幼兒及幼鼠支配性行為之探索

Investigation of dominance behaviors in young children and mice pups

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Abstract

Social hierarchy plays important roles in maintaining social structures (1). Despite similarity in concept, frameworks of human hierarchy have seldom been investigated in parallel with other animals. The present study aimed at establishing, comparing and investigating social hierarchy in young children and weanling mice and exploring the influence of intrinsic characteristics on hierarchical formation (2). In children, we collected data from 216 three- to six-year-old children and examined their social hierarchies by competitive games and teacher rating. The results showed that the ranking status of young children was stable and transitive within five months (Figure 1). Temperament Assessments suggested that children who are less persistent, low emotional intensity and withdrew easily were more likely to be subordinate in competitive scenarios independent of task characteristics and interaction experiences (Figure 2). In weanling mice, we established social hierarchy by the tube test (Figure 1) and found that most conflicts between mice in tube were not resolved by the winner approach but by loser withdrawal (Figure 3). This subordinate withdrawal was mainly determined by internal status regardless of the opponents' identity (Figure 4). Our study presents a remarkable similarity in social hierarchy between children and weanling mice. More importantly, while pervious researches in both humans and mice have mostly focused on dominance behaviors, our study suggested a critical role of the intrinsic subordinate characteristics in hierarchical determination. These findings provide not only new insights into the mechanisms underlying the formation of social ranking but also beneficial implications for preschool education, and contribute to research on social interaction in the fields of biology, psychology, and education.

References

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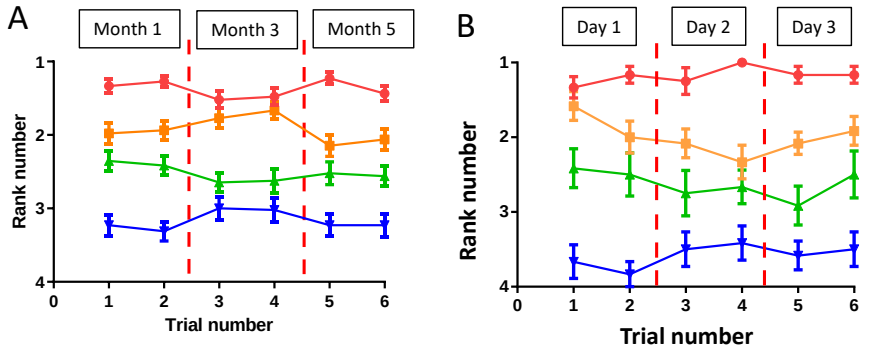

Figure 1. Social ranks are stable in (A) children evaluated by bunny game, and (B) young mice evaluated by tube test.

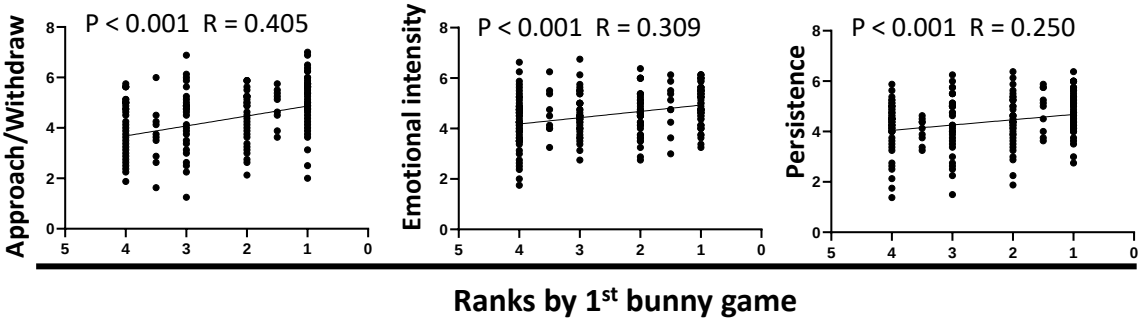

Figure 2. Social ranks in children are positively correlated with temperaments in approach/withdraw, emotion intensity and persistence.

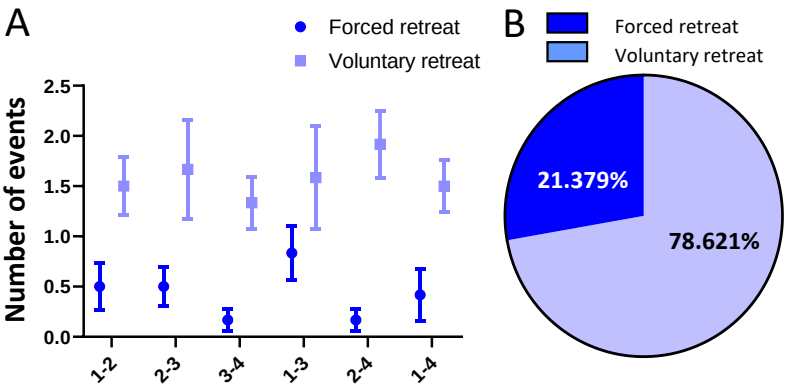

Figure 3 The outcome of the tube test for weanling mice is mainly determined by the voluntary retreat of the losers.

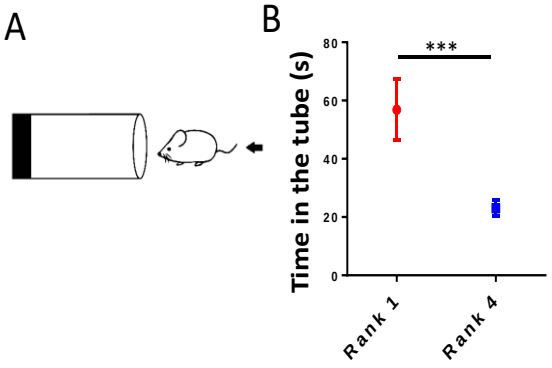

Figure 4 Blocker assay indicated that the withdrawal behavior of the subordinate mice is due to their internal status.