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Play

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Play can loosely be defined as the willing pursuit of seemingly unnecessary costs in pursuit of idiosyncratic ends. It is an intrinsically motivated, intentional behavior characteristic of, although not limited to, the young of many species. Any answer to the question, "Why do humans and other animals play?" other than "because it's fun" would seem to miss the point of play altogether. However, although it is clear that play is rewarding, its function remains in dispute. Early attempts to explain behavior in terms of positive or negative environmental outcomes failed to account for why animals would pursue costly actions in the absence of external rewards. Subsequent accounts have variously characterized play with respect to both noncognitive ends (e.g., a side effect of other evolutionarily important behaviors or a route to social bonding) and cognitive ones (e.g., a way for juveniles to develop skills important in adulthood or a means of gaining information both about the world and the organisms' own abilities). Humans may also find it rewarding to create new problems and plans, even when they may not lead to solutions or achievable outcomes.

History

For much of the 20th century, the prevailing view in psychology was that all behavior could be explained by extrinsic reinforcement: actions that were rewarded in the environment would be repeated; those that were punished would be eliminated (Watson, 2017). Play posed a problem for these accounts from the start, failing to explain, for instance, why rhesus monkeys would explore puzzle boxes even though they were not rewarded for doing so. This led researchers to speculate that the need for exploratory play was a primary drive, like hunger, thirst, or lust (Harlow et al., 1950). However, while the other primary drives contributed to the survival of species, this was much less obvious for play. With the rise of cognitive science, researchers began to consider motivations for behavior other than extrinsic reinforcement, inspiring many different accounts of play [see Reinforcement Learning]. Different forms of play might originate from different processes and serve different ends.

Core concepts

Play as an evolutionary spandrel

One account of the emergence of play is that it is a side effect of other adaptive behaviors rather than being functional in their own right. For instance, dolphins blow bubble nets to capture fish for prey, so dolphins may continue to blow bubbles even when no prey are present (Delfour & Aulagnier, 1997). In this sense, play might be an evolutionary *spandrel* (Gould & Lewontin, 1979), a trait emerging as a byproduct of behaviors that serve other ends.

Play as a signal of fitness

Play takes energy. As a result, hungry, stressed, sick, or injured animals—including human children—are much less likely to play (Alessandri, 1991). Insofar as play is a reliable signal of fitness, play might emerge

from both natural and sexual selection: predators may selectively avoid playful animals, and conspecifics might selectively mate with playful adolescents and young adults.

Play for forming social bonds

Researchers have also proposed that play might reduce in-group aggression and increase in-group coordination. Mock fighting, for instance, could allow members of a herd to establish dominance hierarchies without the risk of injury or death incurred by real fighting, and play chasing might increase social awareness and facilitate group behavior in animals who hunt collectively (Pellis & Iwaniuk, 2000). However, although the idea that play promotes social bonding is intriguing, evidence for this has been limited. Time spent playing as juveniles does not correlate with reductions in social aggression or increased social cohesion in any of the species that have been studied, including wallabies, rats, meerkats, and monkeys (Sharpe, 2005).

Play for practice

One of the oldest and most influential accounts of play is the idea that play lets young animals practice skills they will need as adults (Groos, 1898), and across cultures, children play with scaled-down versions of adult tools (Riede et al., 2023; Edwards, 2000). Nonetheless, there is only limited evidence for a direct relationship between play and adult skills: kittens raised with and without toys are equally successful hunters in adulthood (Caro, 1980), and variability in meerkat play as juveniles does not predict later success in hunting or defending territory (Sharpe, 2005). Similarly, there is little evidence that pretend play causally improves children's language, executive function, or social skills (Lillard et al., 2013).

Play for learning

A different possibility is that play supports learning in the moment. Many animals are intrinsically motivated to explore and gain new information, even in the absence of any extrinsic reward (Gottlieb & Oudeyer, 2018), and human children seem especially likely to explore in ways that are sensitive to opportunities for learning. Babies and children play more with objects that violate their expectations than with ordinary objects, and they play in ways that probe the violations (e.g., 11-month-old babies preferentially bang toys that appeared to pass through walls but drop toys that seemed to float in mid air; Stahl & Feigenson, 2015). The more uncertain children are about the evidence they observe, the longer they explore (Lapidow et al., 2022), and children draw accurate conclusions from the evidence they generate in play, suggesting a link between play and rational inference [see Causal Learning]. Children's play is also sensitive to social cues, and children explore more when adult behavior suggests that more information can be gained (Bonawitz et al., 2011; Wu & Gweon, 2021) [see Social Learning]. Guided play, in which teachers scaffold children's play to highlight important concepts or skills, is especially likely to support children's learning and engagement (Weisberg et al., 2013).

Questions, controversies, and new developments

These accounts of play might seem comprehensive, but the richness of human play can bedevil even these attempts to explain it. It can be challenging, for instance, to watch an 8 year old chasing a pretend monster around the kitchen (or an adult playing Solitaire) and be sure that these activities support valuable ends of any kind. Play in human children and adults often seems to be characterized by setting up and engaging with essentially arbitrary problems. One speculative possibility is that these kinds of distinctively human play are rewarding not because they support learning but because they support thinking: problems, however frivolous, provide a structure in which people can generate hypotheses and plan (Chu & Schulz, 2020). The pleasure humans get from constructing and immersing themselves in well-structured problems may support cognition broadly (Chu et al., 2024) [see Cognitive Development].

Broader connections

For all that play is a familiar, everyday phenomenon, its nature and function remain elusive, inspiring work not only in developmental psychology and cognitive science but in fields ranging from ethology (Caro, 1980; Delfour & Aulagnier, 1997; Sharpe, 2005) to anthropology (Riede et al., 2023). More recently, play has also inspired work on robotics and artificial intelligence in the hopes that machines that play may develop more robust and flexible behaviors (Colas et al., 2022). Understanding play may thus help better understand intelligence itself.

Further reading

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