

## **From play pants to pragmatics: Laughter's linguistic leap**

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Laughter is a universal human behavior with a unique relationship to language (Bryant & Bainbridge, 2022). It is a pre-linguistic signal, developing in infants before language, and is produced by congenitally deaf people (Provine, 2000). Laughter also has deep evolutionary roots. There is strong acoustic and behavioral evidence that laughter is homologous to the play vocalizations of other great apes. It likely evolved from a play-specific, pant-like signal in our shared primate ancestors (Davila-Ross, Owren, & Zimmermann, 2010). However, in humans, laughter can also function as a pragmatic signal to facilitate turn taking and indicate speaker meaning in language use (Bryant & Bainbridge, 2022). Thus, laughter presents an intriguing case in which a pre-linguistic play vocalization became integrated into the language system.

To better understand this relationship, we conducted a systematic review of play vocalizations across species and the relationships to human laughter (Winkler & Bryant, 2021). Our analysis added support to the theory that human laughter and its precursor in primates could have initially evolved from a cue of heavy breathing during play. We found that acoustic signaling during social play is extensive across the animal kingdom. While animals used a wide variety of sounds to communicate during play, a commonality among many mammals was to use pant-like vocalizations (e.g., short, rhythmic, low-frequency, noisy calls linked to the breath). These vocalizations are used to initiate social play and reduce uncertainty in play interactions in order to avoid aggression. Proximally, play vocalizations appear to be mediated by positive affect (as shown in optimism bias experiments, e.g., Saito, Yuki, Seki, Kagawa, & Okanoya, 2016).

How did a vocalization that is emotionally linked and context-dependent become a flexible feature of human communication? We argue that since diverging from other apes, human laughter has evolved unique functions. It is routinely used outside of social play, within speech, and to broadcast social information. Unlike other types of nonlinguistic emotional vocalizations like crying and screaming, laughter is tightly integrated with speech. It occurs in specific, rule-governed patterns relative to other linguistic constituents to punctuate utterances, signal turn-taking, and indicate irony, humor, and other indirect meanings (Provine, 2000). A likely explanation for this is that humans have different vocal production modes allowing for volitional forms of all nonverbal vocalizations. In the case of laughter, spontaneous and volitional forms are acoustically distinct, perceived differently by listeners, and underpinned by independent neural circuits, with volitional laughter generated by the speech production system (Ackermann, Hage, & Ziegler, 2014; Bryant & Bainbridge, 2022). Volitional laughter became incorporated into our speech production suggesting that its signaling functions are interrelated with functions of language-based conversational interaction more generally.

With greater clarity on laughter's phylogenetic origins comes greater pressure for language evolution theories to account for the puzzle of laughter. Research on laughter—its evolutionary history, development, and neural control—can shed light on the ways that language co-evolved with our ancestors' existing repertoires of vocal communication. In turn, research on the origins of language may help clarify the routes by which laughter came to have pragmatic functions.

## References

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