**Electronic supplementary material for Lewis, Call, Berntsen (2017) Non-goal directed recall of specific events in apes after long delays, Proc. R. Soc. B.**

Figure S1. Illustration of the hiding event. The ape watches from the enclosure on the right as the experimenter hides food in the enclosure on the left. The connecting door is pictured in the center of the dividing wall.
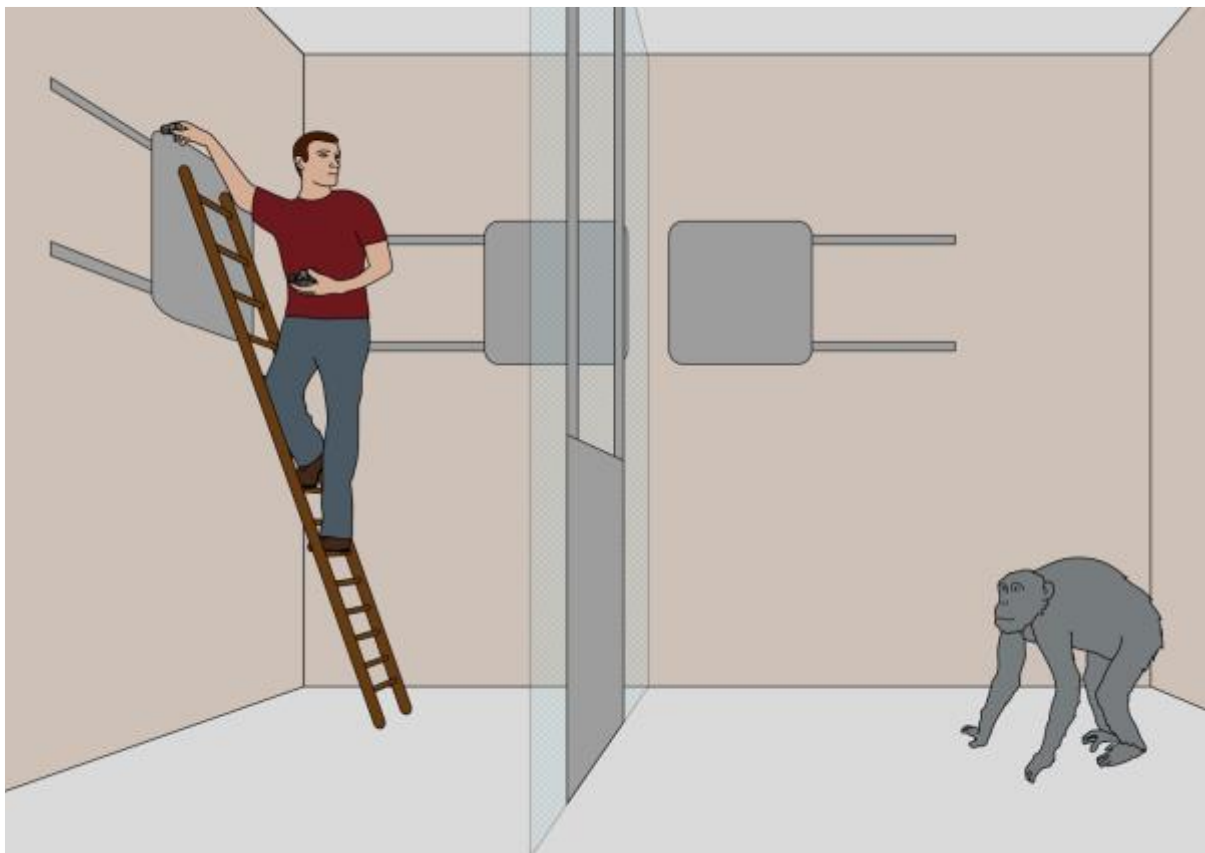
Model description

We opted for a Poisson, rather than a binomial, model since the latter was unrealistic with regard to the estimation of the contribution of the random effect of subject (likely due to only four observations per subject). To keep type I error rate at the nominal level of 0.05, we included a maximal random slopes structure, with condition and retrieval session (both

manually dummy coded and then centered) within subject. We did not include the correlations among random intercepts and slopes so to avoid an overly complex model, and because neglecting these does not largely affect type I error rates.

We fitted the model in R [version 3.3.1; 1] using the function glmer of the package lme4 [2]. Model stability was checked by comparing the estimates from the full model to those obtained from models with the levels of the random effect (each individual subject) excluded one at a time, which revealed no severe issues with model stability, in the sense that the sign of estimates which were not essentially zero remained unaffected. Variance Inflation Factors [3] were obtained from a standard linear model lacking the random effects and the interaction (function vif of the R package car) to check for absence of collinearity among the predictors, which revealed no issues [maximum Generalized VIF=1.08; 4]. Overdispersion was no issue (dispersion parameter: 0.609).

Prior to fitting the model, we z-transformed delay to a mean of zero and a standard deviation of one [5]. The model suffered from complete separation [3], since none of the individuals ever searched in the control condition when this was presented first. To overcome this issue, we choose the approach used by Goodale, Ratnayake [6], and replaced each of these no-searches with a search, one at a time, and fitted the model with the resulting response variable. The results we present are averages across these 30 models. Note that such an approach is conservative as it makes the difference between the conditions slightly less extreme.

Table S1. Results of the full model.

Term	Estimate	SE	χ^2	df	P
Intercept	-4.687	1.250			[1]
z.delay[2]	-0.133	0.357			[1]
experimenter2	-0.515	0.599			[1]
Speciesorangutan[3]	1.513	0.770	5.140	2	0.090[4]
Specieschimpanzee[3]	1.249	0.714			[1]
exposurePellet[5]	0.822	0.673			[1]
sequenceExpFst[6]	1.955	1.063			[1]
conditionExp[7]	2.908	1.168			[1]
conditionExp:z.delay	-0.087	0.412	0.143	1	0.805
conditionExp:experimenter2	0.561	0.699	0.716	1	0.433
conditionExp:exposurePellet	-0.709	0.757	1.000	1	0.365
conditionExp:sequenceExpFst	-2.264	1.113	6.239	1	0.013

[1] not shown because of having a very limited interpretation

[2] z-transformed to mean of 0 and standard deviation of 1; mean and sd of the original variable were 20.016 and 20.781

[3] dummy coded with bonobo being the reference category

[4] the indicated test refers to the overall effect of species

[5] dummy coded with bread being the reference category

[6] dummy coded with control first being the reference category

[7] dummy coded with control being the reference category

References
[1] Team, R.C. 2016 R: A Language and Environment for Statistical Computing. (Vienna, Austria, R Foundation for Statistical Computing.

[2] Bates, D., Mächler, M., Bolker, B. & Walker , S. 2015 Fitting Linear Mixed-Effects Models Using lme4.

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[4] Fox, J. & Monette, G. 1992 Generalized collinearity diagnostics. *Journal of the American Statistical Association* **87**, 178-183.

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[6] Goodale, E., Ratnayake, C.P. & Kotagama, S.W. 2014 Vocal Mimicry of Alarm-Associated Sounds by a Drongo Elicits Flee and Mobbing Responses from Other Species that Participate in Mixed-Species Bird Flocks. *Ethology* **120**, 266-274.