Electronic Supporting Information S1 Studies that met our criteria for inclusion in the dataset. Because poor data reporting prevented the inclusion of more species in our database, we recommend future research to provide raw data on seed dispersal distance accessible in a public data archive. Thus further synthesis can be done on the finest scale of measurement that the original study affords.

YEAR	AUTHOR	TITLE	JOURNAL	PRIMATE SPP.	SOURCE TYPE		
					Average Dist. ❶	Categ. Dist.❷	Min/Max Dist. ❸
1984	Estrada & Coates-Estrada	Fruit eating and seed dispersal by howling primates (*Alouatta palliata*) in the tropical rain forest of Los Tuxlas, MX	Am J Primatol	*A. palliata*	✓		✓
1986	Garber	The ecology of seed dispersal in two species of Callitrichid primates (*Saguinus mystax* and *Saguinus fuscicollis*)	Am J Primatol	*S. mystax* *S. fuscicollis*			✓
1990	Rowell et al.	Comparison of seed dispersal by guenons in Kenya and capuchins in Panama	J Trop Ecol	*C. capucinus*			✓
1991	Estrada & Coates-Estrada	Howler primates (*Alouatta palliata*), dung beetles and seed dispersal: ecological interactions in the tropical rain forest of Los Tuxtlas	J Trop Ecol	*A. palliata*			✓
1995	Zhang & Wang	Fruit consumption and seed dispersal of *Ziziphus cinnamomum* (Rhamnaceae) by two sympatric primates (*Cebus apella* and *Ateles paniscus*) in French Guiana	Biotropica	*C. apella*	✓		
1996	Julliot	Seed dispersal by red howling primates (*Alouatta seniculus*) in the tropical rain forest of French Guiana	Int J Primatol	*A. seniculus*	✓		✓
1999	Yumoto et al.	Estimation of the rentention times and distances of seed dispersed by two primate species, *A. seniculus* and *L. Lagotricha*, in a Colombian forest	Ecol Res	*A. seniculus* *L. lagotricha*	✓		✓
2000	Bravo & Zunino	Germination of seeds from three species dispersed by black howler primates	Folia Primatol	*A. caraya*			✓

2000	Stevenson	Seed dispersal by woolly primates (*Lagothrix lagothricha*) at Tinigua National Park, Colombia: Dispersal distance, germination rates, and dispersal quantity	Am J Primatol	*L.lagothricha*	✓	✓*	✓
2002	Silva & Gray	Interacting effects of forest fragmentation and howler primate foraging on germination and dispersal of fig seeds	Oryx	*A. palliata*	✓		
2003	Wehncke et al.	Seed dispersal patterns produced by white-faced primates: implications for the dispersal limitation of neotropical tree species	J Ecol	*C. capuccinus*	✓	✓	✓
2004	Wehncke et al.	Seed dispersal and defecation patterns of *Cebus capucinus* and *Alouatta palliata*: consequences for seed dispersal effectiveness	J Trop Ecol	*C. capuccinus* *A. palliata*	✓		
2006	Link & DiFiore	Seed dispersal by spider primates and its importance in the maintenance of neotropical rainforest diversity	J Trop Ecol	*A. belzebuth*	✓	✓	✓
2006	Martins	Comparative seed dispersal effectiveness of sympatric *Alouatta guariba* and *Brachyteles arachnoides* in Southeastern Brazil	Biotropica	*A. guariba* *B. arachnoides*		✓	
2007	Giraldo et al.	Resource use and seed dispersal by red howler primates (*Alouatta seniculus*) in a Colombian Andean forest	Neotrop Primates	*A. seniculus*	✓		
2007	Wehncke & Dominguez	Seed dispersal ecology of non-restricted frugivores, capuchin primates in three neotropical forests	J Trop Ecol	*C. apella* *C. capucinus*	✓	✓	
2008	Lapenta & Procopio-Oliveira	Some aspects of seed dispersal effectiveness of golden lion tamarins (*Leontopithecus rosalia)* in a Brazilian Atlantic forest	Trop Cons Sci	*L. rosalia*	✓	✓	✓
2009	Bravo	Implications of behavior and gut passage for seed dispersal quality: The case of black and gold howler primates	Biotropica	*A. caraya*			✓
2010	Valenta & Fedigan	Spatial patterns of seed dispersal by white-faced capuchins in Costa Rica: Evaluating distant-dependent seed mortality	Biotropica	*C. capucinus*	✓	✓	✓

2011	Cardoso et al.	Frugivory patterns and seed dispersal by golden-headed lion tamarins (*Leontopithecus chrysomelas*) in Una Biological Reserve, Bahia, Brazil	Mammalia	*L. chrysomelas*		✓	✓
2012	Heymann et al.	DNA fingerprinting validates seed dispersal curves from observational studies in the Neotropical *Parkia*	Plos One	*S. mystax* *S. fuscicollis*	✓	✓	✓
2013	Bueno et al.	Functional redundancy and complementarities of seed dispersal by the last Neotropical megafrugivores	Plos One	*B. arachnoides*			✓
2014	González & Stevenson	Seed dispersal by woolly primates (*Lagothrix lagothricha*) at Caparú Biological Station (Colombia): Quantitative description and qualitative analysis	Developments in Primatology Progress & Prosp.	*L.lagothricha*	✓		✓
2014	Stevenson et al.	Estimation of seed shadows generated by Andean woolly primates (*Lagothrix lagothricha lugens*)	Int J Primatol	*L. lagothricha*	✓		
2014	Zárate et al.	Black howler primate (*Alouatta pigra*): Activity, foraging and seed dispersal patterns in shaded cocoa plantations vs rainforest in Southern Mexico	Am J Primatol	*A. pigra*	✓		✓
2015	Valenta et al.	Spatial patterns of primary seed dispersal and adult tree distributions: *Genipa americana* dispersed by *Cebus capucinus*	J Trop Ecol	*C. capuchinus*	✓		✓

* Data provided by Pablo Stevenson, personal communication.

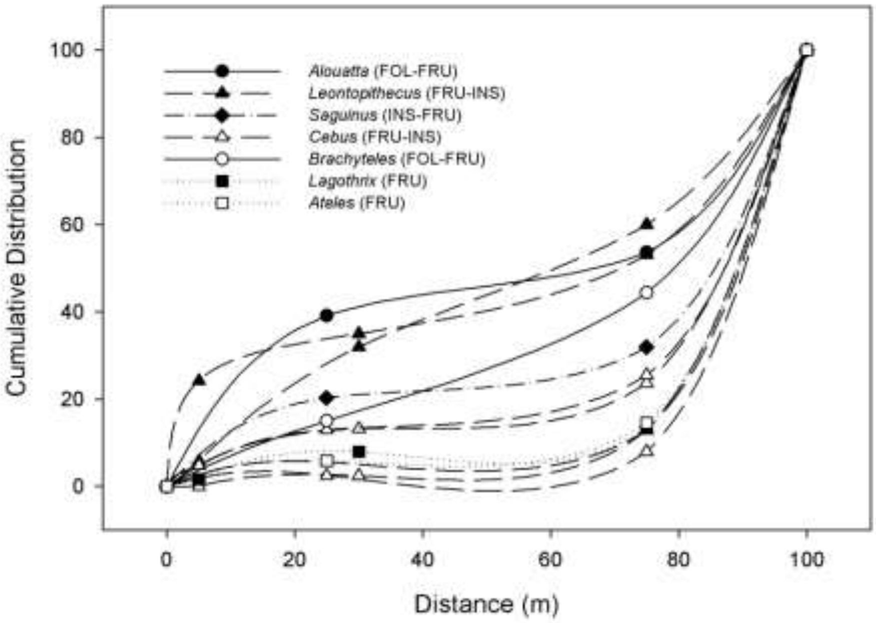
❶ Average Dist. = Average Distance; data for 9 primate species used to perform PGLS and Path Analysis

❷ Categ.Dist..= Categories of Distance; data for 9 primate species and 4 feeding guilds used as category of distance to build Table 1 and Electronic Supporting Information S2

❸ Min/Max Dist. = Minimal and Maximal Distance; data for thirteen primate species used to build Electronic Supporting Information S4.

Electronic Supporting Information S2 Cumulative distribution of categories of seed dispersal distance for each primate genus separated by feeding guild based upon Norconk et al. (2009).

We labeled primate diet specializations using the following criteria: the first label corresponds to the food type constituting 45% or more of the diet, while the second label (if present) relates to the food type comprising 20 – 45% of the diet (Chivers and Hladik 1980).



FRU = Frugivore, FRU-INS = Frugivore-Insectivore, FOL-FRU = Folivore-Frugivore, INS-FRU = Insectivore-Frugivore.

Norconk MA, Wright BW, Conklin-Brittain, NL, Vinyard CJ. 2009. Mechanical and nutritional properties of food as factors in Platyrrhine dietary adaptations. In: P Garber, A Estrada, J Bicca-Marques, E Heymann and K Strier, editors. South American Primates. Springer New York, New York. p 279–319.

Chivers DJ, Hladik CM. 1980. Morphology of the gastrointestinal tract in primates: Comparisons with other mammals in relation to diet. Journal of Morphology 166:337-386.

Electronic Supporting Information S3 Phylogenetic Generalized Least Squares analysis and AIC model selection

First, we created fitted phylogenetically-adjusted regression models and performed Phylogenetic Generalized Least Squares analysis (PGLS) adjusting expected covariance under a Brownian model (Felsenstein 1985, Martins and Hansen 1997) accounting for primate phylogeny (see Figure S1 below).

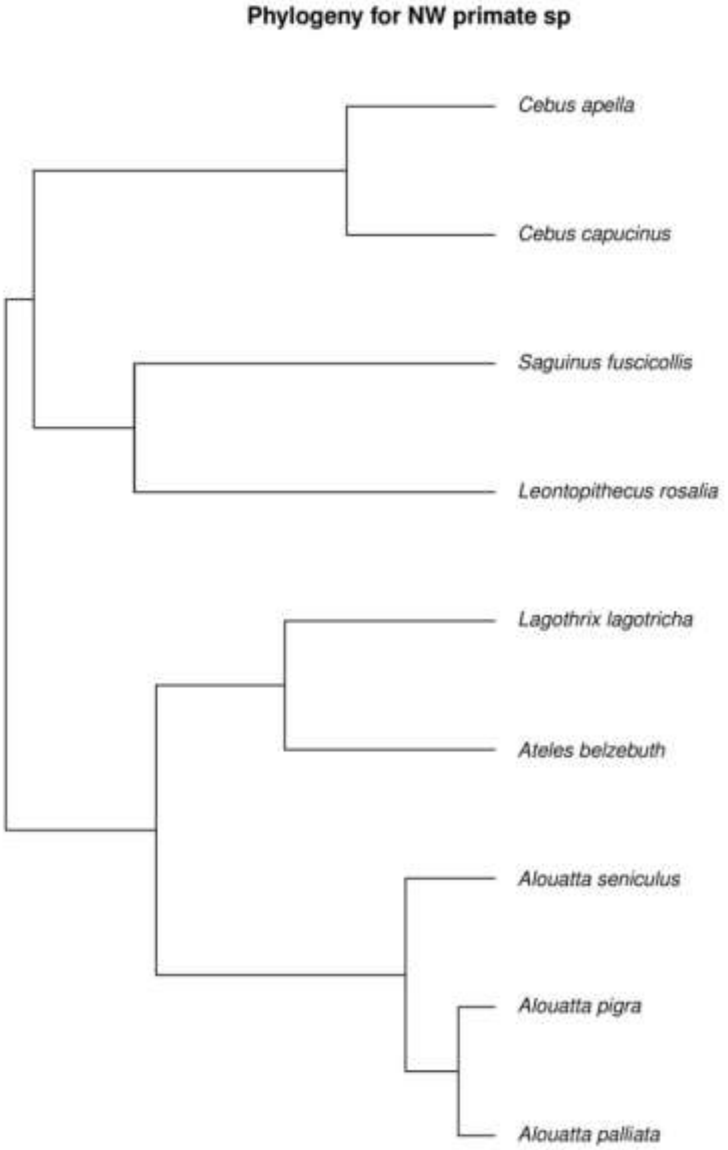


Figure S1 Primate phylogeny used on PGLS analysis.

(Source: 10kTree Website - http://10kTrees.fas.harvard.edu)

Then, to test whether HR, DP, TT, CGD, body mass and fragment size affect SDD, we plotted each predictor variable against SDD and determined the best fitted model by Akaike information criteria (AIC). All statistical analyses were performed in R with the packages car, ape, psych, MuMin, AICcmodavg and plspm. AIC is a model selection tool based on information theory and is defined as the distance between reality and a model (Burnham & Anderson 2004). We used the component ΔAICc to compare AICc between models (the smaller this difference indicates that other designs are approaching the best models condition) and Akaike weights ($AICc_{(WT)}$) *sensu* Burnham & Anderson (2002) to access level of support in favor of each model, selecting the most parsimonious among the candidate model set. The six candidate models were:

M1 – Variation in per-population average dispersal distance explained only by HR, DP, TT.

M2 - Variation in per-population average dispersal distance explained by HR, DP, TT and body mass;

M3 - Variation in per-population average dispersal distance explained by HR, DP, TT and CGD;

M4 - Variation in per-population average dispersal distance explained by HR, DP, TT and fragment size;

M5 - Variation in per-population average dispersal distance explained by HR, DP, TT, CGD and body mass;

M6 - Variation in per-population average dispersal distance explained by all predictor variables: HR, DP, TT, CGD, body mass and fragment size.

Burnham KP, Anderson DR 2002 Model selection and multimodel inference: A practical information-theoretic approach. New York: Springer.

Burnham KP, Anderson DR. 2004. Multimodel inference: Understanding AIC and BIC in model selection. Sociological Methods & Research 33:261–304.

Felsenstein J. 1985. Phylogenies and the comparative method. American Naturalist 126:1–25.

Martins EP, Hansesn TF. 1997. Phylogenies and the comparative method: a general approach to incorporating phylogenetic information into the analysis of inter-specific data. American Naturalist 149**:**646–667.

Electronic Supporting Information S4 PGLS candidate models showing the significance of every variable in each model, and Akaike components

Model	TT p-value	PT p-value	MR p-value	CGD p-value	BM p-value	FS p-value	AICc	K	$AICc_{(WT)}$	ΔAICc
M1	0.019 *	0.001*	0.001*	-	-	-	118.97	5	9.999490e-01	0.000
M2	0.04*	0.005*	0.003*	-	0.679	-	140.10	6	2.592358e-05	21.12
M3	0.058	0.006*	0.005*	0.364	-	-	140.89	6	1.747185e-05	21.91
M4	0.019*	0.01*	0.041*	-	-	0.287	142.54	6	7.638975e-06	23.56
M5	0.12	0.019*	0.012*	0.436	0.713	-	212.41	7	5.147433e-21	93.43
M6	0.02*	0.039*	0.085*	0.425	0.068	0.053	∞	8	0.00	∞
null	-	-	-	-	-	-	114.22	2	1.934824e-01	4.75

TT = transit time, PT = path twisting, MR = movement rate, FS = fragment Size, BM = body mass, K = degrees of freedom in each model (number of independent variables + 1 for the intercept + 1 for the empirically-estimated correlation of the Brownian motion across the phylogenetic tree), $AICc_{(WT)}$ = Akaike weights, ΔAICc = Delta AICc component.

∞ = Infinite: too few df

* Significance level = 0.05

Electronic Supporting Information S5 Summary of Partial Least Squares Path Modeling results.

Path	t-value	p-value	Path Effect	Std.Error	Bootstrap CI Lower	Bootstrap CI Upper
FS→HR	2.17	0.047*	0.49	0.22	0.141726	0.792463
HR→Distance	2.95	0.01*	0.66	0.23	0.013265	1.272062
HR→DP	1.83	0.035*	0.48	0.26	0.066383	0.958453
FS→DP	0.26	0.80	0.26	0.26	-0.302285	0.525747
DP→Distance	3.65	0.003*	0.80	0.22	0.197998	1.560074
BM→CGD	2.48	0.012*	0.59	0.21	0.249357	0.849083
BM→Distance	0.09	0.927	-0.03	0.27	-0.851813	0.718124
CGD→TT	6.46	<0.001*	0.86	0.13	0.699968	0.962393
CGD→Distance	0.15	0.885	0.06	0.37	-1.160428	1.153298
TT→Distance	4.38	0.001*	0.87	0.22	0.121087	2.384262

FS = fragment size, HR = home range, DP = daily path length, TT = transit time, CGD = coefficient of gut differentiation, BM = body mass (in grams), Distance = average dispersal distance

* Significance level = 0.05