



The Multi-Ethnic Consumer

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Multi-Ethnic
Consumers

Products on the Market



Pantene Pro-V
Clinicare
Color/Perm
Damage Repair
Hair Treatment

"for use on Asian
hair types"



Pantene Pro-V
Relaxed & Natural
Intensive
Moisturizing
Conditioner

"for Women of
Color"



Lux Super Rich
Shine Ideal
Oriental Shampoo

"traditional
Chinese hair
nourishing
formula "

CRODA
Innovation you can build on™



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Product Performance

- We have observed that our products do not offer the same performance benefits on all different types of hair
- Even within the same hair type, performance will vary with the season!
- Very important to understand these differences to be able to respond to consumer needs



Differences in Hair Properties

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Hair Type	Caucasian	African	Oriental	Hispanic
Amino Acids	Same	Same	Same	Same
CSD, mm (Average)	29 - 96 (70)	46 - 120 (90)	36 - 125 (92)	30 - 120 (70 - 92)
Ellipticity	1.17 - 1.41	1.68 - 1.98	~ 1.25	1.17 - 1.98
Shape of hair	Oval	Flat	Round	Oval - flat-round
Shape	Straight to wavy/curly	Wavy to very curly	Straight to wavy	Straight/ wavy to very curly
Oiliness	Oily/dry	Dry	Oily	Oily/dry



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Different Hair Types and Measuring Shine



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Factors Effecting Hair Shine

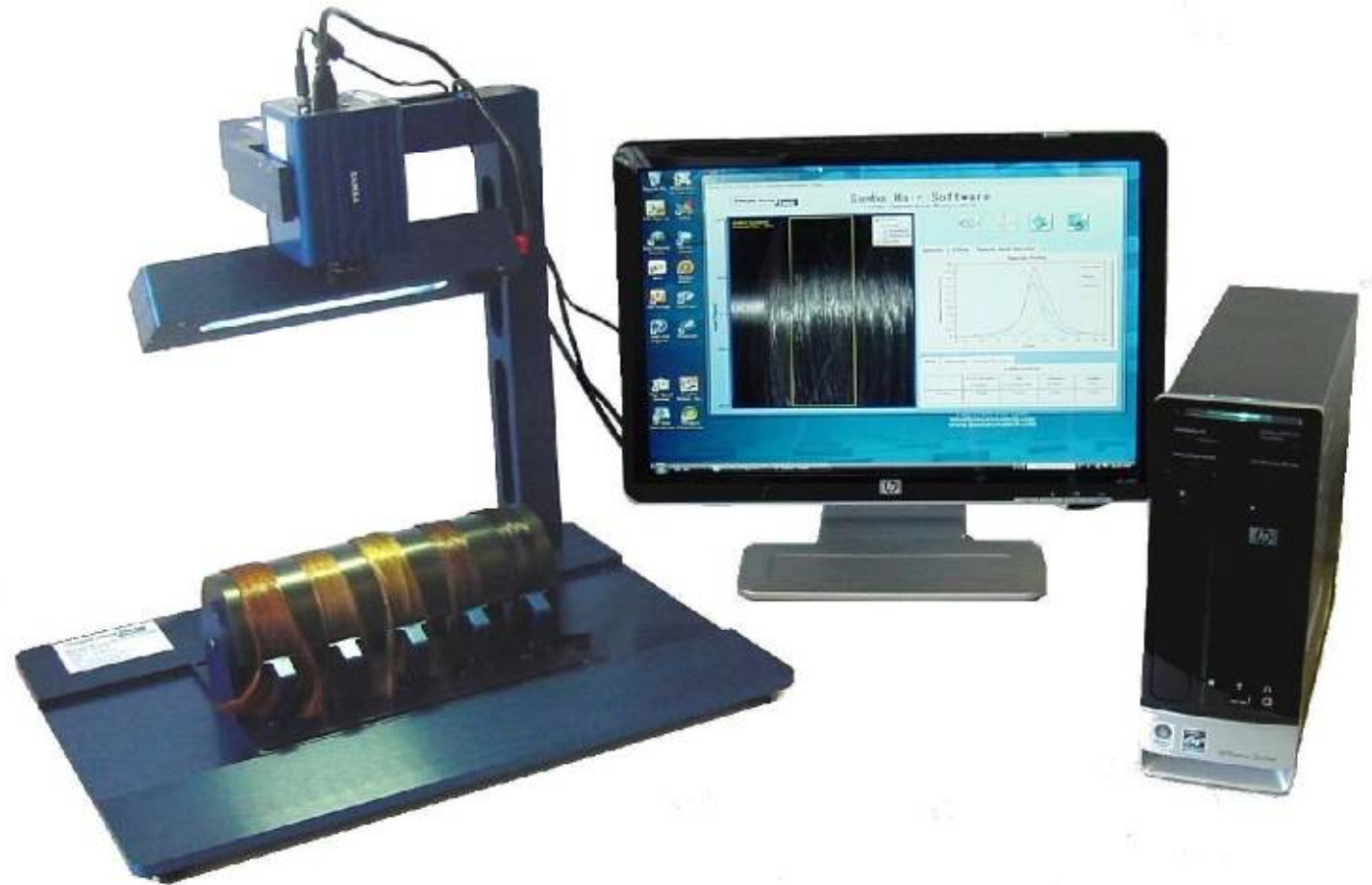
Many things can effect hair shine:

- Lighting environment
- Hair surface smoothness (virgin vs. damaged hair; uniform deposited film vs. discontinuous film)
- Refractive index (RI) and thickness of the deposited film
- Hair color (dark vs. color-dyed)
- Hair morphology (European vs. Oriental)
- Hair fiber density and hair tress alignment (straight vs. curly)



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HSIS (Hair Shine Image System)



Hair Samples

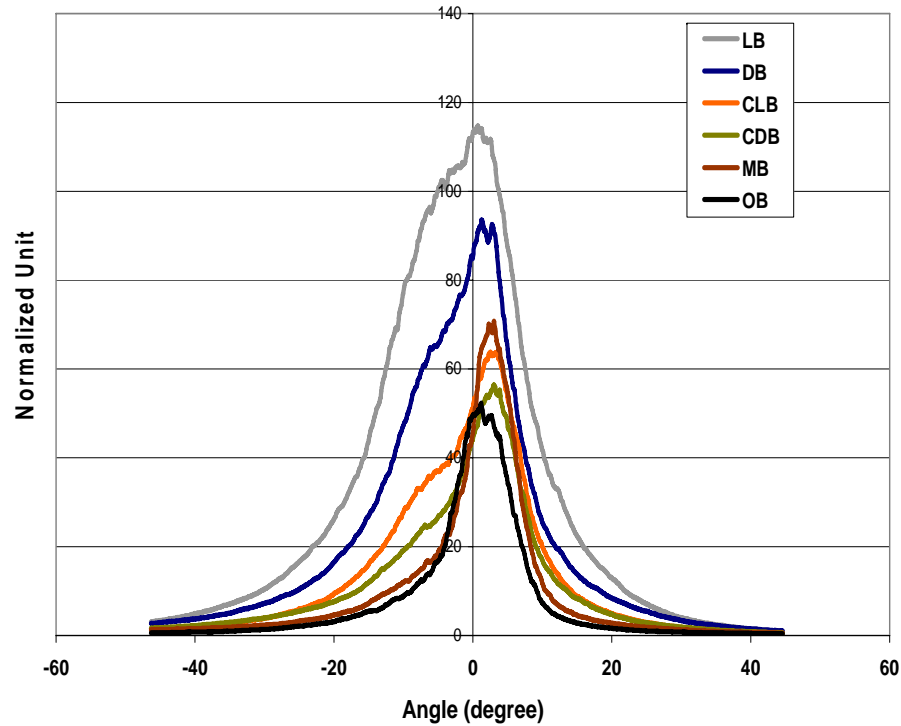


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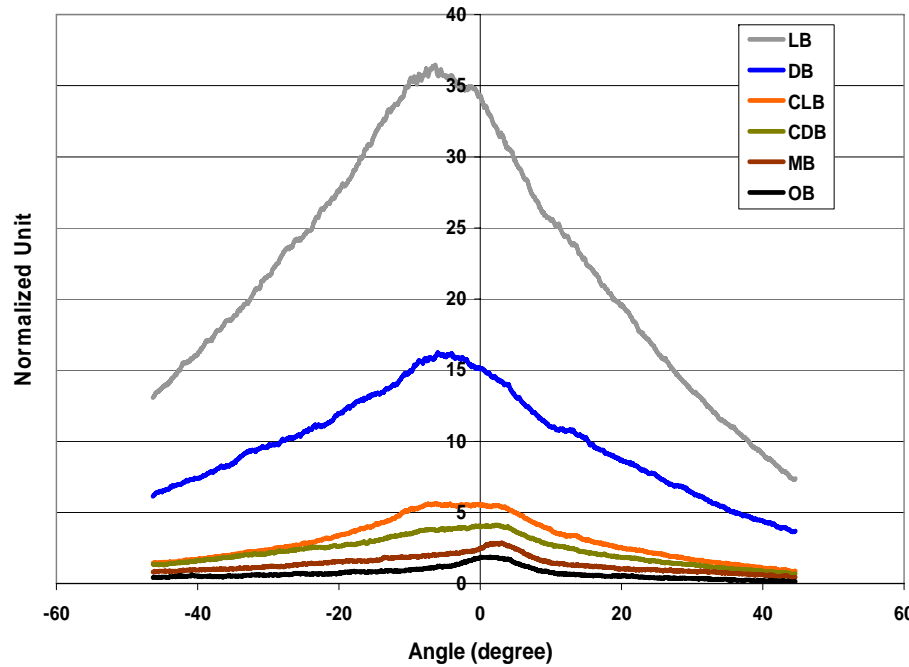
- Medium brown hair (MB)
- Light and dark bleached hair (LB and DB)
- Oriental black hair (OB)
- Dyed light and dark bleached hair (CLB and CDB) using L'Oreal Preference medium auburn hair color (5MB)



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Specular Profile of Different Hairs



Diffuse Profile of Different Hairs



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Definition of Hair Shine Index (L)

$$L = (S - D) / D^*$$

S = the area underneath the specular curve

D = the area under the diffuse curve

* The formula from instrument software

Shine Indexes of Different Hairs



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Hair Sample	LB	DB	CLB	CDB	MB	OB
L	0.43	1.21	3.63	4.06	6.41	9.80

$OB > MB > CDB > CLB > DB > LB$

The darker the hair color, the larger the determined L value



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Different Hair Types and Measuring Softness



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What is Dynamic Mechanical Analysis?

- DMA is a technique used to study and characterize materials, especially for observing the viscoelastic nature of polymers.
- An oscillating force is applied to a sample of material and the resulting displacement of the sample is measured.
- The stiffness, dynamic modulus and damping properties of the sample can be determined/calculated.





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Dynamic Mechanical Analyzer Study Hair Softness

- Objective Measurement of the Storage Bending Modulus of Hair Bundles
- Allows us to measure the differences in between different hair types before and after treatment



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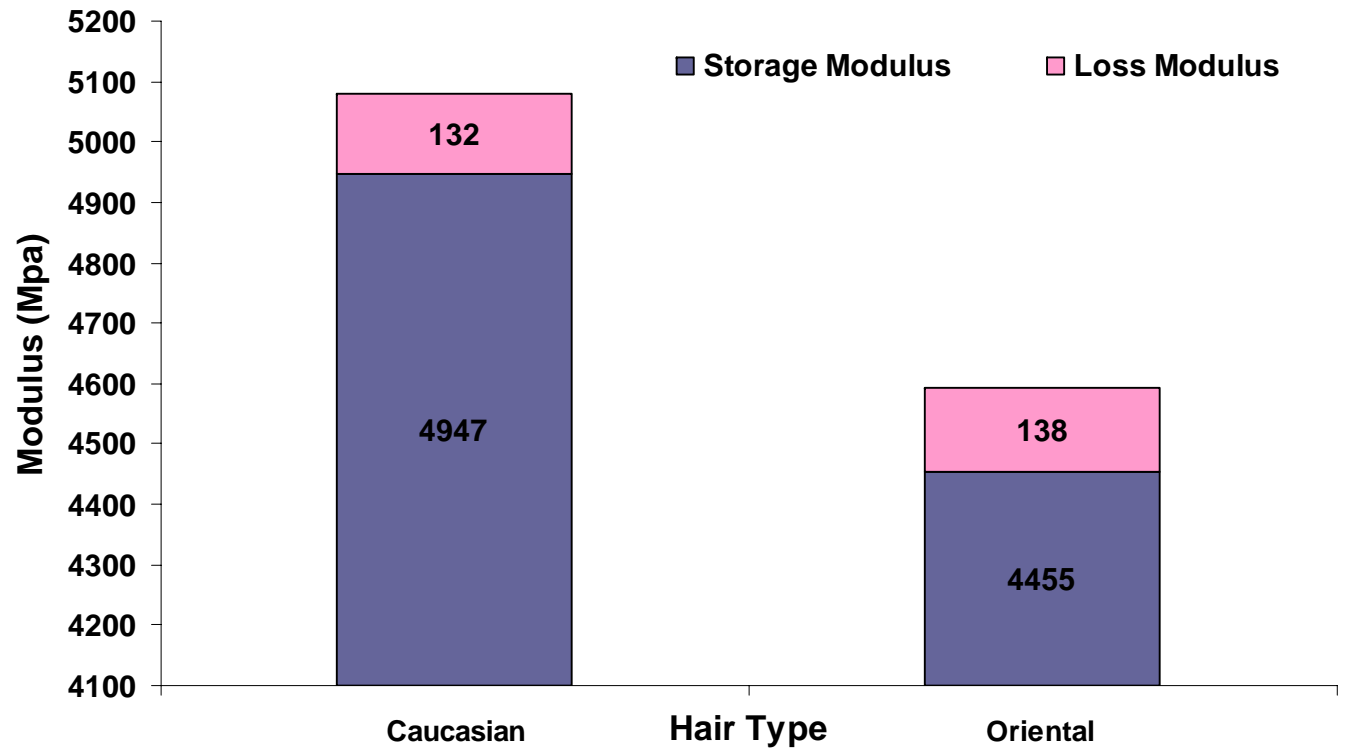
DMA Parameters

- Storage/Elastic Modulus - A measure of how elastic the material is
 - The higher the storage modulus, the more stiff the hair fibers. The hair bounces back to the original state quickly
- Loss/Viscous Modulus - A measure of the loss of energy dissipated as heat portion
 - The Bouncing Ball
- Damping - Characterization of the hair
 - Loss Modulus/Storage Modulus



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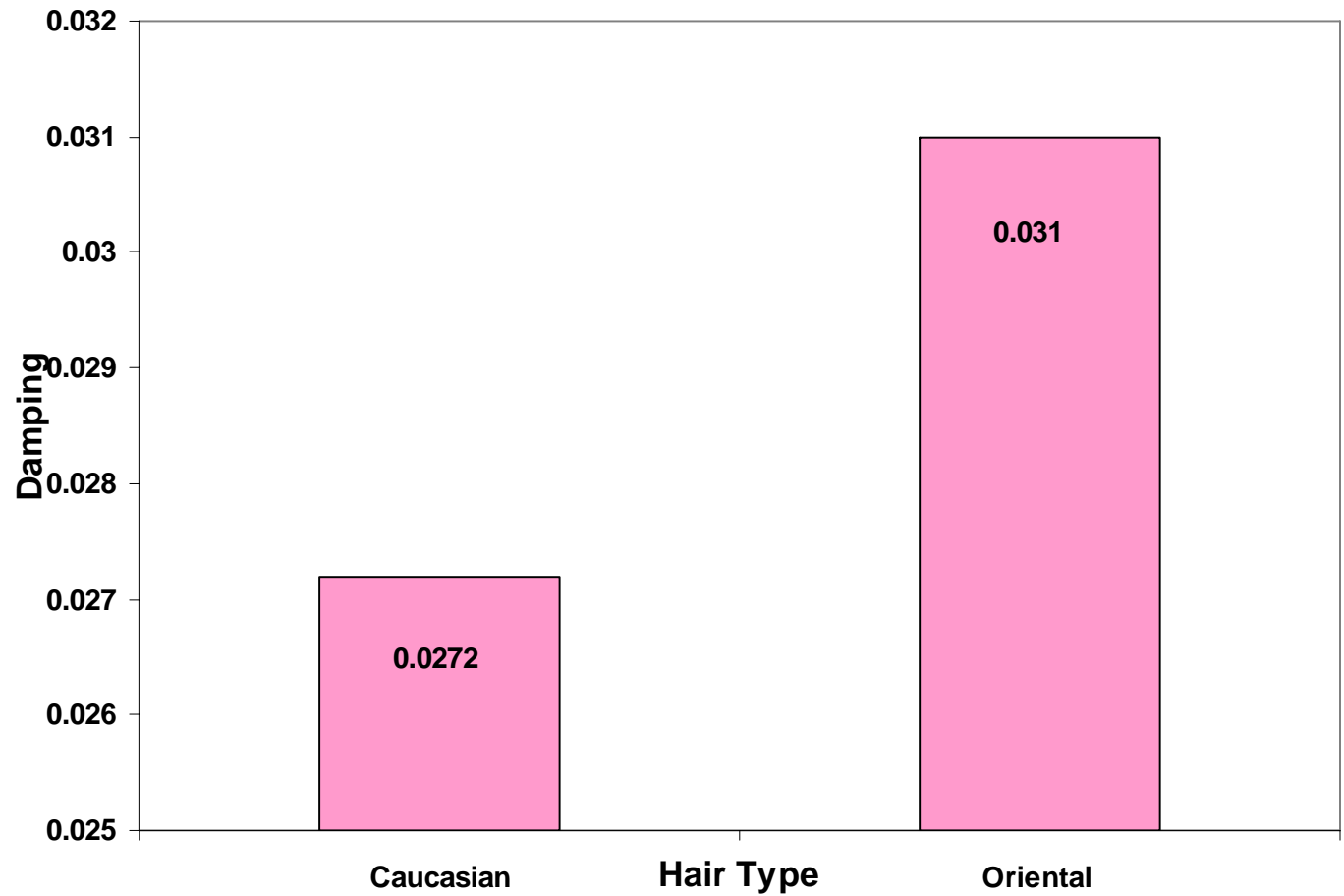
Viscoelasticity of Hair Fibers (60% RH)





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Viscoelasticity of Hair Fibers (60%RH)





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Viscoelasticity of Different Hair Types

- Caucasian hair showed a larger average storage modulus compared to Oriental hair
 - Based on the elliptical shape of Caucasian hair, this kind of result is expected. The larger cross section of the hair fiber makes it more difficult to bend
- Caucasian hair showed a slightly smaller average loss modulus compared to Oriental hair
- Oriental hair showed a higher average damping factor compared to Caucasian hair at the same relative humidity level
- This implies that Oriental hair is **less bouncy** and feels **more soft**



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Effect of Humidity on Hair Viscoelasticity

- The average storage modulus of hair fibers **decreases** with an increase in the environmental humidity level for Caucasian hair, Oriental hair and bleached hair types
 - All hair types are softer or less stiff in these higher humidity levels
- The average loss modulus of hair fibers **increases** with an increase in the environmental humidity level for all tested hair samples
- Therefore, average hair damping **increases** with an increase in the environmental humidity level
 - All hair types are softer or less stiff in these higher humidity levels



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How to Address the Global Melting Pot?

- As our populations around the globe continue to meld, we will see more hair types emerge
- For example in Latin America, there are already several types of hair that are recognized



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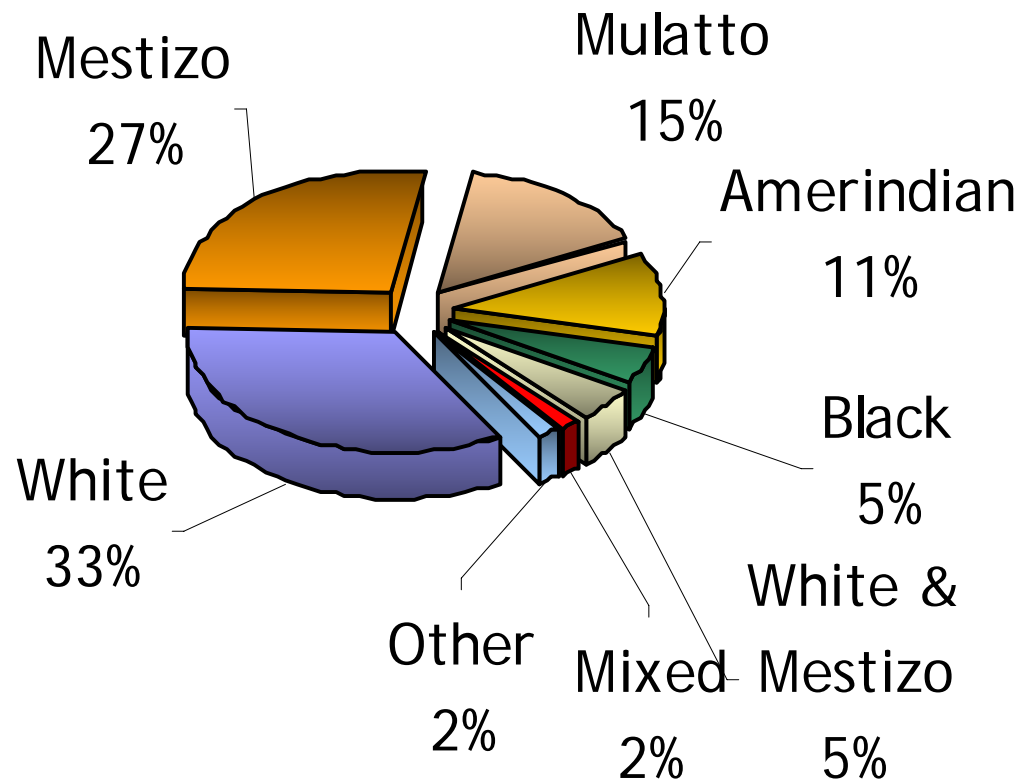
Ethnicity in LATAM

- Mestizos: Amerindian + European
- Mulattos: African + European
- Cafuso (Brasil): Amerindian + African
 - Zambo: Colombia
 - Lobo: Mexico
 - Marabou: Hiati,
 - Garafuna: Honduras, Belize and Guatemala



Ethnic Groups in Latin America

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Sources: Wikipedia, The Economist, Guia Abril

Latin America: Different ethnic groups by country



Sources: Wikipedia, The Economist, Guia Abril

Country	Population	White	Mestizo	Mulatto	Amer- indian	Black	White & Mestizo	Mixed	Other
Brazil	190,010,647	49.9%			0.7%	6.3%		43.2%	
Mexico	108,700,891	16%	70%		12%		1%		1%
Colombia	44,379,598	20%	58%	14%	1%	4%		3%	
Argentina	40,301,927	97%							3%
Peru	28,674,757	15%	37%		45%				3%
Venezuela	26,023,528	41%	49%		1%	7%			2%
Chile	16,284,741				3%		95%		2%
Ecuador	13,755,680	10%	65%		20%	3%			
Guatemala	12,728,111	3%			40.5%		59.4%		0.1%
Cuba	11,394,043	65%		24%		10%			1%
Dominican Republic	9,365,818	16%				11%		73%	
Bolivia	9,119,152	15%	30%		55%				
Haiti	8,706,497					95%		5%	
Honduras	7,483,763	1%	90%		7%	2%			
El Salvador	6,948,073	9%	90%		1%				
Paraguay	6,669,086	30%	65%		1%				4%
Nicaragua	5,675,356	17%	69%		5%	9%			
Costa Rica	4,133,884				1%	3%	94%		2%
Puerto Rico	3,944,259	80.5%			0.4%	8%		4.1%	7%
Uruguay	3,460,607	88%	8%			4%			
Panama	3,242,173	10%	70%		6%			14%	
Aruba	100,018							80%	20%
Total	561,211,057	33.9%	27%	15.2%	10.9%	4.9%	4.8%	1.7%	1.6%



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How many different hair types should be tested?

- As many as possible, especially if trying to market a product globally
- Proves the claim on hair types in which the region is familiar
 - Oriental
 - African
 - Caucasian
 - Latino
- Must not confuse a claim with actually meeting a consumer need



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Addressing the Global Melting Pot

- Most important aspect is to be able to address consumer needs
- Need to be able to speak the consumers language
 - Ex: Hispanic or curly hair types might not use a product that claims to add moisture due to frizz, although their hair type might in fact need moisturization
- Further segmentation



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Cultural Habits and Their Impact on Purchasing

- Another important factor to consider when formulating for various regions
- Cultural habits will impact purchases
 - LATAM region - certain scents
 - India - coconut oil
 - LATAM - cetrimonium chloride



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Conclusions

- As consumers continue to demand products that are designed specifically for their needs, we might see further segmentation
- Formulators are becoming more demanding in the types of amount of information required about products used to make claims
- We need to continue to test and understand different hair types as much as possible