
FACE-MASK USE AND LANGUAGE DEVELOPMENT: REASONS TO WORRY?

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Facemasks are an essential public health tool against COVID-19, and—until we know more about both vaccine distribution and efficacy over time—masks are here to stay. Although essential for infant- and child-caregivers in hospitals, in schools, and in other public spaces, many have asked how degraded auditory speech and the accompanying loss of visible facial cues from wearing masks could influence speech and language development. Indeed, the muffling of speech that occurs from wearing a mask (or two, in the case of double-masking), creates exactly the conditions where visible speech would be incredibly helpful – particularly if there is also background noise such as in a busy classroom or daycare. Some researchers have advocated the use of clear masks, but little research has been done on whether – and what kinds of – clear masks help, with some research suggesting clear masks could distort visible speech. Below, we review what we already know about young children’s use of visible speech, and highlight the future work that is needed to understand the impact of mask-use on language learning and development.

From birth, infants are attracted to faces, and sensitive to the correspondence between the sound and sight of a talking face. By as early as 2 months of age, infants look longer at mouth movements that match heard vowel sounds. By 4-months, babies will even imitate these audiovisually matching faces more than mismatching faces, where the sound and face do not correspond. Infant looking to the mouth only increases over the next few months and years. And, as early as 6-8 months infants more rapidly learn speech sounds when they can see a talking face versus when the face is partially covered. By the time they are 1-year-old, babies can use visual speech to help recognize known words, and by 2-years, they use it to help learn new words. Indeed, by 2.5 years of age, toddlers can even learn new words just by lip-reading if they first hear someone say that word. Together, this work shows that babies and toddlers can and do use visible information in talking faces to assist their processing and learning of spoken language. Importantly, however, visual speech perception is still developing, as the ability to use visual speech continues to grow across childhood and into adolescence.

From 3-8 years of age, children can detect and distinguish individual sounds (like /ba/ versus /ga/) using visual speech as well as adults do, but show much less of a visual influence than adults when recognizing words. And while children throughout the 4 to 14 year age range can use their immature visual speech abilities to aid perception when the auditory signal is obscured, or when listening in noisy environments, their reliance on visual speech is much larger in older than younger children, and it is only in adulthood that visual cues significantly improve speech processing even in quiet environments. When there is no sound at all, children 5-6 years of age can begin to guess what word is being said from lip-reading alone,

but this ability, again, does not reach adult levels of accuracy until at least 13-14 years of age. Thus, even though children use visual speech information, it may not be as important for language comprehension as it is for adults.

How concerned should we be that the need for masks in public settings will impact child language development and school-based learning? While we need to be vigilant, there are perhaps several reasons to not be overly concerned. First, mask-wearing is not common at home, and so infants and children likely have considerable opportunity to hear language while watching talking faces. A critical research question is just how much access to this visual speech component is needed to provide sufficient exposure for language development. For now, we do think it is important to encourage face-to-face interactions in the home for parents and other home caregivers, which not only provides access to visible talking faces, but critically also supports the kind of rich conversational interactions that we know are essential for healthy language development.

Second, it is also not known whether access to visual speech outside the home is equally important for all learners and across all environments. For spoken language, for example, access to visual speech may be crucial in only some circumstances, like in noisy environments, or for some children, like those learning in a second language at a certain age. It may be most essential only in some tasks, such as when teachers are trying to teach children to map sounds on to letters. Finding the answers to these questions can help parents and educators figure out alternative strategies for these settings and/or for these learners.

Third, we need to better understand how much speech information is conveyed from the parts of the face that remain unobscured by masks. While the bulk of speech is certainly conveyed by the movements of the mouth and lower face, there is also information in eye movements, head nods, and the like, which contribute to language understanding. The brains of infants and young children are more plastic than those of adults. Thus, young children may be able to learn – more rapidly than adults – to use the information that is available even in masked faces to facilitate understanding of what is being said. While we wait for research addressing these questions, we can take comfort from recent studies that show children – even toddlers – can learn language in carefully selected interactive online book reading and video chat sessions, providing another avenue of access, even in classrooms, to visual speech information.

The increased use of facemasks in public spaces is anticipated to last for a long time, perhaps for years if vaccinations are not efficiently and equitably distributed around the world². Yet, this is not a new phenomenon: Face coverings—whether for religious and cultural reasons, or as protection against disease or pollution—are common in public spaces within many societies from other parts of the world, and children growing up in these societies are successful too in learning spoken language. So, until masks are no longer required, let us remember that the development of children’s use of visual speech spans many years, and there is not currently any evidence that reduced exposure to faces has any dramatic impact on speech and language development. As we wait for evidence-based best practices about mask use and language development, we should all do our best to ensure that we talk to and interact with our infants and children at home, not simply because home is where we remove our masks, but rather because decades of research has shown that language development is optimal when infants have a rich

language environment, hearing lots of speech with a variety of words and sentences in socially-guided conversational interactions. We can still build a rich linguistic foundation that will be critical as our infants and toddlers enter schools, and as our children move through their school years.

Footnotes

1. <https://www.canada.ca/en/public-health/services/diseases/2019-novel-coronavirus-infection/prevention-risks/about-non-medical-masks-face-coverings.html>
2. https://www.washingtonpost.com/opinions/global-opinions/rich-countries-me-first-vaccine-hoarding-is-leaving-behind-low-income-nations/2021/01/23/3830e7d4-5c23-11eb-a976-bad6431e03e2_story.html

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