



# Effectiveness of familiar kin and unfamiliar nonkin demonstrator rats in altering food choices of their observers

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In a series of three experiments, we examined the prediction from formal theories of the evolution of social learning that, all else being equal, animals should be more likely to learn socially from familiar individuals or kin than from unfamiliar individuals or nonkin. In all three experiments, contrary to prediction, naïve Norway rats, *Rattus norvegicus*, were marginally more likely to learn to prefer a food eaten by an unfamiliar than by a familiar conspecific demonstrator. The finding that, when given a choice, naïve rats spent more time near unfamiliar than near familiar demonstrators offers a possible explanation for the observed greater influence of the former compared to the latter on the food choices of their observers.

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Although copying the behaviour of others has the potential to reduce costs associated with individual trial-and-error learning, such copying does not invariably enhance fitness. Only when social learning has a greater positive effect on fitness than individual trial-and-error learning is learning from the behaviour of others a superior strategy (Boyd & Richerson 1985, 1995; Rogers 1988; Giraldeau et al. 2002; Laland 2004; Kendal et al. 2005).

Mathematical analyses of the evolution of social learning indicate that both the circumstances under which an individual copies the behaviour of others and the characteristics of the individuals chosen as models can affect the fitness value of engaging in social rather than individual learning (for reviews see Laland 2004; Kendal et al. 2005). We investigated two predictions from formal models of the evolution of social learning as to the type of individual one should copy, predictions that Laland (2004, page 5) has labelled 'copy kin' and 'copy friends'.

In moderately variable environments, copying either kin or friends should prove a superior strategy to copying unrelated or unfamiliar individuals for several reasons (see Laland 2004 for review). For example, because kin or friends are more likely than nonkin or strangers to share, respectively, genes or environments with a focal

individual, kin or friends are more likely to engage in behaviours that, if copied, would increase a focal individual's fitness.

For several decades, our laboratory has been engaged in studies of the role of social learning in the development of food preferences of Norway rats, *Rattus norvegicus*. In our basic experiment (e.g. Galef & Wigmore 1983), we first fed a 'demonstrator' rat one of two foods, both of which were unfamiliar to a rat that served as its 'observer'. We then allowed the demonstrator and the observer to interact in a location other than that where the demonstrator ate before offering the observer a choice between two unfamiliar foods, one of which was the food that its demonstrator had previously eaten (Galef 2002). We have found repeatedly that observer rats show an enhanced preference for the diet that their respective demonstrators ate (for review see Galef 1996).

Such social influence on rats' food preferences has been used previously in our laboratory to explore the effects of several variables that formal theory predicts should influence either the extent to which animals should rely on socially acquired information when making decisions (e.g. environmental predictability, Galef & Whiskin 2004, and the cost and success of individual learning, Galef & Whiskin 2006, 2008) or from whom they should learn socially (e.g. the age of a demonstrator relative to its observer, Galef et al. 1984, Galef & Whiskin 2004, and the relative success of a potential demonstrator, Galef et al. 1983, 1991). Results of such investigations have sometimes

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provided evidence consistent with theoretical predictions, and sometimes not (see Galef 2006 for preliminary review). Here, we examined effects of both familiarity and kinship on the influence of demonstrator rats on observers' food choices.

Each of the first two experiments reported below consists of two studies, with each study providing a different way of comparing the effectiveness of familiar and unfamiliar demonstrators in altering their observers' food choices. In the first study in each of experiments 1 and 2, we first allowed some observers to interact with a familiar demonstrator and other observers to interact with an unfamiliar demonstrator and then compared the effects of interacting with familiar and unfamiliar demonstrators on the observers' subsequent preferences for the foods that their respective demonstrators had eaten. In the second study in each of experiments 1 and 2, we allowed observers to choose between two foods after interacting simultaneously with two demonstrators, one familiar and one unfamiliar, each fed one of the two foods between which the observer subsequently chose.

Although the need to restrict exposure of observers to diets fed to their demonstrators before the observers interacted with them complicated our procedures, the basic experimental design was straightforward: in study 1 of experiments 1 and 2 an observer rat interacted with either a familiar or an unfamiliar conspecific demonstrator and then chose between two diets, one of which was the diet its demonstrator had eaten, or, in study 2 of experiments 1 and 2 and in experiment 3, an observer rat interacted simultaneously with both a familiar and an unfamiliar conspecific demonstrator and then chose between two diets, the diet that its familiar demonstrator had eaten and the diet that its unfamiliar demonstrator had eaten.

### EXPERIMENT 1: FAMILIAR KIN VERSUS UNFAMILIAR NONKIN

In an important paper on the relationship between social dynamics and social learning, Coussi-Korbel & Frigaszy (1995) described potential effects of the identity and characteristics of interacting individuals on the probability that social learning would occur. As Coussi-Korbel & Frigaszy (1995) indicate, field studies of social learning frequently reveal that individuals are more likely to adopt the behaviour of kin than that of nonkin. Although such bias in social learning may simply reflect a tendency of the young of innumerable species to spend more time interacting with kin than with nonkin, theoretical analyses suggest that a bias towards copying the behaviour of either familiar individuals or kin might have been favoured by selection. Such bias might evolve because: (1) social learning is useful only when models and their copiers are exposed to similar environments and experience similar outcomes as a result of engaging in similar behaviours and (2) kin and familiar individuals are more likely to share environments and experience similar outcomes as a result of similar actions than are nonkin or unfamiliar individuals (Boyd & Richerson 1985, 1988; Laland 2004).

Previous experiments in our laboratory have shown that the food choices of observer rats can be influenced by

interaction with unfamiliar demonstrators and unrelated demonstrators as well as with familiar demonstrators or related demonstrators (Galef & Wigmore 1983; Galef et al. 1984, 1998). Here, we compared directly the relative effectiveness on observer rats' food choices of demonstrators that were either familiar kin or unfamiliar nonkin.

### Methods (Study 1: Single Demonstrators)

#### Subjects

Fifty-one female rat pups born to eight female Long-Evans rats purchased late in gestation from Charles River Canada (St. Constant, Quebec, Canada) served as subjects when 8 to 9 weeks of age. We randomly assigned three members of each litter to serve in the experiment as: (1) a demonstrator, (2) a familiar kin observer or (3) an unfamiliar nonkin observer. When we weaned the pups at 21–24 days of age, we marked each pup's tail with coloured ink to indicate its future role in the experiment and placed a trio of littermates (one demonstrator, one familiar kin observer and one unfamiliar nonkin observer) together in one of 17 shoebox cages, measuring 46 × 25 × 22 cm, and provided them with ad libitum access to food (pellets of Teklad Laboratory Rodent Diet 8640; diet 8640). We kept all subjects from arrival in the laboratory to completion of the experiment in a temperature- and humidity-controlled colony room illuminated for 12 h/day. After completion of the experiment the subjects served in other studies of social learning before being euthanized by exposure to CO<sub>2</sub>.

#### Apparatus

Experiments took place in stainless-steel hanging cages, measuring 20 × 20 × 34 cm, with grid floors that permitted easy monitoring of spillage by inspection of the trays beneath the cages (no spillage was ever detected). We presented food to all subjects, while they were in the hanging cages, in semicircular food dishes, 10 cm in diameter and 5 cm deep, which we filled to a depth of 2.5 cm or less to prevent spillage. While in the shoebox cages, subjects fed from 8-cm-diameter Pyrex bowls, 4 cm deep.

#### Diets

We composed two diets by mixing either 10 g of McCormick's pure ground cinnamon (diet cin) with 990 g of powdered Teklad Laboratory Rodent Diet 8640 or 20 g of Hershey's cocoa (diet coc) with 980 g of diet 8640.

#### Procedure

Before starting the experiment proper, we left subjects undisturbed for 6 days in trios in shoebox cages to become familiar with their cagemates. At the end of the 6 days of familiarization, we removed all food from the shoebox cages and placed all subjects on a feeding schedule, eating powdered diet 8640 for 1 h/day. We fed the member of each trio designated as a demonstrator in a hanging cage before returning them to their respective home cages. Whilst trio members designated as demonstrators were eating in hanging cages, we fed the two members of

each trio designated observers powdered diet 8640 in their home cages.

On the third day of scheduled feeding, we fed half the demonstrators diet cin and the remainder diet coc during their 1-h feeding period in the individual hanging cages and continued the scheduled feeding of observers in their home cages with diet 8640. Immediately after the third scheduled feeding, we placed one observer from each trio in a clean hanging cage and then placed either a familiar kin demonstrator (one from that observer's own shoebox cage) or an unfamiliar nonkin demonstrator (one from a shoebox cage other than that housing that observer) that had just eaten either diet cin or diet coc in the hanging cage containing each observer, counterbalancing feeding with diet cin and diet coc across familiar kin and unfamiliar nonkin demonstrators. We then allowed each demonstrator–observer pair to interact for 30 min.

After demonstrators and observers had interacted, we returned the demonstrators to their hanging cages (returning demonstrators to their home cage would have permitted them to interact with the observer remaining there) and provided each observer with two weighed food cups, one containing diet cin and the other diet coc. Twenty-four hours later, we removed and weighed the food cups from each observer's hanging cage and determined the percentage of the observer's 24-h intake that was the diet that its demonstrator had eaten (e.g. the percentage of diet cin eaten by observers that had interacted with a demonstrator fed diet cin and the percentage of diet coc eaten by observers that had interacted with a demonstrator fed diet coc).

The following day, we again fed each demonstrator either diet cin or diet coc in its hanging cage and each observer still in a shoebox cage diet 8640 for 1 h. We then moved each observer remaining in a shoebox cage to a clean hanging cage and placed a recently fed demonstrator with each observer for 30 min. Each demonstrator that had interacted with a familiar kin observer the previous day interacted with an unfamiliar nonkin observer, and vice versa, and once again we counterbalanced feeding diet cin and diet coc to familiar kin and unfamiliar nonkin demonstrators.

At the conclusion of the 30-min period of interaction between observers and demonstrators, we returned each demonstrator and the observers that had interacted with demonstrators the preceding day to the shoebox cage from which they initially came and then offered each observer still in a hanging cage two food cups for 24 h, one containing diet cin and the other diet coc. At the end of the 24-h feeding period, we again weighed food cups and calculated the percentage of each observer's 24-h intake that was the diet its demonstrator had eaten.

## Method (Study 2: Simultaneous Demonstrators)

### Subjects

We used 16 of the 17 littermate trios that we had used in study 1 (one pup had died in one trio) and the two individuals in each cage that had served as observers in

study 1 as demonstrators, and the one individual in each cage that had served as a demonstrator in study 1 as an observer.

### Apparatus

We used the same apparatus we had used in study 1.

### Diets

We composed two diets by mixing either 10 g of bulk ground anise (Horn of Plenty, Dundas, Ontario, Canada; diet ani) with 990 g of diet 8640 or 20 g of bulk ground marjoram (Horn of Plenty; diet mar) with 980 g of diet 8640.

### Procedure

We continued to keep littermate trios on a 1-h/day feeding schedule for 3 days, feeding trio members designated as observers in their home cages and the two trio members designated as demonstrators in hanging cages. The next day, we fed eight demonstrators diet ani and eight diet mar in their hanging cages. We then placed one observer from each shoebox cage in a clean hanging cage and introduced two demonstrators simultaneously into each observer's hanging cage for 30 min. One demonstrator introduced into each observer's cage was familiar kin and the other unfamiliar nonkin and one demonstrator had just eaten diet mar and the other diet ani. We counterbalanced across trios the diet fed to unfamiliar nonkin and familiar kin demonstrators.

At the end of the 30-min period of interaction of each observer with two demonstrators, we removed the demonstrators and offered each observer two weighed food cups, one containing diet ani and the other diet mar. Twenty-four hours later we determined the percentage of each observer's 24-h intake that was the diet that its familiar demonstrator had eaten.

The next day we repeated the procedure with the 16 remaining observers, first feeding them diet 8640 for 1 h and then moving them into hanging cages and permitting them to interact with familiar kin or unfamiliar nonkin demonstrators fed either diet ani or diet mar and, last, offering each observer a choice between diets ani and mar.

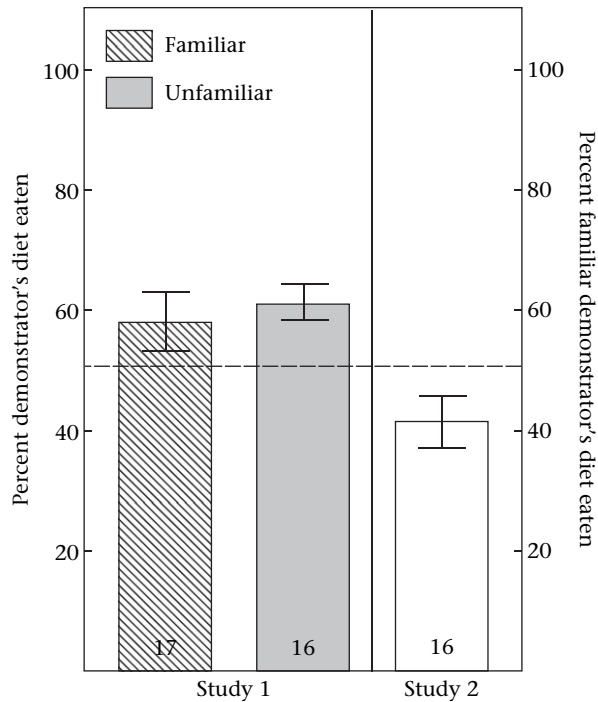
## Ethical Note

The McMaster University Research Ethics Board approved the procedures used in these experiments in June of 2007 (Animal Utilization Proposal 07-06-35).

## Results and Discussion

### Study 1

Observers that interacted with either familiar kin or unfamiliar nonkin demonstrators showed a significant tendency to ingest the diet eaten by their respective demonstrators (familiar kin:  $t_{16} = 1.87$ ,  $P < 0.05$ ; unfamiliar nonkin:  $t_{15} = 3.73$ ,  $P < 0.002$ ; Fig. 1). However, there was no difference in the effectiveness of familiar and



**Figure 1.** (Left) Mean percentage of demonstrator's diet eaten by observers in study 1 of experiment 1. (Right) Mean percentage of familiar demonstrator's diet eaten by observers in study 2 of experiment 1. Flags:  $\pm 1$  SEM.

unfamiliar demonstrators on the food choices of their observers ( $t_{31} = 0.56$ ,  $P = 0.58$ ; Fig. 1).

### Study 2

Familiar kin demonstrators had no greater effect on the food choices of their observers than did unfamiliar nonkin demonstrators. On the contrary, and unexpectedly, observers showed a nonsignificant tendency to prefer the diet eaten by their unfamiliar nonkin demonstrator ( $t_{15} = 2.02$ ,  $P = 0.061$ ; Fig. 1).

## EXPERIMENT 2: EFFECTS OF FAMILIARITY (NONKIN)

Experiment 2 was very similar to experiment 1 except that the familiar and unfamiliar demonstrators with whom observers interacted in study 1 and study 2 were all nonkin. We repeated experiment 1 to determine whether the marginally greater influence of unfamiliar than of familiar demonstrators on observers' food choices seen in study 2 of experiment 1 was reliable whilst circumventing the per diem costs associated with rearing demonstrators and observers in the McMaster animal facility.

## Methods

### Subjects

We received 30 subjects from Charles River Canada; the 10 subjects assigned to serve as demonstrators (7 weeks of age) had a birth date 1 week earlier than that of the 20 subjects assigned to serve as observers. Given the

procedures used by Charles River Canada when pairing males and females this ensured that demonstrators and observers were not sibs and making the probability that they were half-sibs with a common father less than 0.03 (personal communication, Charles River Canada, 1 June 2008). As in experiment 1, we placed one demonstrator and two observer rats in each box cage and left them to become familiar with one another for 6 days.

### Apparatus

The apparatus was that used in experiment 1.

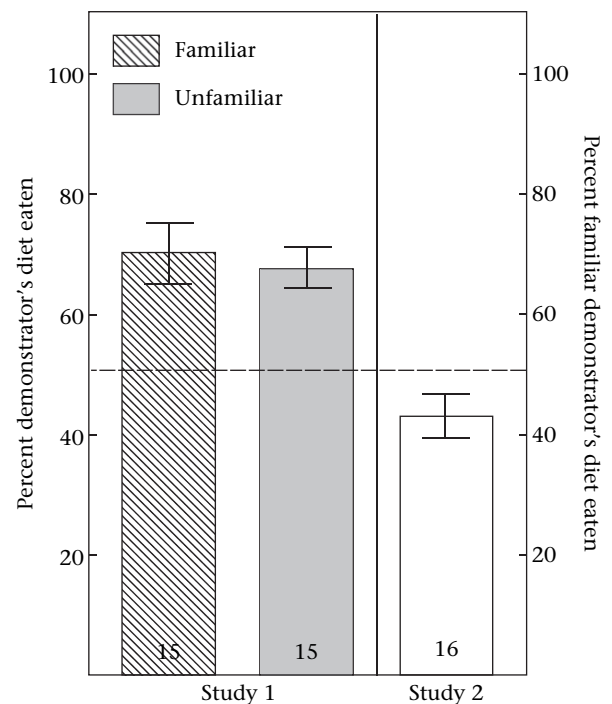
### Procedure

The procedure was the same as that of experiment 1, e.g. in study 1, demonstrators fed either diet cin or diet coc interacted with either familiar or unfamiliar observers, and in study 2 each observer interacted simultaneously with two demonstrators, one familiar and one unfamiliar, one fed diet ani and the other fed diet mar.

## Results and Discussion

### Study 1

Observers that interacted with both familiar and unfamiliar nonkin showed a significant tendency to ingest the diet eaten by their respective demonstrators (familiar nonkin:  $t_{14} = 3.81$ ,  $P < 0.002$ ; unfamiliar nonkin:  $t_{14} = 5.12$ ,  $P < 0.002$ ; Fig. 2). However, as in experiment 1, we found no difference in the effectiveness of familiar and unfamiliar demonstrators on the food choices of their observers ( $t_{28} = 0.38$ ,  $P = 0.70$ ; Fig. 2).



**Figure 2.** (Left) Mean percentage of demonstrator's diet eaten by observers in study 1 of experiment 2. (Right) Mean percentage of familiar demonstrator's diet eaten by observers in study 2 of experiment 2. Flags:  $\pm 1$  SEM.



## Study 2

As in experiment 1, observers showed a marginally significant tendency to prefer the food eaten by their unfamiliar demonstrators ( $t_{15} = 2.06$ ,  $P = 0.058$ ; Fig. 2).

## Experiments 1 and 2

Because it is reasonable to ask whether familiar demonstrators had greater influence on their observers' food choices than unfamiliar demonstrators regardless of the relatedness of demonstrators and observers, we combined the results of experiments 1 and 2 and again looked for effects of demonstrator familiarity on the influence of demonstrators on observers. As when we considered the results of study 1 of experiments 1 and 2 separately: (1) both familiar ( $t_{31} = 3.37$ ;  $P < 0.0001$ ) and unfamiliar demonstrators ( $t_{30} = 6.23$ ;  $P < 0.0001$ ) had a significant influence on the food choices of their observers and (2) familiar and unfamiliar demonstrators did not differ in the degree of their influence on their respective observers ( $t_{61} = 0.29$ ;  $P = 0.77$ ). However, when the results of study 2 of experiments 1 and 2 were considered together, the marginally significantly greater influence of unfamiliar compared to familiar demonstrators on the food choices of their observers when both familiar and unfamiliar demonstrators were present simultaneously became highly significant ( $t_{31} = 2.94$ ,  $P < 0.01$ ), quite the reverse of what formal models have predicted.

## EXPERIMENT 3: WHY WERE PREDICTIONS NOT CONFIRMED?

Although it is difficult to find a relevant description in the literature, those who have worked with Norway rats know that when two individuals encounter one another, they engage in a period of mutual olfactory exploration, with both animals sniffing at their partner's face and anogenital area. Such olfactory exploration, which Barnett (1963) labelled 'recognition sniffing' and of which Ewer (1968) provides numerous examples in other species, is more prolonged when interacting individuals are unfamiliar than when they are familiar with each other (e.g. Engelmann et al. 1995; Pena et al. 2006). If duration of exposure to a demonstrator contributes to the strength of that demonstrator's influence on the food choices of an observer, then the greater influence of unfamiliar than of familiar demonstrators observed in experiments 1 and 2 might be expected.

In experiment 3, we determined whether naïve Norway rats spent more time in the vicinity of an unfamiliar than a familiar conspecific when each had eaten a different food unfamiliar to its observer.

## Methods

### Subjects

Fifteen female Long-Evans rats obtained from Charles River Canada when 7 weeks of age served as observers. An additional 30 rats that had served in previous experiments served as demonstrators.

### Apparatus

We conducted the experiment in a rectangular enclosure, measuring  $120 \times 61 \times 30$  cm, constructed of Plexiglas, painted plywood and  $\frac{1}{2}$ -inch (1.27 cm) screen that rested on aluminium trays covered with wood-chip bedding. Two screen partitions divided the enclosure into a 'central compartment', measuring  $61 \times 61 \times 30$  cm, and two 'end compartments', each measuring  $30 \times 61 \times 30$  cm. To facilitate determining when an observer in the central compartment approached an end compartment, we drew two vertical lines on the Plexiglas front wall of the apparatus, each 10 cm from the screen partition separating each end compartment from the central compartment.

A colour CCTV video camera connected to a time-lapse VHS video-cassette recorder that permitted playback in slow motion faced the front wall of the enclosure.

### Procedure

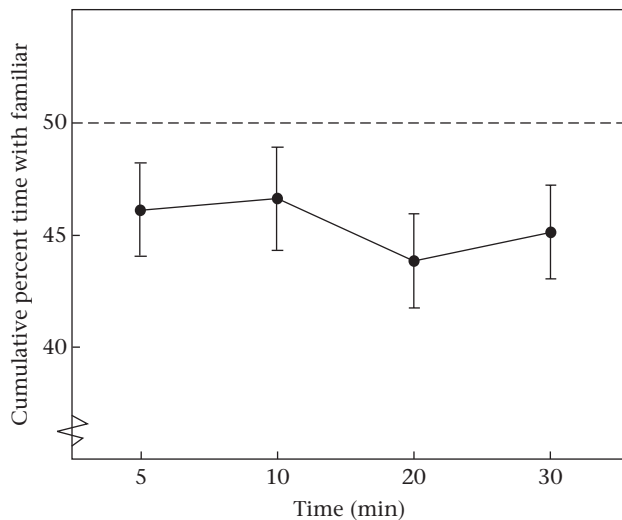
The procedure was similar to that of study 2 of experiment 2 except that, rather than place two demonstrators, one familiar and the other unfamiliar, one fed diet cin and the other diet coc, in a hanging cage with an observer, we placed the observer in the central compartment of the apparatus and one demonstrator in each end compartment. We counterbalanced across demonstrator-observer trios both the end compartment of the apparatus in which we placed familiar and unfamiliar demonstrators and the diets that we fed to them. After we videotaped trios in the apparatus for 30 min, we returned observers to hanging cages, where we offered them a choice between weighed food cups containing diets cin and coc for 24 h.

Both the experimenters who placed observers in the central compartment and the experimenters who scored videotapes to determine the time that each observer spent with its head and both forelimbs within 10 cm of each end compartment were unaware of which end compartment held a familiar or unfamiliar demonstrator.

Twenty-four hours after placement of observers in hanging cages, we determined how much of each diet each observer had eaten and calculated the percentage of total intake that was the diet eaten by each observer's familiar demonstrator.

## Results and Discussion

During 30 min of testing, 12 of the 15 observers spent longer in the vicinity of its unfamiliar than in that of its familiar demonstrator (binomial tests:  $P < 0.04$ ), and a Student  $t$  test revealed that observers spent more time near unfamiliar than near familiar demonstrators throughout the 30 min of testing ( $t_{14} = 2.35$ ,  $P < 0.04$ ; Fig. 3). As was the case in experiments 1 and 2, during a 24-h choice period, observers tended to prefer the foods that their unfamiliar demonstrators had eaten (two-tailed: mean  $\pm$  SE =  $54.12 \pm 2.07\%$ ;  $t_{15} = 1.99$ ,  $P < 0.07$ ). The results are consistent with the hypothesis that observers show a greater preference for foods eaten by unfamiliar than by familiar demonstrators because observers spend more



**Figure 3.** Mean amount of time during the 30 min of experiment 3 that observers spent within 10 cm of the familiar demonstrator. Flags:  $\pm 1$  SEM.

time interacting with unfamiliar than with familiar demonstrators.

### GENERAL DISCUSSION

Taken together the results of the present series of experiments offer no support for theoretical predictions that animals engaged in social learning will attend more closely to information extracted from familiar individuals or kin than from unfamiliar individuals or nonkin. In particular, the marginal tendency of observer rats in all three experiments to prefer a food eaten by an unfamiliar demonstrator to that eaten by a familiar demonstrator is contrary to expectations from predictions that animals should copy friends or kin.

Of course, experimental failures to confirm theory, such as the present one, are difficult to interpret. The possibility always exists that under a different set of experimental circumstances the predicted relationship would be found. Still, the difficulty in finding evidence of enhanced copying of familiar individuals differs strongly with the outcomes of tests of other predictions from formal theory concerning circumstances in which copying should occur. For example, the outcomes of six experiments, each using a quite different method to examine effects of dissatisfaction on Norway rats' reliance on socially acquired information when choosing foods, all provided strong support for theoretical predictions that dissatisfaction should enhance reliance on socially acquired information (Galef et al. 1991, 2008; Galef & Whiskin, unpublished). At the very least, increased reliance on socially acquired information in dissatisfied rats seems to be a robust effect, whereas enhanced reliance on information extracted from familiar demonstrators does not.

The results of experiment 3 offer a possible explanation for our failure to find the anticipated effect of demonstrator familiarity on social learning in Norway rats. Although

we designed experiments 1 and 2 to examine the effects of familiarity on social learning, Norway rats encountering an unfamiliar individual may have social obligations, not directly related to social learning, that affect the likelihood that they will acquire information during an encounter with a conspecific. In particular, engaging in prolonged recognition sniffing with unfamiliar individuals may increase exposure to food-related olfactory cues that they emit, increasing the probability that a focal individual will adopt an unfamiliar individual's food choices. However, because the extent to which the duration of exposure to a demonstrator fed a diet determines that demonstrator's effectiveness in altering its observer's food choices has yet to be determined, such explanations remain speculative.

If, in our experiments, relative duration of exposure to familiar and unfamiliar individuals was the cause of greater social learning from the unfamiliar, then enhanced copying of familiar individuals should be more likely in species in which duration of interaction between a potential demonstrator and its observer is increased when demonstrator and observer are familiar with one another. For example, Valsecchi et al. (1996) report that Mongolian gerbils, *Meriones unguiculatus*, are more likely to enhance their preferences for foods eaten by familiar/kin than by either unfamiliar or nonkin demonstrators. Valsecchi et al. (1996) attributed the greater effectiveness of familiar/kin gerbil demonstrators to the high frequency of aggressive interaction seen when unfamiliar/nonkin meet for the first time, reducing the probability of unfamiliar/nonkin interacting so as to permit observers to acquire food-related information from their demonstrators.

Perhaps similarly, Kaveliers et al. (2003, 2005) have found, first, that observer deer mice, *Peromyscus maniculatus*, that see conspecifics burying themselves in the substrate in response to attacks by biting stable flies, *Stomoxys calcitrans*, subsequently respond to exposure to surgically altered stable flies that are unable to bite with self-burying and second, that observer mice are more likely to self-bury when exposed to surgically altered flies if their demonstrators were familiar individuals or kin than if they were unfamiliar individuals or nonkin. Further, when demonstrator and observer were familiar to one another, demonstrators that were dominant over their observers were more effective than demonstrators that were submissive to their observers. Possibly, deer mice are more likely to attend to the behaviour of familiar individuals, kin and dominant individuals than to the behaviour of unfamiliar individuals, nonkin or subordinates.

Taken together, such data suggest that, as Coussi-Korbel & Frigaszy (1995) proposed, species-characteristic aspects of interactions between individuals with different characteristics may determine the amount of information that a naïve animal acquires during interaction with a more knowledgeable conspecific. If so, the consequences for social learning of interaction with kin and nonkin, familiar and unfamiliar individuals, etc., may depend on the nature of the social interactions that potential observers have with members of a class of potential demonstrators.

Alternative interpretations of the differential effectiveness of familiar and unfamiliar demonstrators in social

learning situations are, of course, possible. For example, in a recent study, Saggerson & Honey (2006) found that Norway rats that had observed a conspecific pull one of two chains to secure food copied the choice of the demonstrator when demonstrator and observer were members of different strains but not when they were members of the same strain. Saggerson & Honey (2006, page 1918) hypothesized that a process of 'attentional modulation', resulting from latent inhibition (Lubow & Moore 1959), was responsible for the greater effectiveness of dissimilar compared to similar demonstrators.

Latent inhibition occurs when familiarity with a stimulus results in decreased attention to it. On the assumption that housing rats with members of their own strain results in their learning to ignore stimuli associated with that strain, it might be predicted that subjects engaged in social learning would be less likely to attend to members of a familiar strain than to members of an unfamiliar strain. The results of the three experiments reported here could be interpreted in terms of the effects of latent inhibition on attention to familiar individuals.

The validity of the interpretation of differences in demonstrator effectiveness in terms of differences in exposure of observers to information from familiar and unfamiliar demonstrators could be tested if we could directly manipulate the amount of information that observers acquire from familiar and unfamiliar demonstrators. Unfortunately, no methods are currently available either to measure or to control the amount of information that observers acquire from conspecific demonstrators. Consequently, the critical experiment must await methodological innovations on which we are currently working. By using human, rather than rat, demonstrators in studies of social influence on observer rats' food choices, we hope to gain control over the amount of information transmitted during social interactions between a demonstrator and its observer, allowing exploration of the effects of different amounts of exposure to social information on use of it.

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