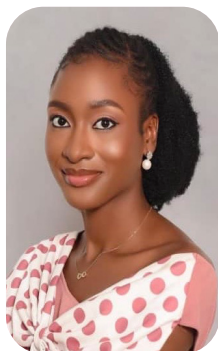


Article • Awareness, Attitudes, and Perceptions of University Students in Nigeria Toward Contact Lenses for Refractive Error Correction

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ABSTRACT

Background: Contact lenses have become an increasingly popular option for vision correction worldwide, offering both functional and cosmetic advantages. Understanding contact lens usage among university students is crucial for promoting eye health. The goal of the study was to ascertain the knowledge, attitude, and perception of university undergraduates towards contact lenses for refractive error correction.

Methods: A survey was used to evaluate the knowledge, attitudes, and perceptions of 377 Life Science students at the University of Benin about using contact lenses for vision correction. The survey was completed both before and after an educational session on contact lenses to measure changes in understanding.

Results: The study sample comprised 63.9% females and 36.1% males, with a mean age of 21.83 ± 2.77 years. Only 75 participants (19.9%) had prior experience with contact lenses, of whom 72% used them for cosmetic purposes, while only 28% used them for vision correction. Despite the high awareness of contact lenses (98.1%), specific knowledge about fitting and removal was low (37.4%). Overall, 60.7% of participants had poor knowledge concerning contact lenses for refractive error correction. Attitudes toward contact lenses remained mostly negative before and after the

educational session: 64.5% and 60.2%, respectively. Similarly, perceptions of contact lens use stayed negative: 53.3% before education and 54.1% after education. A paired t-test showed that the education did not lead to a significant improvement in attitude ($p = 0.130$) or perception ($p = 0.455$).

Conclusions: Despite a high level of awareness, misconceptions about contact lenses persist, contributing to low uptake for refractive error correction. Given the limited impact of a single educational intervention, more sustained engagement by eye care practitioners is necessary to address misconceptions and to promote informed decision-making about vision correction options.

Keywords: attitude, education, contact lens, knowledge, refractive errors

Introduction

Vision is crucial in daily activities, academic performance, and overall quality of life. One of the most common causes of visual impairment worldwide is refractive error. The World Health Organization (WHO) has identified uncorrected refractive error as one of the leading causes of moderate-to-severe visual impairment, affecting over 150 million people globally.¹ The three primary types of refractive error, myopia (nearsightedness), hyperopia (farsightedness), and astigmatism, can be corrected using eyeglasses, contact lenses, or refractive surgery.²

Contact lenses offer unique advantages among these corrective measures, including a wider field of view, enhanced peripheral vision, improved cosmesis, and greater convenience for sports and professional activities.³ Despite these benefits, their adoption remains low in many regions, largely due to misconceptions, safety concerns such as eye infections and corneal ulcers,⁴ and limited awareness regarding proper usage.

The adoption of contact lenses varies widely across different regions and demographics. Globally, the estimated prevalence of contact lens wear is around 10%, but significant disparities exist between developed and developing nations.^{5,6} The highest

adoption rates are seen in the United States (40.5%) and the United Kingdom (30%), where disposable soft lenses are most commonly used.^{7,8}

In Japan and South Korea, cosmetic contact lenses are popular, increasing usage rates, particularly among young adults.⁹ In contrast, India has seen a rise in contact lens adoption from 5% in 2010 to 10% in 2020, driven by greater access to optometric services.¹⁰ However, the prevalence of contact lens usage in Africa is significantly lower, estimated at 2-3%, with variations depending on access to eye care services.¹¹ Limited awareness, affordability concerns, and cultural perceptions contribute to the slow adoption rate.⁶ While contact lens usage is steadily increasing in developing countries, many individuals remain unaware of their availability, safety, and proper care, limiting their adoption as an alternative to eyeglasses.

Several misconceptions and barriers have hindered the widespread adoption of contact lenses for refractive error correction. These barriers can be classified based on lack of knowledge, patients' perception, and practical challenges. Several studies show that while general awareness of contact lenses is high, specific knowledge regarding their proper use, maintenance, and risks is poor. A study among university students in Nigeria found that while 98.1% of participants had heard of contact lenses, only 37.4% knew how to properly fit and remove them.⁸ Similarly, research in Saudi Arabia and Kenya reported that over 60% of students lacked knowledge about cleaning and storage practices, increasing the risk of complications.^{12,13}

Inadequate knowledge can lead to poor compliance with hygiene practices, increasing the likelihood of contact lens-related eye infections such as microbial keratitis.¹⁴ A study in India found that up to 40% of contact lens wearers did not follow proper cleaning routines, raising concerns about corneal health.¹⁵

Cultural and personal beliefs strongly influence attitudes toward contact lenses. Studies show that fear of vision loss is one of the leading reasons people avoid contact lenses, despite evidence indicating that serious complications are rare with proper use.¹⁶ Many believe that contact lenses will irritate their eyes or be difficult to insert and remove, even before trying them.¹⁷ Although modern daily disposable lenses require minimal care, misconceptions about cleaning complexity persist.¹⁸ These perceptions create resistance to contact lens uptake, even among individuals who might benefit from them for medical, occupational, or cosmetic reasons.

Cost is another major factor influencing contact lens adoption, especially in developing countries. A survey in Nigeria revealed that contact lenses were perceived as a luxury, with many respondents believing that they were significantly more expensive than eyeglasses.¹⁹ While daily disposable lenses can be costly, longer-term lenses (e.g., monthly or yearly replacements) are often more economical but require consistent cleaning and maintenance.

Accessibility also plays a role in low adoption rates. Many rural and underserved communities lack access to optometrists and contact lens fitting services, making it difficult for individuals to explore contact lens options.²⁰

University students represent a key demographic in understanding the challenges associated with contact lens adoption. As young adults with increasing independence and exposure to new technologies, they are more likely to explore alternatives to traditional eyeglasses. However, even within this group, knowledge gaps and negative perceptions persist.

A study conducted in South Africa found that only 15% of university students considered contact lenses their primary vision correction method, despite 75% being aware of their existence.²¹ Another study in Malaysia reported that students' decisions were strongly influenced by peer opinions and social media, highlighting the role of targeted education in promoting contact lens use.²²

Given their potential to advocate for better eye health, understanding university students' awareness, attitudes, and perceptions toward contact lenses is crucial. Addressing misconceptions and barriers can help dispel myths and encourage safe contact lens use within their peer networks and communities.

Materials and Methods

Study Design and Participants

This study used a cross-sectional survey design to assess university students' knowledge, attitudes, and perceptions (KAP) regarding contact lens use for refractive error correction. It was conducted at the Faculty of Life Science, University of Benin, Nigeria.

A total of 377 students were recruited using random sampling, ensuring a representative sample of Life Science students. The sample comprised 241 females (63.9%) and 136 males (36.1%), with ages ranging from 18 to 30 years (mean age: 21.83 ± 2.77 years).

Survey Instrument and Data Collection

Data were collected using a structured questionnaire to assess pre- and post-education KAP

levels regarding contact lenses. The questionnaire contained both open-ended and closed-ended questions and was divided into the following sections:

1. Demographic data (age, gender, academic level)
2. Knowledge assessment (awareness of contact lenses, usage, risks, and maintenance)
3. Attitudes toward contact lens use (preference for contact lenses vs. eyeglasses, concerns, willingness to use)
4. Perceptions of contact lens uptake (barriers, myths, and misinformation)
5. Post-education section (changes in knowledge, attitudes, and perceptions after intervention)

To ensure the validity and reliability of the questionnaire:

- The questionnaire was carefully crafted based on relevant literature and expert opinions.
- A pilot test was conducted among 30 students, and modifications were made for clarity.
- Internal consistency was assessed using Cronbach’s alpha, with a coefficient of 0.78, indicating acceptable reliability.

Educational Intervention

To measure the impact of education on KAP levels, an educational intervention was embedded within the study. The intervention consisted of a 20-minute lecture presentation on contact lens usage, benefits, risks, and maintenance. The same questionnaire was re-administered immediately after the educational intervention to assess changes in responses.

Data Analysis

The Statistical Package for Social Sciences (SPSS, version 22) was used to analyze the collected data. Descriptive statistical methods such as frequencies, percentages, and proportions were employed to summarize the demographic characteristics of the participants and the responses to the questionnaire items. Additionally, the chi-square test examined relationships between demographic variables (age, gender, academic level) and KAP scores, with results considered statistically significant at $p < 0.05$. Paired t-tests assessed pre- and post-education differences in attitudes and perceptions, with significance set at $p < 0.05$.

Ethical Consideration

This study strictly adhered to ethical guidelines for human subjects. The institutional ethics review committee granted ethical approval. Before participating, informed consent was obtained from all participants, and their confidentiality and anonymity rights were also protected.

Results

Demographic Characteristics of Respondents

A total of 377 students participated in the study, resulting in a response rate of 88.9%. The sample was predominantly female ($n = 241$; 63.9%) compared to male ($n = 136$; 36.1%), and participants' ages ranged from 18 to 30, with a mean age of 21.83 ± 2.77 years (Table 1). The majority were between 21 and 23 years old (37.4%), followed by 18 and 20 years old (37.1%).

Regarding academic levels, the majority of the respondents, 112 (29.7%), were 400-level students, followed by 26.0% who were 200-level students. This reflects a diverse mix of respondents from different academic backgrounds. Optometry students (35.5%) constituted the largest group, followed by students from Animal and Environmental Biology (14.3%), Plant

Table 1. Socio-Demographic Characteristics of Respondents

Variables	N	%
Gender		
Male	136	36.1
Female	241	63.9
Age (21.83 ± 2.77)		
18 – 20 years	140	37.1
21 – 23 years	141	37.4
24 – 26 years	69	18.3
27 – 29 years	25	6.6
>30 years	2	0.5
Level		
100	44	11.7
200	98	26.0
300	27	7.2
400	112	29.7
500	34	9.0
600	62	16.4
Department		
Animal and Environmental Biology	54	14.3
Environmental Management	38	10.1
Microbiology	41	10.9
Optometry	134	35.5
Plant Biology and Biotechnology	48	12.7
Science Laboratory Technology	41	10.9
Biochemistry	21	5.6
Currently use glasses?		
Yes	112	29.7
No	265	70.3%

Table 2. Responses for Knowledge of Contact Lenses

Statement	Yes		No		Not sure	
	N	%	N	%	N	%
I have heard about contact lenses before	370	98.1	5	1.3	2	0.5
I know what a contact lens is	361	95.8	11	2.9	5	1.3
I know the uses of a contact lens	330	87.5	21	5.6	26	6.9
I have seen and/or held a contact lens before	284	75.3	84	22.3	9	2.4
I know how to fit and remove contact lenses	141	37.4	207	54.9	29	7.7
I am aware of the risks of contact lens wear	251	66.6	74	19.6	52	13.8

Table 3. Description of Knowledge Scores

Variables	Max	Mean ± S.D.	Scores			
	Obtainable Scores		Good		Poor	
			N	%	N	%
Knowledge	6	3.67 ± 2.13	148	39.3	229	60.7

Good knowledge scores (≥5), poor knowledge scores (<5)

Biology and Biotechnology (12.7%), and other life sciences disciplines.

Knowledge of Contact Lenses

A majority of participants (98.1%) had heard of contact lenses before, but only 37.4% knew how to fit and remove them correctly (Table 2). While 87.5% knew the uses of contact lenses, awareness of associated risks was lower (66.6%).

The mean knowledge score was 3.67 ± 2.13 (out of 6), as reflected in Table 3, with 60.7% of respondents classified as having poor knowledge. Table 4 shows a chi-square analysis with significant differences in knowledge levels based on age (p < 0.001) and academic level (p < 0.001), with older and more advanced students demonstrating better knowledge. However, gender was not significantly associated with knowledge (p = 0.311), indicating that both males and females had similar awareness levels.

Attitudes Toward Contact Lenses

Before the educational intervention, 64.5% of participants had an unfavorable attitude toward contact lenses, with only 35.5% showing a positive attitude (Table 5). After the intervention, the proportion of negative attitudes slightly improved to 60.2%, but the change was not statistically significant (p = 0.130, Table 6).

Table 4. Chi-Square Test Comparing Level of Knowledge Regarding Contact Lenses among Respondents to Socio-Demographic Variables

Factor	Level of Knowledge		p-value
	Poor	Good	
Age			<0.001*
18-20	110 (48.0%)	30 (20.3%)	
21-23	77 (33.6%)	64 (43.2%)	
24-26	29 (12.7%)	40 (27.0%)	
27-29	13 (5.7%)	12 (8.1%)	
>30	0 (0.0%)	2 (1.4%)	
Gender			0.311
Male	78 (34.1%)	58 (39.2%)	
Female	151 (65.9%)	90 (60.8%)	
Academic Level			<0.001*
100	37 (16.2%)	7 (4.7%)	
200	80 (34.9%)	18 (12.2%)	
300	16 (7.0%)	11 (7.4%)	
400	79 (34.5%)	33 (22.3%)	
500	16 (7.0%)	18 (12.2%)	
600	1(0.4%)	61 (41.2%)	
Current use of eyewear for vision correction			0.352
Yes	64 (27.9%)	48 (32.4%)	
No	165 (72.1%)	100 (67.6%)	

* statistically significant

Table 5. Description of Attitude and Perception Scores

	Obtainable Scores		Positive		Negative	
			N	%	N	%
Attitude	36	18.26 ± 5.81	134	35.5	243	64.5
	36	18.74 ± 5.78	150	39.8	227	60.2
Perception	24	12.84 ± 4.60	176	46.7	201	53.3
	24	12.68 ± 4.47	173	53.3	204	54.1

Favourable or positive attitude score (≥21), unfavorable/negative attitude score (<21); Positive perception score (≥14), unfavorable/negative perception score (<14)

Table 7 shows a gender-based analysis with a significant difference in attitudes (p = 0.011), with female students (72.4%) more likely to have a positive attitude compared to males (27.6%). No significant differences were observed based on age (p = 0.211) or academic level (p = 0.200).

Perceptions of Contact Lenses

Negative perceptions about contact lenses remained prevalent both before and after the educational intervention, as shown in Figure 1. Before

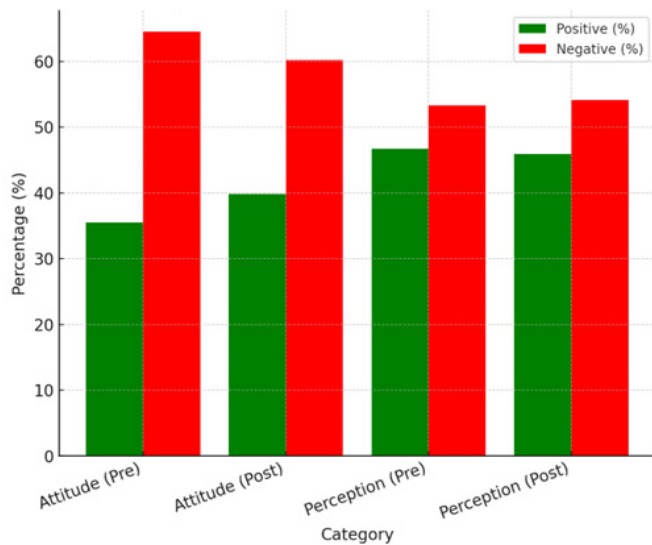


Figure 1. Attitudes and perceptions toward contact lenses before and after the educational intervention

Table 6. Paired T-test Comparing Attitudes and Perceptions Before and After Education on Contact Lenses

Parameters	Pre-education	Post-education	Mean difference	p-value
Attitude to contact lenses	18.26 ± 5.811	18.74 ± 5.781	-0.480	0.130
Perceptions of contact lenses	12.84 ± 4.593	12.68 ± 4.468	0.159	0.455

education, 53.3% of participants had an unfavorable perception of contact lenses, and surprisingly, this slightly increased to 54.1% post-education. Several factors contributed to these negative perceptions, including concerns about comfort, maintenance, and safety.

Chi-square analysis revealed a significant association between gender and perception ($p = 0.036$), with female students generally demonstrating a more positive perception (70.9%) compared to males (29.1%; Table 8). However, there was no statistically significant association between perception and age ($p = 0.495$) or academic level ($p = 0.202$), indicating that misconceptions about contact lenses were widespread across different student demographics. These findings suggest that, while awareness of contact lenses was high, deeper-rooted concerns regarding their practicality and safety prevented a more favorable perception among students.

Discussion

The primary aim of this study was to assess the knowledge, attitudes, and perceptions of contact lenses for refractive error correction among Nigerian university students before and after an educational

Table 7. Chi-Square Test Comparing Attitude Towards Contact Lenses Among Respondents to Socio-Demographic Variables

Factor	Attitude		p-value
	Unfavorable	Favorable	
Age			0.211
18-20	94 (38.7%)	46 (34.3%)	
21-23	82 (33.7%)	59 (44.0%)	
24-26	46 (18.9%)	23 (17.2%)	
27-29	20 (8.2%)	5 (3.7%)	
>30	1 (0.4%)	1 (0.7%)	
Gender			0.011*
Male	99 (40.7%)	37 (27.6%)	
Female	144 (59.3%)	97 (72.4%)	
Academic Level			0.200
100	31 (12.8%)	13 (9.7%)	
200	57 (23.5%)	41(30.6%)	
300	21 (8.6%)	6 (4.5%)	
400	71(29.2%)	41(30.6%)	
500	26 (10.7%)	8 (6.0%)	
600	37 (15.2%)	25 (18.7%)	
Current use of eyewear for vision correction			0.779
Yes	71 (29.2%)	41 (30.6%)	
No	172 (70.8%)	93 (69.4%)	

* statistically significant

Table 8. Chi-Square Test Comparing Perception Towards Contact Lenses Among Respondents to Socio-Demographic Variables

Factor	Perception		p-value
	Negative	Positive	
Age			0.495
18-20	85 (35.0%)	55 (41.0%)	
21-23	90 (37.0%)	51(38.1%)	
24-26	48 (19.8%)	21 (15.7%)	
27-29	18 (7.4%)	7 (5.2%)	
>30	2 (0.8%)	0 (0.0%)	
Gender			0.036*
Male	97 (39.9%)	39 (29.1%)	
Female	146 (60.1%)	95 (70.9%)	
Academic Level			0.202
100	24 (9.9%)	20 (14.9%)	
200	60 (24.7%)	38 (28.4%)	
300	17 (7.0%)	10 (7.5%)	
400	70 (28.8%)	42 (31.3%)	
500	25 (10.3%)	9 (6.7%)	
600	47 (19.3%)	15 (11.2%)	
Current use of eyewear for vision correction			0.779
Yes	71 (29.2%)	41 (30.6%)	
No	172 (70.8%)	93 (69.4%)	

* statistically significant

intervention. Tables 2 and 3 show a high level of awareness (98.1%) but poor knowledge (60.7%), suggesting that while most students had heard about contact lenses, their understanding of proper use, risks, and maintenance was limited. These results align with previous studies that found that awareness does not necessarily translate into informed decision-making regarding contact lens use.^{18,23,24}

Despite the educational intervention, there was no statistically significant change in attitudes ($p = 0.130$) or perceptions ($p = 0.455$) toward contact lenses. While education slightly increased the proportion of participants with a favorable attitude (35.5% to 39.8%), negative perceptions persisted, even increasing slightly post-education (53.3% to 54.1%). Several factors could explain this resistance to change, including preexisting biases, fear of discomfort, and cultural influences.

One possible explanation for the lack of significant change in attitudes and perceptions is the presence of deeply ingrained preconceptions about contact lenses. Many students likely formed strong opinions before participating in the study, and a single educational session was insufficient to alter these established beliefs. Studies have shown that misconceptions about discomfort, maintenance complexity, and infection risks are often reinforced through peer influence and anecdotal experiences rather than factual knowledge.²⁵

Another major limitation of the intervention was its delivery method. The education consisted of a 20-minute lecture, but it lacked interactive or experiential learning components. Research indicates that practical demonstrations and hands-on exposure to contact lenses are far more effective in changing perceptions and improving adoption rates.¹⁴ For instance, a study in Malaysia found that when students were allowed to physically handle contact lenses and observe proper insertion and removal techniques, attitudes improved significantly ($p < 0.05$).²⁶ Similarly, a Kenyan study showed that interactive workshops led to a 20% increase in positive perceptions of contact lenses.¹² This suggests that merely providing information is insufficient; interventions must be more engaging and experiential to create a lasting impact.

Furthermore, fear of eye infections and discomfort remained strong deterrents, even after education. Many students expressed concerns that contact lenses could cause permanent damage to their eyes, a misconception deeply embedded in regions with limited access to optometric care. Previous studies have shown that individuals who lack direct experience with contact lenses are more likely to overestimate

the risks associated with their use, making them less receptive to educational interventions.⁴

A significant gender-based difference was observed (Table 7), with female students exhibiting a more favorable attitude toward contact lenses than male students ($p = 0.011$). This finding aligns with global trends, where women are generally more open to cosmetic and vision-enhancing products.³ The aesthetic appeal of contact lenses may contribute to this, as women are more likely to adopt non-spectacle alternatives due to beauty standards and social influences. Studies from Saudi Arabia and South Africa have similarly found that women are more willing to consider contact lenses, particularly for cosmetic reasons.^{18,27}

However, male students were more resistant, possibly due to cultural perceptions of masculinity and greater reluctance to engage in self-care practices related to vision correction. In some cultures, wearing contact lenses may be perceived as a feminine practice, further discouraging adoption among men.²⁵ Addressing these sociocultural factors requires targeted awareness campaigns that challenge gender norms and promote the functional benefits of contact lenses for both sexes.

Unlike the present study, other educational interventions have successfully improved contact lens adoption, primarily by incorporating hands-on demonstrations, peer-led workshops, and sustained follow-ups. A study was done to examine reasons for non-compliance with recommended contact lens wear and care methods. It analyzed educational methods and applied behavior modification techniques to improve patient understanding and attitudes toward compliance. The findings suggested that enhanced instruction and behavior modification can lead to better compliance and successful contact lens adoption.²⁸ Another study assessed the effectiveness of an online educational video in improving contact lens care knowledge and behavior. Participants showed significant improvement in knowledge scores after watching the video, and reported positive changes in their hygienic behavior two months post-intervention.²⁹ The study concluded that online video-based learning is an effective tool for enhancing contact lens care knowledge and behavior. These studies highlight the positive impact of targeted educational interventions on improving contact lens adoption and compliance. In contrast, the brief, one-time lecture in this study lacked follow-up reinforcement, which may explain why the findings showed minimal shifts in attitudes and perceptions.

Conclusion, Recommendations, and Future Research

This study found that university students exhibited high awareness of contact lenses but poor knowledge, with significant misconceptions about their use, risks, and maintenance. The majority of students had unfavorable attitudes and perceptions toward contact lenses, which remained largely unchanged after an educational intervention. The lack of significant change in attitudes and perceptions suggests that misconceptions, fear of discomfort, maintenance concerns, and cultural perceptions remain strong barriers to contact lens adoption. The findings highlight the limitations of a single-session educational intervention in shifting ingrained views, emphasizing the need for more interactive and sustained educational efforts to promote informed decision-making.

To improve contact lens education, interactive workshops with hands-on demonstrations should be integrated into educational programs, allowing students to physically handle contact lenses and observe proper fitting and maintenance techniques under professional supervision. Additionally, peer testimonials and discussion forums should be incorporated to address concerns from a relatable perspective. Since peer influence plays a significant role in shaping students' attitudes, personal experiences from students who successfully use contact lenses can counter negative perceptions and misconceptions. A comprehensive educational module should also be developed, incorporating videos, infographics, and interactive quizzes tailored to address the most common myths about contact lenses. This module should be accessible online and integrated into university health programs to ensure broader reach and continuous reinforcement of key information.

Given the limited effectiveness of short-term interventions, future research should explore long-term educational approaches, such as multi-session awareness programs with periodic follow-ups to reinforce key concepts. Further studies should also investigate the specific misconceptions preventing contact lens adoption, particularly in different demographic groups, to design targeted awareness campaigns. Since this study found that female students had a more favorable attitude toward contact lenses than male students, future research should explore sociocultural factors influencing gender differences in contact lens adoption. Additionally, economic factors were not the primary focus of this study, but affordability and accessibility may play a role in low adoption rates,

particularly in developing regions. Research into the financial barriers to contact lens adoption and the impact of subsidized vision correction programs could provide valuable insights. Addressing these barriers is crucial for promoting eye health and expanding vision correction options among young adults.

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Petrosyan Workbooks

The 16 workbooks can help improve visual discrimination, form perception, form constancy, figure-ground, visual attention, visual memory, visual sequencing, visual-spatial, perceptual speed, and intersensory integration skills. They can also help increase the speed, accuracy, and automaticity of fixation and large and moderate angle saccades as well as reading related eye movements. They are designed to take the patient from large, simple, and uncrowded visual stimuli to tasks requiring accurate visual perception and speed and accuracy of reading-related eye movements.

