LEXICON FOR LIP PRODUCTS

Koushik Adhikari, Lauren Dooley, Edgar Chambers IV

Sensory Analysis Center, Department of Human Nutrition, Kansas State University, Manhattan, KS 66506

INTRODUCTION

Color cosmetics are considered by women to be essential beauty items – one of the few remaining affordable, non-invasive beauty treatments. As of November 2005, global cosmetic sales were ~$32.7 billion. Increases in global sales are fueled, in part, by emerging markets such as Eastern Europe, India, China and Latin America. Eastern Europe has shown sales growth for five consecutive years for an average annual increase of 10.2% (Horne 2005). As of 2006, lip products were the third largest segment of cosmetics (Datamonitor 2006). The lip product category is important worldwide with growth in various segments of the category depending on region (Feller 2005; Horne 2005; Prance 2007).

Few sensory lexicons appropriate for cosmetic products have been published and those have been proposed for skin creams and lotions (Civille and Dus 1991; ASTM E 1490-92 1997; Wortel and Wiechers 2000; Lee *et al.* 2005). Some terms from prior studies may be appropriate for lip products, but no application of descriptive sensory analysis was found applied to lip products. Several of those lexicons included terminology, definitions and references with intensities for those products. In addition, several authors have used a limited number of attributes to describe oleogels and emollients used in lip and skin care products (Parente *et al.* 2008; Almeida *et al.* 2008). In those studies several attributes associated with appearance, pickup, rub-out, and aftereffects were used to study the products.

Although cosmetic companies may have developed internal lip product lexicons that information is not published. Therefore, the overall objective of this study was to develop a lexicon (appearance and texture) for lip products which could be used for a wide range of products. The study was conducted in three parts: 1) a focus group to understand key attributes, 2) development of a lexicon for use by a trained sensory panel, and 3) confirmation of whether the lexicon could be used effectively for new samples.

EXPERIMENT-I

The specific objective of this part of the study was to understand the reasons why women purchase and wear lip products, and what attributes are desirable and undesirable in those products.

Experimental: Female participants (ages 18-60) who used at least two types of lip products were selected for the focus groups. Two, 90-minute focus groups were conducted by a professionally trained moderator.

Results:

TABLE 1.
SOME CHARACTERISTICS OF LIP PRODUCTS ELICITED BY FOCUS GROUP PARTICIPANTS; AND SOME POTENTIAL ATTRIBUTES GENERATED BY THE GROUPS FOR THE DESCRIPTIVE PANEL

CHARACTERISTICS OF LIP PRODUCTS

Positive Characteristics		Negative Characteristics	
Color	Flavor	Crusty	Gritty feel
Glossy	Feels comfortable	Waxy residue	Gooey/gummy
Cannot feel it on lips	Slipperiness	Sticky	Dull
Proper thickness	No drag/ easy glide	Too thin, too thick	Color
Long-lasting	Applicator- wand, tube, bullet	Stains lips	Messy
Moisturizing	Aroma	Drying	Feathering
Reasonable price	Smooth	Smell or taste	Cracking
Not gritty	Shimmer	Not true to color	Bleeding

ATTRIBUTES SUGGESTED BY FOCUS GROUPS FOR TRAINED PANEL

Appearance	Texture	After removal
Glossiness	Grittiness	Staining
Shimmer	Waxy	Drying
Amount of Color	Thickness	Moisturizing
Sheerness/Opaqueness	Stickiness	
	Viscosity	

EXPERIMENT-II

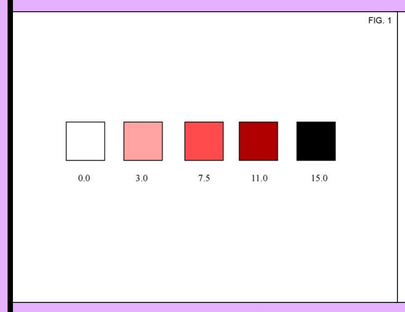
The specific objective of this experiment was to develop a lexicon (appearance and texture attributes only) that could be used for descriptive analysis of lip products, mainly lip glosses, lipsticks and lip balms.

Experimental: Six highly trained panelists were used. Fifteen lip products were selected from various lip categories: balms, glosses, and lipsticks.

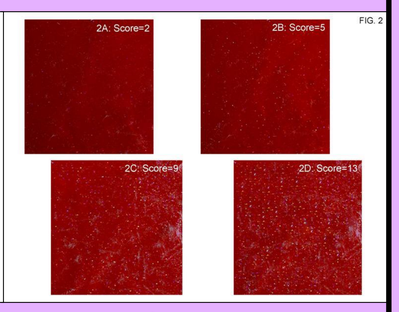
Results:

TABLE 2.
LIP PRODUCT SENSORY ATTRIBUTES, DEFINITIONS, REFERENCES

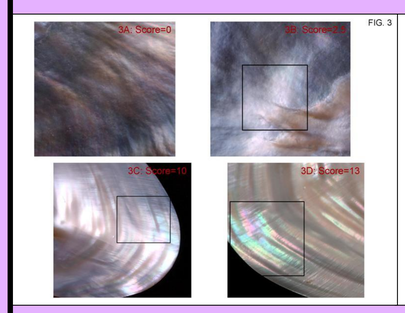
Sensory Attribute	Definition	Reference[a] and Intensity[b]
Initial Texture		
Smoothness	Evenness of the sample; absence of grains, clumps, lumps, etc.	Morton's Iodized Salt = 3.0 Arm & Hammer Baking Soda = 6.0 Johnson & Johnson 24-hour Moisturizer = 15.0
Spreadability	The ease in which the product can be manipulated on the surface of the forearm.	Vaseline® = 5.0 Chapstick (Classic) = 9.0 Johnson & Johnson 24-hour Moisturizer =13.0
Initial Drag	The amount of pressure required for application of product on clean skin.	Johnson & Johnson 24-hour Moisturizer = 1.0 Zinc Oxide = 6.0 Chapstick (Classic) = 12.0
Product to product drag	The amount of pressure required for application of product onto skin with one layer of product already applied.	Johnson & Johnson 24-hour Moisturizer = 1.0 Chapstick (Classic) = 5.0 Zinc Oxide = 12.0
Tackiness	The degree to which fingers adhere to the product; amount of adhesiveness.	Johnson & Johnson Baby Oil = 0.0 Post-it® Note = 7.5
Initial Appearance[c]		
Color Intensity[d]	Intensity of the color of the product on the arm (after application). Fig. 1 can be recreated using Microsoft® Word.	Fig. 1 White (R: 255, G: 255, B: 255) = 0.0 Light Pink (R: 255, G: 163, B: 163) = 3.0 Mid-Pink (R: 255, G: 75, B: 75) = 7.5 Burgundy (R: 176, G: 0, B: 0) = 11.0 Black (R: 0, G: 0, B: 0) = 15.0
Shininess	The amount of gloss or shine perceived on the surface of the product.	Porter Paints #6890-1 Antique White Flat Finish = 0.0 Porter Paints #6890-1 Antique White Eggshell Finish = 2.0 Porter Paints #6890-1 Antique White Satin Finish = 5.0 Porter Paints #6890-1 Antique White Semi-Gloss Finish = 8.0 Porter Paints #6890-1 Antique White Gloss Finish = 12.0
Wet	The appearance of looking wet; opposite of dry.	Vaseline® (untouched) = 5.0 Johnson & Johnson Baby Oil = 14.0
Glittery[d]	Sample composed of individual reflective particles that have a sparkling effect.	Fig. 2A = 2 Fig. 2B = 6 Fig. 2C = 9 Fig. 2D = 14
Pearl-like[d]	A soft, reflective luster reminiscent of a pearl or mother-of-pearl; gives depth.	Fig. 3A = 0 Fig. 3B = 2.5 Fig. 3C = 10 Fig. 3D = 13
Waxy Appearance	The degree to which the product looks like paraffin.	Vaseline® (untouched) = 5.0 Gulf Wax® Household paraffin wax = 12



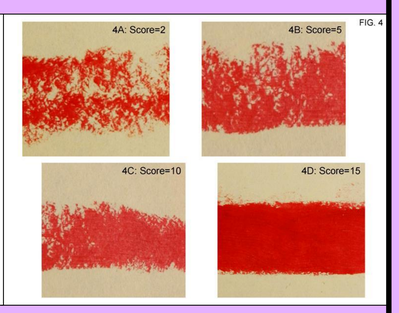
COLOR INTENSITY



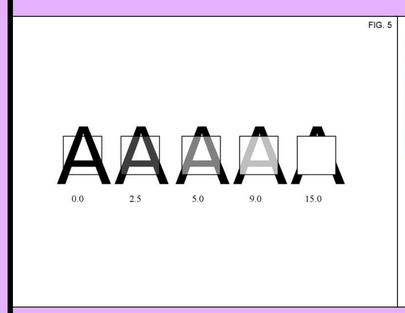
GLITTERY



PEARL-LIKE



COVERAGE



OPACITY



FEATHERING

TABLE 3.
DESCRIPTIVE ANALYSIS ATTRIBUTES' ORDER OF EVALUATION AND EVALUATION TECHNIQUES

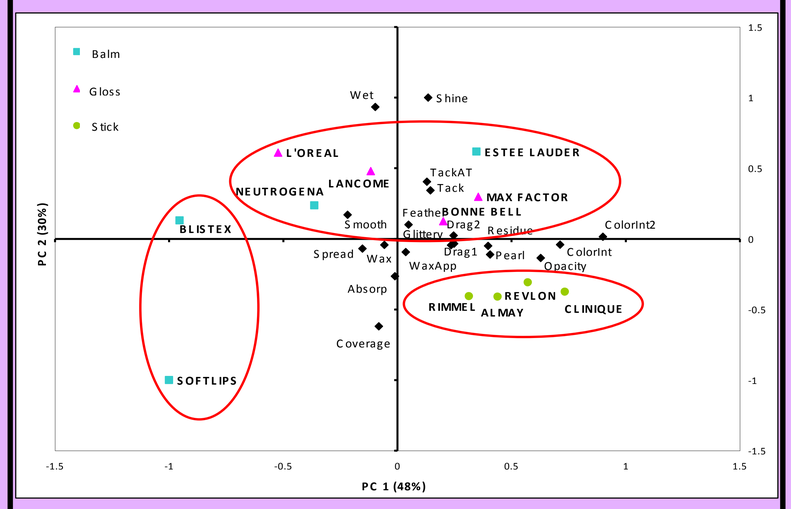
Order of Evaluation	Evaluation Technique
Initial Texture	
Smoothness	Apply a pea sized amount of product (approximately 1/4″ diameter) to thumb, move forefinger across thumb surface to gauge the degree of smoothness.
Spreadability	Spread a pea sized amount of product (approximately 1/4″ diameter) onto forearm using product applicator. If a pot/tub, use a plastic knife to scoop out designated amount. Apply the product to one spot on skin. Spread back-and-forth ONCE with index finger about two inches.
Initial Drag	Apply ONE stroke of the product in a right to left motion using finger or applicator- drag linear- on clean skin of forearm (evaluate product to skin drag)
Product to Product Drag	Leaving finger or applicator in left position move from left to right across the product already on the skin (evaluate product to product drag).
Tackiness	Tap middle finger on product that has been applied to arm; measure the degree to which the finger adheres to the product.
Initial Appearance (New application)	
Color Intensity Shininess Wet Glittery Pearl-like Waxy Appearance	Apply product with ONE forward and backward stroke to designated spot on forearm. Evaluate these 6 attributes (initial appearance) from only that application. Do not apply again.
Coverage	Apply one back-and-forth stroke of the product to beige/flesh-colored PAPER in designated 2″ × 1 ½ ″ area. Measure the intensity according to the amount (i.e. *proportion)* of area covered by the product (NOT a measure of opacity).
Opacity	Using the application from "coverage", evaluate the opacity.
After Appearance (Needs to be measured at times in accordance with the study's objectives and products)	
Feathering	Observe any feathering.
After Texture (Time should be specified for a given study depending on the objectives)	
Tackiness	See under "Initial Texture."
Degree of Absorption	With blotting paper, blot product on forearm. Determine the amount of product on the paper. The higher the amount of product on paper, the lower the Degree of Absorption intensity.
Amount of Residue	With blotting paper, blot product on forearm. Determine the amount of product left on the skin.

EXPERIMENT-III

The specific objective of the third study was to confirm whether the lexicon could be used effectively to discriminate among a new set of samples.

Experimental: Six highly trained panelists participated in this study. Four new products were selected from each category: balms, glosses, and lipsticks. Different brands, packaging, applicators, price points, benefits and claims were utilized to achieve the most representative group.

Results:



SUMMARY

- A lip product lexicon was developed.
- Descriptive testing using the lexicon was conducted to check that the lexicon could differentiate among products both within and among categories of lip products.
- Overall, the lexicon worked well in distinguishing between lip glosses, lip balms and lipsticks.
- The four lipstick samples were grouped more similarly, primarily because of their appearance attributes.
- Scoring overlap occurred for the glosses and balms possibly because of common ingredients or applicator type.
- This study tested a wide range, but limited number of samples in the lip product category.