

PIANIST HAND SPANS: Key statistical findings

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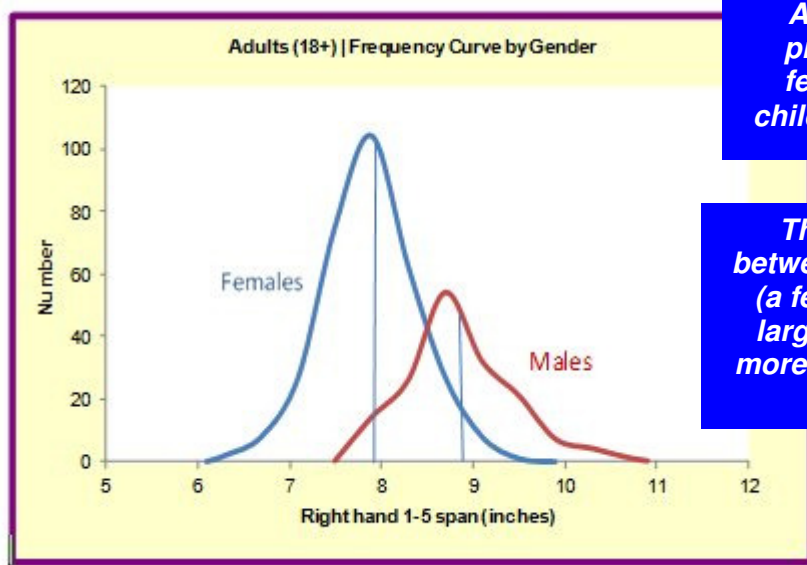
(From Rhonda Boyle, Robin Boyle, and Erica Booker, "Pianist Hand Spans: Gender and Ethnic Differences and Implications for Piano Playing", presented to the Australasian Piano Pedagogy Conference, Melbourne, July 2015. www.appca.com.au)

RESULTS FROM A STUDY OF 473 ADULT PIANISTS FROM 2011 TO 2014

□ Significant variation in hand spans between males and females:

Adult pianists – Right hand 1-5 span by gender– Key statistical measures				
	Males		Females	
Sample size	159		314	
	Inches	Centimetres	Inches	Centimetres
Minimum	7.8	19.7	6.4	16.3
Maximum	10.8	27.4	9.5	24.1
Arithmetic mean	8.9	22.6	7.9	20.1
Standard Deviation	0.56	1.43	0.53	1.35

□ On average males can reach one extra white key due to their larger hand spans:



A significant proportion of females have child-sized hands

The difference between the smallest (a female) and the largest (a male) is more than four white keys

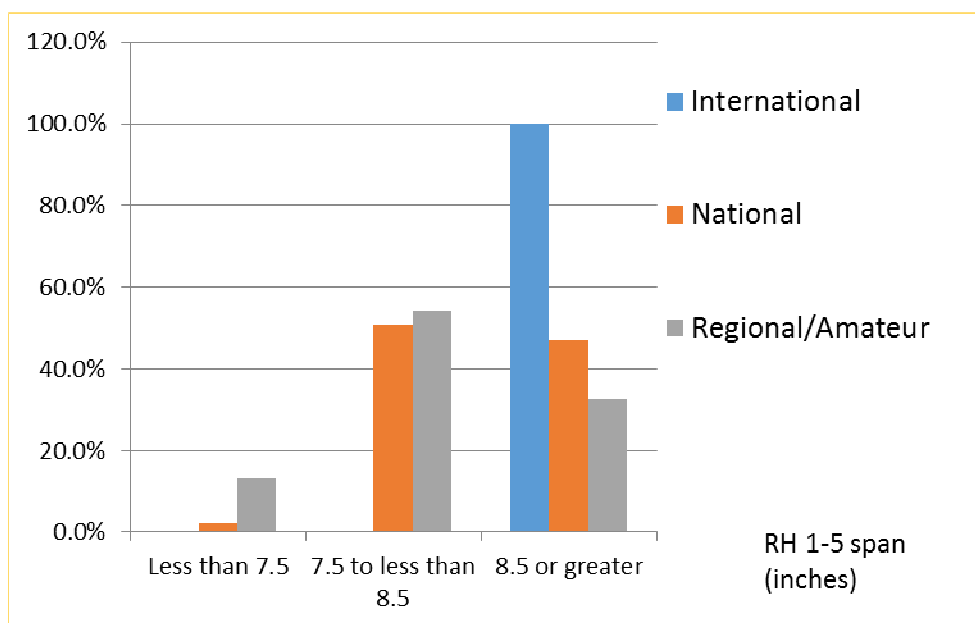
□ Significant variation in hand spans between Caucasians and Asians:

Adult pianists – Male right hand 1-5 span by ethnicity – Key statistical measures				
	Caucasian Males		Asian Males	
Sample size	116		37	
	Inches	Centimetres	Inches	Centimetres
Minimum	7.8	19.8	7.8	19.7
Maximum	10.8	27.4	9.4	24.0
Arithmetic mean	9.0	22.8	8.7	22.0
Standard Deviation	0.60	1.52	0.38	0.97

Adult pianists – Female right hand 1-5 span by ethnicity – Key statistical measures				
	Caucasian Females		Asian Females	
Sample size	216		87	
	Inches	Centimetres	Inches	Centimetres
Minimum	6.4	16.3	6.8	17.2
Maximum	9.5	24.1	9.0	22.9
Arithmetic mean	8.0	20.2	7.8	19.8
Standard Deviation	0.54	1.38	0.45	1.15

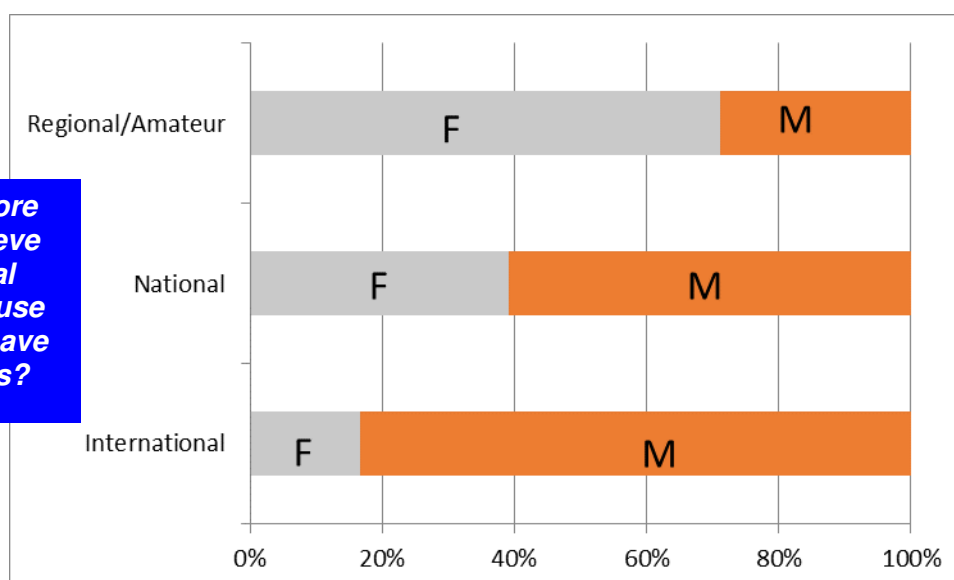
❑ *International soloists have very large spans:*

Adult pianists – Right hand 1-5 span by level of acclaim – Key statistical measures								
	All adults		International		National		Regional/Amateur	
Sample size	473		12		51		410	
	Inches	Cm	Inches	Cm	Inches	Cm	Inches	Cm
Minimum	6.4	16.3	8.8	22.4	7.2	18.3	6.4	16.3
Maximum	10.8	27.4	10.8	27.4	10.2	26.0	10.5	26.7
Arithmetic mean	8.2	21.0	9.5	24.0	8.5	21.6	8.2	20.8
Standard	0.71	1.81	0.52	1.32	0.57	1.45	0.70	1.77



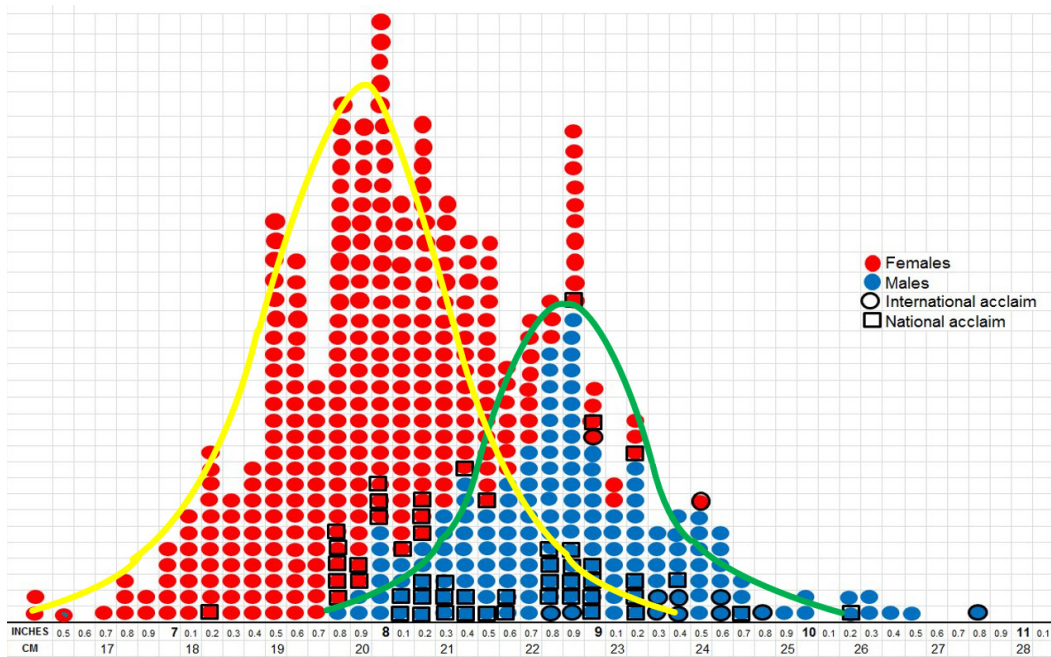
❑ *Males dominate Internationals and Nationals:*

Are males more likely to achieve international acclaim because they tend to have bigger hands?

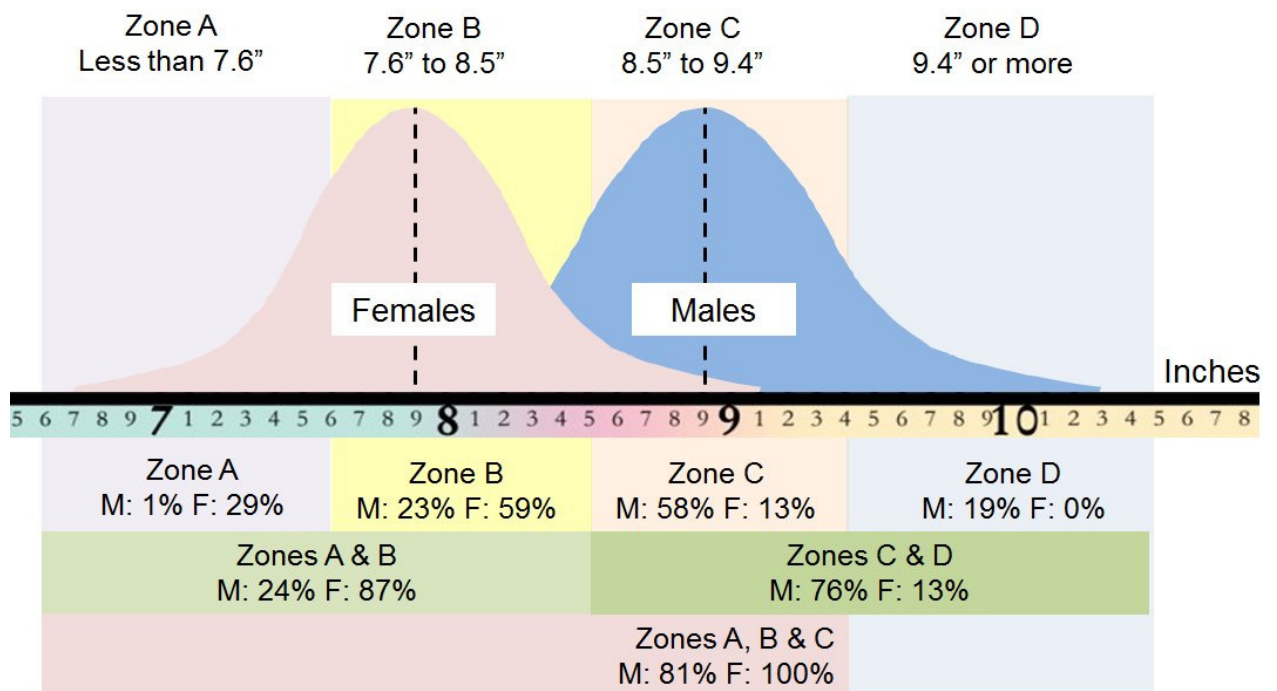


DRAWING CONCLUSIONS ABOUT SUBGROUPS IN THE WIDER POPULATION

□ The sample of 473 adult pianists showed a bi-modal distribution and that hand spans for each gender could be approximated by the normal curve:



□ Separate analysis identified 8.5 inches as the divider between 'Small' and 'Large' hands and sub-groups of 'Very Small' and 'Very Large' with only about 1% of males in the 'Very Small' zone and close to 0% of females in the 'Very Large' zone:



❑ *Caucasian males dominate the 'large hand' zones while Asian females dominate the 'small hand' zones:*

Proportions of adult pianists with 'small' or 'large' hands		
	'Small' hands: 1-5 spans less than 8.5"	'Large' hands: 1-5 spans 8.5" or more
All males*	23.8%	76.2%
All females*	87.1%	12.9%
Caucasian males	20.2%	79.8%
Caucasian females	82.3%	17.7%
Asian males	29.9%	70.1%
Asian females	94.0%	6.0%

*Based on the ethnic mix in the sample of 473 Adult Pianists

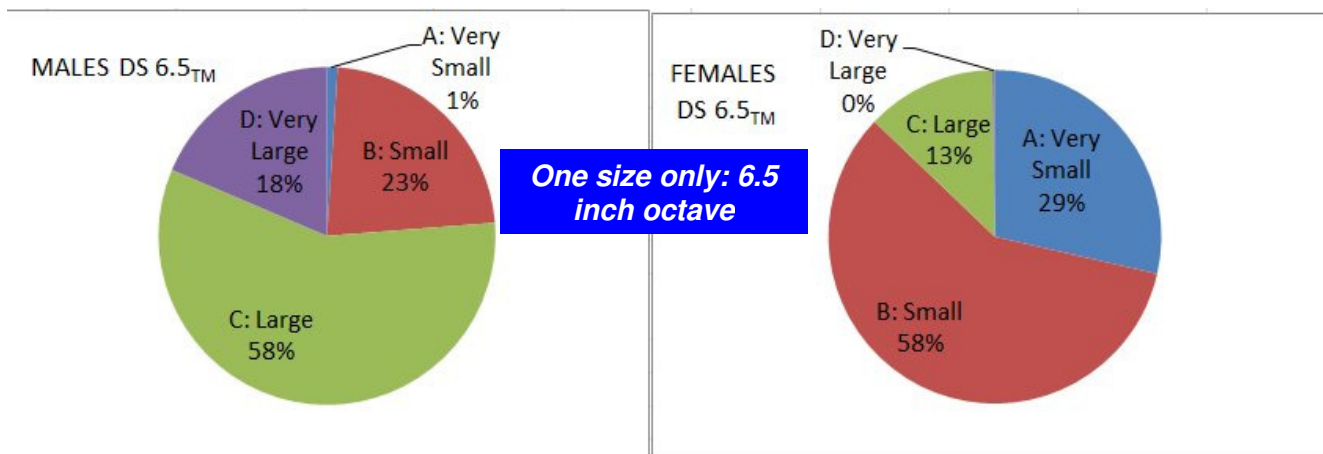
PROVIDING A CHOICE OF KEYBOARD SIZES

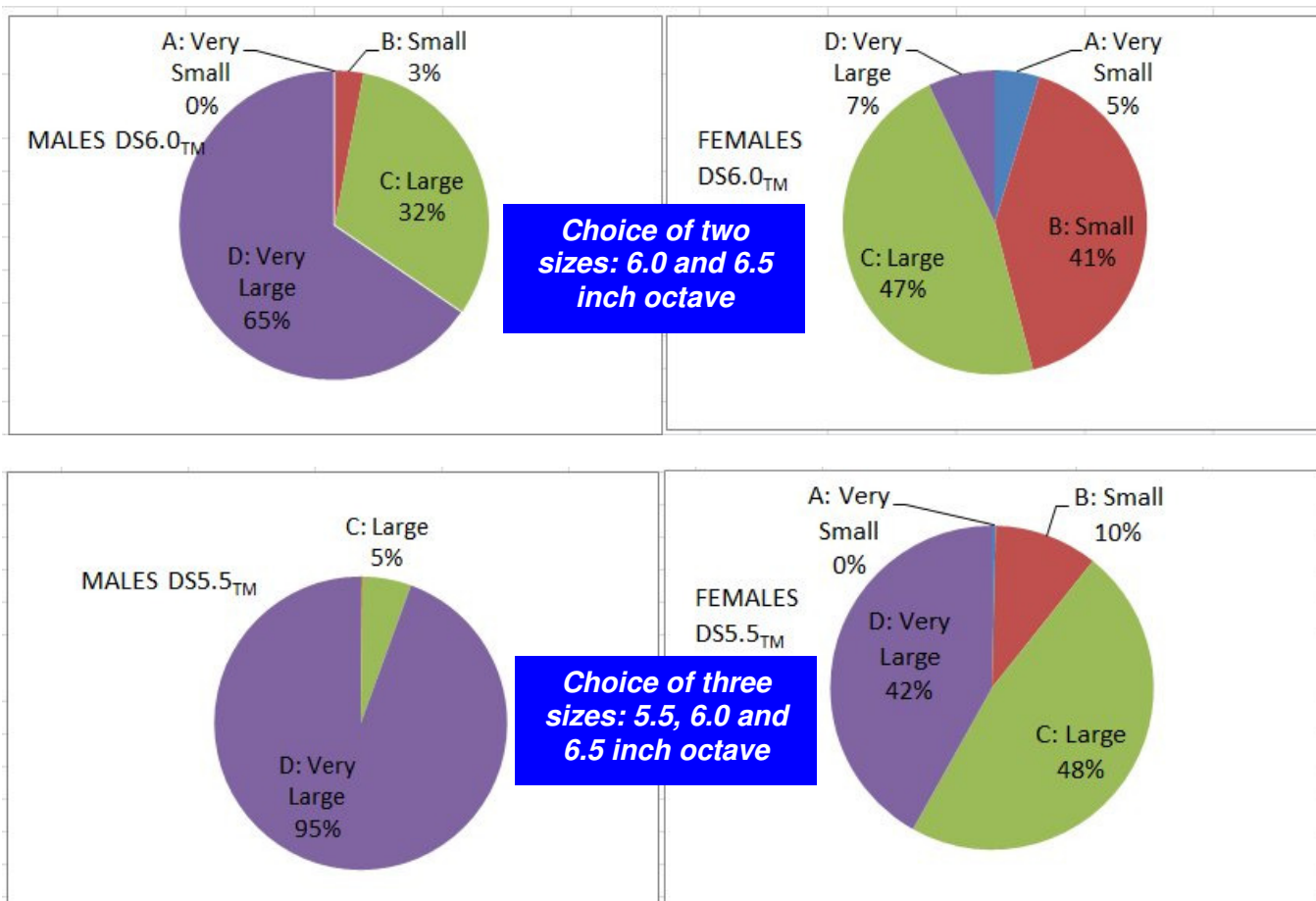
❑ *Keyboards with narrower keys currently have limited availability in at least three sizes:*

3/4	or	DS5.1™	(5.1 inch octave)
7/8	or	DS5.5™	(5.5 inch octave)
15/16	or	DS6.0™	(6.0 inch octave)
Conventional	or	DS6.5™	(6.5 inch octave)

❑ *Offering a choice of just three sizes effectively reduces the proportion of males with 'small' hands to 0% and to 11% for females:*

Hand span zones by keyboard size						
	6.5 inch octave only		6.0 inch & 6.5 inch octave		5.5 & 6.0 & 6.5 inch octave	
Zone	Males	Females	Males	Females	Males	Females
A: Very Small	1%	29%	0%	5%	0%	<1%
B: Small	23%	59%	3%	41%	0%	10%
C: Large	58%	13%	32%	47%	5%	47%
D: Very Large	19%	0%	65%	7%	94%	42%
'Small hands' (A+B)	24%	87%	3%	46%	0%	11%
'Large hands' (C+D)	76%	13%	97%	54%	100%	89%





□ If we assume there are more female than male pianists worldwide, the sample of 473 (ratio F:M is 2:1) shows the impact of CHOICE of keyboard on effective hand size:

