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Prestige-biased learning in children: Attention from others as a cue for cultural transmission

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Complete List of Authors:	Chudek, Maciek; University of British Columbia, Psycholgy Heller, Sarah; University of British Columbia, Psychology Birch, Susan; University of British Columbia, Psychology Henrich, Joseph; University of British Columbia, Psychology and Economics
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Running Head: CHILDREN'S PRESTIGE-BIASED LEARNING

Prestige-biased learning in children:

Attention from others as a cue for cultural transmission

Maciek Chudek, Sarah Heller, Susan Birch, Joseph Henrich

University of British Columbia

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Abstract

Much of the emerging developmental research on young children's patterns of selective imitation supports earlier theoretical work on the coevolutionary foundations of cultural learning. Here, after reviewing the intersection between these disciplines, we present the first direct test of *prestige-bias*, a preference for learning from those to whom others have attended, in children. Our results show that an adult model at whom two bystanders preferentially looked for 10 seconds, without giving any ostensive cues of endorsement, was over twice as likely to have her subsequent behaviours imitated by young children, as a model who did not receive bystander attention. This preferential learning was strongest in the same domain in which the model's "prestige" was established, where the prestigious model was about 8 times more likely to be imitated.

Humans are adapted to a unique niche – we are a highly cultural species. Coevolutionary theories model the evolutionary dynamics facing an emerging cultural species, in particular the interaction of genetic and cultural inheritance systems (Boyd & Richerson, 1985). By combining empirical evidence of human evolutionary history with evolutionary models focused on understanding our capacities for cultural learning as cognitive adaptations to uncertain environments, these theories have derived predictions supported by a wide range of evidence from social psychology, economics, and field studies (Richerson & Boyd, 2005; Powell, Shennan, & Thomas, 2009). These approaches suggest that learners should (1) rely more heavily on cultural learning in uncertain situations (Boyd & Richerson, 1988), (2) use the frequency of behaviour as a cue about whether to adopt it (Henrich & Boyd, 1998), and (3) be selective about whom they learn from (Henrich & Gil-White 2001).

This last prediction involves a suite of hypotheses that cultural learners should attend to cues of potential models' skill (competence), success, prestige, age, sex, dialect and health (among others). Evidence for these predictions has emerged from work in social psychology (Henrich & Gil-White, 2001), behavioural economics (Pingle & Day, 1996), and experimental anthropology (Efferson, Lalive, Richerson, McElreath, & Lubell, 2008), as well as numerous field studies (Rogers, 1995) and recent work with non-human animals (Galef & Whiskin, 2007).

One of the advantages of this approach is that hypotheses about cultural learning can be readily modelled to generate predictions about higher-level sociological phenomena, such as the diffusion of innovations (Henrich, 2001), the emergence of ethnic groups (McElreath et. al. 2003), or the properties of modern religions (Boyer, 2001; Henrich, forthcoming). Such high-level accounts rely on assumptions about individual-level cultural learning biases, which can be tested directly. Developmental evidence is particularly critical: observing a bias in young children can strengthen or refute claims of its generality and evolved character. In this paper we re-examine evidence from developmental psychology in light of these coevolutionary hypotheses, then provide the first developmental test of a learning bias predicted to be common in cultural species: prestige-bias.

The Evolution of Prestige-bias

Coevolutionary theories model which learning strategies give learners the most robust fitness benefits under which circumstances; those concerning *from whom to learn* are termed model-biases in cultural learning. "Model" refers to the individuals being learned from*;* "cultural learning" refers to any social transfer of information (e.g., techniques for using artifacts, food preferences, morals, etc.). Some individuals are just better in certain domains – e.g., they bring home more food or maintain better relationships – and learning from them pays (Henrich & Gil-White, 2001). Skill-bias refers to learners selecting models by direct perception of their skill or competence. Success-bias refers to identifying the best models by the cumulative fruits of their success: bigger houses, better jobs, fatter (or thinner) bodies (Marlowe & Wetsman, 2001), fancier ornamentation (Malinowski, 1922), or longer yams (Kaberry, 1941).

Complementing the substantial multi-disciplinary adult evidence (see Henrich & Henrich, 2007), support for model-bias in children is now rapidly emerging. Young children track the history of accuracy of potential models and preferentially learn from more accurate individuals (e.g., Birch, Vauthier, & Bloom, 2008; Corriveau & Harris, 2009; Koenig & Harris, 2005, Clement, Koenig, & Harris, 2004). Furthermore, although children show a capacity to identify skill differences – trusting makers of artifacts for information about them (Jaswal, 2006), and generally adults over children – they take the word of previously accurate children over previously inaccurate adults (Jaswal & Neely, 2006), suggesting they assign relative weights to cues of both age and competence. Children also seem well-attuned to evaluate indirect signals of skill, such as confidence; they prefer to learn from confident models (Birch, Akmal, & Frampton, in press; Jaswal & Malone, 2007). This suggests that in the absence of direct information on relative skill or success, children may be vigilant for indirect cues of a potential model's competence.

Sometimes a learner needs to make learning decisions in the absence of reliable information about skill or success, particularly since skill differences can be subtle and proxies for success can vary dramatically between communities. In such cases the best models can often be identified by a property they all share: everyone else wants to learn from them too; they have *prestige* – the greatest number of learners observing and imitating them.

Coevolutionary theory predicts that children should display innate dispositions for using fast, reliable heuristics for imitating the bearers of higher-quality cultural information. A prestige-bias facilitates more accurate and rapid learning by allowing learners to capitalize on the information encoded in others' beliefs about who is worthy of attention. Such a learning bias might be domain-general (i.e., imitate everything a prestigious model does), task-specific (i.e., imitate only the behaviour or preference being demonstrated when the model was attended to by other learners), domain-specific (i.e., imitate only in conceptually similar domains) or somewhere in between. Since the attention of third parties doesn't readily reveal what it is about a prestigious model that is responsible for their success, Henrich and Gil-White (2001) predicted that learners should initially imitate prestigious models across domains, but give priority to domains most closely related to those in which their prestige is most salient.

Predictions

To date, the best developmental evidence of prestige-bias comes from Fusaro and Harris (2008). Their four-year-old participants saw two models labelling the same object differently while bystanders either endorsed or denied their claims non-verbally. Children preferentially imitated the model who received endorsement – even on subsequent tests with bystanders absent. However, Fusaro and Harris did not set out to test coevolutionary theories, thus their design does not provide a direct test of prestige-bias for two reasons. First, bystanders gave models their assent (e.g., nodding, smiling) rather than just their attention, potentially endorsing a model's message rather than the model. A critic could claim this is evidence of informational conformity-bias (Richerson & Boyd, 2005) rather than prestige-bias, or due to other factors like concerns about punishment (Henrich & Henrich, 2007). Second, both psychologists and evolutionary theorists have suggested that language acquisition may be a special domain of learning (e.g., Pinker, 1994). From our perspective, learning language may be special because it is about coordinating with one's group and not about adapting to the non-social environment. While it is really the case that some fungi are better (and safer) to eat than others (and people can learn this culturally), whether one calls those fungi *mushrooms* or 茸 depends only on what others in one's linguistic community call it. Because Fusaro and Harris' design only employed label learning, a critic of prestige-bias might doubt that their effect would generalise to non-social domains, like food preferences or artifact-use techniques, and thus not constitute the more general learning bias postulated by coevolutionary theory. Critics might also argue that Fusaro and Harris' participants did not infer models' *prestige* from bystander assent but rather their language or group membership – valuable information for young learners, which has been predicted (McElreath, Boyd & Richerson, 2003) and shown (Kinzler, Dupoux, & Spelke, 2007) to bias children's behaviour.

In this paper we test prestige-bias directly. We predict cultural learning in children will:

1) Be biased toward those models to whom bystanders paid attention. Importantly, unlike Fusaro and Harris' design, our bystanders only attended to the models, rather than explicitly endorsing their statements.

2) Include the acquisition of both preferences and behaviours, especially in potentially costly domains like food and drink.

3) Be strongest in the domain in which the prestige cue occurred (i.e., the activity the model was doing when they received bystander attention), but also generalise to other domains.

<u>Method</u>

<u>Participants</u>

We measured the selective imitation of 23 children (mean age = 50.4 months, SD=5.8 months; 12 girls) recruited from a participant database at a public university. Data from one boy who did not complete the experiment was excluded. The majority of participants were Caucasian or Asian; all were from households where English was the main language spoken.

<u>Procedure</u>

Participants saw on video: a "cuing scene", in which two bystanders stood between two models, attending to only one of them – the "prestigious model"; and several "testing scenes", in which the models individually demonstrated their preference towards an object. Participants' preferences toward testing scene stimuli were evoked and recorded. Which model was prestigious and the order in which they appeared were counter-balanced across participants. Participants observed the scenes in the following order:

Food Choice: Models made a disgusted face at either large round or small square crackers and happily sampled the other. Participants saw this scene before the cuing scene but only later, during "free play", were offered a choice between the two crackers.

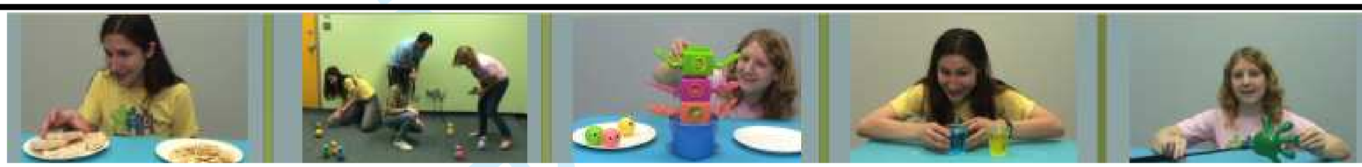

Figure 1

Prestige Cuing Scene: Each model played with a toy in different ways, on opposite sides of a room. Two observers entered and for 10 seconds stood between and slightly behind the models, angled toward and watching the prestigious model.

Artifact Use: Models interacted with a novel toy by delightedly using either coloured balls or blocks. Participants were presented with the same apparatus, the balls and blocks and asked "Can you show me how to play with this?"

Beverage Choice: Models made a disgusted face at either a cup of dyed blue or yellow water and drank from the other. Participants were offered the same and asked "Would you like a drink?" or if unwilling to drink: "Which do you think is better to drink?"

Novel Label Preference: Each model labelled a different object with the same name – a "stroop". Participants were presented with both objects and asked "Can you give me the stroop?"

Playmate Preference and Popularity Selection: After a few minutes of "free play" participants were shown photos of the models and asked our explicit measures: "Who would you rather play with" and "Who do you think is more popular, who has more friends?"

Results

Since participants always chose between two options, each associated with a model, we analysed our data by logistic regression, treating each choice as an endorsement of one actor or the other as the preferred cultural model. Since each participant made multiple, related binary choices, we compensated for non-independence of observations by calculating clustered robust standard errors (clustering on individuals), using standard techniques (White, 1980). We compared logistic models by evaluating the χ^2 distributed ratio of their log-likelihoods and evaluated their goodness of fit by log likelihood ratio tests[1], reported herein as p_{LLRT}. Effect sizes are reported as logistic regression coefficients and odds ratios for ease of interpretation. Odds ratios represent how much more likely a model was to be imitated if she was prestigious.

Is Children's Imitation Biased by a Model's Prestige?

Yes. Regressing who participants imitated onto (1) which model was prestigious, (2) the order in which models appeared, (3) participant's sex and 4) age, produced only one significant predictor: prestige (p=.01). Removing non-significant predictors did not significantly diminish the model's predictive power (P[$\chi^2(3) > 2.1$] = .55). In this parsimonious single-predictor regression model (p_{LLRT}=.03), a cultural model was 2.37 times ($CI_{.95}$ = [1.22, 4.58]) more likely to be imitated if she was prestigious (β = .86; SE = .33; p =.01). Participant's proclivity to prestige-bias was not confounded with their age (p = .32), sex (p = .7), the order in which models

[1] We compared the χ^2 distributed ratio of each model's deviance to a model with only a constant predictor.

appeared (p = .11), nor who the prestigious model (p = .48). See *Supplemental Material* for further details.

Does prestige-bias operate across learning domains?

We next examined theoretically-interesting subsets of measures. As predicted, model-prestige predicted imitation most strongly in the domain in which her prestige was established (i.e., artifact-use), where a model was 8.25 ($CI_{.95}$ = [1.15, 59.0]) times more likely to have her technique for using a *different* artifact imitated if she was prestigious (β = 2.11; SE = 1.0; p =0.04). Since the artifact test was measured immediately after the prestige cue, one may wonder whether this effect is attributable to the salience of the cue in memory. However, the pattern of effect sizes on subsequent measures is inconsistent with decaying salience (i.e., the next strongest effect was in the food test, which was measured last), leading us to suspect that the domain in which prestige is established plays an important role. Prestige also biased imitation in the fitness-relevant domain of food and drink preferences where a model was 4.09 ($CI_{.95}$ = [1.02, 16.38]) times more likely to have her preference imitated if she was prestigious. This effect, however, did not extend to language learning, which was the only imitation measure for which prestige was not a significant predictor (β = -.57; SE = 1.07; p =.59). Model prestige also did not seem to influence children's answers to *explicit* questions about which model they or others would prefer to play with (p_{LLRT} = 0.8).

Discussion

We tested whether children bystanders' attention (prestige cues) to decide from whom to learn. Our findings indicate that they do: on novel tasks with bystanders no longer present, our participants were more than twice as likely to imitate a prestigious model. To be precise, children more often imitated an adult who'd received anonymous bystanders' mere attention, while demonstrating artifact-use techniques for just ten seconds, than an adult who hadn't. Later when they demonstrated a technique for using *a different artifact*, the prestigious adult was eight times more likely to be imitated. Consistent with Henrich and Gil-White's (2001) predictions, we also witnessed biased learning in other behavioural domains, including the potentially costly domain of diet decisions. This strong effect from a minimal manipulation suggests that prestige-biased transmission is likely a potent force in cultural evolution.

Our research extends important work by Fusaro and Harris, who used a similar design in the domain of language learning. First, our approach derives from an explicit evolutionary theory about cultural learning which links many different aspects of learning under one theoretical umbrella. Second, we show that prestige-bias also influences potentially costly learning about the non-social environment, like artifact-use techniques or food-preferences. Moreover, our results suggest that prestige may generalise least from these non-social domains to domains involve primarily social coordination, like language learning. Finally, we show that neutral preferential attention, without nodding or other explicit endorsement, is sufficient to bias cultural learning.

An evolved prestige-bias, properly understood, can make important contributions to explaining modern psychological and social phenomena. For example, why the suicide of famous individuals increases suicide rates in populations of similar sex, age and ethnicity, with even the method copyied (Fu & Yip, 2007; Stack, 1987), or why celebrity endorsements of products entirely unrelated to them result in increased sales (Silvera & Austad, 2004).

This research constitutes the first evidence of prestige-bias in children, an evolved learning bias predicted by coevolutionary theory to be endemic in any highly-cultural species. It provides the much-needed foundation for further investigations, which could manipulate the domain of prestige, delay before testing, age and ethnicity of models and learners, or pit learning biases against one another, to clarify the mechanisms, contingencies, developmental trajectory, and role of prestige-bias in broader social phenomena.

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Figure 1
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Running Head: CHILDREN'S PRESTIGE-BIASED LEARNING - SUPPLEMENTAL

Prestige-biased learning in children:

Attention from others as a cue for cultural transmission

Supplemental Section

Maciek Chudek, Sarah Heller, Susan Birch, Joseph Henrich

University of British Columbia

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Supplemental

This document outlines the details of the findings reported in the main text.

Is prestige-bias strongest in the domain where prestige was observed?

We suspect so. Imitation in the domain of artifacts, operationalised as toy-use techniques, registered by far the strongest effects. Regressing the artifact measure on all predictors yielded one significant coefficient: prestige (p=.04). Removing non-significant predictors did not significantly diminish the predictive power of this model (P[$\chi^2(3) > 5.01$] = .17). In the resulting parsimonious model, an adult was 8.25 times more likely ($CI_{.95}$ = [1.15, 59.0]) to have her artifact-use technique imitated if she was the high prestige model (β = 2.11; SE = 1.0; p =.04). However, because the artifact-use test appeared immediately after the cuing scene – the strength of this effect may in part be a consequence of the greater salience of the prestige cue in memory. Nonetheless, the pattern of effect sizes on subsequent tests is more consistent with domain-specificity than decaying salience – the food choice measure registered stronger effects than the novel label preference measure despite being measured after it. Given this, we suspect the greater effect of prestige-bias on the artifact-use measure was driven at least in part by domain-specificity.

PARSIMONIOUS MODELS - LOGISTIC REGRESSION COEFFICIENTS

Predictors/Models	All Behaviours	Artifact	Food/Drink	Labelling
Prestige	.86 (.33)**	2.11 (1.0)*	1.4 (.7)*	
Sex			1.5 (.7)*	-1.84 (.98)^^
p_{LLRT}	.03	.02	.04	.04
n	100	23	44	23

^^: $p < .06$; $*: p < .05$; $**: p < .01$

Significant logistic regression coefficients and their (standard errors). All models regress predictor on to which actor a child imitated. Parsimonious models were developed by removing only those non-significant predictors from the full models whose abscence did not significantly diminish the model's log likelihood. *Prestige* encodes which actor was prestigious, and *Sex* the sex of the participant. p_{LLRT} is the result of a log-likelihood ratio test of the model.n is the number of observations on which the statistical inference was based, whose non-independence was compensated for by Huber-White clustered robust standard errors. Odds ratios and their confidence intervals can be computed by exponentiating e to these efficients ± interesting multiples of their normally distributed errors.

Table S1

Does prestige-bias generalise across behavioural domains?

Yes, but as anticipated, it generalizes to decreasing degrees for domains that are conceptually more dissimilar from the domain of the prestige cue. Our principal interest was in the directly fitness-relevant domain of food and drink preferences. Regressing just the food and drink measures on prestige, order, sex, and age produced one significant and one marginally significant predictor – prestige (p=.03) and sex (p=.07). Removal of non-significant predictors did not significantly diminish the model (P[$\chi^2(2) > .48$] = .79). In the resulting parsimonious model (p_{LLRT} = .04) an adult was 4.09 ($CI_{.95}$ = [1.02, 16.38]) times more likely to have their food and drink preferences imitated if they were the prestigious model(β = 1.4; SE = .7; p =.05). The actor in the pink shirt was 4.55 ($CI_{.95}$ = [1.13, 18.31]) times more likely to be imitated if the participant was a girl (β = 1.5; SE = .71; p =.03).

PARSIMONIOUS MODELS - ODDS RATIOS [WITH .95 CIs]

Predictors/Models	All Behaviours	Artifact	Food/Drink	Labelling
Prestige	2.37 [1.22, 4.58]	8.25 [1.15, 59.0]	4.09 [1.02, 16.38]	
Sex			4.55 [1.13, 18.31]	.16 [.02, 1.08]
p_{LLRT}	.03	.02	.04	.04
n	100	23	44	23

Significant odds ratios and their .95 confidence intervals in square parentheses. All models regress which model subjects imitated onto those predictors with non-empty table cells. Parsimonious models were developed by removing only those non-significant predictors from the full models whose abscence did not significantly diminish the model's log likelihood. *Prestige* encoded which actor was cued as prestigious, and *Sex* the sex of the participant. p_{LLRT} is the result of a log-likelihood ratio test of the model. n is the number of observations on which the statistical inference was based, whose non-independence was accounted for by Huber-White clustered, robust standard errors.

Table S2

Is language learning a special domain?

It seems so. Of all our measures, the only one which was non-significant for prestige-bias was the labelling task (β = -.57; SE = 1.07; *p* =.59). We describe in the main text why we suspected that a critic might be concerned that prestige would generalise least between skill-based domains (like artifact use, where we established prestige in this study) and convention-based domains (like language). Though Fusaro and Harris (2008) observed an effect (that arguably could be conceived of as a prestige effect) purely within the domain of language learning, our results seem to suggest a prestige effect, cued in a skill-based domain, does not generalise to language learning. There may exist an effect of skill-cued prestige on language learning that requires a more powerful test to detect, but we suspect that it would not be as large as the effects in the artifact and food domains. Interestingly, sex was a marginally significant predictor in this analysis (β = -1.84; SE =0.98; *p* =.06). Removal of non-significant predictors did not significantly diminish the predictive power of this model (P[$\chi^2(3) > 3.15$] = .37), but did produce a significant model (p_{LLRT} =.05) with sex the only predictor.

Are there gender effects? What about other effects?

In the analyses described in the main text, we regressed *which model was imitated* on our predictors, (including which model was prestigious) – that is, model prestige (and the other variables) predicted who was imitated. To investigate confounds we instead regressed *whether the imitated model was prestigious* on our predictors – that is, the other variables (including which actor happened to have been cued as prestigious) predicted whether participants imitated whichever was the prestigious model – their proclivity to prestige-bias. Participants' proclivity to *prestige-bias* on the behavioural measures was not predicted (p_{LLRT} =0.44) by participants' sex (p = .7), their age (p = .32), by which actor was the prestigious model (p = .48), nor whether they appeared first in videos (p = .11).

Participants' sex did however predict their preference for one actor over another (in the domains of diet and language), though in different directions in each case. We think this may have stemmed from girls' significant preference for the actor in the pink shirt, evident from a binomial test of the proportion of times they imitated each model (p_{binom} < .001), since boys did not show such a preference (p_{binom} = .41). We suspect gender was tapping the *self-similarity imitation heuristic* (Henrich & Gil-White, 2001). That is, girls may have had a competing influence on their imitative decisions: an affinity between themselves and the model based on their shirt colour. The hypothesis that children were weighing competing cues is consistent with our observed pattern of results (see table S1): children's sex predicted patterns of imitation in domains where prestige-bias was weaker.

FULL MODELS - LOGISTIC REGRESSION COEFFICIENTS

Predictors/Models	All Behaviours	Artifact	Food/Drink	Labelling
Prestige	.90 (.37)**	2.60 (1.30)*	1.42 (.67)*	-.57 (1.07)
Sex	.0 (.34)	-1.33 (1.43)	1.30 (.73)^	-2.90 (1.48)*
Order	-.56 (.33)^	-2.49 (1.50)^	-.42 (.57)	-1.94 (1.36)
Age	-.02 (.03)	-.08 (.14)	.03 (.06)	.01 (.10)
p_{LLRT}	.16	.04	.14	.13
n	100	23	44	23

^ : $p < .1$; $*: p < .05$; $**: p < .01$

Logistic regression coefficients and their (standard errors). All models regress predictor on to which actor a child imitated. *Prestige* encodes which actor was prestigious, *Sex* the sex of the participant, *Order* encodes which actor appeared first and *Age* the participant's age in months. p_{LLRT} is the result of a log-likelihood ratio test of the model. n is the number of observations on which the statistical inference was based, whose non-independence was compensated for by Huber-White clustered robust standard errors. Odds ratios and their confidence intervals can be computed by exponentiating e to these efficients ± interesting multiples of their normally distributed errors.

Table S3

Do children explicitly report their prestige-bias?

Regressing all predictors on our explicit measures produced no significant coefficients and a highly non-significant model (p_{LLRT} = .8). This is consistent with work on adults in which prestige-bias often emerges unconsciously (for a review, see Henrich & Gil-White, 2001). If there is an effect of prestige-bias on children's explicit awareness of which model they like or which they think others like, it was not strong enough for our tests to detect.

TABLES FOR CHILDREN'S PRESTIGE-BIASED LEARNING

Parsimonious Models - Logistic Regression Coefficients

Predictors/Models	All Behaviours	Artifact	Food/Drink	Labelling
Prestige	.86 (.33)**	2.11 (1.0)*	1.4 (.7)*	
Sex			1.5 (.7)*	-1.84 (.98)^^
p_{LLRT}	.03	.02	.04	.04
n	100	23	44	23

^^: $p < .06$; $*: p < .05$; $**: p < .01$

Table S1

Significant logistic regression coefficients and their (standard errors). All statistical models regress which actor participants imitated onto the listed predictors. Parsimonious models were developed by removing only those non-significant predictors from the full models whose absence did not significantly diminish the model's log likelihood. *Prestige* encodes which actor was prestigious, and *Sex* the sex of the participant. p_{LLRT} is the result of a log-likelihood ratio test of the model. n is the number of observations on which the statistical inference was based, whose non-independence was compensated for by Huber-White clustered robust standard errors. Odds ratios and their confidence intervals can be computed by exponentiating e to these efficients ± interesting multiples of their normally distributed errors.

PARSIMONIOUS MODELS - ODDS RATIOS [WITH .95 CIS]

Predictors/Models	All Behaviours	Artifact	Food/Drink	Labelling
Prestige	2.37 [1.22, 4.58]	8.25 [1.15, 59.0]	4.09 [1.02, 16.38]	
Sex			4.55 [1.13, 18.31]	.16 [.02, 1.08]
p_{LLRT}	.03	.02	.04	.04
n	100	23	44	23

Table S2

Significant odds ratios and their [.95 confidence intervals]. All statistical models regress which actor participants imitated onto those predictors with non-empty table cells. Parsimonious models were developed by removing only those non-significant predictors from the full models whose absence did not significantly diminish the model's log likelihood. *Prestige* encoded which actor was cued as prestigious, and *Sex* the sex of the participant. p_{LLRT} is the result of a log-likelihood ratio test of the model. n is the number of observations on which the statistical inference was based, whose non-independence was accounted for by Huber-White clustered, robust standard errors.

Full Models - Logistic Regression Coefficients

Predictors/Models	All Behaviours	Artifact	Food/Drink	Labelling
Prestige	.90 (.37)**	2.60 (1.30)*	1.42 (.67)*	-.57 (1.07)
Sex	.0 (.34)	-1.33 (1.43)	1.30 (.73)ˆ	-2.90 (1.48)*
Order	-.56 (.33)ˆ	-2.49 (1.50)ˆ	-.42 (.57)	-1.94 (1.36)
Age	-.02 (.03)	-.08 (.14)	.03 (.06)	.01 (.10)
p_{LLRT}	.16	.04	.14	.13
n	100	23	44	23

ˆ: $p < .1$; $*: p < .05$; $**: p < .01$

Table S3

Logistic regression coefficients and their (standard errors). All statistical models regress which actor participants imitated onto the listed predictors. *Prestige* encodes which actor was prestigious, *Sex* the sex of the participant, *Order* encodes which actor appeared first and *Age* the participant's age in months. p_{LLRT} is the result of a log-likelihood ratio test of the model.n is the number of observations on which the statistical inference was based, whose non-independence was compensated for by Huber-White clustered robust standard errors. Odds ratios and their confidence intervals can be computed by exponentiating e to these efficients ± interesting multiples of their normally distributed errors.