Supplementary Materials for the manuscript "Spontaneous rhythm discrimination in a mammalian vocal learner" (Verga, Sroka, Varola, Villanueva, Ravignani)

Extended methodology

Animals and husbandry. Research took place in the Netherlands at the Sealcentre Pieterburen, which rescues and rehabilitates more than 150 phocids (family Phocidae) every year. We successfully tested 20 fully rehabilitated harbour seal weaners (11 females), aged ≤ 10 months (as an indication of the developmental stage of our participants, harbour seals typically reach sexual maturity between 3-5 years; [1]). We originally tested 25 seals; 5 of them (2 females) were excluded for the following reasons: two seals' recording sessions did not produce suitable videos because of technical video problems; one seal was distracted by a common fly during the experiment, causing unreliable orienting responses; two seals turned their bodies completely in the box during the experiment, hence ending up facing the camera at rest position. All individuals were born in the wild during the summer of 2018 and arrived at the Sealcentre Pieterburen as parasitic pneumonia patients during the following autumn or winter. Individuals were only tested if they were naïve to any kind of playback and had not shown any sign of anatomical, neurological, or cognitive damage during their rehabilitation. The research was approved by the Sealcentre's veterinarians and adhered to current ethical guidelines [2].

Experimental procedure. Successfully rehabilitated seals were individually tested on the day of their release into the wild. To alleviate visual and auditory distractions, playbacks were performed once each animal was in its transport box (routinely employed, independently of this experiment, to bring a seal to its release site) and in absence of major noises. Since seals in rehabilitation are familiar with being weighed and transported in tightly fitting boxes (approximate size: 53x123x60 cm), we expected short periods of confinement and human interaction to have a limited impact on their baseline behaviour [3]. No animal was kept in the transport boxes for longer than needed for its release for the purpose of this experiment. We exposed each seal to a playback sequence played from an iPhone 5S connected via cable to a JBL Flip 2 speaker (frequency response 100 Hz-20 kHz; Figure 1, main text). The speaker was positioned 30 cm away from the box on the caudal side of the seal to mimic the sound pressure level of a conspecific positioned 1-2 metres away from the subject (SPL = 88.5±5 dB measured with a CHECK MATE CM-130 sound pressure level metre). A Zoom Q8 camera recorded the seal's behaviour at 25 fps in a caudal-to-frontal perspective, with additional light provided by a lamp. An experimenter triggered the playbacks remotely while out of acoustic and visual contact with the animal.

Playbacks. Each seal was exposed to a playback sequence consisting of naturally emitted and unmanipulated mother-attraction calls (MACs) recorded from 2–3-week-old conspecifics. Calls were recorded in 2017 (more than one year before the experiment took place) to ensure that test subjects would be naïve to the experimental sounds. Conspecifics' calls were chosen to enhance the ecological relevance of the experiment while reducing the potential stress caused by heterospecific or human-made sounds. A playback phase consisted of 16 blocks, each lasting between 50s and 100s, depending on the specific factor-level combination. Each block consisted of 21 concatenated identical single MACs (20 minutes in total; Figure 1, main text). Following a full factorial design, each block contained a different combination of two levels of four factors (three rhythmic factors plus the sex of the call emitter; $2^4 = 16$ blocks). The four factors were: 1) tempo: calls were presented in fast (average IOI, namely the sum of call duration and silent gap, of 2000 ms) or slow sequences (average IOI of 4000 ms); 2) length: calls, measured from onset to offset, could be either short (470-485 ms) or long (945-950 ms); 3) regularity: the inter-onset interval (IOI) between calls could be isochronous or random (see [4] for details; of note, the order of the random IOIs was different in each block, thus configuring different random patterns); 4) sex: calls were emitted by male or female conspecifics. Two additional phases of silence (5 minutes each) were added before ("acclimation") and after ("post-playback") the playback phase, bringing the total playback sequence time to 30 minutes. These silent phases were necessary to let the animal acclimate to the new situation, to rest after the experiment, and to measure the potential behavioural differences between these 3 conditions. The order of the 16 blocks within the playback phase was randomised and it was unique for each seal.

Behavioural assessment. Behavioural responses to playbacks were measured with the Behavioural Observation Research Interactive Software (BORIS, v. 7.1.3 - 2018-11-16; [5]). Two trained seal scientists (MGUS and MV) independently annotated the videos according to the orientation method [6–8], a technique commonly used to investigate acoustic perception in several species, from human infants to marine mammals [6,9–11], including pinnipeds [6–8]. The orientation method relies on the fact that animals respond to acoustic stimulation by orienting themselves with head lifts and turns towards the sound source; crucially, these orienting responses may vary according to the nature and content of the stimulus [12–14]. In the transport box, seals were free to turn their heads towards the sound source placed behind them. Seals' reactions were annotated to compute the number of looks towards the camera (i.e., the number of times the head movements resulted in more than 50% of the seal's eye being captured by the camera) and their respective duration (i.e., the time passing from eye presentation until the eye was no longer visible). To account for possible differences in overall duration of blocks, both measures were normalised by the total duration of the block. Raters did not start annotating videos before meeting an intra-rater reliability of ICC > .90 (see below) for a set of randomly chosen training videos. Crucially, videos were blindly coded: all annotations were performed without sound, so that the annotators were unaware of the experimental conditions for each block [15].

Statistics. Statistical analyses were conducted in R (version 4.1.2, https://www.R-project.org/ ; [16] running in R studio (version 1.3.959, http://www.rstudio.com/, [17]). Intra- and inter-rater reliability were computed via the Intraclass Correlation Coefficient (ICC [18,19]; package *irr*) to assess the quality of annotations. Both reliability indexes indicated moderate to good agreement within and between raters (intra-rater reliability ICC > .90, see above; inter-rater reliability ICC > .54); therefore, subsequent analyses were conducted using only annotations made by one of the two raters (MGUS).

We analysed the data in two steps to investigate differences i) resulting from the experimental phases (i.e., acclimation, playback, and post-playback; *phase effects*) and ii) among different playback sequences, due to specific rhythmic aspects (*playback effects*). In all analyses the distribution of each dependent variable was visually inspected via histograms and Cullen and Frey graphs (package *fitdistrplus*); deviations from normality were further statistically investigated (Shapiro-Wilk test, package *stats*) to inform on the choice of either linear or generalized linear mixed effects models [20] (packages *lme4* and *lmerTest*). For all models, bootstrapped 95% confidence intervals were calculated based on 2000 simulations (*confint*, package *stats*). All results were deemed significant at an alpha level of .05.

We analysed *phase effects* (i.e., response differences between acclimation, playback, and post-playback) to confirm that seals would differentiate between silence and stimulation: Phases without acoustic stimulation (acclimation, post-playback) should result in fewer responses compared to phases with acoustic stimulation. To analyse observations during the playback, blocks were summed (number of looks) or averaged (look duration) to produce one data-point, resulting in a total of three observations for each seal (one for acclimation, one for playback, one for post-playback). The resulting variables were modelled using a linear mixed effect model (number of looks) or a generalized linear mixed effect model following a Gamma distribution (duration) and including fixed effects for phase type (acclimation, playback, post-playback) and random by-seal slopes. Post-playback (supposedly eliciting the lowest stress from human handling) was selected as the reference level. The **number of looks** significantly differed between the three experimental phases (statistical model: number of looks ~ phase+(1|seal_id), class lmer) and were further investigated with Tukey post-hoc tests. Post-playback (mean±SE=.01±.01) elicited significantly fewer looks compared to acclimation (.04±.01; model estimate .02±.004, bootstrap 95% CI [.02;.03]) and to playback (.03±.01; model estimate .02±.004, bootstrap 95% CI [.01;.03]). **Duration of looks** was significantly shorter in post-playback (.04±.01) as compared to both acclimation (.13±.03; model estimate 1.25±.30, bootstrap 95% CI [.29; 2.21]) and playback (.18±.04; model estimate 1.59±.29, bootstrap 95% CI [.67;2.56]; statistical model: duration ~ phase+(1|seal_id), class glmer, family Gamma, link log). Thus, the tested seals responded with fewer reactions during the post-playback phase as compared to both acclimation and playback phase. The frequent number of looks of relatively short duration during acclimation may be due to the frequent visual inspection of the new surroundings, supporting the necessity of an acclimation period before starting acoustic stimulation. However, the trend for longer looks in the playback phase suggests increased reactivity to the acoustic stimuli, which confirms that the orientation method can be used to assess the seals' responsiveness to the acoustic stimuli.

Playback effects for both number of looks and their duration were analysed using generalized linear mixed-effects models. The normalisation of the dependent variable number of looks resulted in a highly skewed and zero inflated distribution. Shapiro-Wilk test and visual inspection confirmed a non-normal distribution (S-W = .74, p < .001; estimated skewness = 2.25; estimated kurtosis = 9.38). This data distribution was not suitable for either Gamma or Poisson statistical models, which are otherwise frequently used for count variables. We therefore fitted a simpler linear mixed-effects model including fixed effects for rhythmic conditions (tempo, length, regularity) and random by-seal slope. This model yielded significant results for tempo and length; however, residuals were not normally distributed (Shapiro-Wilk = .93, p < .001; estimated skewness = .89; estimated kurtosis = 6.10). For this reason, we converted the number of looks into a binomial variable by assigning 0 to observations without looks and 1 to observations with one or more looks; this binomial variable was then modelled with a generalized linear model from the binomial family. For both binomial number of looks and duration, we first defined a full model including all possible fixed effects tested in the current experiment, namely tempo, length, regularity, sex of the call emitter, sex of the tested seal and block number (i.e., position in the sequence of 16 different blocks). Besides the rhythmic factor of interest, we wanted to evaluate the effect of sex, as this factor is known to influence the structural and temporal features of harbour seal vocalizations [21]. In addition, block number may inform on the presence of habituation, suggesting differences in predictability or complexity between conditions [22,23]; should there be a habituation effect, we would expect the number of looks or their duration to decrease over time. Random effects included random slopes for each seal to account for individual variability. We progressively reduced this model by comparing the corrected Akaike Information Criterion (AICc) between the full model and simpler models stepwise excluding non-rhythmic fixed effects (i.e., sex of the weaner or call emitter in playback, block number). Both models (i.e., predicting number of looks and duration) led to higher AICc values when including sex and/or block number; in addition, none of these factors were significant in any of the models (for block number: all ps>.22; for sex all ps>.10), suggesting their influence in our experimental design to be unlikely. Thus, the final model included fixed effects for the rhythmic factors and random by-seal slope. We avoided adding interaction terms in the model as we did not have a-priori hypotheses on interactions effects; furthermore, we were concerned about statistical power and the risk of model over-specification. However, in an exploratory addition to our analyses, we run our final model while adding 2-way interaction terms between the three rhythmic factors (i.e., IOI x length, IOI x regularity, and length x regularity) for both number of looks and look duration. None of the interactions was significant (all ps > .26), In addition, the models including the interaction terms resulted in higher AICc values (5 units higher for number of looks and 4 units higher for look duration) compared to the reduced models.

Multiverse analysis. The choices required for data pre-processing and statistical modelling can have a substantial impact on the results of a study, leading to a multitude of different outcomes. Multiverse Analysis (MvA) has been proposed to increase transparency in this process: by conducting not one, but multiple analysis, it is possible to identify which choices have a greater impact on the results [24]. In line with this recommendation, we conducted an MvA to identify the most influential decisions concerning data cleaning, data structuring, and statistical analyses. Yet, it must be stressed that while some decisional nodes provide alternative ways to analyse the data, some choices should nonetheless be driven by empirical and theoretical motivations; for example, the adoption of a statistical model should be informed by the necessary assumptions. This consideration guided the selected models and results reported in the main manuscript.

The multitude of outcomes makes the reporting an MvA a particularly lengthy and cumbersome effort; hence, we report only the MvA analysis regarding our weakest result, namely the impact of the factor regularity, trusting the stronger effects observed for the other factors to be less sensitive to minor decisions.

MvA was conducted the software BOBA [25,26] and implemented in R Studio running R version 4.1.2. [16,17]. Boba has a domain specific language (Boba DSL) for writing multiverse specifications, and a visual analysis interface (Boba Visualizer) for exploring multiverse outcomes. The visual analysis interface facilitates the interpretation of the MvA results, for example by colour coding the decisional tree to highlight particularly influential decisions. This sensitivity measure is calculated by BOBA as the median of all K-S statistic between all pairs of alternatives in a decision node [26].

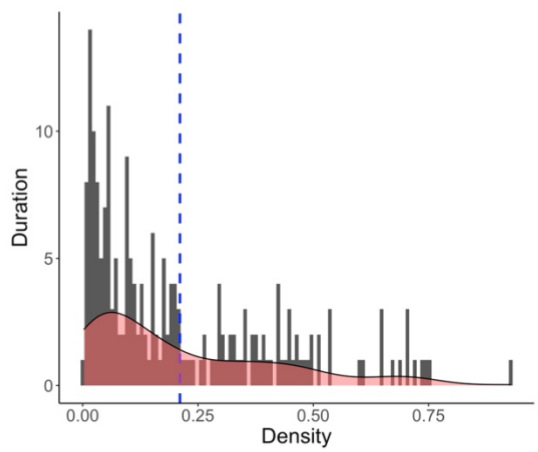
From each multiverse, the following outcomes were evaluated: point estimates, p-values, and uncertainty for the parameter *regularity;* predicted values of the dependent variable based on the chosen statistical model; model fit as expressed by the normalized Root Mean Squared Error (NRMSE) calculated from a k-fold cross-validation. By referring the RMSE to the observed range of the variable, the NRMSE facilitates the comparison between models with different scales as compared to other fit metrics (e.g., Akaike Information Criterion), which should not be used when comparing different classes of models [26].

Concerning *look duration*, we considered six alternative decisional nodes, covering both data preparation and analysis (**Supplementary Table 1;** see **Supplementary Table 3** for an overview):

- *outliers*: one of the seals (seal-258) started the experiment in a resting position, making it potentially an outlier. The choice was then to either retain this seal in the participants' sample, or to remove it.
- *duration*: look duration, as a dependent variable, is strictly dependent on the number of looks. If there are no looks in response to a stimulus, duration can be either coded as a missing value (NA) or as a minimum duration (0s). This decision consequently influences the choice of the statistical family to be employed (see below).
- *model*: our data distribution was particularly problematic as it was severely zero-skewed (**Supplementary Figure 1**). Wanting to fit a mixed-effect model, we opted for three alternative

choices: a) a linear mixed effects model, b) a generalized mixed effect models of the Gamma family, c) a linear mixed effects model fitted on the log-transformed look duration.

- *fixed effects*: besides the experimental manipulations (length, regularity, inter-onset interval, sex of the playback), the choice of fixed effects included other aspects that may impact the outcome, such as the sex of the (tested) seal and the trial number as a proxy for possible habituation effects or fatigue.
- *Random effects*: we identified two main random effects, namely the subject (seal id) and the trial number.
- *Restricted maximum-likelihood:* when fitting linear mixed effects models, maximum likelihood typically gives biased estimates of the variance estimators, i.e., it may either over- or under-estimate the true variance. REML is then used to solve this issue. However, when comparing models with different fixed effects, REML cannot be used, and ML should be used instead (see for example [27]. Because both aims co-existed in our analysis, we added the choice of REML or ML as a decisional node.

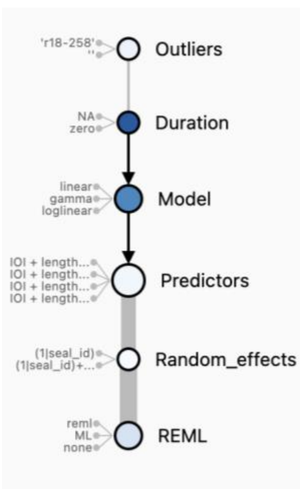


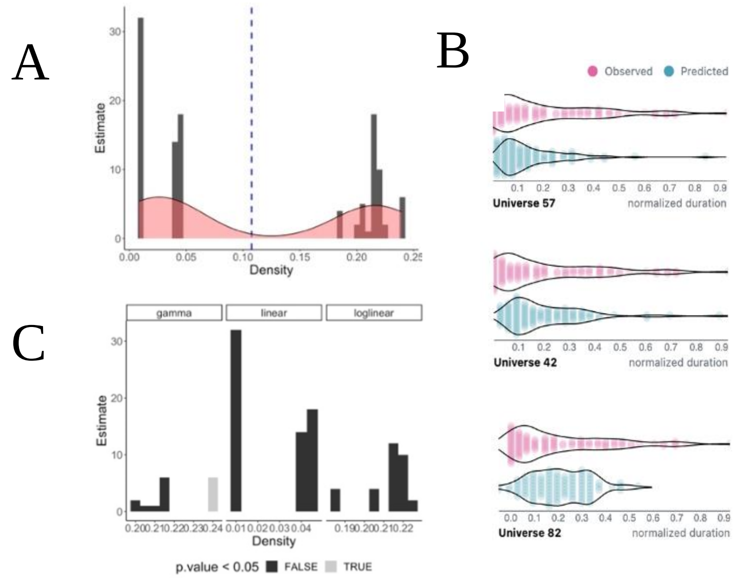
Supplementary Figure 1. Histogram showing data distribution for the dependent variable look duration.

The combination of all decisional nodes led to a total of 112 possible alternatives (or "universes"). None of these universes failed to compute, yet several universes (n = 44, 40%) elicited convergence or singularity warnings, a known issue when fitting (over specified) mixed effects models [28]. The graphic model in **Supplementary Table 1** depicts the decisional nodes color-coded for their relevance: the coding of *duration* and the choice of statistical model emerged as the most influential decisions. Notably, these two decisions are intrinsically linked, as the coding of duration influences the choice of the statistical model (as neither Gamma models nor log-transformations are suitable for 0 values).

The average parameter estimate was .11 ± .10 (median: .05). The distribution of the estimates for the regularity parameter was bimodal (**Supplementary Figure 2**), with a cluster of universes centred around 0 (n = 64) and one cluster centred around .20 (n = 48). Upon closer inspection, the universes clustering around zero exclusively resulted from linear models (n = 64), while higher estimates belonged to either log-linear (n = 32) or gamma models (n = 16). To further investigate this discrepancy, we looked more closely into model fitness, as well as the similarity between observed and predicted model values. The averaged NRMSE was .41 ± .38 (median: .17) across universes. Model fit was on average higher (corresponding to worse fit) for loglinear models (mean 1.01 ± .02) than either gamma models (mean .18 ± .002) or linear models (mean .17 ± .003); the difference between these scores was significant (Kruskal-Wallis test: chi-squared = 81.28, df = 2, p < .001; post-hoc Dunn test: p < .001 for all pairwise comparisons). We then investigated the observed and predicted values for linear and gamma models and concluded that Gamma models yielded more accurate predictions as compared to the other models (**Supplementary Figure 2B and 2C**).

Supplementary Table 1. Summary of the decision nodes concerning either the cleaning and preparation of the data or the statistical approach. The colour coded dots on the left image represent the choices sensitivity based on the Kolmogorov–Smirnov (K–S) statistic, with darker colours indicating duration and model as the most influential decisions (see Liu et al., 2020, for details). For each decision, the table describes the possible alternatives choices, whether a specific decision was conditional on another, and to which dependent variable it was applied (number of looks, look duration, both).

<table>
<tr><th colspan="3">Decisions</th><th>Alternative choices</th><th>Conditional</th></tr>
<tr><td rowspan="6">
</td><td rowspan="2">Data</td><td>Outliers</td><td>None
Seal 258</td><td>no</td></tr>
<tr><td>Duration</td><td>0
NA</td><td>no</td></tr>
<tr><td rowspan="4">Stats</td><td>Model</td><td>Linear
Gamma
Loglinear</td><td>yes (Duration, DV)</td></tr>
<tr><td>Fixed effects</td><td>IOI+length+regularity+trial_nmb+sex_pb+sex
IOI+length+regularity+trial_nmb+sex_pb
IOI+length+regularity+trial_nmb
IOI+length+regularity</td><td>no</td></tr>
<tr><td>Random effects</td><td>(1|seal_id)
(1|seal_id)+(1|trial_nmb)</td><td>no</td></tr>
<tr><td>REML</td><td>True (REML)
False (ML)
None</td><td>yes (Model)</td></tr>
</table>



Supplementary Figure 2. A) Histogram showing the distribution of the parameter estimate for regularity. B) Plot showing the distribution of observed values and predicted estimates for *look duration* in a representative universe for a Gamma model (Universe 57), a log-linear model (Universe 42), and a linear model (Universe 82). The same decisions were applied to each of these universes. C) Distribution of parameter estimates colour coded by p-value significance and faceted according to the model employed. See the **Supplementary Table 3** for an overview.

The effect of regularity was significant only in a small subset of all universes (Universe 33, 34, 35, 36, 37, 38); crucially, it was only significant in those fitting generalized models with the Gamma family, which were those deemed a priori as the most appropriate ones, and excluding seal 258. For these universes, the average estimate was .24 ± .00 with an average p-value of .048 ± .00 and an average NRMSE of .18 ± 0.00.

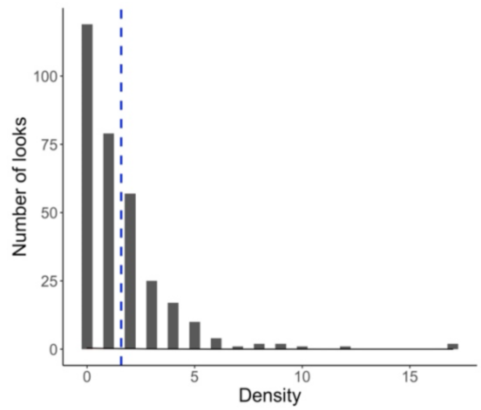
The dependent variable *number of looks* showed a zero inflated distribution. The following choices were implemented, as in the analysis of look duration (see above for details and **Supplementary Table 2** and **Supplementary Table 4** for an overview):

- *outliers*: seal-258 was either removed or not
- *fixed effects*: length, regularity, inter-onset interval, sex of the playback, sex of the (tested) seal, and the trial.
- *Random effects*: seal id and trial number.
- *Restricted maximum-likelihood:* REML vs. ML for linear models.

In addition, some decisions specifically applied to the current dependent variable:

- *model*: the number of looks was a count variable with a severely zero-skewed distribution (**Supplementary Figure 3**). We considered several statistical models: a) a generalized mixed effects model fitting a Poisson distribution, which is typically employed for positive count data; b) a negative binomial mixed effects model, which is a less restrictive generalization of the Poisson model tolerating over dispersion in the data; c) a generalized mixed effects model fitted on the number of looks (excluding trials with no looks) normalized for trial duration using a Gamma distribution; d) a linear mixed effect models fitted on the normalized number of looks;

d) a logistic model applied to the number of looks binarized to express the probability of having one or more look against not having looks. Notably, the use of each of these models relies on linked decisions concerning the transformation of the dependent variable (for example, via binarization or normalization). For example, Poisson and negative binomial models cannot be used for non-count data; hence, the normalization of our dependent variable required the adoption of a different statistical model.

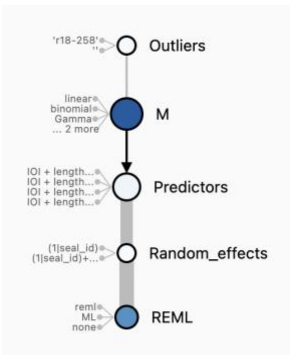


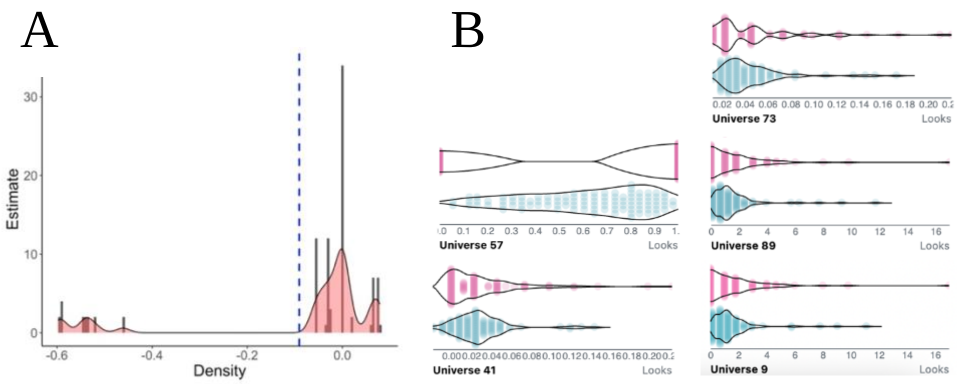
Supplementary Figure 3. Histogram showing the data distribution for the dependent variable look duration.

In total, the combination of 5 main decisional nodes resulted in 96 universes. 16 (17%) universes elicited warning messages due to convergence or singularity issues. The average parameter estimate was -.09 ± .21, with a distribution in two main clusters. The predominant cluster was centred around 0, deriving from linear, Gamma, Poisson, and negative binomial models, while binomial models resulted in lower estimates. Model fit on average was .16 ± .11, denoting a moderately good fit with mild variation across universes. Because model selection once again represented a most relevant decisional node, we looked more in detail into the differences between models Kruskal-Wallis test: chi-squared = 79.87, df = 4, $p < .001$; post-hoc Dunn test: $p < .001$ for all pairwise comparisons except between negative binomial and Poisson models). Linear and binomial models had the highest NRMSE (binomial = .51 ± .01; linear = .18 ± .002), indicating worse fit compared to the other models (NRMSE = .14 ± .00 for all models).

Six universes yielded significant estimates for *regularity*; these universes were all fitting binomial models in which all seals were retained as subjects. The average p-value for these universes was .032 ± .001, corresponding to an average parameter estimate of - .60 ± .003.

Supplementary Table 2. Summary of the decision nodes concerning either the cleaning and preparation of the data or the statistical approach. The colour coded dots on the left image represent the choices sensitivity based on the K–S statistic (see Liu et al., 2020, for details). For each decision, the table describes the possible alternatives choices, whether a specific decision was conditional on another, and to which dependent variable it was applied (number of looks, look duration, both).

Decisions			*Alternative choices*	*Conditional*
	Data	Outliers	None Seal 258	no
	Stats	Model	Linear Binomial Gamma Poisson Negative Binomial	Yes (DV)
		Fixed effects	IOI+length+regularity+trial_nmb+sex_pb+sex IOI+length+regularity+trial_nmb+sex_pb IOI+length+regularity+trial_nmb IOI+length+regularity	no
		Random effects	(1|seal_id) (1|seal_id)+(1|trial_nmb)	no
		REML	True (REML) False (ML) None	yes (Model)



Supplementary Figure 4. A) Histogram showing the distribution of the parameter estimate for regularity. B) Plot showing the distribution of observed values and predicted estimates for *number of looks* in a representative universe for a Gamma model (Universe 73), a binomial model (Universe 57), a linear model (Universe 41), a negative binomial model (Universe 9), and a Poisson model (Universe 89). The same decisions were applied to each of these universes. See the **Supplementary Table 4** for an overview.

Supplementary Table 3. Overview of all possible combinations of choices for the dependent variable *look duration*.

	Filename	outliers	predictors	random_effects	duration	model	REML
1	universe_1.R	'r18-258'	IOI + length + regularity + trial_nmb + sex_pb + sex	(1|seal_id)	zero	linear	reml
2	universe_2.R	'r18-258'	IOI + length + regularity + trial_nmb + sex_pb + sex	(1|seal_id)+(1|trial_nmb)	zero	linear	reml
3	universe_3.R	'r18-258'	IOI + length + regularity + trial_nmb + sex_pb	(1|seal_id)	zero	linear	reml
4	universe_4.R	'r18-258'	IOI + length + regularity + trial_nmb + sex_pb	(1|seal_id)+(1|trial_nmb)	zero	linear	reml
5	universe_5.R	'r18-258'	IOI + length + regularity + trial_nmb	(1|seal_id)	zero	linear	reml
6	universe_6.R	'r18-258'	IOI + length + regularity + trial_nmb	(1|seal_id)+(1|trial_nmb)	zero	linear	reml
7	universe_7.R	'r18-258'	IOI + length + regularity	(1|seal_id)	zero	linear	reml
8	universe_8.R	'r18-258'	IOI + length + regularity	(1|seal_id)+(1|trial_nmb)	zero	linear	reml
9	universe_9.R	''	IOI + length + regularity + trial_nmb + sex_pb + sex	(1|seal_id)	zero	linear	reml
10	universe_10.R	''	IOI + length + regularity + trial_nmb + sex_pb + sex	(1|seal_id)+(1|trial_nmb)	zero	linear	reml
11	universe_11.R	''	IOI + length + regularity + trial_nmb + sex_pb	(1|seal_id)	zero	linear	reml
12	universe_12.R	''	IOI + length + regularity + trial_nmb + sex_pb	(1|seal_id)+(1|trial_nmb)	zero	linear	reml
13	universe_13.R	''	IOI + length + regularity + trial_nmb	(1|seal_id)	zero	linear	reml
14	universe_14.R	''	IOI + length + regularity + trial_nmb	(1|seal_id)+(1|trial_nmb)	zero	linear	reml
15	universe_15.R	''	IOI + length + regularity	(1|seal_id)	zero	linear	reml
16	universe_16.R	''	IOI + length + regularity	(1|seal_id)+(1|trial_nmb)	zero	linear	reml
17	universe_17.R	'r18-258'	IOI + length + regularity + trial_nmb + sex_pb + sex	(1|seal_id)	zero	linear	ML
18	universe_18.R	'r18-258'	IOI + length + regularity + trial_nmb + sex_pb + sex	(1|seal_id)+(1|trial_nmb)	zero	linear	ML
19	universe_19.R	'r18-258'	IOI + length + regularity + trial_nmb + sex_pb	(1|seal_id)	zero	linear	ML
20	universe_20.R	'r18-258'	IOI + length + regularity + trial_nmb + sex_pb	(1|seal_id)+(1|trial_nmb)	zero	linear	ML
21	universe_21.R	'r18-258'	IOI + length + regularity + trial_nmb	(1|seal_id)	zero	linear	ML
22	universe_22.R	'r18-258'	IOI + length + regularity + trial_nmb	(1|seal_id)+(1|trial_nmb)	zero	linear	ML
23	universe_23.R	'r18-258'	IOI + length + regularity	(1|seal_id)	zero	linear	ML

24	universe_24.R	'r18-258'	IOI + length + regularity	(1|seal_id)+(1|trial_nmb)	zero	linear	ML
25	universe_25.R	"	IOI + length + regularity + trial_nmb + sex_pb + sex	(1|seal_id)	zero	linear	ML
26	universe_26.R	"	IOI + length + regularity + trial_nmb + sex_pb + sex	(1|seal_id)+(1|trial_nmb)	zero	linear	ML
27	universe_27.R	"	IOI + length + regularity + trial_nmb + sex_pb	(1|seal_id)	zero	linear	ML
28	universe_28.R	"	IOI + length + regularity + trial_nmb + sex_pb	(1|seal_id)+(1|trial_nmb)	zero	linear	ML
29	universe_29.R	"	IOI + length + regularity + trial_nmb	(1|seal_id)	zero	linear	ML
30	universe_30.R	"	IOI + length + regularity + trial_nmb	(1|seal_id)+(1|trial_nmb)	zero	linear	ML
31	universe_31.R	"	IOI + length + regularity	(1|seal_id)	zero	linear	ML
32	universe_32.R	"	IOI + length + regularity	(1|seal_id)+(1|trial_nmb)	zero	linear	ML
33	universe_33.R	'r18-258'	IOI + length + regularity + trial_nmb + sex_pb + sex	(1|seal_id)	NA	gamma	none
34	universe_34.R	'r18-258'	IOI + length + regularity + trial_nmb + sex_pb + sex	(1|seal_id)+(1|trial_nmb)	NA	gamma	none
35	universe_35.R	'r18-258'	IOI + length + regularity + trial_nmb + sex_pb	(1|seal_id)	NA	gamma	none
36	universe_36.R	'r18-258'	IOI + length + regularity + trial_nmb + sex_pb	(1|seal_id)+(1|trial_nmb)	NA	gamma	none
37	universe_37.R	'r18-258'	IOI + length + regularity + trial_nmb	(1|seal_id)	NA	gamma	none
38	universe_38.R	'r18-258'	IOI + length + regularity + trial_nmb	(1|seal_id)+(1|trial_nmb)	NA	gamma	none
39	universe_39.R	'r18-258'	IOI + length + regularity	(1|seal_id)	NA	gamma	none
40	universe_40.R	'r18-258'	IOI + length + regularity	(1|seal_id)+(1|trial_nmb)	NA	gamma	none
41	universe_41.R	"	IOI + length + regularity + trial_nmb + sex_pb + sex	(1|seal_id)	NA	gamma	none
42	universe_42.R	"	IOI + length + regularity + trial_nmb + sex_pb + sex	(1|seal_id)+(1|trial_nmb)	NA	gamma	none
43	universe_43.R	"	IOI + length + regularity + trial_nmb + sex_pb	(1|seal_id)	NA	gamma	none
44	universe_44.R	"	IOI + length + regularity + trial_nmb + sex_pb	(1|seal_id)+(1|trial_nmb)	NA	gamma	none
45	universe_45.R	"	IOI + length + regularity + trial_nmb	(1|seal_id)	NA	gamma	none
46	universe_46.R	"	IOI + length + regularity + trial_nmb	(1|seal_id)+(1|trial_nmb)	NA	gamma	none
47	universe_47.R	"	IOI + length + regularity	(1|seal_id)	NA	gamma	none
48	universe_48.R	"	IOI + length + regularity	(1|seal_id)+(1|trial_nmb)	NA	gamma	none
49	universe_49.R	'r18-258'	IOI + length + regularity + trial_nmb + sex_pb + sex	(1|seal_id)	NA	loglinear	ML

50	universe_50.R	'r18-258'	IOI + length + regularity + trial_nmb + sex_pb + sex	(1|seal_id)+(1|trial_nmb)	NA	loglinear	ML
51	universe_51.R	'r18-258'	IOI + length + regularity + trial_nmb + sex_pb	(1|seal_id)	NA	loglinear	ML
52	universe_52.R	'r18-258'	IOI + length + regularity + trial_nmb + sex_pb	(1|seal_id)+(1|trial_nmb)	NA	loglinear	ML
53	universe_53.R	'r18-258'	IOI + length + regularity + trial_nmb	(1|seal_id)	NA	loglinear	ML
54	universe_54.R	'r18-258'	IOI + length + regularity + trial_nmb	(1|seal_id)+(1|trial_nmb)	NA	loglinear	ML
55	universe_55.R	'r18-258'	IOI + length + regularity	(1|seal_id)	NA	loglinear	ML
56	universe_56.R	'r18-258'	IOI + length + regularity	(1|seal_id)+(1|trial_nmb)	NA	loglinear	ML
57	universe_57.R	''	IOI + length + regularity + trial_nmb + sex_pb + sex	(1|seal_id)	NA	loglinear	ML
58	universe_58.R	''	IOI + length + regularity + trial_nmb + sex_pb + sex	(1|seal_id)+(1|trial_nmb)	NA	loglinear	ML
59	universe_59.R	''	IOI + length + regularity + trial_nmb + sex_pb	(1|seal_id)	NA	loglinear	ML
60	universe_60.R	''	IOI + length + regularity + trial_nmb + sex_pb	(1|seal_id)+(1|trial_nmb)	NA	loglinear	ML
61	universe_61.R	''	IOI + length + regularity + trial_nmb	(1|seal_id)	NA	loglinear	ML
62	universe_62.R	''	IOI + length + regularity + trial_nmb	(1|seal_id)+(1|trial_nmb)	NA	loglinear	ML
63	universe_63.R	''	IOI + length + regularity	(1|seal_id)	NA	loglinear	ML
64	universe_64.R	''	IOI + length + regularity	(1|seal_id)+(1|trial_nmb)	NA	loglinear	ML
65	universe_65.R	'r18-258'	IOI + length + regularity + trial_nmb + sex_pb + sex	(1|seal_id)	NA	loglinear	reml
66	universe_66.R	'r18-258'	IOI + length + regularity + trial_nmb + sex_pb + sex	(1|seal_id)+(1|trial_nmb)	NA	loglinear	reml
67	universe_67.R	'r18-258'	IOI + length + regularity + trial_nmb + sex_pb	(1|seal_id)	NA	loglinear	reml
68	universe_68.R	'r18-258'	IOI + length + regularity + trial_nmb + sex_pb	(1|seal_id)+(1|trial_nmb)	NA	loglinear	reml
69	universe_69.R	'r18-258'	IOI + length + regularity + trial_nmb	(1|seal_id)	NA	loglinear	reml
70	universe_70.R	'r18-258'	IOI + length + regularity + trial_nmb	(1|seal_id)+(1|trial_nmb)	NA	loglinear	reml
71	universe_71.R	'r18-258'	IOI + length + regularity	(1|seal_id)	NA	loglinear	reml
72	universe_72.R	'r18-258'	IOI + length + regularity	(1|seal_id)+(1|trial_nmb)	NA	loglinear	reml
73	universe_73.R	''	IOI + length + regularity + trial_nmb + sex_pb + sex	(1|seal_id)	NA	loglinear	reml
74	universe_74.R	''	IOI + length + regularity + trial_nmb + sex_pb + sex	(1|seal_id)+(1|trial_nmb)	NA	loglinear	reml
75	universe_75.R	''	IOI + length + regularity + trial_nmb + sex_pb	(1|seal_id)	NA	loglinear	reml

76	universe_76.R	"	IOI + length + regularity + trial_nmb + sex_pb	(1|seal_id)+(1|trial_nmb)	NA	loglinear	reml
77	universe_77.R	"	IOI + length + regularity + trial_nmb	(1|seal_id)	NA	loglinear	reml
78	universe_78.R	"	IOI + length + regularity + trial_nmb	(1|seal_id)+(1|trial_nmb)	NA	loglinear	reml
79	universe_79.R	"	IOI + length + regularity	(1|seal_id)	NA	loglinear	reml
80	universe_80.R	"	IOI + length + regularity	(1|seal_id)+(1|trial_nmb)	NA	loglinear	reml
81	universe_81.R	'r18-258'	IOI + length + regularity + trial_nmb + sex_pb + sex	(1|seal_id)	NA	linear	reml
82	universe_82.R	'r18-258'	IOI + length + regularity + trial_nmb + sex_pb + sex	(1|seal_id)+(1|trial_nmb)	NA	linear	reml
83	universe_83.R	'r18-258'	IOI + length + regularity + trial_nmb + sex_pb	(1|seal_id)	NA	linear	reml
84	universe_84.R	'r18-258'	IOI + length + regularity + trial_nmb + sex_pb	(1|seal_id)+(1|trial_nmb)	NA	linear	reml
85	universe_85.R	'r18-258'	IOI + length + regularity + trial_nmb	(1|seal_id)	NA	linear	reml
86	universe_86.R	'r18-258'	IOI + length + regularity + trial_nmb	(1|seal_id)+(1|trial_nmb)	NA	linear	reml
87	universe_87.R	'r18-258'	IOI + length + regularity	(1|seal_id)	NA	linear	reml
88	universe_88.R	'r18-258'	IOI + length + regularity	(1|seal_id)+(1|trial_nmb)	NA	linear	reml
89	universe_89.R	"	IOI + length + regularity + trial_nmb + sex_pb + sex	(1|seal_id)	NA	linear	reml
90	universe_90.R	"	IOI + length + regularity + trial_nmb + sex_pb + sex	(1|seal_id)+(1|trial_nmb)	NA	linear	reml
91	universe_91.R	"	IOI + length + regularity + trial_nmb + sex_pb	(1|seal_id)	NA	linear	reml
92	universe_92.R	"	IOI + length + regularity + trial_nmb + sex_pb	(1|seal_id)+(1|trial_nmb)	NA	linear	reml
93	universe_93.R	"	IOI + length + regularity + trial_nmb	(1|seal_id)	NA	linear	reml
94	universe_94.R	"	IOI + length + regularity + trial_nmb	(1|seal_id)+(1|trial_nmb)	NA	linear	reml
95	universe_95.R	"	IOI + length + regularity	(1|seal_id)	NA	linear	reml
96	universe_96.R	"	IOI + length + regularity	(1|seal_id)+(1|trial_nmb)	NA	linear	reml
97	universe_97.R	'r18-258'	IOI + length + regularity + trial_nmb + sex_pb + sex	(1|seal_id)	NA	linear	ML
98	universe_98.R	'r18-258'	IOI + length + regularity + trial_nmb + sex_pb + sex	(1|seal_id)+(1|trial_nmb)	NA	linear	ML
99	universe_99.R	'r18-258'	IOI + length + regularity + trial_nmb + sex_pb	(1|seal_id)	NA	linear	ML
100	universe_100.R	'r18-258'	IOI + length + regularity + trial_nmb + sex_pb	(1|seal_id)+(1|trial_nmb)	NA	linear	ML
101	universe_101.R	'r18-258'	IOI + length + regularity + trial_nmb	(1|seal_id)	NA	linear	ML

102	universe_102.R	'r18-258'	IOI + length + regularity + trial_nmb	(1|seal_id)+(1|trial_nmb)	NA	linear	ML
103	universe_103.R	'r18-258'	IOI + length + regularity	(1|seal_id)	NA	linear	ML
104	universe_104.R	'r18-258'	IOI + length + regularity	(1|seal_id)+(1|trial_nmb)	NA	linear	ML
105	universe_105.R	''	IOI + length + regularity + trial_nmb + sex_pb + sex	(1|seal_id)	NA	linear	ML
106	universe_106.R	''	IOI + length + regularity + trial_nmb + sex_pb + sex	(1|seal_id)+(1|trial_nmb)	NA	linear	ML
107	universe_107.R	''	IOI + length + regularity + trial_nmb + sex_pb	(1|seal_id)	NA	linear	ML
108	universe_108.R	''	IOI + length + regularity + trial_nmb + sex_pb	(1|seal_id)+(1|trial_nmb)	NA	linear	ML
109	universe_109.R	''	IOI + length + regularity + trial_nmb	(1|seal_id)	NA	linear	ML
110	universe_110.R	''	IOI + length + regularity + trial_nmb	(1|seal_id)+(1|trial_nmb)	NA	linear	ML
111	universe_111.R	''	IOI + length + regularity	(1|seal_id)	NA	linear	ML
112	universe_112.R	''	IOI + length + regularity	(1|seal_id)+(1|trial_nmb)	NA	linear	ML

Supplementary Table 4. Overview of all possible combinations of choices for the dependent variable *number of looks*.

	Filename	outliers	predictors	random_effects	M	REML
1	universe_1.R	'r18-258'	IOI + length + regularity + trial_nmb + sex_pb + sex	(1|seal_id)	negbin	none
2	universe_2.R	'r18-258'	IOI + length + regularity + trial_nmb + sex_pb + sex	(1|seal_id)+(1|trial_nmb)	negbin	none
3	universe_3.R	'r18-258'	IOI + length + regularity + trial_nmb + sex_pb	(1|seal_id)	negbin	none
4	universe_4.R	'r18-258'	IOI + length + regularity + trial_nmb + sex_pb	(1|seal_id)+(1|trial_nmb)	negbin	none
5	universe_5.R	'r18-258'	IOI + length + regularity + trial_nmb	(1|seal_id)	negbin	none
6	universe_6.R	'r18-258'	IOI + length + regularity + trial_nmb	(1|seal_id)+(1|trial_nmb)	negbin	none
7	universe_7.R	'r18-258'	IOI + length + regularity	(1|seal_id)	negbin	none
8	universe_8.R	'r18-258'	IOI + length + regularity	(1|seal_id)+(1|trial_nmb)	negbin	none
9	universe_9.R	''	IOI + length + regularity + trial_nmb + sex_pb + sex	(1|seal_id)	negbin	none
10	universe_10.R	''	IOI + length + regularity + trial_nmb + sex_pb + sex	(1|seal_id)+(1|trial_nmb)	negbin	none

11	universe_11.R	"	IOI + length + regularity + trial_nmb + sex_pb	(1|seal_id)	negbin	none
12	universe_12.R	"	IOI + length + regularity + trial_nmb + sex_pb	(1|seal_id)+(1|trial_nmb)	negbin	none
13	universe_13.R	"	IOI + length + regularity + trial_nmb	(1|seal_id)	negbin	none
14	universe_14.R	"	IOI + length + regularity + trial_nmb	(1|seal_id)+(1|trial_nmb)	negbin	none
15	universe_15.R	"	IOI + length + regularity	(1|seal_id)	negbin	none
16	universe_16.R	"	IOI + length + regularity	(1|seal_id)+(1|trial_nmb)	negbin	none
17	universe_17.R	'r18-258'	IOI + length + regularity + trial_nmb + sex_pb + sex	(1|seal_id)	linear	ML
18	universe_18.R	'r18-258'	IOI + length + regularity + trial_nmb + sex_pb + sex	(1|seal_id)+(1|trial_nmb)	linear	ML
19	universe_19.R	'r18-258'	IOI + length + regularity + trial_nmb + sex_pb	(1|seal_id)	linear	ML
20	universe_20.R	'r18-258'	IOI + length + regularity + trial_nmb + sex_pb	(1|seal_id)+(1|trial_nmb)	linear	ML
21	universe_21.R	'r18-258'	IOI + length + regularity + trial_nmb	(1|seal_id)	linear	ML
22	universe_22.R	'r18-258'	IOI + length + regularity + trial_nmb	(1|seal_id)+(1|trial_nmb)	linear	ML
23	universe_23.R	'r18-258'	IOI + length + regularity	(1|seal_id)	linear	ML
24	universe_24.R	'r18-258'	IOI + length + regularity	(1|seal_id)+(1|trial_nmb)	linear	ML
25	universe_25.R	"	IOI + length + regularity + trial_nmb + sex_pb + sex	(1|seal_id)	linear	ML
26	universe_26.R	"	IOI + length + regularity + trial_nmb + sex_pb + sex	(1|seal_id)+(1|trial_nmb)	linear	ML
27	universe_27.R	"	IOI + length + regularity + trial_nmb + sex_pb	(1|seal_id)	linear	ML
28	universe_28.R	"	IOI + length + regularity + trial_nmb + sex_pb	(1|seal_id)+(1|trial_nmb)	linear	ML
29	universe_29.R	"	IOI + length + regularity + trial_nmb	(1|seal_id)	linear	ML
30	universe_30.R	"	IOI + length + regularity + trial_nmb	(1|seal_id)+(1|trial_nmb)	linear	ML
31	universe_31.R	"	IOI + length + regularity	(1|seal_id)	linear	ML
32	universe_32.R	"	IOI + length + regularity	(1|seal_id)+(1|trial_nmb)	linear	ML
33	universe_33.R	'r18-258'	IOI + length + regularity + trial_nmb + sex_pb + sex	(1|seal_id)	linear	reml
34	universe_34.R	'r18-258'	IOI + length + regularity + trial_nmb + sex_pb + sex	(1|seal_id)+(1|trial_nmb)	linear	reml
35	universe_35.R	'r18-258'	IOI + length + regularity + trial_nmb + sex_pb	(1|seal_id)	linear	reml
36	universe_36.R	'r18-258'	IOI + length + regularity + trial_nmb + sex_pb	(1|seal_id)+(1|trial_nmb)	linear	reml

37	universe_37.R	'r18-258'	IOI + length + regularity + trial_nmb	(1|seal_id)	linear	reml
38	universe_38.R	'r18-258'	IOI + length + regularity + trial_nmb	(1|seal_id)+(1|trial_nmb)	linear	reml
39	universe_39.R	'r18-258'	IOI + length + regularity	(1|seal_id)	linear	reml
40	universe_40.R	'r18-258'	IOI + length + regularity	(1|seal_id)+(1|trial_nmb)	linear	reml
41	universe_41.R	''	IOI + length + regularity + trial_nmb + sex_pb + sex	(1|seal_id)	linear	reml
42	universe_42.R	''	IOI + length + regularity + trial_nmb + sex_pb + sex	(1|seal_id)+(1|trial_nmb)	linear	reml
43	universe_43.R	''	IOI + length + regularity + trial_nmb + sex_pb	(1|seal_id)	linear	reml
44	universe_44.R	''	IOI + length + regularity + trial_nmb + sex_pb	(1|seal_id)+(1|trial_nmb)	linear	reml
45	universe_45.R	''	IOI + length + regularity + trial_nmb	(1|seal_id)	linear	reml
46	universe_46.R	''	IOI + length + regularity + trial_nmb	(1|seal_id)+(1|trial_nmb)	linear	reml
47	universe_47.R	''	IOI + length + regularity	(1|seal_id)	linear	reml
48	universe_48.R	''	IOI + length + regularity	(1|seal_id)+(1|trial_nmb)	linear	reml
49	universe_49.R	'r18-258'	IOI + length + regularity + trial_nmb + sex_pb + sex	(1|seal_id)	binomial	none
50	universe_50.R	'r18-258'	IOI + length + regularity + trial_nmb + sex_pb + sex	(1|seal_id)+(1|trial_nmb)	binomial	none
51	universe_51.R	'r18-258'	IOI + length + regularity + trial_nmb + sex_pb	(1|seal_id)	binomial	none
52	universe_52.R	'r18-258'	IOI + length + regularity + trial_nmb + sex_pb	(1|seal_id)+(1|trial_nmb)	binomial	none
53	universe_53.R	'r18-258'	IOI + length + regularity + trial_nmb	(1|seal_id)	binomial	none
54	universe_54.R	'r18-258'	IOI + length + regularity + trial_nmb	(1|seal_id)+(1|trial_nmb)	binomial	none
55	universe_55.R	'r18-258'	IOI + length + regularity	(1|seal_id)	binomial	none
56	universe_56.R	'r18-258'	IOI + length + regularity	(1|seal_id)+(1|trial_nmb)	binomial	none
57	universe_57.R	''	IOI + length + regularity + trial_nmb + sex_pb + sex	(1|seal_id)	binomial	none
58	universe_58.R	''	IOI + length + regularity + trial_nmb + sex_pb + sex	(1|seal_id)+(1|trial_nmb)	binomial	none
59	universe_59.R	''	IOI + length + regularity + trial_nmb + sex_pb	(1|seal_id)	binomial	none
60	universe_60.R	''	IOI + length + regularity + trial_nmb + sex_pb	(1|seal_id)+(1|trial_nmb)	binomial	none
61	universe_61.R	''	IOI + length + regularity + trial_nmb	(1|seal_id)	binomial	none
62	universe_62.R	''	IOI + length + regularity + trial_nmb	(1|seal_id)+(1|trial_nmb)	binomial	none

63	universe_63.R	"	IOI + length + regularity	(1|seal_id)	binomial	none
64	universe_64.R	"	IOI + length + regularity	(1|seal_id)+(1|trial_nmb)	binomial	none
65	universe_65.R	'r18-258'	IOI + length + regularity + trial_nmb + sex_pb + sex	(1|seal_id)	Gamma	none
66	universe_66.R	'r18-258'	IOI + length + regularity + trial_nmb + sex_pb + sex	(1|seal_id)+(1|trial_nmb)	Gamma	none
67	universe_67.R	'r18-258'	IOI + length + regularity + trial_nmb + sex_pb	(1|seal_id)	Gamma	none
68	universe_68.R	'r18-258'	IOI + length + regularity + trial_nmb + sex_pb	(1|seal_id)+(1|trial_nmb)	Gamma	none
69	universe_69.R	'r18-258'	IOI + length + regularity + trial_nmb	(1|seal_id)	Gamma	none
70	universe_70.R	'r18-258'	IOI + length + regularity + trial_nmb	(1|seal_id)+(1|trial_nmb)	Gamma	none
71	universe_71.R	'r18-258'	IOI + length + regularity	(1|seal_id)	Gamma	none
72	universe_72.R	'r18-258'	IOI + length + regularity	(1|seal_id)+(1|trial_nmb)	Gamma	none
73	universe_73.R	"	IOI + length + regularity + trial_nmb + sex_pb + sex	(1|seal_id)	Gamma	none
74	universe_74.R	"	IOI + length + regularity + trial_nmb + sex_pb + sex	(1|seal_id)+(1|trial_nmb)	Gamma	none
75	universe_75.R	"	IOI + length + regularity + trial_nmb + sex_pb	(1|seal_id)	Gamma	none
76	universe_76.R	"	IOI + length + regularity + trial_nmb + sex_pb	(1|seal_id)+(1|trial_nmb)	Gamma	none
77	universe_77.R	"	IOI + length + regularity + trial_nmb	(1|seal_id)	Gamma	none
78	universe_78.R	"	IOI + length + regularity + trial_nmb	(1|seal_id)+(1|trial_nmb)	Gamma	none
79	universe_79.R	"	IOI + length + regularity	(1|seal_id)	Gamma	none
80	universe_80.R	"	IOI + length + regularity	(1|seal_id)+(1|trial_nmb)	Gamma	none
81	universe_81.R	'r18-258'	IOI + length + regularity + trial_nmb + sex_pb + sex	(1|seal_id)	poisson	none
82	universe_82.R	'r18-258'	IOI + length + regularity + trial_nmb + sex_pb + sex	(1|seal_id)+(1|trial_nmb)	poisson	none
83	universe_83.R	'r18-258'	IOI + length + regularity + trial_nmb + sex_pb	(1|seal_id)	poisson	none
84	universe_84.R	'r18-258'	IOI + length + regularity + trial_nmb + sex_pb	(1|seal_id)+(1|trial_nmb)	poisson	none
85	universe_85.R	'r18-258'	IOI + length + regularity + trial_nmb	(1|seal_id)	poisson	none
86	universe_86.R	'r18-258'	IOI + length + regularity + trial_nmb	(1|seal_id)+(1|trial_nmb)	poisson	none
87	universe_87.R	'r18-258'	IOI + length + regularity	(1|seal_id)	poisson	none
88	universe_88.R	'r18-258'	IOI + length + regularity	(1|seal_id)+(1|trial_nmb)	poisson	none

89	universe_89.R	"	IOI + length + regularity + trial_nmb + sex_pb + sex	(1|seal_id)	poisson	none
90	universe_90.R	"	IOI + length + regularity + trial_nmb + sex_pb + sex	(1|seal_id)+(1|trial_nmb)	poisson	none
91	universe_91.R	"	IOI + length + regularity + trial_nmb + sex_pb	(1|seal_id)	poisson	none
92	universe_92.R	"	IOI + length + regularity + trial_nmb + sex_pb	(1|seal_id)+(1|trial_nmb)	poisson	none
93	universe_93.R	"	IOI + length + regularity + trial_nmb	(1|seal_id)	poisson	none
94	universe_94.R	"	IOI + length + regularity + trial_nmb	(1|seal_id)+(1|trial_nmb)	poisson	none
95	universe_95.R	"	IOI + length + regularity	(1|seal_id)	poisson	none
96	universe_96.R	"	IOI + length + regularity	(1|seal_id)+(1|trial_nmb)	poisson	none

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