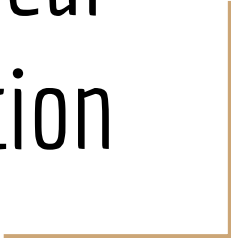


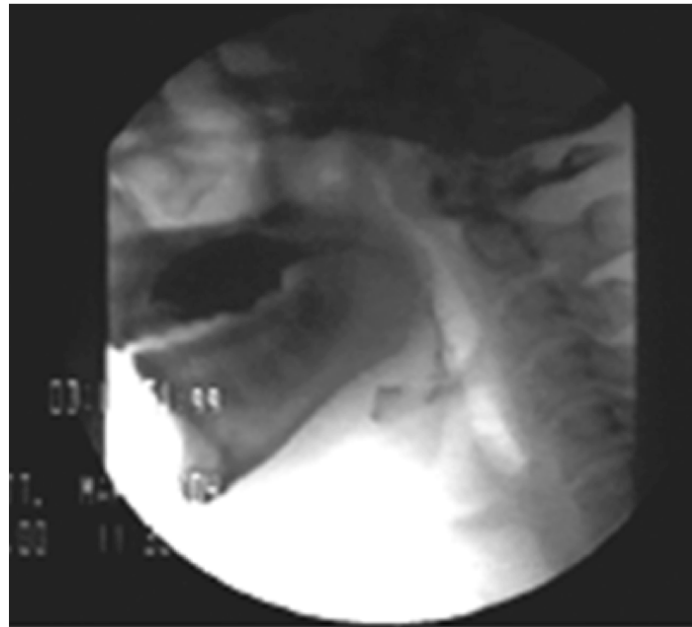
Listener Impressions of Individuals Who Use Alaryngeal Communication



By Kate Scott

Introduction

- Speech Language Pathology
- SCoPE Lab
 - Dr. Stephanie Knollhoff



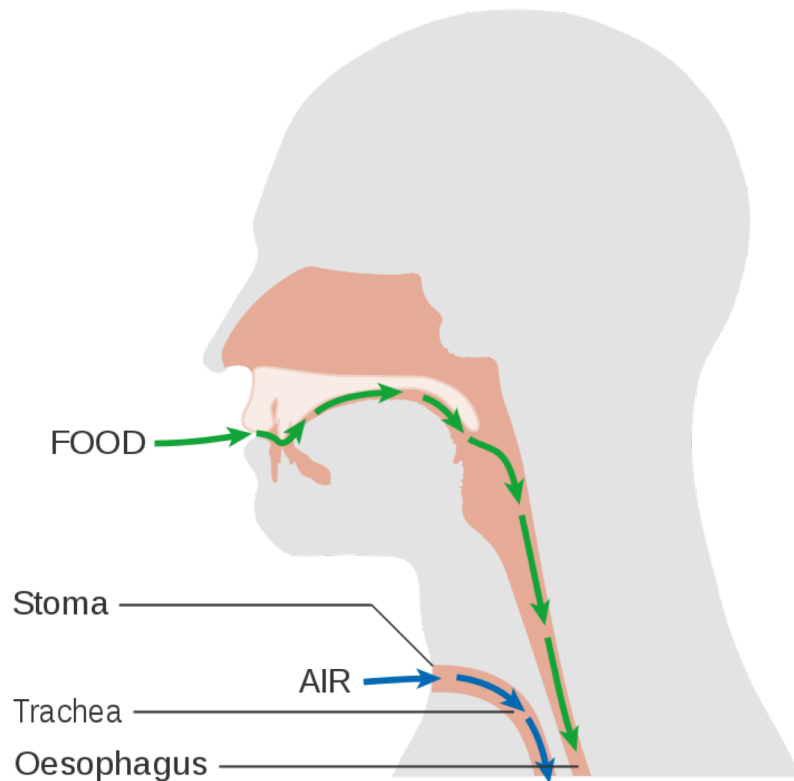
Voice



Terminology

Alaryngeal communication

- Tracheoesophageal speech (TES)
- Esophageal Speech (ES)
- Electrolarynx (EL)



PURPOSE

Investigate listener impressions
of laryngeal communication based on
perceived intelligence, likability, and
employability

Procedures

1. Survey
2. 8 recordings
 - a. Mode
 - b. Male and Female
3. MTurk



To what extent do you agree with this statement?

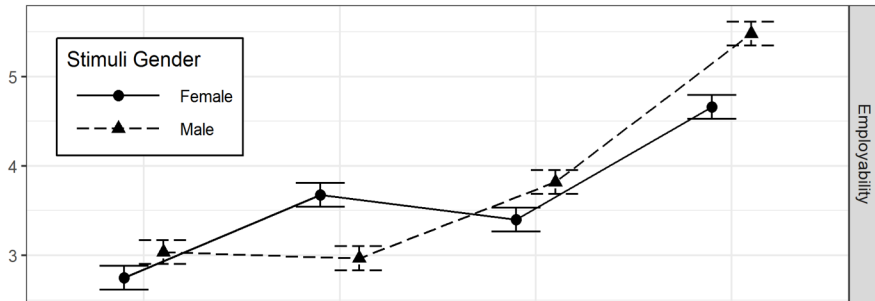
1. This person is intelligent
2. This person is likable
3. I would hire this person for employment

| <i>Listener impression code</i> | |
|---------------------------------|-------------------|
| Number | Rating |
| 1 | Strongly disagree |
| 2 | Disagree |
| 3 | Slightly disagree |
| 4 | Neutral |
| 5 | Slightly agree |
| 6 | Agree |
| 7 | Strongly agree |

Participants

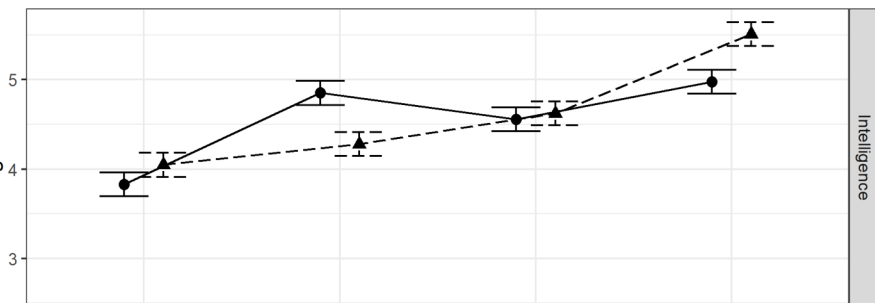
- 384 listener participants

| <i>Demographic Data of Listener Participants</i> | | |
|--|----------------------|---------|
| Gender | | |
| | Male | 53.40% |
| | Female | 46.60% |
| Age | | |
| | 19-29 | 25.80% |
| | 30-40 | 43.70% |
| | 41-51 | 17.00% |
| | 52-69 | 13.50% |
| Education | | |
| | HS/GED | 35.70.% |
| | Currently in College | 5.7% |
| | Bachelors | 50.0% |
| | Masters | 6.0% |
| | Doctorate | 1.8% |
| | Did not complete HS | 0.8% |
| Location | | |
| | Midwest | 19.30% |
| | Northeast | 21.40% |
| | Pacific | 14.80% |
| | Rocky Mountain | 2.30.% |
| | Southeast | 30.50% |
| | Southwest | 11.70% |



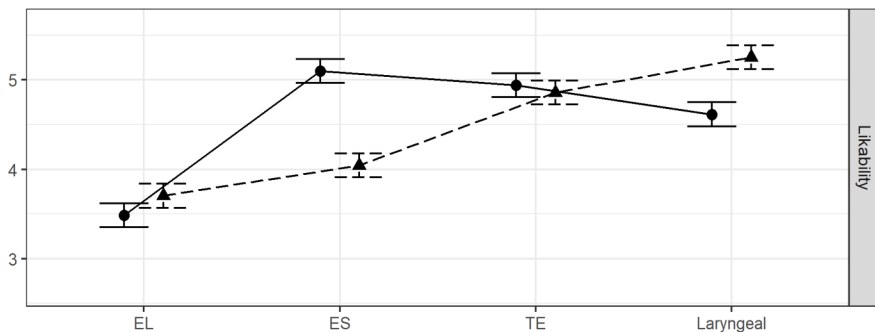
Employability

- Alary (M=3.28) vs. Lary (M=5.07) $p=.001$
- Sig difference between modes across all comparison $p=.001$
EL (M=2.89) ES (M=3.32) TE (M=3.61) Lary (M=5.07)
- Males (M=3.83) were rated higher than females (M=3.62) $p=.001$
- ES: female higher than male $p=.001$
- TE & Lary: males higher than females $p=.03$, $p=.01$



Intelligence

- Alary (M=4.36) vs. Lary (M=5.24) $p=.001$
- Sig difference between modes across all comparison $p=.001$, except ES vs TE
EL (M=3.94) ES (M=4.57) TE (M=4.59) Lary (M=5.24)
- No sig difference between female ES and Lary $p=.73$
- Female ES higher than male ES and both TE $p=.001$, $p=.01$



Likability

- Alary (M=4.35) vs. Lary (M=4.93) $p=.001$
- Sig difference between modes across all comparisons $p=.001$, except TE vs Lary
EL (M=3.59) ES (M=4.57) TE (M=4.90) Lary (M=4.93)
- Females (M=4.53) were rated higher (M=4.46) $p=.03$
- Female ES higher than female Lary $p=.003$

Conclusion

1. This population is judged negatively
2. Listener perception research is limited
3. We want to know more about the impacts
4. Awareness



References

Adil, E. A., MD, & Goldenberg, D., MD. (2018, September 10). Total Laryngectomy (A. D. Meyers MD, Ed.). Retrieved from <https://emedicine.medscape.com/article/2051731-overview>

Allard, E.R., Williams, D.F. (2008). Listeners' perceptions of speech and language disorders. *Journal of Communication Disorders*, 41:108-123.

Boone, D.R., McFarlane, S.C., Von Berg, S.L., & Zraick, R.I. (2015). The voice and voice therapy. Upper Sadle River, NJ: Pearson Education Inc.

Burley, P. & Rinaldi, W. (1986). Effects of sex of listener and of stutterer on ratings of stuttering speakers. *Journal of Fluency Disorders*, 17, 329-333.

Cancer Stat Facts. (n.d.). Retrieved October 10, 2018, from <https://seer.cancer.gov/statfacts/>

Clark JG, Stemple JC. (1982). Assessment of three modes of alaryngeal speech with a synthetic sentence identification (SSI) task in varying message-to-competition ratios. *J Speech Hear Res*, 25:333-8.

Costa, J. M., López, M., García, J., León, X., & Quer, M. (2018). Impact of Total Laryngectomy on Return to Work. *Acta Otorrinolaringologica (English Edition)*, 69(2), 74-79. doi:10.1016/j.otoeng.2017.02.013

de Klerk, V., & Bosch, B. (1995). Linguistic stereotypes: Nice accent, nice person. *International Journal of the Sociology of Languages*, 116, 17–37.

Deore, N., Palav, R., Kazi, R., Shah, R., Jagade, M., & Kapila, M. (2011). A brief review of voice restoration following total laryngectomy. *Indian Journal of Cancer*, 48(1), 99. doi:10.4103/0019-509x.75841

Douglas Bates, Martin Maechler, Ben Bolker, Steve Walker (2015). Fitting Linear Mixed-Effects Models Using lme4. *Journal of Statistical Software*, 67(1), 1-48. doi:10.18637/jss.v067.i01.

Eadie, T. L., Doyle, P. C., Hansen, K., & Beaudin, P. G. (2008). Influence of speaker gender on listener judgments of tracheoesophageal speech. *Journal of Voice*, 22(1), 43-57.

Evitts, P.M., Portugal, L., Van Dine, A., Holler, A. (2010). Effects of audio-visual information on intelligibility of alaryngeal speech. *Journal of Communication Disorders*, 43:92-104.

Evitts, P. M., Van Dine, A., Holler, A. (2009). Effects of audio-visual information and mode of speech on listener perception of alaryngeal speakers. *International Journal of Speech-Language Pathology*, 11:450-460.

Farrand, P., & Duncan, F. (2007). Generic health-related quality of life amongst patients employing different voice restoration methods following total laryngectomy. *Psychology, health & medicine*, 12(3), 255-265.

Finizia C, Hammerlid E, Westin T, Lindstrom J. (1998). Quality of life and voice in patients with laryngeal carcinoma: a posttreatment comparison of laryngectomy (salvage surgery) versus radiotherapy. *Laryngoscope*, 108:1566–1573

Gates, G. A., Ryan, W., Cooper Jr, J. C., Lawlis, G. F., Cantu, E., Lauder, E., ... & Hearne, E. (1982). Current status of laryngectomy rehabilitation: I. Results of therapy. *American Journal of Otolaryngology*, 3(1), 1-7.

Giordano, L., Toma, S., Teggi, R., Palonta, F., Ferrario, F., Bondi, S., & Bussi, M. (2011). Satisfaction and quality of life in laryngectomees after voice prosthesis rehabilitation. *Folia Phoniatrica Et Logopaedica:International Journal Of Phoniatrics, Speech Therapy And Communication Pathology*, 63(5), 231-236. doi:10.1159/000323185

Hillman, R.E., Walsh, M.J., & Heaton, J.T. (2005). Laryngectomy speech rehabilitation: A review of outcomes. In P.C. Doyle & R.L. Keith (Ed.), *Contemporary considerations in the treatment and rehabilitation of head and neck cancer: Voice, Speech, and Swallowing* (pp. 75-90). Austin, TX: Pro-Ed.

Hox, J. J., Moerbeek, M., & Van de Schoot, R. (2017). *Multilevel analysis: Techniques and applications*. Routledge.

IBM Corp. Released 2017. IBM SPSS Statistics for Windows, Version 25.0. Armonk, NY: IBM Corp.

Kaye, R., Tang, C. G., & Sinclair, C. F. (2017). The electrolarynx: voice restoration after total laryngectomy. *Medical devices (Auckland, NZ)*, 10, 133.

Key Statistics for Laryngeal and Hypopharyngeal Cancers. (n.d.). Retrieved from <https://www.cancer.org/cancer/laryngeal-and-hypopharyngeal-cancer/about/key-statistics.html>

Lango, M. N. (2009). Multimodal treatment for head and neck cancer. *Surgical Clinics of North America*, 89(1), 43-52.

Most, T., Tobin, Y., & Mimran, R. C. (2000). Acoustic and perceptual characteristics of esophageal and tracheoesophageal speech production. *Journal of communication disorders*, 33(2), 165-181.

Nayak, U., & Kazi, R. (Eds.). (2009). *Voice Restoration After Total Laryngectomy: Current Science and Future Perspectives*. Byword Books Private Limited.

Orosco, R. K., Weisman, R. A., Chang, D. C., & Brumund, K. T. (2013). Total laryngectomy: national and regional case volume trends 1998-2008. *Otolaryngology--Head and Neck Surgery*, 148(2), 243-248.

Osazuwa-Peters, N., Simpson, M. C., Zhao, L., Boakye, E. A., Olomukoro, S. I., Deshields, T., ... & Schootman, M. (2018). Suicide risk among cancer survivors: Head and neck versus other cancers. *Cancer*, 124(20), 4072-4079.

Palmer, A. D., & Graham, M. S. (2004). The relationship between communication and quality of life in alaryngeal speakers. *Journal of Speech Language Pathology and Audiology*, 28(1), 6-24.

Parker, M.A., Borrie, S.A. (2017). Judgments of intelligence and likability of young adult female speakers of American English: the influence of vocal fry and the surrounding acoustic-prosodic context. *Journal of Voice*, Article in press.

Perry, A., Casey, E., & Cotton, S. (2015). Quality of life after total laryngectomy: Functioning, psychological well-being and self-efficacy. *International Journal of Language and Communication Disorders*, 50 (4), 467-475.

Ramirez, M. J.F., Ferriol, E.E., Domenech, F.G., LLatas, M.C., Suarez-Varela, M.M., & Martinez, R.L. (2003). Psychosocial adjustment in patients surgically treated for laryngeal cancer. *Otolaryngology - Head and Neck Surgery*, 129:92-97.

R Core Team (2018). R: A language and environment for statistical computing. R Foundation for Statistical Computing, Vienna, Austria. URL: <https://www.R-project.org/>.

Robbins, J., Fisher, H. B., Blom, E. C., & Singer, M. I. (1984). A comparative acoustic study of normal, esophageal, and tracheoesophageal speech production. *Journal of Speech and Hearing disorders*, 49(2), 202-210.

Şahin, M., Ogut, M. F., Vardar, R., Kirazlı, T., Engin, E. Z., & Bor, S. (2016). Novel esophageal speech therapy method in total laryngectomized patients: biofeedback by intraesophageal impedance. *Diseases of the Esophagus*, 29(1), 41-47.

Schaefer, S. D., & Johns, D. F. (1982). Attaining functional esophageal speech. *Archives of Otolaryngology*, 108(10), 647-649.

Searl, J., & Knollhoff, S. (2018). Sense of Effort and Fatigue Associated With Talking After Total Laryngectomy. *American journal of speech-language pathology*, 27(4), 1434-1444.

Trudeau, M. D. (1987). A comparison of the speech acceptability of good and excellent esophageal and tracheoesophageal speakers. *Journal of communication disorders*, 20, 41-49.

Uemi N, Ifukube T, Takahashi M, Matsushima J. Design of a new electrolarynx having a pitch control function. Paper presented at: 3rd IEEE International Workshop on Robot and Human Communication (RO-MAN '94); 1994; Nagoya, Japan.

Wang L, Feng Y, Yang Z, Niu H. Development and evaluation of wheelcontrolled pitch-adjustable electrolarynx. *Med Biol Eng Comput*. Epub 2016 Dec 24.

Williams, D. F., & Dietrich, S. (2001). Perceptions of communicative disorders: Verification and specification of rater variables. *Journal of Communication Disorders*, 34, 355-366.

Xi, S., Li, Z., Gui, C., & Huang, X. (2009). The effectiveness of voice rehabilitation on vocalization in post-laryngectomy patients: a systematic review. *JB1 Database of Systematic Reviews and Implementation Reports*, 7(23), 1004-1035.