573879 | 113.151365 | 111.870727 | 111.202636 | 117.340287 | 125.538462 |
| 21 | 108.387097 | 107.430618 | 109.974425 | 113.263785 | 111.970869 | 112.149533 | 118.153846 | 126.077586 |
| 22 | 108.493151 | 107.589658 | 110.638298 | 113.468635 | 112.123974 | 112.627986 | 118.309859 | 126.358696 |
| 23 | 108.493151 | 108.494533 | 110.957004 | 114.182148 | 115.99297 | 112.77232 | 118.955513 | 127.991675 |
| 24 | 108.527132 | 108.534323 | 111.162575 | 114.515319 | 117.344313 | 113.793103 | 120.754717 | 128.410915 |
| 25 | 108.561342 | 108.571429 | 111.258278 | 114.745848 | 117.52888 | 114.545455 | 121.583412 | 130.515848 |
| 26 | 108.744903 | 109.772423 | 111.36108 | 115.093387 | 117.702008 | 114.747131 | 122.211445 | 131.25 |
| 27 | 108.794198 | 110.188019 | 111.818182 | 115.662651 | 118.301314 | 115.909091 | 122.377622 | 131.736527 |
| 28 | 108.837209 | 110.429448 | 112.623182 | 115.685253 | 119.815668 | 116.173121 | 124.066628 | 132.264529 |
| 29 | 108.887855 | 110.769231 | 112.927192 | 116.030534 | 120 | 116.504854 | 124.690747 | 132.635253 |
| 30 | 109.090909 | 110.860748 | 112.927192 | 116.335434 | 120.194911 | 117.103236 | 125 | 132.678133 |
| 31 | 109.368376 | 110.900474 | 113.140837 | 116.413214 | 120.529152 | 117.142857 | 125.356125 | 133.518776 |
| 32 | 109.422492 | 110.915493 | 113.151365 | 116.41791 | 120.729995 | 117.647059 | 127.272727 | 134.969325 |
| 33 | 109.756098 | 110.953058 | 113.262343 | 116.543871 | 120.954907 | 118.811881 | 129.545455 | 137.339056 |
| 34 | 110.273327 | 111.157895 | 113.42155 | 117.056856 | 121.100917 | 121.037464 | 136.363636 | 139.534884 |
| 35 | 110.275689 | 111.158983 | 113.582584 | 117.073171 | 122.286221 | 121.356336 | 140.377358 | 141.639344 |
| 36 | 110.35818 | 111.66591 | 114.374034 | 117.274168 | 122.389509 | 121.661721 | 140.900196 | 156.202144 |
| 37 | 110.854503 | 112.173913 | 114.667941 | 117.352056 | 123.443422 | 122.102883 | 142.528736 | 157.156221 |
| 38 | 110.900474 | 112.449799 | 114.997604 | 117.41683 | 123.640527 | 122.44898 | 144.082333 | 157.894737 |
| 39 | 111.317254 | 112.5 | 115.107914 | 117.911286 | 123.966942 | 128.219178 | 144.578313 | 158.203125 |
| 40 | 111.615245 | 112.554113 | 115.495669 | 118.4 | 128.992629 | 128.233971 | 146.017699 | 159.574468 |
| 41 | 111.702128 | 112.740605 | 115.618661 | 118.421053 | 130.434783 | 129.144852 | 149.433962 | 160 |
| 42 | 112.097151 | 113.636364 | 115.727003 | 118.633913 | 137.787056 | 130.584192 | 150.197628 | 160.899654 |
| 43 | 112.449799 | 113.744076 | 116.129032 | 119.631902 | 141.122914 | 134.701732 | 152.450091 | 161.616162 |
| 44 | 114.285714 | 114.503817 | 117.298578 | 119.810825 | 148.363636 | 144 | 153.232243 | 165.876777 |
| 45 | 114.738806 | 114.545455 | 117.41683 | 119.94003 | 148.514851 | 150.537634 | 153.39664 | 169.014085 |
| 46 | 115.942029 | 115.163148 | 118.16839 | 120.527307 | 151.304348 | 154.255319 | 157.360406 | 169.761273 |
| 47 | 116.037736 | 115.523466 | 118.301314 | 121.008403 | 153.439153 | 155.306299 | 157.480315 | 171.903882 |
| 48 | 117.090479 | 115.638767 | 118.481013 | 121.558442 | 155.080214 | 156.697557 | 158.394931 | 173.374613 |
| 49 | 117.41683 | 115.808824 | 118.518519 | 121.846154 | 158.908507 | 159.04936 | 158.940397 | 175.050302 |
| 50 | 118.421053 | 116.407982 | 119.521912 | 122.646584 | 161.410019 | 160.714286 | 160.64257 | 178.107607 |
| 51 | 119.521912 | 116.567728 | 120.218579 | 122.797044 | 164.781906 | 161.264822 | 161.001789 | 179.640719 |
| 52 | 119.782214 | 117.507418 | 120.437956 | 124.161074 | 166.522116 | 162.809258 | 162.283997 | 182.683159 |
| 53 | 120.274914 | 118.343195 | 121.621622 | 125.72759 | 174.523571 | 163.206872 | 162.650602 | 183.086312 |
| 54 | 120.658135 | 120 | 121.748179 | 153.191489 | 177.419355 | 167.953668 | 166.666667 | 206.708976 |

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| **Tabla 14. “Models and Mechanisms of Interval Timing”** (Matell y Meck, 2000) | | | |
| **Model name** | **Clock type** | **“Psychological” mechanism** | **Neurobiological feasibility/General**  **criticisms** |
| Scalar expectancy  theory | Pacemaker-accumulator | Continuously running pacemaker is gated into an accumulator upon signal onset. Value in  accumulator is stored in reference memory.  Comparison process utilizes a ratio comparison in order to achieve scalar variance. | Currently suffers from unbounded accumulation processes. Dopaminergic  pacemaker hypothesis is unlikely due to limited range of modulation (~15%). May require chaining of  pacemakers/accumulators. |
| Behavioral theory of  timing | Pacemaker-accumulator | Pacemaker is started upon signal onset that drives animals into different “behavioral” states with each pulse. Pacemaker speed is proportional to  reinforcement density in order to achieve scalar property. | Reinforcement-density based pacemaker speed does not hold up to experimental findings. Recent evidence has found  successive states of striatal activity, which is likely gated by SNPC dopamine pulses, thus this could be a neural mechanism for this model. |
| Multiple Time  Scales | Process-decay | Decay of memory strength serves the role of the clock. Specific times are associated with specific amounts of decay. Scalar property is inherent in the “form” of the decay curve, as it approximates a negatively decelerating function. | Memory decay curves are computed over multiple trials in experimental situations, and it is unclear whether such activity could be found in the brain. Model has difficulty with gap and reset phenomenon. |
| Spectral timing  model | Process-decay | Differential activation rates of neurons lead to  differential habituation rates. The combination of  these rates leads to specific combinations of  activity at different durations. Scalar property is achieved through habituation property specifying that rates of activation and habituation are roughly equivalent. | This type of neural activation/habituation  phenomenon has not been found in regions of the brain thought to be  involved in timing. Model has some difficulties with gap phenomenon. |
| Multiple oscillator  model | Oscillator/coincidence detection | A large variety of oscillation periods are initiated at signal onset and time is coded by the combination of half-phase readouts across the ensemble of oscillators. Longer durations are primarily coded by longer oscillations, and scalar property is built into the oscillation periods. | Model requires oscillation periods of equal length to the duration being timed. The ability to find oscillations in the brain of  sufficient duration (e.g., 90 secs) is questionable. However, recent evidence  has found 60 sec oscillations in basal ganglia. |
| Beat frequency  model | Oscillator/coincidence detection | A variety of fast oscillation periods (~5—15 Hz) are initiated at signal onset and the time code consists of those neurons that fired spikes at the criterion time. This ensemble of coincidentally firing neurons produces maximal activity at the  criterion duration, as well as a large degree of  activity at the harmonics (1/2, 1/4, . . . ) of the  criterion duration, thereby inducing the scalar property. | Model in its current form does not reproduce the data obtained in psychophysical timing experiments. However, the building blocks of the model are on the proper  time scale of the brain (milliseconds), and  therefore this model is easily adaptable to a neural implementation. |