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CHIMPANZEES ARE BETTER AT MECHANICS, BUT ORANGS EXCEL AT OPTICS!

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Koehler's description of the beleaguered female orangutan, Catalina, reveals much about the investigator and his times: A modern investigator would be unlikely, for example, to describe an individual of one species as "... without doubt 'finer,' 'more decent,' 'more reliable' ..." than individuals of another species, as Koehler does in comparing the orangutan to the chimpanzee! On the other hand, a modern investigator would be equally unlikely to give as much attention to the temperamental and emotional factors in problem solving as Koehler does, let alone to contrast species along these dimensions.

Koehler's sensitivities to temperamental and emotional factors apparently arose in part from his use of gestalt theory:

After long observation of anthropoids . . . I consider it *entirely* inappropriate to assign an absolute and primary distinction in-kind between the first emergence and establishment of strong 'expressive actions' in such primitive goal-directed acts and the smooth, certainly insightful solution of suddenly posed experimental problems. Generally, only the latter have actually successful results. But the basic situation from which these variants of organized happenings arise seems to me to be the same in all three cases: the causative situation, a *spatial structuring of the field of perception*, in which an emotional component releases directed forces.

Perhaps this same perspective led Koehler to appreciate the time and repeated efforts necessary to elicit successful performances from his animals.

Modern investigators might do well to emulate not only Koehler's patience, but his interest in the interacting roles of temperament, emotion, and intelligence in primate problem solving, and their significance in generating species differences. Few would doubt that such tempera-

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mental and emotional factors as excitability, fearfulness, attachment, dependency, curiosity, and persistence influence intellectual performance both within and between species. Yet attention to such factors, when it occurs at all, tends to be anecdotal rather than systematic. This omission may be related to the tendency to allocate temperament studies in human infants to behavior genetics (Buss & Plomin, 1984) and/or to physiological studies (Kagan, Kearsley & Zelazo, 1978), that is, to dichotomize temperamental and attachment behaviors and to attribute temperament strictly to inborn tendencies and attachment strictly to learned tendencies (Stevenson-Hinde, 1991). As Stevenson-Hinde argues, this is unfortunate because a better understanding could emerge from studying the relationship between constitutional and environmental factors. Such an emerging approach may provide models for comparative studies.

Koehler's framework and persistence led him to discover that, like chimpanzees, orangutans are capable of insight, and to conclude that the primary difference between the problem solving abilities of orangutans and chimpanzees resides in temperament and motivation, the orangutan being more placid and languorous, less motivated and less persistent than chimpanzees, resulting in a muddling, diffuse style. Koehler was surprised, for example, at the time it took Catalina to comprehend the use of the stick as a tool. Koehler attributed her reluctance to use the stick as a tool in part to Catalina's morphologically determined discomfort with the stick as well as to her lack of "naive knowledge of physics" and her difficulty in making a transition from one context to another (she persisted in using the stick like a blanket, throwing it at the goal-object). Even so, he found her superior to chimpanzees at the dynamics of manipulating the stick relative to the goal-object once she had comprehended its utility. She also seemed to understand the physics of using stones as hammers without much priming. On the other hand, Koehler found that Catalina was far better than chimpanzees at clearing away obstacles, suggesting that she lacked the "optical weakness" of chimpanzees.

Koehler patiently continued his efforts to elicit tool use in the face of Catalina's persistence in such ineffective behaviors as throwing her blanket or even wisps of straw onto the recalcitrant object, rather than using a stick as a tool to retrieve it. He did not dismiss such behaviors as stupid, noting in his tantalizingly nonanthropocentric, yet Eurocentric, fashion:

Both the child and the adult are guided naively by the forces that the situation arouses in them, and they may consider themselves to have acted as sensibly as in the most perfectly planned action. Even in northern Europe extreme cases remain of people who allow themselves to be 'carried away' into actions that are futile.

He also does not, however, discuss the possible significance of these

perseverent behaviors as innate reactions which must be overcome before insightful patterns emerge as he does briefly in his original monograph.

Koehler's overall conclusion that orangutans are similar to chimpanzees in their problem solving abilities accords with recent observations which suggest that captive orangutans are more or less equivalent to chimpanzees in their intellectual and symbolic capacities (Chevalier-Skolnikoff, 1983; Mathieu & Bergeron, 1983; Russon & Galdikas, in press; Miles, 1990). Likewise, recent observations suggest that gorillas are like both chimpanzees and orangutans in these capacities (Chevalier-Skolnikoff, 1977; Redshaw, 1978; Patterson, 1980). These similarities in problem solving ability undoubtedly reflect the close phylogenetic relationship among the three species (Weiss, 1987), while differences in temperament and emotion (save a few commonalities such as love of tickling) probably reflect the influence of radically different spatial distributions and social relationships among the three species (Wrangham, 1979): chimpanzees with their alternately dispersed and concentrated foods and fission-fusion social groupings; gorillas with their concentrated foods and their stable small groups; and orangutans with their dispersed foods and almost solitary groupings (Galdikas, 1978). Once temperamental differences are systematically characterized, investigators may be able to discover social interaction patterns that shape these differences, and even to reconstruct social selection pressures that may have operated under differing conditions.

Reading this article engendered the irrational hope that hidden away somewhere is a third study by Koehler on the mentality of gorillas which would complete a trilogy on ape mentalities.

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