

Supplemental Information

Genotyping Methods

Genotyping methods for the *rh5-HTTLPR* polymorphism have been described in detail elsewhere (1, 2). Briefly, DNA was isolated from whole blood that was collected from the femoral vein after the animals had been given ketamine anesthesia (15 mg/kg, intramuscular). The serotonin transporter gene promoter region (*rh5-HTTLPR*) was amplified from 25 ng of genomic DNA with flanking oligonucleotide primers (stpr5, 5'-GGCGTTGCCGCTCTGAATGC; intl, 5'-CAGGGGAGATCCTGGGAGGG), in 15- μ L reactions using Platinum Taq and the PCRX Enhancer System kit (Invitrogen, Carlsbad, CA), according to the manufacturer's protocol. Amplifications were performed on a thermocycler (9700) (Perkin-Elmer, Fremont, CA) with 1 cycle at 96°C for 5 minutes followed by 30 cycles of 94°C for 15 seconds, 60°C for 15 seconds, 72°C for 30 seconds, and a final 3-minute extension at 72°C. Amplicons were separated by electrophoresis on a 10% polyacrylamide gel, and the short (s) (398-bp) and long (l) (419-bp) alleles of the *rh5-HTTLPR* were identified by direct visualization following ethidium-bromide staining.

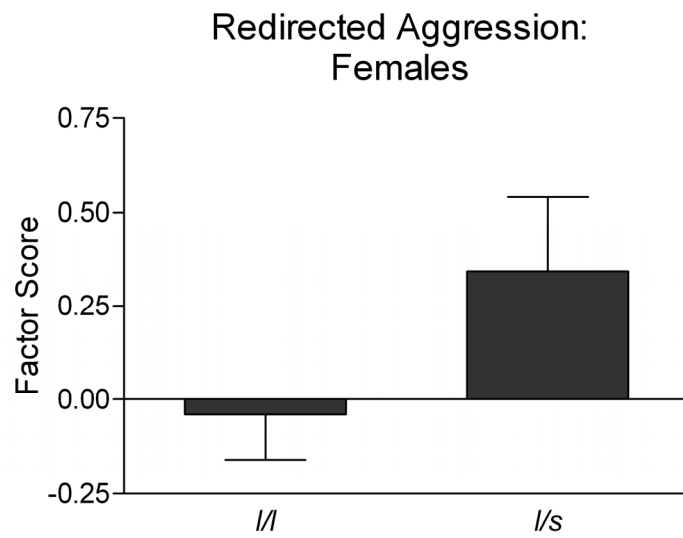


Figure S1. Redirected aggression in females. Although an initial significant effect of genotype was indicated (see Table 2), this effect did not remain significant after the Bonferroni correction for multiple testing.

Table S1. Subject sample characteristics

Sex	<i>n</i>	Mean Age (months)	Age Range	Rearing Condition and <i>rh5-HTTLPR</i> Genotype ^a (<i>n</i>)				Age Group ^b (<i>n</i>)	
				MR, <i>l/l</i>	MR, <i>l/s</i>	NR, <i>l/l</i>	NR, <i>l/s</i>	Subadult	Adult
Males	77	44.4	20.5 - 192.7	21	12	34	10	61	16
Females	106	61.8	26.0 - 156.8	36	19	40	11	60	46
Total	183	54.3	20.5 – 192.7	57	31	74	21	121	62

^a Only 3 males and 1 female had the *s/s* genotype, and these individuals were lumped together with the *l/s* animals for the purpose of analysis.

^b This categorization of age group was only used in the first round of ANOVAs testing for the effects of age and sex. The analysis of rearing condition and genotype effects included age as a continuous covariate

Table S2. Behavior Definitions

Factor	
Individual Behavior Component ^a	Definition
High Risk Aggression:	
Contact aggression to intruder	Aggression involving actual physical contact (e.g., bites, slaps) performed by the test subject towards the intruder.
Receive contact aggression from intruder	Aggression involving actual physical contact (e.g., bites, slaps) performed by the intruder towards the test subject.
Receive non-contact aggression from intruder	Aggression without physical contact (e.g., open-mouth threats) performed by the intruder towards the test subject.
Impulsivity/Novelty-Seeking:	
Latency to Approach the Intruder ^b	The time (in seconds) from the beginning of the test until the test subject first approaches within 1m of the intruder animal (as indicated by a measured circular marking on the floor of the test enclosure).
Approach Intruder	Number of times during the 30 minute test that the test subject approaches within 1m of the intruder animal.
Locomotion	Any self-induced change in location, including by means of walking, running, dropping from the ceiling to the floor, swinging across the cage, bouncing, rolling, hopping on all fours, and “displays.” Social contact (see below) is scored if the subject is locomoting within arm’s reach of another animal. Any locomotor pattern that is repeated more than 3 times, however, is considered a stereotypy (see below).

Gregariousness/Boldness:

Explore Environment	Any active manual, oral, or pedal examination, exploration, or manipulation of the physical environment, or the attempt to do the same. This includes manipulating or playing with chow while eating or drinking, but does not include active play on the substrate, chewing chow, or passively holding an object (food or other).
Social contact with intruder	Sitting, standing, lying, or engaging in locomotion within arm's reach (in reference to the test subject) of the intruder.
Social contact with intruder & cagemate(s)	Sitting, standing, lying, or engaging in locomotion within arm's reach of both the intruder and a cagemate.

Harm Avoidance:

Social contact with cagemate(s)	Sitting, standing, lying, or engaging in locomotion within arm's reach of a cagemate.
Passive	Absence of locomotion, social behaviors, and environmental manipulation. May be accompanied by self-directed behaviors and self-mouthing (see below). Includes bouncing in place.

Redirected Aggression:

Contact aggression to cagemate(s)	Aggression involving actual physical contact (e.g., bites, slaps) performed by the test subject towards a cagemate.
Non-contact aggression to cagemate(s)	Aggression without physical contact (e.g., open-mouth threats) performed by the test subject towards a cagemate.

Behaviors that did not load onto a specific factor:

Self-directed behavior	Includes firm manual or pedal gripping of self (self-clasping), which is not a component of an ongoing behavior. Also includes self-grooming, self-
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Stereotypy/Stypic	scratching, and self mouthing, or sucking (not biting) at any bodily appendage.
Vocalization	Repetitive stereotyped behaviors. A stereotypy is any repetitive, patterned, and rhythmic locomotive movement, initially scored only following the third repetition of the motor act (during the remainder of the test session, it is scored whenever it occurs). A stypic is any <i>non-locomotive</i> stereotyped action such as saluting, picking the teeth, or strumming the mesh. As with stereotypy, stypic is scored initially only after the third repetition, and afterwards whenever it occurs. Any vocal sound emitted by the test subject. Includes coo, bark, screech, squeal, etc. Can be scored with any other behavior. Sounds made by coughing or sneezing are not vocalizations.

^a With the exception of latency to approach the intruder (measured as the time in seconds from the initiation of the test to the first time the test subject approached the intruder), behaviors were scored either in seconds of duration (social contact, explore environment, locomotion, passive, self-directed behaviors, stereotypy/stypic) or as a frequency (vocalization, aggression, and approach intruder).

^b If a test subject did not approach the intruder before the end of the 30 minutes, the latency was recorded as 1800 seconds (i.e., 30 minutes).

Table S3. Results of Factor Analysis

Factor	Eigenvalue	Variance Explained	Behavior	Factor Loadings
High Risk Aggression	3.27	17.2%	Contact aggression to intruder	0.890
			Receive contact aggression from intruder	0.927
			Receive non-contact aggression from intruder	0.738
Impulsivity/Novelty-Seeking	1.84	9.7%	Latency to approach intruder	-0.590
			Approach intruder (Frequency)	0.875
			Locomotion	0.770
Gregariousness/Boldness	1.73	9.1%	Explore environment	0.807
			Social contact with intruder	0.680
			Social contact with intruder & cagemate(s)	0.879
Harm Avoidance	1.64	8.6%	Social contact with cagemate(s)	0.767
			Passive	-0.897
Redirected Aggression	1.40	7.4%	Contact aggression to cagemate(s)	0.812
			Non-contact aggression to cagemate(s)	0.781

1. Barr CS, Newman TK, Shannon C, Parker C, Dvoskin RL, Becker ML, *et al.* (2004): Rearing condition and rh5-HTTLPR interact to influence limbic-hypothalamic-pituitary-adrenal axis response to stress in infant macaques. *Biol Psychiatry* 55:733-738.
2. Bennett AJ, Lesch KP, Heils A, Long J, Lorenz JP, Shoaf S, *et al.* (1999): Serotonin transporter gene variation and early rearing environment interact to affect CSF 5-HIAA concentrations, aggressive behavior, and alcohol consumption in rhesus monkeys. *Behav Genet* 29:349-350.