Journal: Sports Medicine

Title: **Reporting on Diversity in Concussion-Focused Neurocognitive Research: A Demographic Review**

Authors: Adam C. Raikes, Ph.D., ATC, Lillian Durán, Ph.D., Sydney Y. Schaefer, Ph.D.

Corresponding author: Dr. Adam C. Raikes

Department of Psychiatry

1501 N. Campbell Blvd

Room 7304

PO Box 245002

Tucson, AZ 85724-5002

Phone: (520)-626-8710

Email: raikes@psychiatry.arizona.edu

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Supplementary Table 1** Articles reporting race, ethnicity, or country of origin | | | | |
| Article | Year | Countrya | Total sample size | Origin |
| Allen & Gfeller, 2011 [68] | 2011 | USA | 100 | Caucasian, 76  Asian, 9  Asian Indian, 8  African-American, 4  Other, 2  Pacific Islander, 1 |
| Amick et al. [69] | 2013 | USA | 72 | Caucasian, 73.61  Hispanic, 19.44  African-American, 5.56  Unknown, 1.39 |
| Araujo et al. [70] | 2014 | USA | 382 | Caucasian/White, 83.15  Black or African American, 10.77  Other/Unknown, 5.8 |
| Armistead-Jehle et al. [71] | 2016 | USA | 129 | Caucasian, 80.62  African-American, 11.63  Hispanic, 5.43  Native American, 1.55  Asian, 0.78 |
| Babikian et al. [72] | 2011 | USA | 384 | White, 44.01  Hispanic, 21.35  Unknown, 12.76  Hispanic American, 9.9  Other, 6.77  Black, 5.47 |
| Barker-Collo et al. [58] | 2015 | New Zealand | 246 | New Zealand European, 63.82  Maori, 29.27  Other, 6.1  Pacific Islander, 0.81 |
| Barrow et al. [73] | 2003 | USA | 48 | Caucasian, 54.17  African-American, 41.67  Hispanic, 2.08 |
| Barwick et al. [74] | 2012 | USA | 14 | Caucasian, 71.43  African-American, 7.14  Asian American, 7.14  Mixed ethnicities, 7.14 |
| Barwood & Murdoch [75] | 2013 | Australia | 32 | Australian, 100 |
| Beers et al. [76] | 1994 | USA | 82 | African-American, 10.98 |
| Bernick et al. [59] | 2015 | USA | 246 | Caucasian, 36.18  Other, 30.89  African-American, 23.98 |
| Biederman et al. [77] | 2015 | USA | 99 | Caucasian, 86.21 |
| Bigler et al. [78] | 2015 | Multiple countries | 84 | Caucasian, 84.52  Multicultural, 8.33  African or Caribbean, 4.76  Unspecified, 2.38 |
| Blake et al. [60] | 2015 | USA | 60 | US or Canada, 68.33  Mexico, 25  South America, 8.33 |
| Boake et al. [79] | 2004 | USA | 448 | Hispanic, 57.59  African-American, 26.12  Caucasian, 13.62  Other, 2.68 |
| Bolzenius et al. [80] | 2015 | USA | 30 | Caucasian, 93.33  African-American, 6.67 |
| Brooks et al. [81] | 2016 | Canada | 105 | Caucasian, 87.62 |
| Brooks et al. [82] | 2014 | Canada | 105 | Caucasian, 87.62 |
| Broshek et al. [61] | 2005 | USA | 131 | Caucasian, 68.7  African-American, 22.9  Other, 7.63 |
| Clark et al. [83] | 2016 | USA | 79 | Caucasian, 56.96  Hispanic, 21.52  African-American, 7.59  Other, 7.59  Asian, 6.33 |
| Classen et al. [84] | 2011 | USA | 38 | White, 68.42  Other, 28.95  Missing, 2.63 |
| Cole et al. [57] | 2013 | USA | 419 | Caucasian, 60.14  African-American, 17.42  Latino, 12.89  Other, 6.44  Asian, 2.15 |
| Cole et al. [85] | 2015 | USA | 9 | African-American, 44.44  White (non-Hispanic), 33.33  Hispanic or Latino, 22.22 |
| Collins et al. [31] | 1999 | USA | 393 | European American, 48.09  African-American, 46.06  Polynesian American, 4.07  Asian American, 1.02  Hispanic American, 1.02 |
| Combs et al. [86] | 2015 | USA | 251 | Non-Hispanic, 75.7  Hispanic, 17.13  Caucasian, 43.83  Other, 14.34  African-American, 9.56 |
| Coughlin et al. [87] | 2015 | USA | 20 | Caucasian, 65  African-American, 35 |
| Daniel et al. [88] | 1999 | USA | 34 | White, 38.23  Black, 23.53  Filipino, 23.53  Hispanic, 14.71 |
| De Beaumont et al. [89] | 2013 | Canada | 30 | Caucasian, 100 |
| Didehbani et al. [90] | 2013 | USA | 59 | Caucasian, 83.05  African-American, 18.64 |
| Dretsch et al. [91] | 2015 | USA | 50 | Caucasian, 78  Hispanic, 14  Black, 6  Other, 2 |
| Dretsch et al. [92] | 2015 | USA | 85 | White, 58.82  Other, 18.82  Black, 10.59  Hispanic, 5.88 |
| Dretsch et al. [93] | 2015 | USA | 458 | White, 76.64  Black, 10.04  Hispanic or Latino, 6.99  Pacific Islander, 2.84  Other, 2.4  Native American, 1.09 |
| Durazzo et al. [94] | 2013 | USA | 64 | Caucasian, 71.88 |
| Echemendia et al. [95] | 2001 | USA | 49 | Caucasian, 81.63  African-American, 12.24  Undeclared ethnicity, 4.08  Latino, 2.04 |
| Erlanger et al. [96] | 2003 | USA | 440 | Caucasian, 55  African-American, 11.59  Asian American, 5.91  Hispanic, 4.09 |
| Ettenhofer & Abeles [97] | 2008 | USA | 126 | Caucasian/White, 90.48  African-American/Black, 3.97  Asian, 2.38  Hispanic or Latino, 1.59  Other, 1.59 |
| Fann et al. [98] | 2001 | USA | 15 | White, 86.67  American Indian, 6.67  Asian or Pacific Islander, 6.67 |
| Fay et al. [99] | 2010 | USA | 281 | Caucasian, 69.04 |
| Fisher et al. [100] | 2000 | USA | 90 | White, 93.33  Asian, 2.22  Black, 2.22  Hispanic, 2.22 |
| Franke et al. [101] | 2015 | USA | 181 | Caucasian, 79.01  African-American, 14.92  Other, 6.08 |
| Gill et al. [102] | 2016 | USA | 31 | White, 80.64 |
| Gordon et al. [103] | 2011 | USA | 82 | Caucasian, 51.22  Hispanic or Latino, 32.93  African-American, 9.76  Asian American, 3.66  Native American, 1.22 |
| Greiffenstein & Baker [104] | 2003 | USA | 75 | White, 72  Black, 2.67 |
| Grills & Armistead-Jehle [105] | 2016 | USA | 589 | Caucasian, 60.95  Hispanic, 13.92  African-American, 13.07  Pacific Islander, 7.98  Asian, 2.04  Other, 2.04 |
| Hänninen et al. [106] | 2016 | Finland | 304 | Caucasian, 100  Finnish, 86.84 |
| Hanna-Pladdy et al. [107] | 2001 | USA | 88 | Caucasian, 85.23  African-American, 9.09  Asian, 4.54  Native American, 1.14 |
| Hart et al. [108] | 2013 | USA | 48 | White, 78.33  African-American, 21.67 |
| Hess et al. [109] | 2003 | USA | 66 | Caucasian, 56.06  Minority, 43.94 |
| Hill et al. [110] | 2013 | USA | 629 | Caucasian, 89.35  Hispanic, 3.18  African-American, 2.38 |
| Hill et al. [111] | 2015 | USA | 174 | White, 62.07  African-American, 17.82  Asian, 10.92  Other, 9.2 |
| Hinton-Bayre et al. [112] | 1997 | Australia | 64 | Caucasian, 67.19  Aboriginal, 10.94  Other, 6.25 |
| Hunt & Ferrara [113] | 2009 | USA | 198 | White, 90.91 |
| Ivins et al. [114] | 2015 | USA | 789 | White, 65.78  African-American, 15.34  Hispanic, 13.05  Other, 5.83 |
| Jamora et al. [115] | 2013 | USA | 66 | Caucasian, 78.79  Asian American, 7.58  African-American, 6.06  Latino, 4.54  Biracial, 3.03 |
| Jones et al. [63] | 2014 | USA | 405 | US - English as primary language, 67.9  Dominican Republic, 14.81  Venezuela, 4.44  Canada, 3.95  US - Spanish as primary language, 3.21  Mexico, 0.74  Puerto Rico, 0.74  Cuba, 0.49  Nicaragua, 0.25 |
| Kashluba et al. [116] | 2008 | USA | 229 | Black, 71.62  White, 25.76  Other, 2.62 |
| Killam et al. [117] | 2005 | USA | 28 | Caucasian, 82.14  Other, 17.86 |
| Kontos et al. [41] | 2010 | USA | 96 | African-American, 50  White, 50 |
| Krishnan et al. [118] | 2012 | USA | 304 | Caucasian, 52.63  Hispanic, 2.3  Other, 1.97  African-American, 1.64 |
| Krivitzky et al. [119] | 2011 | USA | 26 | Caucasian, 88.46  African-American, 11.54 |
| Lange et al. [120] | 2012 | USA | 56 | Caucasian, 89.29  African American, Asian, or Other, 10.71 |
| Lange et al. [121] | 2009 | USA | 40 | Caucasian, 100 |
| Lange et al. [122] | 2010 | Canada | 63 | Caucasian, 74.6  East Indian, 9.52  Other, 7.94  Asian, 4.76  First Nations, 3.17 |
| Lange et al. [123] | 2012 | USA | 143 | Caucasian, 84.61  African-American, 8.39  Hispanic, 4.2  Other, 2.8 |
| Larson et al. [64] | 2013 | USA | 155 | African-American, 67.74  Caucasian, 29.68 |
| Larson et al. [124] | 2013 | USA | 205 | African-American, 63.9  Caucasian, 32.2 |
| Levin et al. [125] | 2013 | USA | 187 | Non-Black, 65.24  Black, 34.76 |
| Lippa et al. [126] | 2014 | USA | 131 | Caucasian, 64.89  Hispanic, 18.32  African-American, 11.45  Other, 4.58  Multiracial, 0.76 |
| Lopez et al. [127] | 2017 | USA | 39 | Caucasian, 74.36  African-American, 10.26  Hispanic, 7.69  Mixed racial background, 5.13  Asian, 2.56 |
| Louey et al. [128] | 2014 | Australia | 524 | English or European, 46.18  Indigenous, 4.2 |
| Lovell et al. [129] | 1999 | USA | 383 | White, 95.56  Other, 4.44 |
| Luethcke et al. [130] | 2011 | USA | 77 | White, 68.83  Black, 22.08  Hispanic, 11.69  Asian or Pacific Islander, 2.6 |
| Mac Donald et al. [131] | 2015 | USA | 72 | White, 70.83  Hispanic or Latino, 19.44  African-American, 9.72 |
| Macciocchi et al. [56] | 2013 | USA | 117 | White, 60.68  African-American, 36.75  Other, 2.56 |
| MacDonald et al. [132] | 2014 | USA | 84 | White, 77.38  African-American, 11.9  Hispanic or Latino, 11.9  Asian, 2.38 |
| Maillard-Wermelinger et al. [133] | 2009 | USA | 285 | White (non-Hispanic), 68.77 |
| Maruff et al. [134] | 2009 | Unknown or Unreported | 493 | Caucasian, 97.97 |
| Massey et al. [135] | 2015 | Australia | 50 | Australian, 64 |
| Matser et al. [136] | 1998 | Netherlands | 80 | Dutch, 100 |
| Matser et al. [137] | 2001 | Netherlands | 84 | Dutch, 100 |
| Matser et al. [138] | 1999 | Netherlands | 60 | Netherlands, 100 |
| Matser et al. [139] | 2000 | Netherlands | 64 | Dutch, 100 |
| McAllister et al. [140] | 2005 | USA | 66 | Caucasian, 100 |
| McAllister et al. [141] | 2012 | USA | 113 | Caucasian, 94.69 |
| McCauley et al. [142] | 2008 | USA | 139 | Hispanic, 39.57  African-American, 38.13  European American, 19.42  Other, 2.88 |
| McCauley et al. [143] | 2014 | USA | 178 | Non-Hispanic, 62.36  Hispanic, 37.64  European American, 60.67  African-American, 35.39  Biracial or multiracial, 2.81  Asian, 1.12 |
| McDonald & Franzen [144] | 1999 | USA | 75 | White, 88  Black, 12 |
| McGlinchey et al. [145] | 2014 | USA | 88 | White, 81.82  Hispanic or Latino, 10.23  Black or African American, 4.54  American Indian, 1.14  Asian, 1.14 |
| Merritt & Arnett [146] | 2014 | USA | 757 | Caucasian, 73.18  African-American, 20.48  Other, 6.34 |
| Meyer & Arnett [147] | 2015 | USA | 462 | Caucasian, 71.43  African-American, 20.13  Biracial or multiracial, 3.25  Hispanic American, 1.73  Asian American, 1.51  Other, 1.08  Latin American, 0.43  Multiracial, 0.43 |
| Meyers & Rohling [148] | 2004 | USA | 160 | Caucasian, 96.25  Mixed racial background, 1.88  Native American, 1.25  Hispanic, 0.62 |
| Nakayama et al. [149] | 2014 | USA | 85 | White, 75.29  Unreported, 11.77  African-American, 5.88  Hispanic or Latino, 3.53  Asian American, 2.35  Other, 2.35 |
| Nelson et al. [150] | 2010 | USA | 119 | Caucasian, 93.28 |
| Nelson et al. [151] | 2012 | USA | 104 | Caucasian, 97.11 |
| Nelson et al. [152] | 2016 | USA | 331 | White, 85.5  Black, 11.78  Other, 1.21  Asian, 0.91  Native Hawaiian or Pacific Islander, 0.6 |
| Nelson et al. [153] | 2016 | USA | 8056 | White, 73.5  African-American, 21.5 |
| Nelson et al. [154] | 2015 | USA | 2063 | White, 83.42  Black, 12.12  Unknown, 2.08  Asian, 1.21  Native Hawaiian or Pacific Islander, 0.58 |
| Newman et al. [155] | 2013 | USA | 184 | Caucasian, 22.28  African-American, 14.13  Mixed or multiple, 4.35  Asian or Pacific Islander, 0.54  Hispanic, 0.54 |
| Ord et al. [156] | 2010 | USA | 84 | Caucasian, 71.43 |
| Ott et al. [53] | 2014 | USA | 23775 | Hispanic, 49.72 |
| Panenka et al. [157] | 2015 | Canada | 94 | Caucasian, 55.32 |
| Paré et al. [158] | 2009 | Canada | 116 | White, 100 |
| Ponsford et al. [159] | 2011 | Australia | 223 | Australia or New Zealand, 82.06  United Kingdom, 4.48  India, 3.14  Other European, 2.24  Brazil, 0.45  Egypt, 0.45  Indonesia, 0.45  Lebanon, 0.45  Singapore, 0.45  South African, 0.45 |
| Proto et al. [160] | 2014 | USA | 178 | White, 67.42  Latino, 15.73  Black, 12.92  Asian, 2.81  Other, 1.12 |
| Provance et al. [161] | 2014 | USA | 80 | White, 68.75  Unknown, 18.75  Black, 6.25  Other, 5  Asian, 1.25 |
| Rabinowitz & Arnett [162] | 2012 | USA | 574 | Caucasian, 74.91  African-American, 17.94  Asian American, 1.04 |
| Rabinowitz & Arnett [163] | 2013 | USA | 113 | Caucasian, 80.53  African-American, 15.93 |
| Rabinowitz et al [65] | 2015 | USA | 167 | Black, 37.13 |
| Rabinowitz et al. [164] | 2015 | USA | 655 | Caucasian, 73.44 |
| Ravdin et al. [165] | 2003 | USA | 18 | White, 44.44  Hispanic, 38.89  Black, 16.67 |
| Register-Mihalik et al.  [66] | 2015 | USA | 245 | White, 71.02 |
| Resch et al. [67] | 2013 | Multiple countries | 92 | Irish, 50  US or Canada, 50 |
| Rieger et al. [166] | 2013 | USA | 69 | Caucasian, 76.81  African-American, 11.59  Native American, 4.35  Asian American, 2.9  Multi-ethnic, 2.9  Latin American, 1.45 |
| Ruocco & Swirsky-Sacchetti [167] | 2007 | USA | 161 | Caucasian, 86.96  African-American, 9.32  Hispanic, 1.86  Other, 1.24  Native American, 0.62 |
| Schatz & Maerlender [168] | 2013 | USA | 21917 | United States, 100 |
| Schatz & Sandel [39] | 2013 | USA | 236 | United States, 100 |
| Schnabel & Kydd [169] | 2012 | New Zealand | 240 | Caucasian, 73.33  Maori, 15  Asian, 6.25  Other, 5.42 |
| Schroeder et al. [170] | 2015 | USA | 91 | Caucasian, 79.12  Asian American, 7.69  African-American, 5.5  Latino, 5.5  Biracial, 2.2 |
| Shandera-Ochsner et al.  [171] | 2013 | USA | 81 | Caucasian, 85.19  African-American, 12.35  Hispanic, 2.47 |
| Shuttleworth-Edwards et al. [172] | 2014 | South Africa | 251 | South African, 100 |
| Shuttleworth-Edwards et al. [173] | 2008 | South Africa | 45 | Caucasian, 91.11  Zimbabwean, 8.89 |
| Shuttleworth-Edwards et al. [54] | 2009 | Multiple countries | 11257 | White, 100  United States, 85.64  South African, 14.36 |
| Silverberg et al. [174] | 2014 | Finland | 59 | Caucasian, 100 |
| Siman et al. [175] | 2013 | USA | 38 | Non-Black, 60.53 |
| Soble et al. [176] | 2013 | USA | 125 | White, 91.2  African-American, 4  Hispanic or Latino, 4  Other, 0.8 |
| Sponheim et al. [177] | 2011 | USA | 17 | Caucasian, 100 |
| Stamm et al. [178] | 2015 | USA | 42 | African-American, 42.86 |
| Strain et al. [179] | 2015 | USA | 55 | White, 78.18  African-American, 20  Asian, 1.82 |
| Straume-Næsheim et al. [180] | 2009 | Norway | 455 | Norweigan or Scandinavian, 69.67 |
| Straume-Næsheim et al. [181] | 2005 | Norway | 232 | Norway, 83.19  Other European, 9.05  Scandinavian, 8.19 |
| Suchy et al. [182] | 2014 | USA | 38 | Non-Caucasian, 18.42 |
| Tay et al. [183] | 2010 | Singapore | 76 | Chinese, 78.95  Indian, 13.16  Malay, 5.26  Other, 2.63 |
| Taylor et al. [184] | 2010 | USA | 285 | White, 68.77 |
| Teel et al. [185] | 2016 | USA | 152 | White, 66.45  African-American, 28.29 |
| Terry et al. [186] | 2012 | USA | 40 | White (non-Latino), 87.5  White Latino, 5  African-American, 5  Asian American, 2.5 |
| Thaler et al. [187] | 2013 | USA | 78 | Caucasian, 65.39  Hispanic, 15.38  African-American, 11.54  Other, 7.69 |
| Theadom et al. [188] | 2013 | New Zealand | 60 | New Zealand European, 76.67  Maori, 23.33 |
| Theadom et al. [189] | 2016 | New Zealand | 341 | White, 66.28  Maori, 28.15  Asian, 2.64  Pacific, 2.64  Other, 0.29 |
| Theadom, et al. [190] | 2015 | New Zealand | 346 | New Zealand European, 63.3  Maori, 33.24  Other, 3.47 |
| Theadom et al. [191] | 2015 | New Zealand | 142 | New Zealand European, 78.17 |
| Trontel et al. [192] | 2013 | USA | 49 | Caucasian, 91.84  African-American, 4.08  American Indian, 4.08 |
| Tsushima & Siu [51] | 2014 | USA | 247 | Mixed racial background, 43.32  Native Hawaiian or Pacific Islander, 34.01  Asian, 11.74  Caucasian, 4.86  Unreported, 3.64  Hispanic, 2.02  African-American, 1.22  Native American or Alaskan Native, 0.4 |
| Tsushima et al. [193] | 2013 | USA | 51 | Mixed ethnicities, 43.14  Asian, 31.37  Caucasian, 15.69  Pacific Islander, 9.8 |
| Van Patten et al. [194] | 2016 | USA | 150 | Caucasian, 96 |
| Vanderploeg et al. [195] | 2009 | USA | 826 | Minority, 19.25 |
| Vanderploeg et al. [196] | 2005 | USA | 3832 | White, 81.31  Black, 12.11  Hispanic, 4.67  Other, 1.85 |
| Vasterling et al. [197] | 2012 | USA | 760 | Ethnic Minority, 42.9 |
| Veeramuthu et al. [198] | 2014 | Malaysia | 21 | Malay, 57.14  Indian, 28.57  Chinese, 14.29 |
| Veeramuthu et al. [199] | 2016 | Malaysia | 41 | Polynesian Malay, 75.61 |
| Vilar-López et al. [200] | 2007 | Spain | 61 | Spain, 100 |
| Wäljas et al. [201] | 2015 | Finland | 186 | Caucasian, 100 |
| Waid-Ebbs et al. [202] | 2014 | USA | 6 | White, 83.33  African-American, 16.67 |
| Walker et al. [203] | 2014 | USA | 60 | Caucasian, 78.33  Hispanic, 16.67  African-American, 3.33  Native American, 1.67 |
| Wang et al. [204] | 2016 | USA | 37 | White, 72.97  Black, 24.32  Other, 2.7 |
| Whiteside et al. [205] | 2015 | USA | 224 | Caucasian, 95.98 |
| Willeumier et al. [206] | 2012 | USA | 100 | Caucasian, 60  African-American, 33  Mixed or multiple, 6  Hispanic, 1 |
| Winkler et al. [207] | 2016 | USA | 100 | Caucasian, 70  African-American, 14  Multiracial, 9  Asian, 5  American Indian or Alaskan Native, 1  Native Hawaiian or Pacific Islander, 1 |
| Wisdom et al. [208] | 2014 | USA | 134 | Caucasian, 60.45  Hispanic, 20.15  African-American, 14.18  Other, 5.22 |
| Wright et al. [209] | 2016 | USA | 40 | Caucasian, 57.5  African-American, 32.5  Other, 10 |
| Zollman et al. [210] | 2014 | USA | 300 | Black or African American, 66.33  White or European American, 30 |
| Note:  aCountry is the country of affiliation for the authors. This does not necessarily imply that recruitment of participants occurred in this country.  USA: United States of America | | | | |