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	Country ^a	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

			1	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
				Caucasian, 81.63
Echemendia et al. [95]	2001	USA	49	African-American, 12.24
Lonemendia et al. [95]	2001	USA	49	Undeclared ethnicity, 4.08
				Latino, 2.04
				Caucasian, 55
Erlanger et al. [96]	2003	USA	440	African-American, 11.59
				Asian American, 5.91
				Hispanic, 4.09 Caucasian/White, 90.48
				African-American/Black, 3.97
Ettenhofer & Abeles [97]	2008	USA	126	Asian, 2.38
	2000	00/1	.20	Hispanic or Latino, 1.59
				Other, 1.59
				White, 86.67
Fann et al. [98]	2001	USA	15	American Indian, 6.67
				Asian or Pacific Islander, 6.67
Fay et al. [99]	2010	USA	281	Caucasian, 69.04
				White, 93.33
Fisher et al. [100]	2000	USA	90	Asian, 2.22
i isilei et al. [100]	2000	USA	90	Black, 2.22
				Hispanic, 2.22
Franks at al. [404]	0045	1104	404	Caucasian, 79.01
Franke et al. [101]	2015	USA	181	African-American, 14.92 Other, 6.08
Gill et al. [102]	2016	USA	31	White, 80.64
Gill et al. [102]	2010		31	Caucasian, 51.22
				Hispanic or Latino, 32.93
Gordon et al. [103]	2011	USA	82	African-American, 9.76
20.40 0. 4 [0]			"-	Asian American, 3.66
				Native American, 1.22
Greiffenstein & Baker	2003	USA	75	White, 72
[104]	2003	00/	73	Black, 2.67
				Caucasian, 60.95
				Hispanic, 13.92
Grills & Armistead-Jehle	2016	USA	589	African-American, 13.07
[105]				Pacific Islander, 7.98 Asian, 2.04
				Other, 2.04
				Caucasian, 100
Hänninen et al. [106]	2016	Finland	304	Finnish, 86.84
				Caucasian, 85.23
Hanna-Pladdy et al. [107]	2001	USA	88	African-American, 9.09
Hanna-Pladdy et al. [107]	2001	UUA	00	Asian, 4.54
				Native American, 1.14
Hart et al. [108]	2013	USA	48	White, 78.33
1 1				African-American, 21.67
Hess et al. [109]	2003	USA	66	Caucasian, 56.06 Minority, 43.94
Hill of al. [110]	2012	1167	620	-
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

	1			
				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

	1	T		T
				Asian, 6.25
Schroeder et al. [170]	2015	USA	91	Other, 5.42 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
Theodom et al. [400]	2015	New	246	New Zealand European, 63.3
Theadom, et al. [190]	2015	Zealand	346	Maori, 33.24 Other, 3.47
Theadom et al. [191]	2015	New Zealand	142	New Zealand European, 78.17
				Caucasian, 91.84
Trontel et al. [192]	2013	USA	49	African-American, 4.08
Tsushima & Siu [51]	2014	USA	247	American Indian, 4.08 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
	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