

REVIEW

The Importance of Motacilla Alba Behavior on Hitting Its Own Mirror Reflection

Yan Zhang¹ Greg Mirt² Fan Xu^{1*} Fangfang Liu^{3*}

1. Department of Public Health, Chengdu Medical College, Sichuan, 610500, China

2. Occupational Activity Centre Novo mesto, Slovenia, EU

3. Art college, Southwest Minzu University, Sichuan, 610041, China

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ABSTRACT

Self-awareness is considered as a capability of recognize oneself and increasingly received attention. However, self-awareness in the bird Motacilla Alba is unclear. To study the self-recognition in Motacilla Alba, the subject is observed by mirror while eating. The bird performed the look around, confirm again the surroundings, become alert, hit the mirror. These behaviors suggests that presently Motacilla Alba does not have the capacity of self-awareness by the test.

1. Self-awareness Process

The ability to recognize oneself in the mirror is considered as self-awareness^[1]. Mirror self-recognition (MSR) is designed as a method to explore the animal's sense of self^[2]. Tests of mirror self-recognition (MSR) have been central to our understanding of self-awareness from developmental and evolutionary perspectives.

Self-awareness in humans spontaneously emerged^[3]. In 2000, Kusayama et al showed that four jungle crows (*Corvus macrorhynchos*) were exposed to a mirror with peck and flap behaviors but species failed to pass the MSR^[4]. In 2002, Watanabe experimented that java sparrows were equaled to choose a mirror and a frosted live bird when they were exposed to a mirror and a frosted mirror. The

result suggested that java sparrows saw the self-image on the mirror as conspecific image^[5]. Furthermore, In 2017, Fanny-Linn Kraft tested the great tit mirror response with social behavior. The result showed no evidence that the great tit possessed self-awareness^[6].

2. Fly to Mirror Behavior

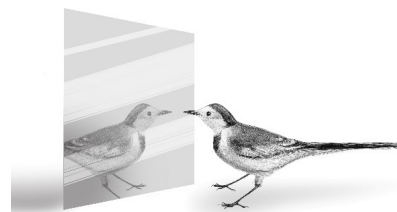


Figure 1. Check the subject in the mirror

*Corresponding Author:

Fangfang Liu,

Art college, Southwest Minzu University, Sichuan, 610041, China;

Email: 619898782@qq.com

Fan Xu,

Department of Public Health, Chengdu Medical College, Sichuan, 610500, China;

Email: xufan@cmc.edu.cn

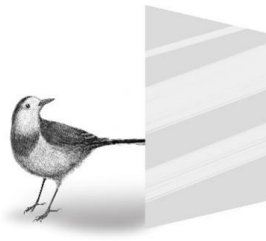


Figure 2. Check who/which hide behind the mirror

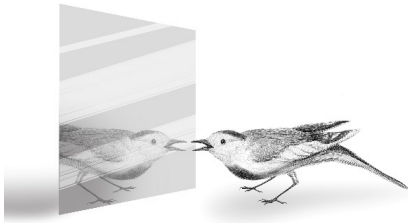


Figure 3. Get angry about the unknown subject



Figure 4. Fly to Mirror Behavior

Interestingly, we have set up a mirror on the ground in the open field. The bread was placed in front of the mirror. In this test, we found that *Motacilla alba* looked around before it approached the bread, see Figure 1. The reflection of mirror was found by the subject while picking food. It became more nervous. Then it walked to the back of the mirror to confirm whether there is conspecifics behind of the mirror for three times, see Figure 2, 3. At the beginning, the subject picked the food peacefully. It became more and more alert when it saw the reflection in the mirror. Ultimately, *Motacilla alba* violently attacked the reflection continuously in the mirror and a bright chirp, see Figure 4.

The MSR is an excellent method to test self-awareness. *Motacilla alba* presented the aggressive behavior when saw its reflection in the mirror. Unfortunately, neither of these behaviors could be demonstrate that the *Motacilla alba* can recognized itself in the mirror.

3. Meanings



Figure 5. Aggressive behavior-Fly to mirror

So far, most of the species on the MSR tested have failed to identify itself in the mirror. Many of them responded to their self-image with social behavior if considered the image their conspecifics. Some species have shown aggressive behavior^[7]. Even humans aren't born with a sense of self. We may not recognize ourselves in a mirror from 15 to 24 months of age^[8]. There is an important evidence that only a few species can pass the MSR test, and only long-term use of mirrors as visual stimuli can pass the MSR test such as (four great apes^[9], bottlenose dolphins^[10], Asian elephants^[11], and magpies^[12]). Some species have the possibility to modify their self-characteristics through learning^[13]. This proves to a certain extent that self-consciousness requires certain conditions, which can be learned. However it cannot be absolutely denied that those animals (fishes, birds, sea lions, dogs and cats^[14]) have no sense of self. It only proves that they are not self-aware at this stage. When the birds are facing the similar selection pressures that leads to changes in neural structure, particularly in cognition^[15]. Our data demonstrated that *Motacilla alba* are not capable to recognize itself in the mirror for the first time.

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