NEW ASSESSMENT METHOD UNDER STYLING AIDS ON CURLY HAIR

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ABSTRACT

Introduction

Afro-consumers with short relaxed or natural hair experience frustrations during styling. Hence a light textured product is needed with minimal greasiness that defines curls without weighing them down giving a voluminous, tangle-free look. Due to market demand in this category, the aim was to create a standardized evaluation method for gestures that are inclusive and consumer relevant.

Materials & Method

Multiple studies were conducted on volunteers of African Origin, aged 18-50 years, in Nairobi, Kenya. The focus was on short-length hair, chemically texturized ('S' curl) 1 week prior.

Hair demographics and product descriptions were noted after which the hair was shampooed and assessed after application. On wet hair attributes wetting effect, softness, curl evenness, and curl definition were evaluated. To ensure uniformity a standard camera was used under natural lighting, A scale from 0 to 5 was generated using SIMS software designed to convert the results into raw data translating the information on product efficacy validated by conducting tests over the last 4 years to ensure reproducible method.

Results

Key visual gestures and tactile attributes of the product such as distribution, wetting effect, suppleness, greasiness, curl evenness, and curl definition are prescribed for scoring. Standardized Atlas was also created from the customized attributes leading to harmonizing the ways of evaluating and validation.

Conclusion

This methodology directly addresses consumer needs and the attributes in our assessment help formulate appropriate products. This work has supported previous launches within our portfolio on superiority performance, and strong claims versus competition.

Keywords: Sensory, Curly Hair, Styling Aid, Visual Gestures

INTRODUCTION

Creating the ideal end look that can be appreciated for several days is important when styling hair. The style should enhance physical features and improve the individual's beauty including identity on their sense of style (1). Many Black women of African descent consider their hair and hairstyles as crowns, as expressions of ethnicity and socio-cultural background. The style should enhance features and improve the individual's beauty. Since the mid-70s, the desired goal of this hairstyle for consumers has been to achieve the 'wet look', resulting from the finishing products used at the time, which provide definition to the curl and produce a high glossed and oily finish to permed hair. Consumers still utilize the same products to define the curls; however, they prefer a light-textured product format, for easier application, a less greasy feel that does not weigh down the curls, luster, body, and beauty that builds confidence from the even-defined curly look.

BACKGROUND

Consumers with short Afro-hair, whether relaxed or natural, experience frustration when combing or styling on day-to-day and for special occasions. A curl activator is a product that will trigger a curl pattern either when applied on non-chemically treated hair or texturized hair, or synthetic and human hair extensions that are curly. Curl Pattern (CP) describes the specific shape of the hair strands (2) i.e., how it naturally grows, and it depends on the shape of the hair bulb in the hair follicle (3). The more oval-shaped the hair follicle, the curlier the hair. Manipulation using a chemical service (blow-out or permanent waving) can also alter the CP from VII+ to VI. giving a loser 'S' curl shape effect.

PURPOSE

In response to the consumer need in this category of styling formulations, there was a need to evaluate the products. A simple and accurate standardized manual was created with a key focus on the main attributes leading from consumer pain points and needs that guided the measurement, analysis, and interpretation of the performance of the prototypes.

This article demonstrates in detail the key attributes used during sensorial expert evaluation of curl activator prototypes to guide, measure, analyze, and interpret by following the standardized gestures (accompanied by clear visuals) of the steps that may guide hair expert evaluators to use under similar category testing.

Physical Properties of Hair

Identifying curl patterns can give more information about a person's genetic background and physical properties such as hair texture, and hair porosity as described below. The texture is influenced by the thickness of each strand (the size or diameter of the hair shaft). Porosity is the hair's ability to absorb liquids or hold moisture (hair in good condition has tightly closed cuticle scales, this presents a hard, smooth surface that protects the cortical fibers, making the absorption of liquids difficult). Density is the measurement of the number of hairs per square inch of the scalp. Elasticity is the ability of the hair to stretch and return to its natural state without breaking or being deformed. Tensile strength is the force required to stretch a hair strand until it breaks (the strength is considerably reduced in hair that is chemically overdressed.

The definition used for this article is Type IV Curly Pattern ('S' Curl) displayed in the below image.

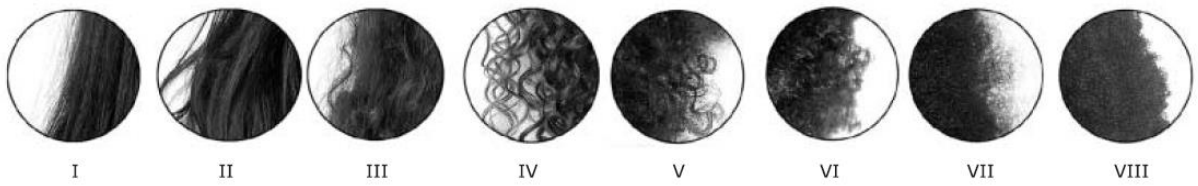

Figure 1*. Illustration of different categories of hair 8 curl patterns. The purpose of S-curl hairstyles is to shift the curl pattern from CP VII+ to VI.* (Loussouarn et al, 2007).

METHODS & MATERIALS

Following the signed consent form under the data privacy policy, multiple studies were conducted on volunteers of African Origin, aged 18-50 years, in Nairobi, Kenya. Hair demographics and product descriptions were noted after which the hair was shampooed and assessed after application. Hair treatment was done by first assessing the hair and scalp for any lacerations or irritations. The hair was shampooed twice with 20g shampoo. It was sectioned in two equal halves, and 5g of the sample was applied simultaneously from the nape to the front. Wet hair attributes including wetting effect, softness, curl evenness, and curl definition were evaluated.

To ensure uniformity a standard camera was used under natural lighting, A scale from 0 to 5 was generated using SIMS software (Sensory Information Management System. SIMS 2000 for Windows, version 6) designed to convert the results into raw data translating the information on product efficacy validated by conducting tests over the last 4 years to ensure reproducible method.

1. KEY ATTRIBUTES / SENSORIAL ATTRIBUTES

3.1. Product Aspects: Dispensing

Product dispensing is an important aspect to assess during the product development process, especially for products that are designed to be dispensed, such as liquids, powders, gels, or even solid items. The way a product is dispensed directly affects the user experience and product functionality. For example, if the dispensing process is difficult, messy, or time-consuming, it can lead to user frustration and product dissatisfaction. A positive user experience is key to the success of a product.

Figure 2. *Illustration of key product aspect attributes: a) Ease of dispensing, b) consistency, and c) sensation on hands*

3.2. Product Aspects: Description

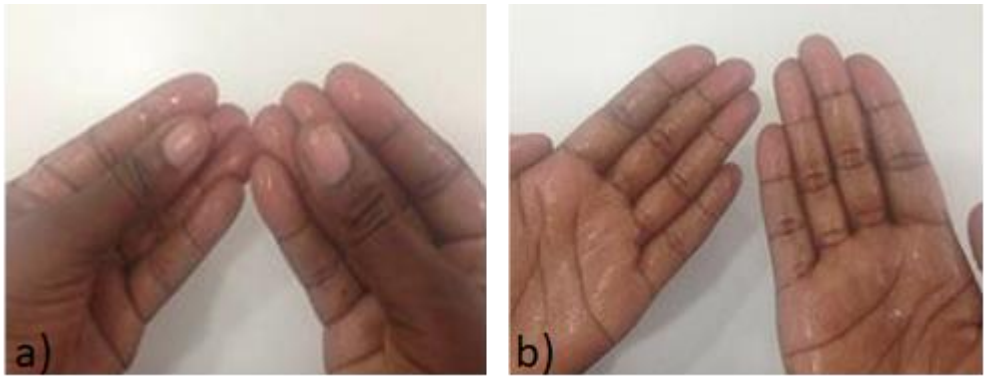

Figure 3. Product Description: a) Feel of fingers and b) melting sensation.

2. PRODUCT APPLICATION AND WET HAIR OBSERVATION

Figure 4. a) Distribution to ends, b) wetting effect, and c) suppleness

Table 1: Properties of the sensorial attributes to be evaluated.

	Sensorial Attribute	**Typical Property**
1	**Product Aspects: Dispension**	
1. i	Ease of dispensing	Describes the ease of dispensing the product, i.e., how easy or difficult it is to pick from the packaging and to ensure that the package is appropriate for the form of a product.
1. ii	Consistency	Characterizes the speed at which the product flows, i.e., the thicker the product, the more difficult it is to spread.
1. iii	Sensation on Hands	Describes how the product feels.
2	**Product Aspects: Description**	
2. i	Feel on Fingers	Characterizes the texture of the product.
2. ii	Melting Sensation	How quickly the product dissolves on hands.
3	**Wet Hair Application**	
3. i	Distribution to Ends	How the product spreads from roots to ends.
3. ii	Wetting Effects	How wet the hair gets after product application.
3. iii	Hair Suppleness	This shows how the product transforms the hair, i.e., hair softness.
3. iv	Wet Hair Combing	This is done to guide in the preparation of evaluating the curl evenness and definition attribute. Combing lifts the curl to have an even finish from roots to ends.

Table 2: Evaluation of sensorial attributes

	SENSORIAL ATTRIBUTES	**DEFINITION**	**EVALUATION**	**GESTURE**	**TYPE OF EVALUATION**	**REFERENCE**
I	**PRODUCT ASPECTS: DISPENSION**					
I.I	EASE OF DISPENSING	Is the product easy or challenging to pick from the packaging.	Visual + tactile.	Evaluation when product is dispensed from the container using a spatula.	Scale 1 to 4 (indicating most difficult to easiest)	Easy/Difficult
I.II	CONSISTENCY	Is the product thick, and does it have a good consistency (it is neither fluid nor liquid).	Visual + tactile.	Evaluation when spreading out on the hands.	Scale 0 to 5	Fluid/Thick.
I.III	SENSATION ON HANDS	How warm or cool the product feels on the hands.	Tactile	Evaluation when product is deposited in the hand and when spread out.	Categories	Cool Sensation-Warm Sensation-Others
II	**PRODUCT ASPECTS: DESCRIPTION**					

II.I	FEEL ON FINGERS	Feel on the fingers as related to product texture.	Tactile	Evaluation when rubbing the product between the fingers.	Scale 0 to 4	Greasy-Slippery-Waxy-Others
II.II	MELTING SENSATION	The product is transformed; it liquefies when in contact with the hands. It becomes less thick, or in the extreme case, it becomes watery.	Tactile	Evaluation when spreading out in the hands.	Scale 1-4	Not at all / a lot
III	**WET HAIR APPLICATION**					
III.I	DISTRIBUTION TO ENDS	The product spreads easily on the hair.	Tactile	Evaluation of the spreadability of the product on the hair.	Scale 1-4	Not at all / a lot
III.II	WETTING EFFECT	Amount of dampness felt on the hair.	Visual + tactile.	Evaluation by pressing your hands on the hair and then lifting.	Scale 0 to 5	Not at all / a lot
III.III	HAIR SUPPLENESS	Hair is pliable; it is not rigid or stiff.	Tactile	Evaluation by grasping a handful of hair and trying to bend it.	Scale 0 to 5	Not at all / a lot
III.IV	WET HAIR COMBING	The comb slides through the hair easily, and no drag is felt (90° angle in relation to the scalp)	Visual	Using a 2-in-1 comb to lift the hair from the scalp.		

Figure 5. Images showing scalp hair attributes a) Curl evenness: shows the results of 'S' curl formation; how even the curl is from roots to ends and b) Curl definition: shows how defined the curl is from the roots to the ends.

RESULTS

The below diagram illustrates how 2 different products score on performance on different attributes after evaluation.

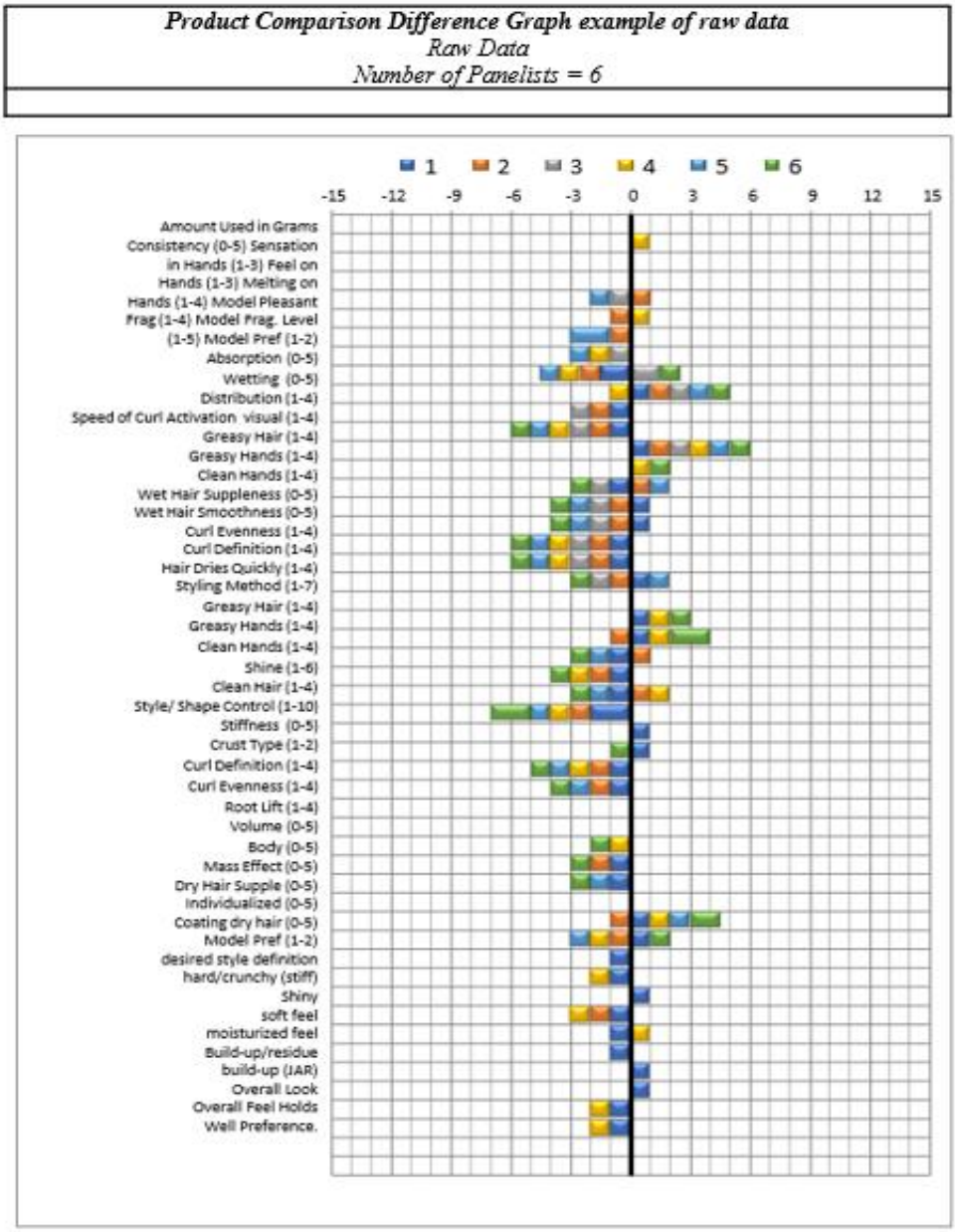

Figure 6: Product Comparison difference as shown on SIMS software. The scale is from 0-5, 0 being the least and 5 being the most for each attribute.

TABLE 3: RESULTS OF PERCEIVED CONSUMER EXPECTATION ON PRODUCT CLAIM

The below diagram illustrates all the attributes evaluated. The key focus on curl gel from consumer perception is gives a long-lasting shine, leaves the hair soft to touch, non-greasy feel, and has an all-day curl definition.

Performance - Nairobi %Top 2Box (% Top Box)	(A)		(B)	(E)		(F)
Leaves hair easy to style, to manage	96 (55)		99 (63)	97 (82)		97 (85)
Is gentle and kind for my scalp	96 (54)		90 (46)	**100** (81)	√	94 (81)
Gives liveliness to my hair	85 (40)		81 (48)	97 (82)		96 (75)
Is non- greasy	79 (39)		81 (49)	96 (69)		91 (63)
It does not irritate the scalp	91 (51)		87 (55)	81 (99)		84 (96)
Does not leave residue	84 (46)		73 (40)	100 (79)		99 (82)
Provides the right amount of care	72 **(25)**	x	75 (36)	97 (67)		96 (72)
Preserves my natural black colour	72 **(33)**	x	75 (43)	88 (72)		91 (70)
Does not weigh hair down	72 (30)		63 (30)	82 (55)		91 (61)
Gives hair the desired volume	58 (30)		64 (34)	88 (61)		91 (72)
Leaves scalp feeling really fresh	97 **(57)**	√√	88 (42)	100 **(85)**	√	97 (78)
Soothes the scalp	97 (52)		90 (43)	100 (75)		99 (75)
Relieves itchiness on scalp	85 (37)		79 (42)	97 (78)		94 (76)
Protects hair from breakage	46 **(18)**	xx	52 (30)	96 (63)		97 (72)
Gives strength to the hair	64 (21)		67 (31)	93 (64)		96 (67)
Leaves hair soft to the touch	97 **(69)**	√√	94 (57)	99 (85)		94 (82)
Has a pleasant long-lasting fragrance	87 (54)		88 (52)	96 (82)		97 (90)
Leaves the hair moisturised	**100** (57)	√	90 (52)	99 (76)		96 (79)
Leaves scalp moisturised	96 (57)		90 (57)	100 (79)		96 (78)
Does not dry the hair out	82 (33)		81 (39)	85 **(60)**	x	90 (72)
Gives a long-lasting shine	87 (37)		79 (40)	93 **(78)**	xx	94 (88)
Gives an all-day curl definition	84 (46)		75 (42)	94 (78)		96 (82)

√ = significant at 95% (better)
x = significant at 95% (worse)
√ = significant at 90% (better)
x = significant at 90% (worse)

Table 3: Showcasing the results achieved from a blind use test (BUT), n =265women

DISCUSSION

This approach of creating a standardized manual for sensory evaluation on curly hair can be applied on short, texturized hair as well as on natural hair to assess curl activator styling aid products that are under development process for consumer usage. There was a need for this manual that translated to consumer product usage routine and product satisfaction that was linked/ translated to sensory gestures with visual images that are measurable using a scoring scale to guide on superiority performance.

Consumer tests helped with a deeper understanding of their product usage, perception, routine, preference, and motivation of purchasing power with overall consumer behavior which helped with the gestures created and the finish of the final look of the product.

This study generated data that we used to summarize consumer benefits, needs & and expectations that we used as our foundation for attribute selection and formula improvement. SIMS Software (Scale 0-5) was designed to convert the results into raw data translating the information on product efficacy that has helped guide the Labs to the formulation of appropriate products. For e.g., the attribute of texture was too greasy for the curl gel and the lab had there for optimize this formulation to ensure that the texture needs of the consumer were met.

CONCLUSION

This methodology directly links sensory expert evaluation to consumer needs from the attributes used in our assessment, and this has helped guide the labs to the formulation of appropriate products for curly hair and supported previous launches within our portfolio on superiority performance and strong claims versus competition. The key point is the product should be lightly textured, with a less greasy feel, leaving soft, even-defined curls with long-lasting moisture. Making the hair manageable during day-to-day styling. It sets the foundation for sensory evaluation as consumers evolve in this changing world and helps inspire evaluators from other zones that have higher curl types of hair to apply.

The manual sets a foundation for sensory evaluation on curl activator styling gel products, however open to embracing additional attributes from the evolving consumer behavior on usage, and expectations from the upcoming new trends in the future.

Authors Contribution

Conceptualizations K.N and M.K; Methodology K.N and M.P; Writing K.N and M.K; All authors have read and agreed to the published version of the manuscript.

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Informed Consent Statement

All participants signed and gave informed consent for product evaluation studies.

Conflicts of Interest

The authors declare no conflict of interest.

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