

**Supplementary Digital Content 1: Data Collection questionnaire**

<b>Participant information number</b>	
<b>Order of pictures</b>	

**Age:**

\_\_\_\_\_

**Gender:**

\_\_\_\_\_

**Please tick place of residence in 2021:** Kgautswane  Pretoria

**Highest academic qualification:** \_\_\_\_\_

**Employed? Yes/ No, if yes please indicate your occupation:** \_\_\_\_\_

**Do you have a hearing problem?** \_\_\_\_\_

**Do you have family history of hearing loss?** \_\_\_\_\_

**What comes to your mind when you think about hearing aids?**

There is no right or wrong answer to this question. We are interested in knowing your personal opinion and views about hearing aid(s) in terms of what comes to mind regarding its function, potential benefits and limitations, as well as how it looks, etc. Please write as much as you can.

.....  
.....  
.....  
.....

Please rate the pictures according to the corresponding scales below:

1.

<b>Unattractive</b>	1	2	3	4	5	6	7	<b>Attractive</b>
<b>Young</b>	1	2	3	4	5	6	7	<b>Old</b>
<b>Unsuccessful</b>	1	2	3	4	5	6	7	<b>Successful</b>
<b>Hard Working</b>	1	2	3	4	5	6	7	<b>Lazy</b>
<b>Untrustworthy</b>	1	2	3	4	5	6	7	<b>Trustworthy</b>
<b>Unintelligent</b>	1	2	3	4	5	6	7	<b>Intelligent</b>
<b>Friendly</b>	1	2	3	4	5	6	7	<b>Unfriendly</b>
<b>Uneducated</b>	1	2	3	4	5	6	7	<b>Educated</b>

*(From Rauterkus & Palmer, 2014)*

2.

<b>Unattractive</b>	1	2	3	4	5	6	7	<b>Attractive</b>
<b>Young</b>	1	2	3	4	5	6	7	<b>Old</b>
<b>Unsuccessful</b>	1	2	3	4	5	6	7	<b>Successful</b>
<b>Hard Working</b>	1	2	3	4	5	6	7	<b>Lazy</b>
<b>Untrustworthy</b>	1	2	3	4	5	6	7	<b>Trustworthy</b>
<b>Unintelligent</b>	1	2	3	4	5	6	7	<b>Intelligent</b>
<b>Friendly</b>	1	2	3	4	5	6	7	<b>Unfriendly</b>
<b>Uneducated</b>	1	2	3	4	5	6	7	<b>Educated</b>

*(From Rauterkus & Palmer, 2014)*

3.

<b>Unattractive</b>	1	2	3	4	5	6	7	<b>Attractive</b>
<b>Young</b>	1	2	3	4	5	6	7	<b>Old</b>
<b>Unsuccessful</b>	1	2	3	4	5	6	7	<b>Successful</b>
<b>Hard Working</b>	1	2	3	4	5	6	7	<b>Lazy</b>
<b>Untrustworthy</b>	1	2	3	4	5	6	7	<b>Trustworthy</b>
<b>Unintelligent</b>	1	2	3	4	5	6	7	<b>Intelligent</b>
<b>Friendly</b>	1	2	3	4	5	6	7	<b>Unfriendly</b>
<b>Uneducated</b>	1	2	3	4	5	6	7	<b>Educated</b>

*(From Rauterkus & Palmer, 2014)*

4.

<b>Unattractive</b>	1	2	3	4	5	6	7	<b>Attractive</b>
<b>Young</b>	1	2	3	4	5	6	7	<b>Old</b>
<b>Unsuccessful</b>	1	2	3	4	5	6	7	<b>Successful</b>
<b>Hard Working</b>	1	2	3	4	5	6	7	<b>Lazy</b>
<b>Untrustworthy</b>	1	2	3	4	5	6	7	<b>Trustworthy</b>
<b>Unintelligent</b>	1	2	3	4	5	6	7	<b>Intelligent</b>
<b>Friendly</b>	1	2	3	4	5	6	7	<b>Unfriendly</b>
<b>Uneducated</b>	1	2	3	4	5	6	7	<b>Educated</b>

*(From Rauterkus & Palmer, 2014)*

5.

<b>Unattractive</b>	1	2	3	4	5	6	7	<b>Attractive</b>
<b>Young</b>	1	2	3	4	5	6	7	<b>Old</b>
<b>Unsuccessful</b>	1	2	3	4	5	6	7	<b>Successful</b>
<b>Hard Working</b>	1	2	3	4	5	6	7	<b>Lazy</b>
<b>Untrustworthy</b>	1	2	3	4	5	6	7	<b>Trustworthy</b>
<b>Unintelligent</b>	1	2	3	4	5	6	7	<b>Intelligent</b>
<b>Friendly</b>	1	2	3	4	5	6	7	<b>Unfriendly</b>
<b>Uneducated</b>	1	2	3	4	5	6	7	<b>Educated</b>

*(From Rauterkus & Palmer, 2014)*

6.

<b>Unattractive</b>	1	2	3	4	5	6	7	<b>Attractive</b>
<b>Young</b>	1	2	3	4	5	6	7	<b>Old</b>
<b>Unsuccessful</b>	1	2	3	4	5	6	7	<b>Successful</b>
<b>Hard Working</b>	1	2	3	4	5	6	7	<b>Lazy</b>
<b>Untrustworthy</b>	1	2	3	4	5	6	7	<b>Trustworthy</b>
<b>Unintelligent</b>	1	2	3	4	5	6	7	<b>Intelligent</b>
<b>Friendly</b>	1	2	3	4	5	6	7	<b>Unfriendly</b>
<b>Uneducated</b>	1	2	3	4	5	6	7	<b>Educated</b>

*(From Rauterkus & Palmer, 2014)*

7.

<b>Unattractive</b>	1	2	3	4	5	6	7	<b>Attractive</b>
<b>Young</b>	1	2	3	4	5	6	7	<b>Old</b>
<b>Unsuccessful</b>	1	2	3	4	5	6	7	<b>Successful</b>
<b>Hard Working</b>	1	2	3	4	5	6	7	<b>Lazy</b>
<b>Untrustworthy</b>	1	2	3	4	5	6	7	<b>Trustworthy</b>
<b>Unintelligent</b>	1	2	3	4	5	6	7	<b>Intelligent</b>
<b>Friendly</b>	1	2	3	4	5	6	7	<b>Unfriendly</b>
<b>Uneducated</b>	1	2	3	4	5	6	7	<b>Educated</b>

*(From Rauterkus & Palmer, 2014)*

**Supplementary Digital Content 2. Findings from Friedman’s two-way analysis of different devices and their attributes compared to the BTE device (n=322).**

Sample 1-Sample 2	Test Statistic	Std. Error	Std. Test Statistic	Sig.	Adj. Sig. <sup>a</sup>
PSAP_Attractiveness-BTE_Attractiveness	0.595	0.170	3.493	<0.001*	0.010
ITC_Attractiveness-BTE_Attractiveness	0.405	0.170	2.380	0.017	0.363
AIRPOD_Attractiveness-BTE_Attractiveness	0.270	0.170	1.587	0.113	1.000
BTE_Attractiveness-CIC_Attractiveness	-0.391	0.170	-2.298	0.022	0.452
BTE_Attractiveness-RIC_Attractiveness	-0.430	0.170	-2.526	0.012	0.242
BTE_Attractiveness-ST_Attractiveness	-0.601	0.170	-3.530	<0.001*	0.009
PSAP_Age-BTE_Age	0.258	0.170	1.514	0.130	1.000
BTE_Age-ITC_Age	-0.031	0.170	-0.182	0.855	1.000
BTE_Age-CIC_Age	-0.124	0.170	-0.730	0.466	1.000
BTE_Age-AIRPOD_Age	-0.135	0.170	-0.793	0.427	1.000
BTE_Age-RIC_Age	-0.168	0.170	-0.985	0.325	1.000
BTE_Age-ST_Age	-0.180	0.170	-1.058	0.290	1.000
ITC_Age-CIC_Age	-0.093	0.170	-0.547	0.584	1.000
ITC_Age-AIRPOD_Age	-0.104	0.170	-0.611	0.541	1.000
ITC_Age-RIC_Age	-0.137	0.170	-0.803	0.422	1.000
ITC_Age-ST_Age	0.149	0.170	0.876	0.381	1.000
CIC_Age-AIRPOD_Age	0.011	0.170	0.064	0.949	1.000
CIC_Age-RIC_Age	0.043	0.170	0.255	0.798	1.000
CIC_Age-ST_Age	0.056	0.170	0.328	0.743	1.000
AIRPOD_Age-RIC_Age	-0.033	0.170	-0.192	0.848	1.000
AIRPOD_Age-ST_Age	0.045	0.170	0.264	0.791	1.000
RIC_Age-ST_Age	0.012	0.170	0.073	0.942	1.000
PSAP_Success-BTE_Success	0.321	0.170	1.888	0.059	1.000
ITC_Success-BTE_Success	0.180	0.170	1.058	0.290	1.000
AIRPOD_Success-BTE_Success	0.065	0.170	0.383	0.702	1.000
BTE_Success-CIC_Success	-0.205	0.170	-1.204	0.229	1.000
BTE_Success-RIC_Success	-0.258	0.170	-1.514	0.130	1.000
BTE_Success-ST_Success	-0.300	0.170	-1.760	0.078	1.000
BTE_Hardworking-AIRPOD_Hardworking	-0.054	0.170	-0.319	0.750	1.000

BTE_Hardworking-PSAP_Hardworking	-0.104	0.170	-0.611	0.541	1.000
BTE_Hardworking-ITC_Hardworking	-0.124	0.170	-0.730	0.466	1.000
BTE_Hardworking-CIC_Hardworking	-0.186	0.170	-1.094	0.274	1.000
BTE_Hardworking-RIC_Hardworking	-0.318	0.170	-1.870	0.062	1.000
BTE_Hardworking-ST_Hardworking	-0.419	0.170	-2.463	0.014	0.290
ITC_Trustworthiness-BTE_Trustworthiness	0.500	0.170	2.937	0.003*	0.070
AIRPOD_Trustworthiness-BTE_Trustworthiness	0.416	0.170	2.444	0.015	0.305
CIC_Trustworthiness-BTE_Trustworthiness	0.146	0.170	0.857	0.391	1.000
RIC_Trustworthiness-BTE_Trustworthiness	0.112	0.170	0.657	0.511	1.000
PSAP_Trustworthiness-BTE_Trustworthiness	0.102	0.170	0.602	0.547	1.000
BTE_Trustworthiness-ST_Trustworthiness	-0.026	0.170	-0.155	0.877	1.000
AIRPOD_Intelligence-BTE_Intelligence	0.293	0.170	1.724	0.085	1.000
ITC_Intelligence-BTE_Intelligence	0.228	0.170	1.341	0.180	1.000
PSAP_Intelligence-BTE_Intelligence	0.033	0.170	0.192	0.848	1.000
BTE_Intelligence-CIC_Intelligence	-0.124	0.170	-0.730	0.466	1.000
BTE_Intelligence-ST_Intelligence	-0.158	0.170	-0.930	0.352	1.000
BTE_Intelligence-RIC_Intelligence	-0.293	0.170	-1.724	0.085	1.000
AIRPOD_Friendliness-BTE_Friendliness	0.084	0.170	0.493	0.622	1.000
BTE_Friendliness-CIC_Friendliness	-0.002	0.170	-0.009	0.993	1.000
BTE_Friendliness-ITC_Friendliness	-0.028	0.170	-0.164	0.870	1.000
BTE_Friendliness-PSAP_Friendliness	-0.158	0.170	-0.930	0.352	1.000
BTE_Friendliness-ST_Friendliness	-0.247	0.170	-1.450	0.147	1.000
BTE_Friendliness-RIC_Friendliness	-0.323	0.170	-1.897	0.058	1.000
AIRPOD_Educated-BTE_educated	0.110	0.170	0.648	0.517	1.000
ITC_Educated-BTE_educated	0.067	0.170	0.392	0.695	1.000
BTE_educated-PSAP_Educated	-0.022	0.170	-0.128	0.898	1.000

BTE_educated-CIC_Educated	-0.280	0.170	-1.642	0.101	1.000
BTE_educated-ST_Educated	-0.328	0.170	-1.924	0.054	1.000
BTE_educated-RIC_Educated	-0.331	0.170	-1.943	0.052	1.000

\* Significant at 1% level of significance



**Supplementary Digital Content 3. Ratings as a function of device types for rural (n=161) and urban (n=161) participants using the Mann-Whitney test.**

<i>Attributes</i>	<i>Devices</i>	<i>Rural mean (SD); median (IQR)</i>	<i>Urban mean (SD); median (IQR)</i>	<i>Z<sub>u</sub> (p-value)</i>
<i>Attractiveness</i>	BTE	5.2 (1.8); 6.0 (3.0)	5.2 (1.8); 6.0 (3.0)	-0.066.0 (0.948)
	ST	5.5 (1.7); 6.0 (3.0)	5.9 (1.4); 6.0 (2.0)	-1.610.0 (0.107)
	ITC	5.1 (1.9); 5.0 (3.0)	4.4 (2.1); 5.0 (3.0)	-3.122.0 (0.002*)
	Airpod	5.1 (1.9); 5.0 (3.0)	4.7 (2.0); 5.0 (3.5)	-1.712.0 (0.087)
	RIC	5.5 (1.7); 6.0 (3.0)	5.5 (1.8); 6.0 (3.0)	-0.275 (0.783)
	CIC	5.6 (1.6); 6.0 (2.0)	5.6 (1.6); 6.0 (3.0)	-0.004.0 (0.997)
	PSAP	4.9 (2.0); 5.0 (3.0)	4.3 (2.1); 4.0 (3.5)	-2.311 (0.021)
<i>Age</i>	BTE	4.4 (1.7); 4.0 (2.0)	4.8 (1.8); 5.0 (2.5)	-2.081 (0.037)
	ST	4.5 (1.8); 4.0 (2.5)	5.0 (1.7); 5.0 (3.0)	-2.639 (0.008 *)
	ITC	4.3 (1.8); 4.0 (3.0)	4.9 (1.7); 5.0 (2.0)	-2.945 (0.003*)
	Airpod	4.3 (1.7); 4.0 (2.0)	5.2 (1.9); 6.0 (3.0)	-4.585 (<0.001*)
	RIC	4.5 (1.7); 4.0 (2.0)	5.0 (1.8); 5.0 (3.0)	-2.962 (0.003*)
	CIC	4.6 (1.8); 5.0 (2.0)	4.8 (1.8); 5.0 (3.0)	-1.047 (0.295)
	PSAP	4.4 (1.7); 4.0 (3.0)	4.3 (1.8); 4.0 (3.0)	-0.344 (0.731)
<i>Success</i>	BTE	5.1 (1.7); 6.0 (3.0)	5.5 (1.4); 6.0 (2.0)	-2.220 (0.026)
	ST	5.3 (1.5); 6.0 (3.0)	5.7 (1.4); 6.0 (2.0)	-2.310 (0.021)
	ITC	5.1 (1.6); 5.0 (2.5)	5.2 (1.6); 5.0 (3.0)	-0.162 (0.872)
	Airpod	5.2 (1.6); 6.0 (3.0)	5.1 (1.6); 5.0 (3.0)	-0.512 (0.608)
	RIC	5.4 (1.5); 6.0 (3.0)	5.6 (1.5); 6.0 (2.0)	-1.222 (0.222)

<i>Hardworking</i>	CIC	5.4 (1.5); 6.0 (3.0)	5.5 (1.4); 6.0 (3.0)	-0.991 (0.322)	
	PSAP	5.0 (1.7); 5.0 (3.0)	5.2 (1.6); 5.0 (3.0)	-1.247 (0.212)	
	BTE	4.3 (1.9); 4.0 (3.0)	4.7 (1.9); 5.0 (3.5)	-1.657 (0.097)	
	ST	4.4 (1.8); 5.0 (3.0)	5.2 (1.7); 5.0 (3.0)	-3.926 ( $<0.001^*$ )	
	ITC	4.2 (1.8); 4.0 (2.0)	4.9 (1.7); 5.0 (2.5)	-3.670 ( $<0.001^*$ )	
	Airpod	4.3 (1.9); 4.0 (3.0)	4.6 (1.8); 4.0 (3.0)	-1.244 (0.213)	
	RIC	4.5 (1.9); 4.0 (3.0)	4.9 (1.7); 5.0 (2.0)	-2.265 (0.024)	
	CIC	4.3 (2.0); 4.0 (3.0)	4.7 (1.9); 5.0 (4.0)	-1.973 (0.048)	
	PSAP	4.2 (1.9); 4.0 (2.0)	4.7 (1.9); 5.0 (2.5)	-2.867 (0.004*)	
	<i>Trustworthiness</i>	BTE	5.4 (1.6); 6.0 (3.0)	5.4 (1.4); 6.0 (3.0)	-0.328 (0.743)
ST		5.3 (1.5); 6.0 (2.0)	5.7 (1.4); 6.0 (2.5)	-2.350 (0.019)	
ITC		5.0 (1.7); 5.0 (2.0)	5.1 (1.6); 5.0 (3.0)	-0.163 (0.870)	
Airpod		5.0 (1.7); 5.0 (2.0)	5.1 (1.6); 5.0 (3.0)	-0.279 (0.780)	
RIC		5.3 (1.6); 6.0 (3.0)	5.5 (1.4); 6.0 (3.0)	-1.144 (0.252)	
CIC		5.3 (1.6); 6.0 (3.0)	5.3 (1.6); 6.0 (3.0)	-0.325 (0.745)	
PSAP		5.2 (1.7); 5.0 (3.0)	5.5 (1.5); 6.0 (3.0)	-0.977 (0.329)	
BTE		5.5 (1.5); 6.0 (2.0)	5.5 (1.5); 6.0 (3.0)	-0.242 (0.809)	
ST		5.6 (1.5); 6.0 (2.0)	5.8 (1.4); 6.0 (2.0)	-0.889 (0.374)	
ITC		5.4 (1.6); 6.0 (2.5)	5.4 (1.5); 6.0 (3.0)	-0.090 (0.928)	
<i>Intelligence</i>	Airpod	5.5 (1.5); 6.0 (2.5)	5.2 (1.6); 5.0 (3.0)	-1.463 (0.143)	
	RIC	5.8 (1.3); 6.0 (2.0)	5.7 (1.4); 6.0 (2.0)	-1.028 (0.304)	
	CIC	5.7 (1.4); 6.0 (2.0)	5.6 (1.4); 6.0 (2.0)	-0.666 (0.505)	
	PSAP	5.5 (1.5); 6.0 (2.0)	5.6 (1.4); 6.0 (2.5)	-0.329 (0.742)	
	BTE	4.4 (2.0); 5.0 (3.0)	4.7 (1.8); 5.0 (2.0)	-1.048 (0.295)	
	ST	4.6 (1.9); 5.0 (3.0)	5.0 (1.9); 5.0 (3.0)	-2.531 (0.011)	
	<i>Friendliness</i>				

<i>Educated</i>	ITC	4.5 (1.9); 5.0 (3.0)	4.6 (1.8); 4.0 (2.0)	-0.049 (0.961)
	Airpod	4.4 (2.0); 5.0 (3.0)	4.6 (1.8); 4.0 (3.0)	-0.542 (0.588)
	RIC	4.7 (1.9); 5.0 (3.0)	4.9 (1.8); 5.0 (3.0)	-1.027 (0.305)
	CIC	4.5 (2.0); 5.0 (3.0)	4.7 (2.0); 5.0 (4.0)	-0.895 (0.371)
	PSAP	4.6 (2.0); 5.0 (3.0)	4.8 (1.8); 5.0 (2.5)	-1.048 (0.295)
	BTE	5.5 (1.6); 6.0 (2.5)	5.6 (1.3); 6.0 (2.0)	-0.327 (0.744)
	ST	5.6 (1.5); 6.0 (2.0)	6.0 (1.2); 6.0 (2.0)	-1.866 (0.062)
	ITC	5.6 (1.5); 6.0 (2.0)	5.4 (1.5); 6.0 (3.0)	-1.293 (0.196)
	Airpod	5.4 (1.6); 6.0 (2.0)	5.5 (1.5); 6.0 (3.0)	-0.190 (0.850)
	RIC	5.7 (1.5); 6.0 (2.0)	5.8 (1.4); 6.0 (2.0)	-1.030 (0.303)
	CIC	5.7 (1.6); 6.0 (2.0)	5.8 (1.3); 6.0 (2.0)	-0.141 (0.888)
	PSAP	5.4 (1.7); 6.0 (3.0)	5.7 (1.4); 6.0 (2.0)	-1.176 (0.240)

\* Significant at 1% level of significance

## **Plain Language Summary**

This study aimed to investigate the "hearing aid effect" and its association with socioeconomic factors in African communities. The study used a cross-sectional design with 322 participants from rural and urban areas, who rated photographs of seven different hearing devices worn by a peer model. The devices included standard behind-the-ear hearing aid (BTE HA) with an earmould, mini BTE HA with a slim tube (ST), in-the-canal (ITC) HA, Airpod, receiver-in-canal (RIC), completely-in-canal (CIC) HA, and Personal Sound Amplification Product (PSAP). The participants rated the devices on eight attributes, including *attractiveness*, *age*, *success*, *hardworking*, *trustworthiness*, *intelligence*, *friendliness*, and *education*. No hearing aid effect was observed across all participants with device ratings ranging between neutral and positive. There was a preference for less visible, conventionally styled devices. Socioeconomic variables such as educational attainment and geographical location influence perceptions of hearing devices emphasizing the importance of taking these aspects into account when prescribing hearing devices.

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