

REVIEW ARTICLE

Impact of Excessive Screen Time on Speech & Language in Children

Amreen Raheem¹, Sikander Ghayas Khan¹, Muhammad Ahmed¹, Farrukh Jawad Alvi²,
Khadeeja Saleem¹, Sehar Batool¹

¹Department of Health Professional Technologies, Faculty of Allied Health Sciences, University of Lahore.

²Institute of Public Health, Faculty of Allied Health Sciences, University of Lahore.

Correspondence: 77amreen@gmail.com

doi: 10.22442/jlumhs.2023.01020

ABSTRACT

Excessive use of screen time can negatively affect children's development of speech and language as well as other characteristics. Other researches also been conducted on screen time's influence on children's development. In this review, we examine the literature review done nationally and internationally. For this purpose, the researcher used two methods: (1) searches from different databases (Google Scholar, PubMed, Google and Research Gate) and (2) Reference sections of previous studies. The maximum effect of screen time reported in the John JJ study, where 89.4% have excessive screen use. The minimum impact written in a study by Meta Van Den, which showed that only 6.6% of the patient reported speech delays due to media usage.

The findings that have been analyzed in this study point to access the strategies to recede the habit of using electronic media in youngsters as it is impacting their speech and language development and causing attention, vision and other health problems. However, more researches are mandatory to examine several factors that lead to excessive screen time.

KEYWORDS: Screen time, speech delay, effect of screen time, language development, children, negative effects, media use.

INTRODUCTION

Screen time is spent with electronic media such as watching TV or movies, playing games on tabs, laptops, smartphones or other portable electronic gadgets and playing computer games¹. Often used while seated or lying down, these devices contribute enormously to the time individuals of any age spend in sedentary activities². Technology has become an integral part of both children and adults who spend most of their time on the internet by browsing different kinds of things or utilizing a personal computer³. There are no proven benefits of media exposure or screen time for infants and toddlers; the media will never replace essential face-to-face interaction required for communication⁴. There has always been and will always be the exact method or way of learning through communication and interaction⁵. The first several years are crucial and critical for children's growth and development. It is when their brain is developing rapidly and quickly; it's the same age your child's receptive language learning occurs at its peak⁶. The fundamental speech and language skills they will learn at this age remain forever with them. Unfortunately, if the child spends half the day playing with the gadgets, he does not get much time to interact with his peers⁷.

Now, in the world of technology and media, many parents use different kinds of gadgets for their children to keep them flustered so they can do their work efficiently without interrupting child tantrums⁸. Children use devices with more interest than other indoor activities; thus, parents use these things regularly, irrespective of their impact⁹. Excessive screening can affect/impact speech, language, cognition, and physical and mental health¹⁰. The Australian Physical Activity & Sedentary Behavior Guidelines recommended limits for screen time of all ages are as follows: 0-2 years: not greater than 1 hour at a time being lazy but prefer no use of screen time during this age.

2-5 years: not greater than 60-80 minutes daily regardless of their restrictive or cranky behavior.

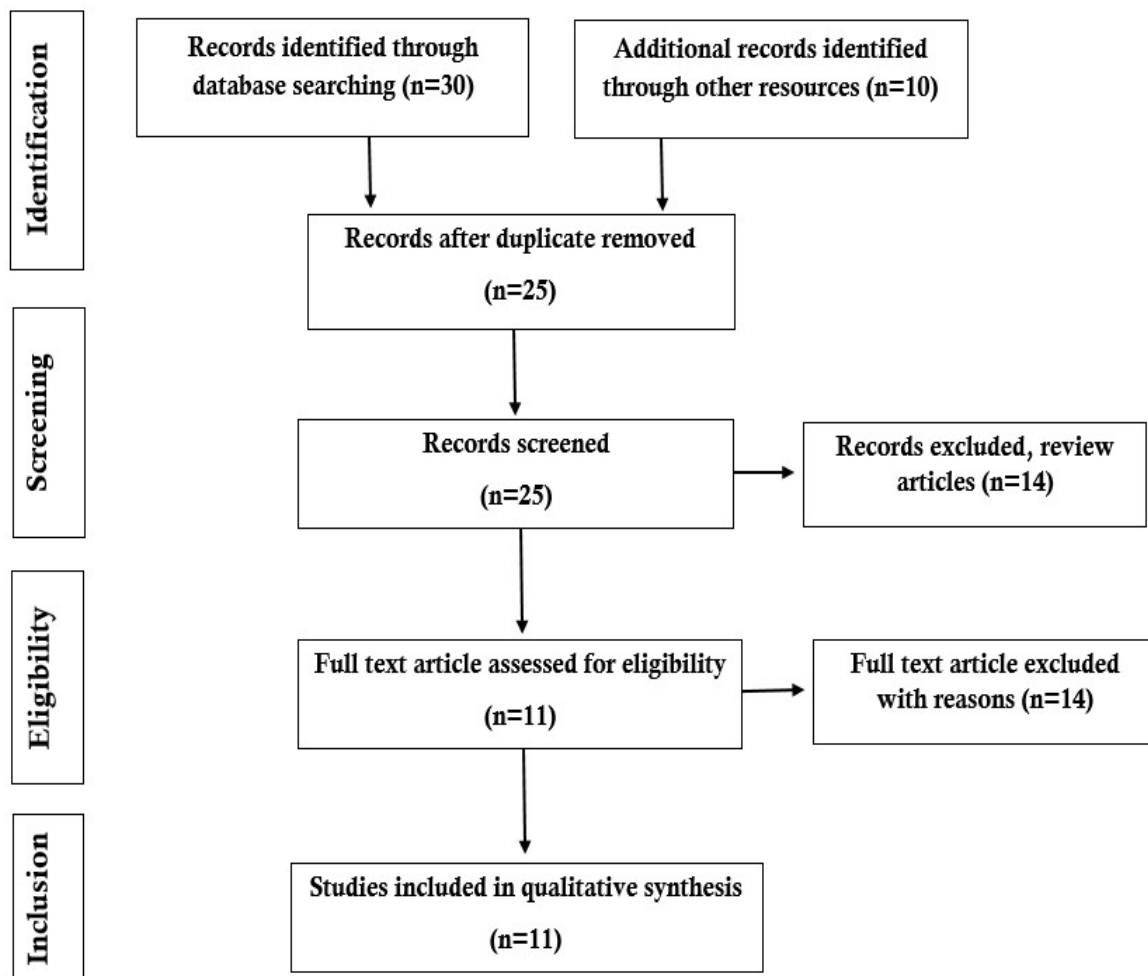
5-12 years: involved in activities, don't use excess screen 2 hours a day are enough¹¹.

Screens hijack attention span; for a brain to develop and mature, it demands fundamental stimulants from the environment, and more significantly, they require some period to operate that stimuli¹². When we read storybooks loudly, the children get enough time to process what we say by listening to our voices and seeing the picture. However, the continuous appearance of on-screen images does not provide enough time for children to process, which affects their focus and attention¹³. It decreases their ability to control impulses; they don't wait and want to get their desired thing immediately¹⁴. If they consistently use electronic media or are hooked by it, they do not get how they can handle frustration because they have never learnt it¹⁵. Heavy screen usage limits children's skills to read individual emotions and distracts them from activities such as playing and interacting with peers¹⁶. If toddlers and young adults have been exposed to screen time for long, it is considered a red flag for attention deficit and hyperactivity¹⁷. Suicide consideration may also be correlated with an immoderate display of electronic devices. Lastly, if children have higher screen time, it gradually becomes a habit that can result in addictive behavior¹⁸.

METHODOLOGY

This research is a review study, and a systematic search applied to explore the articles on screen time association with speech and language development. Studies were searched out by using different keywords "screen time", "effects", "speech development", "language development", and "impact of excessive screen time". These studies searched from different databases, Google Scholar, Scopus, PubMed, Web of Science and Research Gate. Eligibility criteria were limited to the specific search more relevant to the research objectives. We chose the study with the largest sample size, where many studies using the same data set existed. Review articles and copyright or permission issues or the full text was not available were excluded from the study. Studies were included if Screen time affects/impacts speech and language in their title; the full text was available. It should fall under the Speech-Language Pathology diagnosis domain and be published between January 2016 and December 2021.

Figure I: Flow chart describing the selection procedure



RESULTS & DISCUSSION

Characteristics of selected studies:

The total number of articles meeting the critical appraisal criteria was 11. All these studies met the inclusion criteria. Most of the research was conducted internationally; however, a national literature review is present but did not match the inclusion criteria. The articles include a cross-sectional survey (n=06), cohort study (n= 02), case-control study (n=02) and longitudinal study (n=1), as shown in Table I.

Table I: Review article list of Findings

Sr. No	Author (year)	Focus of research	Study design	Conclusion
1.	Vrinda R 2021 ⁸	Impact Of Screen Time On Communication	Cross-sectional Survey	Use of screen has deleterious impact on children's health and normal development.
2.	John JJ et al. 2021 ¹⁹	Association of screen time with cognitive delay	Cross-sectional survey	Screen time is not being supervised by parents consistently thus resulting in cognitive delay.
3.	Maulana MS 2020 ²⁰	Risk Of Language Delay In Toddlers With Prolonged Screen Time	Retrospective cohort study	Use of electronic or digital media is related with delayed language.
4.	Basit H 2020 ²¹	Association of Screen Time with Delay Language	Cross-sectional study	Excessive use of screen can be one of the elements which can cause and demolish language delay.
5.	Levelink B et al. ²²	Relationship Between Screen Time, Sleep and ADHD	Prospective cohort study	Regardless of relationship between use of electronic media and sleep disturbances in childhood, it is not related with ADHD.
6.	van den Heuvel M et al. ⁷	Association of media device With Expressive Language Delay	Cross-sectional study	There is remarkable correlation between speech delay and use of handheld or touchscreen devices.
7.	Sha-sha W et al. ²³	Screen Time And Language Delay In Children Aged 1 To 3 Years	Case-control study	Use of screen is negatively influencing normal development.
8.	American Academy of Pediatrics (Sci. Daily) 2017 ²⁴	Handheld Screen Time Linked With Speech Delays In Young Children	Cross-sectional study	Speech development is effected by use of media devices.
9.	Kamarudin SS 2018 ²⁵	Comparison Study In Children With And Without Speech Delay	Case-control study	There is an association between speech delay and time spent watching screens.
10.	Wu X et al. ²⁶	Impact of screen time on mental health	Longitudinal study	The inclusive effects are persistent, but screen time is not increasing psychological problems.
11.	Montagni I 2016 ²⁷	Association of screen time with attention problems and hyperactivity.	Cross-sectional study	Use of electronic media is somehow affecting attention levels.

Association of screen time with neurology:

Children under the age of 5 years are accessible and sensitive because, at this age, most of the brain maturation or development occurs, and more use of electronic media is correlated with negative neurocognitive consequences and delayed speech²⁸. The research was carried out to assess functional cerebral MRI that has shown a close relationship between excessive screen usage and diminished microstructural rectitude of the brain consisting of regions that are sustentative to language and learning abilities²⁹. Inordinate use of electronic devices in infants and toddlers has been exhibited to have adverse influence on the receptive, speech and motor skills³⁰. Modern research conducted with handheld gadgets has resulted in too much use of these devices in children related to many health problems such as psychological issues, uneasiness/stress side effects, consideration and hyperactivity issues, and forceful ways of behaving without influencing speech³¹. Unrestricted and uncontrolled use of electronic media, such as exceeding more than 2–3h usage of digital media, including television, personal computers, portable and other gadgets, can influence the growing brain that has significant ramifications for cognition and motor development, learning and memory, mental stability and general wellbeing³².

Comparison between children of different ages:

When a comparison is drawn between the children born in 1980 who ordinarily started sitting in front of television at age of 4 and children born after 2000 who began sitting in front of the television consistently at four months, significant differences have been marked³³. The study proposes that prior and increased manifestation of screen time is related with more liability of mental health symptoms, especially those associated with apprehension, attention deficit issues and impulsivity²⁵. Studies recommend that any utilization of educational media relies upon the child's age and also on what they are watching, and how much time they are being exposed to screen may negatively affect development in toddlers and infants³⁴. If screen time surpasses the limits, it will have a terrible effect or, at times, demolish the speech, language, vision or general health of an individual³⁵. Patricia Kuhl experimented with more than 4000 children, and she discovered that children do not learn from devices/machines³⁶. Even if you are showing them videos that are captivating as well as educational, the distinct learning is very much lesser. Children can't acquire the knowledge from a machine that an individual can provide and increase their creativity and imagination skills³⁷.

Screen time and Covid-19:

During the Covid-19 pandemic, when lockdowns were applied everywhere, children were prevented from going to school or parks, resulting in a considerable increase in screen time; they continued to stick to their phones, play video games, and watch cartoons because they had no other option. There has been a tremendous increase in screen time during this period; as of now, Covid-19 is under control, but it is challenging for children to get back to their routine with minimum or no screen time³⁸.

This review article study findings from 11 articles involve the enormous use of media devices and their significant relationship with speech and language development in children. As electronic media may have some sort of benediction, such as entertainment, this research showed that excessive use could deleteriously influence speech-language growth, specifically for infants and toddlers. Thus, multiple studies point out the significance of parental guidance and the advantage we can get by limiting the time on our children's screens. Children are growing up in the digital era, and the influence of electronic gadgets with screens has increased remarkably. Parenting was also made easy with the coming of devices and screens. Children are now used to

ONLINE FIRST

gadgets and screens from a very young age, limiting their productivity and creativity. Several factors have been present that contribute to excessive screen time, such as increased screen time in past years due to lockdown situations when the children have no other activities, such as going to school, parks or any other kind of outdoor activity. They are homebound; thus, they spend more time on television watching cartoons, playing video games, etc. Also, the education system went online for the past few years, which plays a significant part in screen usage as it is also necessary for them.

Another reason for excessive screen time is that mothers are not as attentive and careful towards their children as in earlier times. Nowadays, mothers turn on the screen when their child gets cranky or bored and want some activity other than ordinary routine without realizing that it can damage their child's normal development as it is a crucial time for the growth and maturation of the speech and language process. In modern households, turning on screens for children while eating has become a trend. The vocabulary and learning a child could get by playing with their mother, siblings, and peers did not get by watching cartoons and playing online games. The most common reason for increased screen time is lack of time and attention from parents that leads to the children's divergence towards screen; if both parents are working and not giving enough time to children, then there is a chance that their everyday speech and language development becomes affected. All the research that has been conducted showed that maximum screen time necessarily affects children's development at a point due to many reasons. One is that all the things shown on the screen are imaginary, especially animated cartoons. The children do not understand realistic and fictional worlds; thus, they cannot distinguish between them; in addition, children start living in their world. By watching the screen, they start isolating themselves and not playing or interacting with their peers, greatly restricting their learning.

Research manifests the negative aftermath of screen time being inconsiderate of how socially isolated or cognitively obligated you are. Studies propose that regardless of how you are utilizing electronic media, such as for education, occupation or entertainment, it can be harmful or, we can say that destructive for normal development without sufficient moderation or restriction.

CONCLUSION

The correlations found in this study suggest potential intervention strategies to limit young children's screen use as it is impacting their speech and language development and causing attention, vision and other health problems. Moreover, the findings of this study support pediatric recommendations to limit children's duration of screen exposure. More researches are mandatory to examine several factors that lead to excessive screen time.

Conflict of Interest: No conflicts of interest, as stated by authors.

Financial Disclosure / Grant Approval: No funding agency was involved in this research.

Data Sharing Statement: The corresponding author can provide the data proving the findings of this study on request. Privacy or ethical restrictions bound us from sharing the data publically.

AUTHOR CONTRIBUTIONS

Raheem A: Manuscript Writing
Khan SG: Idea and concept
Ahmed M: Final review of the article
Alvi FJ: Idea and concept
Saleem K: Initial review of manuscript
Batool S: Manuscript Writing

REFERENCES

1. Karani NF, Sher J, Mophosho M. The influence of screen time on children's language development: A scoping review. *South Afr J Commun Disord.* 2022; 69(1): 825. doi: 10.4102/sajcd.v69i1.825.
2. Chong WW, Abd Rahman FN, Harun NA. Screen time of children with speech delay: a cross-sectional study in a tertiary center in Kuantan, Malaysia. *Pediatr Int.* 2022; 64(1): e15105. doi: 10.1111/ped.15105.
3. Jalil J, Bashir F. Screen time, effects on cognitive, psychological and physical development of children. *Pak Armed Forces Med J.* 2021; 71(2): 375-76.
4. Monteiro R, Fernandes S, Rocha N. What Do Preschool Teachers and Parents Think about the Influence of Screen-Time Exposure on Children's Development? Challenges and Opportunities. *Educ Sci.* 2022; 12(1): 52. doi: 10.3390/educsci12010052.
5. Garth AL. Negative Influence of Screen Time on Speech and Language Development. 2020. 2020 SLP Posters. 3. Available from: <https://griffinshare.fontbonne.edu/slp-posters/3>.
6. Krupa M, Boominathan P, Ramanan PV, Sebastian S. Relationship between screen time and mother-child reciprocal interaction in typically developing children and children with autism spectrum disorders. *Indian J Pediatr.* 2019; 86(4): 394. doi: 10.1007/s12098-018-02844-w. Epub 2019 Jan 9.
7. van den Heuvel M, Ma J, Borkhoff CM, Koroshegyi C, Dai DW, Parkin PC et al. Mobile media device use is associated with expressive language delay in 18-month-old children. *J Dev Behav Pediatr.* 2019; 40(2): 99-104. doi: 10.1097/DBP.0000000000000630.
8. Vrinda R, Reji MM, Sanjeevan SS. Impact of Screen Time on Communication in Toddlers: A Parental Awareness Survey. *Language in India.* 2021; 21: 42-54.
9. Madigan S, Browne D, Racine N, Mori C, Tough S. Association between screen time and children's performance on a developmental screening test. *JAMA Pediatrics.* 2019; 173(3): 244-50. doi: 10.1001/jamapediatrics.2018.5056.
10. Zhang Z, Adamo KB, Ogden N, Goldfield GS, Okely AD, Kuzik N et al. Associations between screen time and cognitive development in preschoolers. *Paediatr Child Health.* 2021; 27(2): 105-10. doi: 10.1093/pch/pxab067.
11. Fatima M, Akram MM. Relationship between parental negligence, screen time and expressive language delay among young children. *Bahria Univ J Human Soc Sci.* 2022; 5(1): 45-57.
12. Hill MM, Gangi D, Miller M, Rafi SM, Ozonoff S. Screen time in 36-month-olds at increased likelihood for ASD and ADHD. *Infant Behav Develop.* 2020; 61: 101484. doi: 10.1016/j.infbeh.2020.101484. Epub 2020 Aug 29.
13. Lissak G. Adverse physiological and psychological effects of screen time on children and adolescents: Literature review and case study. *Environ Res.* 2018; 164: 149-57. doi: 10.1016/j.envres.2018.01.015. Epub 2018 Feb 27.
14. McArthur BA, Tough S, Madigan S. Screen time and developmental and behavioral outcomes for preschool children. *Pediatr Res.* 2022; 91(6): 1616-21. doi: 10.1038/s41390-01572-w.
15. McGough K. Pediatric screen time. *J Am Assoc Nurse Pract.* 2022; 34(4): 631-8. doi: 10.1097/JXX.0000000000000682.

16. Yang A, Rolls ET, Dong G, Du J, Li Y, Feng J et al. Longer screen time utilization is associated with the polygenic risk for Attention-deficit/hyperactivity disorder with mediation by brain white matter microstructure. *EBioMedicine*. 2022; 80: 104039. doi: 10.1016/j.ebiom.2022.104039. Epub 2022 May 1.
17. Suggs K. Help Parents Replace Screen Time With Talking. *Leader Live*. August 24, 2017. Available from: <https://leader.pubs.asha.org/doi/10.1044/hold-the-phone/full/>
18. Tamana SK, Ezeugwu V, Chikuma J, Lefebvre DL, Azad MB, Moraes TJ et al. Screen-time is associated with inattention problems in preschoolers: Results from the CHILD birth cohort study. *PLoS One*. 2019; 14(4): e0213995. doi: 10.1371/journal.pone.0213995.
19. John JJ, Joseph R, David A, Bejoy A, George KV, George L. Association of screen time with parent-reported cognitive delay in preschool children of Kerala, India. *BMC Pediatrics*. 2021; 21: 1-8. doi: 10.1186/s12887-021-02545-y.
20. Maulana MS, Gunardi H. Risk of language delay in toddlers with prolonged screen time: evidence based case repor. *J Early Childhood Islamic Education Study*. 2020; 1(1): 34-48.
21. Basit H, Waseem H, Yousaf N. Association between screen timing and delay language development among the toddlers and preschoolers. *Asian J Allied Health Sci*. 2020; 5(1): 34-9.
22. Levelink B, van der Vlegel M, Mommers M, Gubbels J, Dompeling E, Feron FJ et al. The longitudinal relationship between screen time, sleep and a diagnosis of attention-deficit/hyperactivity disorder in childhood. *J Atten Disord*. 2021; 25(14): 2003-13. doi: 10.1177/1087054720953897.
23. Sha-sha W, Yuan T, Yu W, Jin-Jin C, Department of Child Healthcare, Shanghai Childrens Hospital. Case-control study on the association between screen time and language delay in children aged 1 to 3 years. *Chinese J Child Health Care*. 2019; 27(12): 1281-4.
24. American Academy of Pediatrics. Handheld screen time linked with speech delays in young children, *Science Daily*. 2017. Available from: <https://www.sciencedaily.com/releases/2017/05/170504083141.htm>
25. Kamarudin SS, Dannae M. Media screen time and speech delay: comparison study in children with and without speech delay. 2018; 3(4): 5.
26. Wu X, Tao S, Zhang S, Zhang Y, Chen K, Yang Y et al. Impact of screen time on mental health problems progression in youth: a 1-year follow-up study. *BMJ Open*. 2016; 6(11): e011533.
27. Montagni I, Guichard E, Kurth T. Association of screen time with self-perceived attention problems and hyperactivity levels in French students: a cross-sectional study. *BMJ Open*. 2016; 6(2): e009089.
28. Vanderloo LM, Carsley S, Aglipay M, Cost KT, Maguire J, Birken CS. Applying harm reduction principles to address screen time in young children amidst the COVID-19 pandemic. *J Dev Behav Pediatr*. 2020; 41(5): 335-6. doi: 10.1097/DBP.0000000000000825.
29. Nobre JNP, Santos JN, Santos LR, Guedes SdC, Pereira L, Costa JM et al. Determining factors in children's screen time in early childhood. *Cien Saude Colet*. 2021; 26(3): 1127-36. doi: 10.1590/1413-81232021263.00602019. Epub 2019 Jun 12.

30. Robidoux H, Ellington E, Lauerer J. Screen Time: The impact of digital technology on children and strategies in care. *J Psychosoc Nurs Ment Health Serv.* 2019; 57(11): 15-20. doi: 10.3928/02793695-20191016-04.
31. Wiederhold BK. Children's screen time during the COVID-19 pandemic: boundaries and etiquette. Mary Ann Liebert, Inc., publishers 140 Huguenot Street, 3rd Floor New York; 2020. p. 359-60.
32. Aishworiya R, Kiing JS, Chan YH, Tung SS, Law E. Screen time exposure and sleep among children with developmental disabilities. *J Paediatr Child Health.* 2018; 54(8): 889-94. doi: 10.1111/jpc.13918. Epub 2018 Apr 19.
33. Teichert L. Negotiating screen time: a mother's struggle over 'no screen time'with her infant son. *J Early Childhood Literacy.* 2020; 20(3): 524-50. doi: 10.1177/1468798420926623.
34. Shafqat F. Screen Addiction Among Young Pakistani Children: Handicapping The Typically Developed. *Rehabil J.* 2018; 2(01): 38-9. doi: 21-2017/re-trjvol02iss01p38.
35. Varadarajan S, Venguidesvarane AG, Ramaswamy KN, Rajamohan M, Krupa M, Christadoss SBW. Prevalence of excessive screen time and its association with developmental delay in children aged < 5 years: A population-based cross-sectional study in India. *Plos One.* 2021; 16(7): e0254102. doi: 10.1371/journal.pone.0254102.
36. Singh SJ, Mohd Azman FNS, Sharma S, Razak RA. Malaysian parents' perception of how screen time affects their children's language. *J Children Media.* 2021; 15(4): 588-96. doi: 10.1080/17482798.2021.1938620.
37. Straker L, Zabatiero J, Danby S, Thorpe K, Edwards S. Conflicting guidelines on young children's screen time and use of digital technology create policy and practice dilemmas. *J Pediatr.* 2018; 202: 300-3. doi: 10.1016/j.peds.2018.07.019.
38. Colley RC, Bushnik T, Langlois K. Exercise and screen time during the COVID-19 pandemic. *Health Rep.* 2020; 31(6): 3-11. doi: 10.25318/82-003-x202000600001-eng.