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Contextualised behavioural measurements
of personality differences obtained in
behavioural tests and social observations
in adult capuchin monkeys (*Cebus apella*)

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**Contextualised behavioural measurements of personality differences
obtained in behavioural tests and social observations
in adult capuchin monkeys (*Cebus apella*)**

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S 1 Behavioural tests and observations

S 1.1 Behavioural test situations

All behavioural tests were carried out in highly standardised ways in the indoor cages, where the impact of random external influences could be minimised and where we could test the monkeys individually or in selected dyads in the food competition test (S 1.1.3). Between these cages and the experimenter area was a mesh from floor to ceiling with exchangeable panels near the floor. The panels could be either mesh (58 x 59 cm) or Plexiglas (58 x 80 cm) at which we could fix the test apparatus (see S 1.1.1 to S 1.1.15). One main experimenter (AG) assisted by a second experimenter (JU in most sessions) tested all individuals; the same experimenter (AG) carried out all test situations in which we recorded behaviour towards humans (S 1.1.4, S 1.1.6, S 1.1.7, S 1.1.9-11). All tests were videotaped for detailed, software-assisted behavioural coding (see 2.4). Below we describe the behavioural tests and the group observations in detail. All personality constructs and their operationalisations in terms of behavioural measures and the experimental and group situations in which they were studied are listed in Table S2.

S 1.1.1 Conveyor belt test

Food was placed on a small conveyor belt (breadth 13 cm, length 45 cm, height 20 cm) fixed to the mesh on the cage floor. Through an opening in the mesh (10 cm x 13 cm), the monkey could reach a rubber wheel (20 cm in diameter, breadth 5 cm) attached to the right side of the conveyor. By turning the wheel, the monkey could move the conveyor belt thereby transporting food items placed on it towards him/her where the items fell on a small slide (17 cm x 15 cm), and from there directly into the cage where the monkey could pick them up. A small Plexiglas (9 cm x 16 cm) fixed vertically between wheel and conveyor belt, and a large exchangeable Plexiglas panel (see S 1.1) fixed to the mesh between monkey and apparatus hindered him/her from reaching directly for the food. All monkeys received 2 training sessions to learn to turn the wheel reliably for highly preferred food. Only one individual, Pippi, was unable to turn the wheel due to physical disabilities and was therefore excluded from this and the Conveyor belt disconnected test (S 1.1.2).

The food items used varied in terms of desirability and quantity (e.g., pumpkin seeds were more preferred than carrots). In each test session, we first carried out one initial trial of 1 min without food. In 10 consecutive trials, the experimenter then placed hidden behind her hand at the end of the conveyor belt facing away from the monkey the following items in randomised, predetermined order that differed among sessions: 1 unpeeled pumpkin seeds, 1 chocolate flake, 1 Cheerio (commercial breakfast cereal consisting of sugared puffy oat-rings of 1 cm in diameter), 1 piece cracker (1.5 cm x 1.5 cm), and 1-2 pieces of zucchini, carrot, apple, and celery root (each approximately 1 cm³). Trials started when the monkey was close to the apparatus and the experimenter lifted her hand to uncover the food. If the monkey did not turn the wheel immediately, or not enough to get the food or if he/she refused (i.e., dropped) the food, we waited 1 min before starting the following trial. Because retrieving highly preferred and non-preferred food required the same effort, and because all tested individuals were physically capable to move the conveyor by turning the wheel, we used this situation to measure various behaviours operationalising the construct Food orientation.

S 1.1.2 Conveyor belt disconnected test

After each Conveyor belt test (S 1.1.1), we conducted two additional 2-min trials in which we placed several highly preferred food items (5 pumpkin seeds and 3 Cheerios) on the conveyor belt (15 cm away from the wire mesh). The order of presentation of these foods was reversed in the second session of each test block. Each trial started when the monkey was close to the apparatus and the experimenter removed an opaque panel between cage and conveyor belt to uncover the baits. The same apparatus of the previous test was used with its mechanism disconnected. Although it looked exactly the same, turning the wheel no

longer moved the conveyor belt. In this potentially frustrating situation, we recorded various behaviours operationalising the constructs Arousability and Impulsiveness.

S 1.1.3 Food competition test

The experimenter offered one piece of preferred food (crackers) to two individuals kept in the same cage, when they were both at approximately the same distance from it. We conducted five competitive trials for each dyad, and we tested all possible combinations among the testable individuals of each group. For the individuals belonging to the two smaller groups, we repeated the sessions twice so that each individual was tested in 20-30 competitive trials during each test block. We scored percentages of trials in which each individual took the food and additional behavioural measures to operationalise the constructs Dominance, Competitiveness, and Aggressiveness.

S 1.1.4 Hidden food test

We stuck 7 small black pieces of dried plum (about 1 cm³) to the darker parts of the indoor cage (i.e., to the metal and wooden parts), and 3 small pieces of yellow raisins (about 0.7 cm³) to the brighter parts of the indoor cage (i.e., to the wall) and cage elements. The individual entered the room without having observed either the baiting or the test of other group members. There was no indication of hidden food except for the food itself. We measured the number of items found within a 10-min test period, and the latency to find each item (we assigned items not found a 600-sec latency). These measures were used to operationalise the construct Vigilance. We also used this fairly unstructured situation to code behaviours operationalising the constructs Physical activity, Arousability, (mild) Anxiousness, Social orientation to conspecifics (as time peering through the door crack to the group members in the outdoor enclosure), and Social orientation to humans (as affiliative behaviours towards the experimenter standing in front of the cage while videotaping the individual).

S 1.1.5 Yoghurt grid test

A small opaque plastic platform (length 42 cm, width 8 cm) smeared with plain, low fat yoghurt (a highly preferred food for all individuals) was attached to the mesh 25 cm above the cage floor. To reach the yoghurt, the monkey had to stick his/her hand(s), fingers, or tongue through the mesh. By baiting the platform with sufficient amounts of yoghurt, we ensured that the individual was occupied with this task for the entire test duration. As soon as the monkey started recovering the yoghurt, the experimenter produced considerable noise by knocking with a plastic tube (length 15 cm, diameter 1.5 cm) on the metal cage frame located 1.7 m away from the food platform. The noise lasted for 2 consecutive min. In this noisy situation, we recorded the duration spent recovering yoghurt to measure the construct Distractibility.

S 1.1.6 Human interaction test

The experimenter sat in front of the monkey's cage for 5 min. Right at the start of the session, she called the individual's name, lip-smacked 5 times consecutively and then waited silently for 1 min (lip-smacking is a prosocial facial display in capuchins that they also use towards humans). When 2 min had elapsed, she fed the monkey with crackers for 1 min, and then repeated the procedure without offering any food for further 2 min. The monkey's behaviours towards the experimenter throughout the 5-min period were recorded to measure the constructs Social orientation to humans and Aggressiveness to humans. We also recorded behaviours operationalising the construct Arousability (see Table S2).

S 1.1.7 Masked human test

The experimenter entered the test room silently, disguised with a pink Venetian style facemask, a black shorthaired wig, a long purple dress and black fabric rain boots. She wore beige cloth gloves, one of which was stiffed with cloth. Very likely the monkeys could not

recognize her. She kneeled in front of the cage without saying anything and offered the monkey consecutively 14 peeled, dark green pumpkin seeds placed on the fingers of the stiffened glove. She stuck the glove through the mesh into the monkey's cage so that they could bite and grab 'her' without any risk of injury for the experimenter. After 90 sec, she placed the seeds not taken by the monkey on a small chair in reach of the monkey and left the room. To reduce situational strength and to allow individual differences to emerge, the masked experimenter behaved very friendly and non-threateningly towards the monkey (see S 1.1.16 Ethical note). In the second test block, administered about four weeks after the first session, we dressed the experimenter differently with a red Venetian style mask, a blond-haired wig, and a long black dress to maintain unfamiliarity. The boots and gloves of the experimenter were as described above. We measured behaviours operationalising the constructs Social orientation to humans, Aggressiveness to humans, Anxiousness and Arousability.

S 1.1.8 Novel food test

The monkeys received four crackers and four novel food items they never had before (approximately 1-2 cm³ in size) in alternating order, for a total of eight food items. In each session, the experimenter offered two pieces of the same kind of 'less processed' novel food (beet root, canned white beans, canned meat, soft cheese) and two pieces of the same kind of 'more processed' food (dry cat food, dry dog food, paprika crackers, spinach gnocchi). If the monkey did not take the food or dropped it inside the cage, the experimenter waited 2 min and scored whether the monkey got back to the food, or not. If the monkey threw the food out of the cage, the trial was discontinued. We measured behaviours operationalising the constructs Food orientation (as responses to normal food) and Curiosity (as differences in responses to novel versus familiar food).

S 1.1.9 Multiple objects test

We placed six small different objects familiar and unfamiliar to the monkeys in a 1m² area in the middle of the test cage, 1m away from the sliding door through which each monkey entered. The items included objects like a metal cup (5 cm high, 4.5 or 7.5 cm in diameter), 1 to 3 small opaque PVC tubes (6 and 14 cm long, 3 cm in diameter), a T-shaped opaque plastic tube (9 cm x 6.5 cm x 3.5 cm diameter), a small white hollow PVC ball with holes of 1.2 cm, a small plastic bottle (15 cm long, 5 cm in diameter), a yellow brush (15.5 cm x 6 cm x 4.5 cm), a metal chain (38 cm, each ring 1 cm x 2.5 cm), a dog chewing stick (12 cm long and 0.7 cm in diameter), and parts of a dog toy of yellow soft plastic shaped like a chicken that we cut into 3 different parts: head and neck, with eyes removed to reduce potential threat (10 cm long and 3 cm in diameter), breast and wings (5cm x 2.5 cm 10 cm), and lower body part with legs (9 cm x 2.5 cm x 15 cm). We changed the composition of objects among the four sessions administered; yet all monkeys encountered exactly the same assortments of objects. After having entered the cage, each monkey had 10 min time to explore the objects. All individuals touched or inspected at least one of them closely (at about 5 cm distance); the influence of anxiety towards unknown objects can thus be considered negligible. We measured behaviours operationalising the constructs Curiosity and Creativeness/Inventiveness (as combinatory actions with multiple objects and manipulations of them), Anxiousness, Aggressiveness, Arousability, and Physical activity.

S 1.1.10 Tunnel basket test

The monkey encountered a large, open-worked laundry basket of blue PVC of which we removed the bottom so that both ends were open (75 cm long, 50 cm diameter on one end and 40 cm diameter on the opposite end). The Tunnel basket was placed in the middle of the cage with its larger opening towards the sliding door through which the monkey entered. At the smaller end, we fixed a tubular dark blue cloth that prolonged the basket for 50 cm so that the monkeys could go through it. Because the tunnel basket resembled a net sometimes used by the keepers to capture the monkeys during medical check-ups, it could

be a frightening situation. We therefore left the sliding door open so that the monkey could access the adjacent indoor cage. For the same reason, we repeated this test just once in the second test block about 4 weeks later (see S 1.1.16 Ethical note). To maintain some degrees of novelty in this second session, we hung the tunnel vertically on a rope so that it could swing and the larger opening faced the monkey's sliding door 60 cm above the floor. Additionally, we placed a white cloth (50 cm x 60 cm) on top of the tunnel basket so that it was a bit darker inside and the monkey could no longer see through parts of the open-worked plastic. The monkey had 10 min to explore the apparatus. We measured behaviours operationalising the constructs Aggressiveness, Anxiousness, Arousability, Physical activity, Curiosity, Creativeness/ inventiveness and Social orientation to humans.

S 1.1.11 Large cloth test

A large bed sheet (2 m x 2 m) with dark blue and small white stripes was hung up transversally in the test cage with two knots (one knot in the rear part of the cage above the sliding door and the other knot on the opposite side; both knots were 1.60-1.80 m above the floor). Since this situation could be potentially disturbing, we performed it once in the first block and once in the second block (see S 1.1.16 Ethical note). To maintain some degree of novelty, in block 2 we used a different bed sheet with dark and light blue stripes and we hung it over the entire wooden perch in the rear of the cage so that the monkeys had to walk over it when they used that perch. We measured behaviours operationalising the constructs Aggressiveness, Anxiousness, Arousability, Physical activity, Curiosity, Creativeness/ inventiveness and Social orientation to humans.

S 1.1.12 Furry animal test

When the monkey was inside the test cage, we placed a small yellow soft teddy bear (4 cm x 10 cm x 12 cm) covered by a beige cloth at 50 cm distance from the monkey's cage on the floor. The teddy bear was attached to a black disc (30 cm in diameter) located at 2 m distance from the cage that the experimenter could rotate by means of two thin loops. We covered the teddy bear's eyes with crepe tape to reduce the degree of threat that the presence of eyes constitutes for capuchins (see S 1.1.16 Ethical note). The first trial started when the experimenter removed the cloth covering the teddy bear. In this trial, the bear was placed with its back towards the monkey. The second trial started after 60 sec when the experimenter rotated the disk so that the teddy bear was facing the monkey. This trial ended after 60 sec when the experimenter covered the teddy bear again and took the entire apparatus out of the monkey's sight. We carried this test out once in the first block and once in the second block, in which we used a small brown soft dog, again with covered eyes. We measured behaviours operationalising the constructs Aggressiveness, Arousability, and Anxiousness.

S 1.1.13 Blocked food tube test

A transparent tube (75 cm long and 3 cm in diameter) was fixed to an apparatus at a 45° angle. We positioned the apparatus in front of the cage so that the lower opening was 10 cm above the floor and a few cm inside the cage, while the higher end was on the experimenter's side at about 55 cm above the floor. Thirty cm away from the lower opening, the tube had a thin slot in which the experimenter could insert one of two transparent plastic slides; one slide had a hole, while the other had not. In the first trial of each session, the experimenter inserted the hollowed slide allowing the food (4 half Cheerios) to pass through the tube and be recovered by the monkey. In the second trial, the experimenter manipulated the hollowed slide, and again inserted the food (4 half Cheerios) into the tube from which the monkey could retrieve it. In the third trial, the experimenter exchanged the hollowed slide with the solid slide. Then, she dropped 8 whole Cheerios one by one into the tube. The food piled up above the slide in full view of the monkey, where it was left for 3 min. This situation permitted us to measure behaviours operationalising the constructs Impulsiveness, Arousability, and Food orientation (food calls).

S 1.1.14 Foraging box test

We attached a metal box (50 cm long, 20 cm high, 21 cm wide) vertically to the mesh inside the test cage so that the monkey could sit on it. The upper opening of the box (30 cm x 16 cm) was covered by a Plexiglas panel leaving only a small slot (30 cm x 4.5 cm) open on one side through which the monkey could reach with one arm inside the box. Additionally, the box had a Plexiglas window at one of its small sides so that the monkey could peer into it not only from top, but also from the side. The experimenter filled the box with beige and brown wood shavings, in which she hid 3 beige unshelled pumpkin seeds; and then she placed other 2 pumpkin seeds inside the box on top of the wood shavings. In the first session, each individual received also one additional pumpkin seed on top of the box. The trial lasted 5 min during which we measured behaviours operationalising the constructs Persistency and Vigilance.

S 1.1.15 Sudden noise test

After 1 minute of silence and independently from the experimenter's activity (who stood in front of the monkey's cage manually videotaping him/her), we played back a 10 sec record of a German news programme in moderate volume followed by 20 sec of silence, and a further 10 sec record of German news. The speaker was inside the test room at a distance of 2.20 m from the monkey's cage. The monkeys were familiar neither with this language nor with these particular voices. We recorded the monkey's behaviour for 5 more min during which there was no playback of sounds. Due to its (previously unknown) potential to elicit fear, we repeated this test only once in the second test block after about 4 weeks using a different record of a different news speaker to maintain unfamiliarity (see S 1.1.16 Ethical note). We measured behaviours operationalising the constructs Arousability, Anxiousness, and Vigilance.

S 1.2 Ethical note

We followed high ethical standards when designing the 5 test situations constituting a potential threat for the monkeys (S 1.1.7, S 1.1.10, S 1.1.11, S 1.1.12, S 1.1.15). That no monkey showed signs of acute distress in all of these tests argues for ethically acceptable levels of arousal and anxiety. For example, in the Masked human test (S 1.1.7), all monkeys took pumpkin seeds from the experimenter directly before and after the test session; several monkeys took seeds even directly from the masked human's hand, and most monkeys from the small chair after she had left. In the Large cloth test (S 1.1.11), all individuals entered the test cage and touched the large cloth at least once, except for one individual in one of the two sessions. In the Furry animal test (S 1.1.12), all monkeys took a food reward from the experimenter directly after the end of the last trial.

S 1.3 Behavioural observations

S 1.3.1 Prefeeding observation

We observed the monkeys prior to their daily main feeding at about 3.15 p.m., while they could hear the keepers preparing their food in the nearby kitchen and distributing it in the indoor and outdoor enclosures of the neighbouring groups. We asked the keepers to be particularly noisy during these activities to trigger prefeeding-related behaviours. We obtained 2 data points per individual per day over 10 days in each test block to record behaviours operationalising Arousability, Food orientation, and Social orientation.

S 1.3.2 Social observations

Starting at about 4 p.m., we observed the individuals when they were in their groups in the outdoor enclosures. Group observations included measurements of behaviours operationalising Aggressiveness, Social orientation to conspecifics, Social orientation and Aggressiveness to humans, Gregariousness, Arousability, Anxiousness, Dominance, Playfulness, Physical activity, Food orientation, Self-cleanliness, and Sexual activity.

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Tables

Table S1 Individuals, their group membership, name, sex, age, rearing history, and participation in behavioural tests and observations

Group	Individual	Name code	Sex	Age	Rearing history	Participation
1	Patè ^α	Pat	M	20	Mother	All
	Robot	Rot	M	16	Mother	All
	Brahms	Brm	F	29	Hand	PFO, SGO
	Robinia	Rbn	F	18	Hand	All
	Saroma	Sar	F	10	Mother	PFO, SGO
2	Gal ^α	Gal	M	21	Hand	PFO
	Cammello	Cam	M	33	Hand	PFO
	Carlotta	Cta	F	27	Hand	PFO
	Rame	Ram	F	24	Mother	PFO
	Paprika	Pka	F	22	Hand	PFO
3	Vispo ^α	Vis	M	11	Mother	All
	Pepe	Ppe	M	24	Hand	All
	Sandokan	San	M	11	Hand	All
	Pippi	Pip	F	30	Hand	Most tests
	Roberta	Rta	F	25	Hand	All
	Virginia	Vig	F	12	Hand	PFO, SGO
4	Cognac ^α	Cog	M	24	Mother	All
	Robin Hood	Hod	M	14	Mother	All
	Pedro	Pdr	M	10	Mother	All
	Pacchia	Pch	F	15	Mother	PFO, SGO
	Pacaja	Pja	F	14	Mother	PFO, SGO
	Robiola	Rla	F	13	Mother	All
	Penelope	Pnl	F	12	Mother	All
	Rucola	Ruc	F	11	Mother	All
	Peonia	Peo	F	8	Mother	PFO, SGO
Quincy	Qui	F	8	Mother	All	

Note. PFO – Prefeeding observation (S 1.3.1), SGO – Social observation (S 1.3.2).

^α The individual holding the alpha male status in its group.

Table S2 Minimum, maximum, mean, standard deviation, test-retest reliability (*r* and *p*-values) and sample size for all the 160 contextualised behavioural measurement variables listed by working construct and the test or group situation studied

Working construct		Behavioural measures			<i>Min</i> _{t1}	<i>Max</i> _{t1}	<i>M</i> _{t1}	<i>SD</i> _{t1}	<i>r</i> _{tt} ²	<i>p</i> _{tt}	<i>N</i>
Test or group situation	Description	Type ¹									
Aggressiveness											
. Food competition test	1 Threaten conspecific	Freq	0.00	23.00	5.00	6.00	-.05	.850	14		
Furry animal test	2 Threaten soft toy	Dur	0.00	53.12	10.56	15.91	.52	.049	14		
Large cloth test	3 Threaten novel element	Dur	0.00	3.76	0.43	1.15	n.a.	n.a.	15		
Multiple objects test	4 Threaten objects	Dur	0.00	43.66	5.83	12.24	.24	.400	14		
Social observation	5 Contact aggression (slap, grab, pull, bite)	Freq	0.00	0.20	0.02	0.05	.43	.049	21		
	6 Chase	Freq	0.00	0.60	0.07	0.15	.48	.030	21		
	7 Threat (vocal, facial display, body posture)	Freq	0.00	0.90	0.12	0.24	.31	.180	21		
Tunnel basket test	8 Threat novel elements (tunnel basket)	Dur	0.00	2.40	0.16	0.62	.99	.000	15		
Aggressiveness to humans											
Human interaction test	9 (Attempt to) grab	Freq	0.00	4.50	0.90	1.56	.64	.010	15		
	10 Threaten experimenter	Dur	-	-	-	-	n.o.	n.o.	15		
Masked human test	11 Grab experimenter's stiffed hand	Freq	-	-	-	-	n.o.	n.o.	14		
	12 Threaten masked person/experimenter	Dur	0.00	66.04	21.84	27.56	.54	.040	14		
Social observation	13 (Attempt to) contact aggression (slap, grab, pull, bite) to humans	Freq	0.00	0.90	0.19	0.26	.65	.000	21		
	14 Threat (vocal, facial display, body posture) frequency to humans	Freq	0.00	0.80	0.12	0.19	.61	.000	21		
Arousability											
Blocked food tube test	15 Scratch (near apparatus)	Freq	0.00	85.50	34.04	31.53	.35	.220	14		
	16 Twist around	Freq	0.00	1.00	0.11	0.29	.11	.700	14		
	17 Urine wash (near apparatus)	Freq	0.00	2.00	0.25	0.55	.92	.000	14		
Conveyor belt disconnected test	18 Scratch (near apparatus)	Freq	0.00	69.00	17.04	19.12	.49	.070	14		
	19 Urine wash	Freq	0.00	1.50	0.18	0.46	.75	.000	14		
Furry animal test	20 Pace	Dur	0.00	10.80	0.77	2.89	-.08	.790	14		
	21 Scratch	Freq	0.00	41.00	9.00	11.62	.31	.280	14		

Hidden food test	22	Pace	Dur	0.00	133.76	19.32	42.71	.89	.000	15
	23	Scratch	Freq	7.50	192.00	84.53	50.13	.28	.320	15
Human interaction test	24	Urine wash	Freq	0.00	2.50	0.97	0.74	.17	.550	15
	25	Scratch	Freq	0.00	132.50	52.03	42.50	.56	.030	15
	26	Urine wash	Freq	0.00	3.00	0.50	0.82	.54	.040	15
Large cloth test	27	Pace	Dur	0.00	135.40	10.26	34.95	.03	.920	15
	28	Scratch	Freq	9.00	351.00	116.80	85.40	.42	.120	15
Multiple objects test	29	Scratch	Dur	14.50	163.50	76.96	42.87	.11	.700	14
Preeeding observation	30	Body shake	1/0	0.00	0.05	0.00	0.01	n.a.	n.a.	25
	31	Fear hiccup	1/0	0.00	0.05	0.00	0.01	n.a.	n.a.	25
	32	Pace	1/0	0.00	0.95	0.39	0.21	.59	.000	25
	33	Scratch	1/0	0.05	0.55	0.22	0.14	.30	.150	25
	34	Urine wash	1/0	0.00	0.15	0.03	0.04	.16	.460	25
Social observation	35	Body shake, Focal observation	Freq	-	-	-	-	n.o.	n.o.	21
	36	Scratch, Focal observation	Freq	0.00	4.20	2.13	0.97	.57	.010	21
	37	Urine wash, Focal observation	Freq	0.00	1.10	0.35	0.30	.20	.380	21
Sudden noise test	38	Pace	Dur	0.00	95.36	11.97	24.54	.15	.590	15
	39	Scratch	Freq	0.00	5.36	1.93	1.95	-.07	.810	15
Tunnel basket test	40	Pace	Dur	0.00	243.40	30.89	76.75	-.01	.970	15
Anxiousness										
Furry animal test	41	Fear hiccup	Freq	1.00	27.00	7.57	8.26	.78	.000	14
	42	Stay in opposite half part of the cage (diametrically) than the soft toy	Dur	0.00	97.20	43.16	33.90	.69	.010	14
	43	Approach towards soft toy (2 rows of 3 tiles and space above) -> if 0, set to 120s	Lat	0.00	109.08	50.68	31.65	.72	.000	14
	44	Vocalisation indicating discomfort, anxiety (not hiccup)	Freq	0.00	100.04	40.16	30.44	.65	.010	14
Hidden Food test	45	Fear hiccup	Freq	0.00	7.00	1.10	2.10	.72	.000	15
	46	Not on floor	Dur	9.56	453.88	286.41	120.46	.70	.000	15
Large cloth test	47	Approach closely (5 cm) to novel element -> if 0, set to 600s	Lat	3.12	600.00	93.75	206.06	.02	.950	15
	48	Fear hiccup	Freq	-	-	-	-	n.o.	n.o.	15
	49	Not on floor	Dur	107.88	573.45	308.41	111.47	.43	.112	15

Masked human test	50	Fear hiccup	Freq	0.00	16.00	3.43	5.33	.93	.000	14	
	51	Stay in opposite half part of the cage (diametrically) than the masked human	Dur	0.00	209.04	89.29	60.07	.86	.000	14	
	52	All seeds taken in all trials* \pm	Nr	6.00	14.00	12.14	2.60	.55	.040	14	
	53	Take first pumpkin seed	Lat	9.24	148.84	95.35	42.59	.89	.000	14	
	54	Total nr of pumpkin seeds taken directly from experimenter*	Nr	0.00	11.00	1.50	3.37	.66	.010	14	
	55	Total nr of pumpkin seeds taken during test and redressing of experimenter	Nr	3.00	14.00	10.64	3.79	.68	.008	14	
Multiple objects test	56	Vocalisation indicating discomfort, anxiety (not hiccup)	Dur	0.00	67.44	20.19	25.00	.94	.000	14	
	57	Approach closely to novel elements -> if 0, set to 600s	Lat	0.70	292.38	39.66	75.39	.24	.400	14	
	58	Fear hiccup	Freq	0.00	27.50	2.21	7.34	.05	.870	14	
	59	Vocalisation indicating discomfort, anxiety (not hiccup)	Freq	0.00	206.60	22.36	55.07	.18	.530	14	
Social observation	60	Not on floor	Dur	66.27	545.68	353.45	140.37	.83	.000	14	
	61	Scream, fearful vocalisation	Freq	0.00	0.50	0.10	0.16	.35	.120	21	
	62	Flight	Freq	0.00	0.40	0.07	0.12	.44	.049	21	
Sudden noise test	63	Freeze	Dur	0.00	4.56	0.30	1.18	n.a.	n.a.	15	
	64	Stay in upper half of the cage	Dur	0.00	286.44	101.39	80.80	.56	.030	15	
	65	Vocalisation indicating discomfort, anxiety (not hiccup)	Dur	0.00	2.16	0.34	0.67	.74	.000	15	
Tunnel basket test	66	Approach closely to novel elements (tunnel basket) -> if 0, set to 600s	Lat	2.32	600.00	75.53	154.48	.38	.160	15	
	67	Enter the cage with novel elements (tunnel basket) -> if 0, set to 600s	Lat	0.64	91.08	13.09	24.05	.26	.360	15	
	68	Fear hiccup	Freq	0.00	2.00	0.20	0.56	.39	.150	15	
	69	Stay outside the cage where novel elements are (if parts were taken to the other cage, then the individual was never out)	Dur	62.12	505.60	352.90	121.51	.59	.020	15	
	70	Duration of time spent out before entering the cage with tunnel basket for the first time	Dur	63.76	525.48	365.99	128.83	.57	.030	15	
Competitiveness	Food competition test	71	Not on floor	Dur	40.49	563.81	262.97	167.99	.47	.078	15
		72	Latency to take food in the dyadic competition in sec*	Lat	1.00	4.00	2.00	1.00	.33	.250	14

Curiousness

Large cloth test	73	Contact explore (haptic, oral), i.e. touch	Dur	0.00	348.52	37.10	89.37	.73	.000	15
	74	Non-contact explore (visually, olfactorially), i.e. look, sniff	Dur	0.00	45.84	18.79	15.15	.07	.810	15
Multiple objects test	75	Contact explore (haptically, orally), i.e. touch	Dur	0.00	388.88	122.55	123.13	.87	.000	14
	76	Non-contact explore (visually, olfactorially), i.e. look, sniff	Dur	4.10	120.00	42.96	32.80	.68	.010	14
Novel food test	77	Nr of diverse objects closely inspected	Freq	0.00	6.00	3.46	2.13	.86	.000	14
	78	Difference nr items eaten normal – novel*	Nr	0.00	2.00	0.86	0.89	.75	.000	14
	79	Novel food items eaten (or percentage thereof) [±]	Nr	2.00	4.00	3.14	0.89	.78	.000	14
	80	Difference between latency to take novel - normal food*	Lat	0.96	122.00	50.89	49.24	.33	.240	14
	81	Take novel food*-> if 0, set to 120s [±]	Lat	4.52	125.64	55.63	49.67	.32	.260	14
	82	Difference between exploring novel - normal food	Dur	-1.94	68.08	20.55	21.82	.42	.140	14
Tunnel basket test	83	Contact explore novel food	Dur	28.84	129.64	65.54	31.92	.60	.020	14
	84	Contact explore (haptically, orally), i.e. touch	Dur	0.00	356.92	40.07	91.19	.89	.000	15
	85	Non-contact explore (visually, olfactorially), i.e. look, sniff	Dur	0.00	100.32	19.82	24.96	.87	.000	15

Creativeness/inventiveness

Large cloth test	86	Move around and try to manipulate object	Dur	0.00	267.12	21.51	68.17	.53	.040	15
Multiple objects test	87	Combinatory actions with multiple objects	Dur	0.00	28.98	3.38	8.35	-.09	.750	14
	88	Try to manipulate objects	Dur	0.00	233.18	45.50	74.76	.60	.020	14
Tunnel basket test	89	Try to manipulate objects	Dur	0.00	172.60	19.85	46.14	.76	.000	15

Distractibility

Yoghurt grid test	90	Dusting off yoghurt while the experimenter makes noise	Dur	13.54	119.92	64.28	40.45	.64	.010	14
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Dominance

Food competition test	91	Keep a distance (> 1,5m) to the final winner of the trial already from the session start *	Freq	0.00	100.00	41.00	38.00	.53	.049	14
	92	Gain food items in the dyadic competition (max. 5 per session)	Freq	3.00	100.00	50.00	30.00	.89	.000	14
Social observation	93	Displace (clear take-over of place by another), Focal observation	Freq	0.00	2.60	0.44	0.66	.74	.000	21

	94	Submissive facial display or vocalisation, Focal observation*	Freq	0.00	0.40	0.05	0.10	.75	.000	21
Food orientation										
Blocked food tube test	95	Food call	Dur	0.00	6.92	1.27	2.26	.92	.000	14
Conveyor belt disconnected test	96	Food call	Dur	0.00	4.50	0.93	1.48	-.04	.880	14
Conveyor belt test	97	Turning the wheel	Dur	2.60	13.46	5.75	2.81	.70	.000	14
	98	Food items eaten (or percentage thereof)	Nr	0.60	1.15	0.89	0.15	.57	.030	14
	99	Turning the wheel (measured with a mark on the wheel), 2 turns were needed to move the food item into the cage \pm	Freq	1.20	4.90	2.35	0.85	.54	.046	14
	100	. Start turning the wheel*	Lat	0.63	5.81	2.71	1.89	.54	.049	14
	101	Speed in turning the wheel (= ftrn / dtrn)	Speed	0.28	0.89	0.48	0.16	.62	.018	14
Hidden food test	102	Food call	Freq	0.00	109.66	11.33	27.83	.52	.049	15
Novel food test	103	Normal food items eaten	Nr	4.00	4.00	4.00	0.00	n.a.	n.a.	14
	104	Take normal food -> if 0, set to 120s	Lat	2.96	10.10	4.74	1.84	.17	.560	14
	105	Contact explore normal food	Dur	21.64	80.74	44.99	16.24	.75	.000	14
Prefeeding observation	106	Food call	1/0	0.00	0.60	0.22	0.14	.43	.030	25
	107	Near door	1/0	0.00	0.90	0.36	0.24	.82	.000	25
	108	Vigilant to door	1/0	0.25	1.00	0.70	0.17	.74	.000	25
Social observation	109	Foraging, feeding	Scan	1.00	4.40	2.74	1.11	.56	.010	21
Gregariousness										
Social observation	110	Within 2 arms lengths	Scan	0.00	2.20	0.64	0.56	.59	.010	21
	111	Contact sit	Scan	0.00	1.20	0.32	0.28	.74	.000	21
Impulsiveness										
Blocked food tube test	112	Reach for, bang, knock, grab, bite at panels, tube or apparatus	Freq	1.50	54.00	22.75	15.84	.79	.000	14
Conveyor belt disconnected test	113	Turning the wheel	Dur	25.42	115.44	62.65	26.74	.39	.170	14
	114	Turning the wheel (measured with the mark on the wheel) \pm	Freq	15.50	96.50	42.61	25.13	.61	.000	14
	115	Reach for, bang, knock, grab, bite at panels, tube or apparatus	Freq	0.00	32.50	14.14	11.83	.34	.230	14
	116	Speed in turning the wheel (= ftrn / dtrn)	Speed	0.39	1.00	0.67	0.21	.53	.000	14
Physical activity										

Hidden food test	117	Inactive/rest *	Dur	0.00	88.02	12.18	26.62	.79	.000	15
	118	Move on the spot (> 3 sec) [©]	Dur	114.56	457.63	292.32	105.05	.79	.000	15
	119	Move about	Dur	142.38	485.45	295.50	105.11	.78	.001	15
Large cloth test	120	Inactive/rest *	Dur	0.00	71.56	5.17	18.4	.88	.000	15
	121	Move on the spot (> 3 sec) [©]	Dur	94.55	393.86	244.91	96.95	.48	.072	15
	122	Move about	Dur	206.14	505.45	349.92	92.88	.50	.059	15
Multiple objects test	123	Inactive/rest *	Dur	0.00	39.27	7.30	12.17	-.08	.781	14
	124	Move on the spot (> 3 sec) [©]	Dur	110.78	486.14	319.75	102.86	.76	.002	15
	125	Move about	Dur	113.87	487.22	272.95	104.78	.78	.001	15
Tunnel basket test	126	Inactive/rest *	Dur	0.00	94.56	9.00	24.93	.95	.000	15
	127	Move on the spot (> 3 sec) [©]	Dur	74.04	422.39	258.42	111.33	.44	.098	15
	128	Move about	Dur	177.61	525.96	332.58	113.66	.46	.081	15
Social observation	129	Inactive/rest *	Scan	0.00	0.50	0.09	1.40	.12	.600	21
	130	Move on the spot (> 3 sec) [©]	Scan	0.40	6.10	4.68	1.23	.67	.000	21
	131	Move about	Scan	0.90	2.90	1.81	0.61	.43	.049	21
Persistency										
Foraging test	132	Search inside the wood shavings	Dur	22.28	228.82	118.13	58.82	.70	.010	15
Playfulness										
Multiple objects test	133	Play with objects (repetitive actions)	Dur	-	-	-	-	n.o.	n.o.	14
Social observation	134	Social and solitary play, Focal observation	Freq	0.00	0.50	0.03	0.11	.92	.000	21
	135	Social and solitary play, Focal observation	Dur	0.00	8.00	0.69	2.19	.60	.000	21
Tunnel basket test	136	Play with objects (repetitive actions, moving them about)	Dur	-	-	-	-	n.o.	n.o.	15
Self-Cleanliness										
Social observation	137	Self-groom, self-lick, self-care, Focal observation	Freq	0.00	1.60	0.25	0.35	.47	.030	21
	138	Self-groom, self-lick, self-care, Focal observation	Dur	0.00	23.70	2.03	5.74	.09	.690	21
Social orientation to conspecifics										
Hidden Food test	139	Stay at door to outdoor cage and peer through the slot to group members	Dur	0.00	73.68	23.71	25.65	.81	.000	15
Prefeeding observation	140	Social alert	1/0	0.00	0.95	0.32	0.23	.76	.000	25
Social observation	141	Affiliative act or signal to observer, Focal observation	Freq	0.00	0.40	0.05	0.09	.32	.150	21
	142	Co-feeding within 2 arms length	Scan	0.00	0.10	0.04	0.50	.42	.060	21

	143	Grooming	Scan	0.00	0.50	0.14	0.17	.52	.020	21
Social orientation to humans										
Hidden Food test	144	Scalp lifting and lip-smacking to experimenter	Freq	0.00	26.00	4.50	7.29	.83	.000	15
	145	Stay at grate near observer (first row of tiles and space above and mesh)	Dur	15.12	500.32	217.18	123.74	.55	.030	15
Human interaction test	146	Cling to the mesh directly in front of experimenter	Dur	38.26	165.44	104.24	39.28	.43	.110	15
	147	Scalp lifting and lip-smacking to human	Freq	0.00	2.00	0.13	0.52	.10	.710	15
	148	Stay near experimenter (2 rows of 3 tiles and space above)	Dur	53.14	231.06	162.68	53.62	.71	.000	15
Masked human test	149	Cling to the mesh directly in front of experimenter	Dur	0.00	44.48	13.65	12.67	-.03	.910	14
	150	Scalp lifting and lip-smacking to masked human	Freq	0.00	6.00	0.43	1.60	.99	.000	14
	151	Stay near experimenter (2 rows of 3 tiles and space above)	Dur	17.72	178.68	69.48	53.69	.82	.000	14
Social observation	152	Affiliative act or signal to conspecific, Focal observation	Freq	0.00	5.20	1.07	1.57	.74	.000	21
	153	Close to mesh near observer	Scan	0.00	3.70	0.19	0.10	.77	.000	21
Sexual activity										
Social observation	154	Courtship	Freq	0.00	0.90	0.09	0.24	-.07	.770	21
	155	Courtship	Dur	0.00	89.50	4.53	19.51	.14	.540	21
	156	Mounting	Freq	0.00	0.80	0.09	0.23	.83	.000	21
Vigilance										
Foraging test	157	Nr. of seeds found	Nr	0.00	6.50	4.23	1.71	.64	.010	15
Hidden Food test	158	Total of hidden food items found	Nr	0.00	10.00	6.17	2.76	.34	.210	15
	159	Find the (max. 10) food items* for each trial -> if 0, set to 600s	Lat	149.78	600.00	336.31	162.03	.83	.000	15
Sudden noise test	160	Visually scanning environment	Dur	0.00	34.60	7.72	10.45	.34	.210	15

Note. ¹ Abbreviations for type of measure: Dur = Duration, Freq = Frequency, Lat = Latency, Nr = Number, Scan = Instantaneous record in Scan sampling, 1/0 = One/zero coding; n.o. – no occurrence; n.a. – r_{tt} not available due to lack of occurrence in either of the two blocks of data collection. ² Pearson-correlation r ; significant test-retest correlations are in bold. ³ Scores inversed considering these variables' meaning for the given construct. ⁴ Redundant variables used for calculating some new variables. ⁵ Variables not included in the composite score of Physical activity because the three activity categories are mutually exclusive; a sum score over all categories would be uninformative about individual differences on the construct level.