exp1=read.csv(“./Experiment1.csv”)

exp1$Condition=factor(exp1$Condition, levels=c("Small Field", "Drift Balanced", "Theta", "Fourier"))

**Combined model with both motion type (small-field, drift balanced, theta or Fourier) and disparity of motion (crossed or uncrossed) as independent factors and animal identity as a random factor. The dependent variable was the probability of a response (either a strike or a tension)**

**BEST MODEL**

m=glmer(Presp~Disp+Condition+(1 | ID), data=exp1, family=binomial(link="logit"))

summary(m)

Generalized linear mixed model fit by maximum likelihood (Laplace Approximation) ['glmerMod']

 Family: binomial ( logit )

Formula: Presp ~ Disp + Condition + (1 | ID)

 Data: exp1

 AIC BIC logLik deviance df.resid

 522.3 550.2 -255.2 510.3 762

Scaled residuals:

 Min 1Q Median 3Q Max

-1.734 -0.417 -0.190 -0.031 32.251

Random effects:

 Groups Name Variance Std.Dev.

 ID (Intercept) 0.4444 0.6666

Number of obs: 768, groups: ID, 8

Fixed effects:

 Estimate Std. Error z value Pr(>|z|)

(Intercept) -6.9561 1.0630 -6.544 5.99e-11 \*\*\*

Disp 2.0386 0.2649 7.695 1.42e-14 \*\*\*

ConditionDrift Balanced 4.1759 1.0237 4.079 4.52e-05 \*\*\*

ConditionTheta 4.7752 1.0222 4.672 2.99e-06 \*\*\*

ConditionFourier 3.7915 1.0265 3.694 0.000221 \*\*\*

---

Signif. codes: 0 ‘\*\*\*’ 0.001 ‘\*\*’ 0.01 ‘\*’ 0.05 ‘.’ 0.1 ‘ ’ 1

Correlation of Fixed Effects:

 (Intr) Disp CndtDB CndtnT

Disp -0.237

CndtnDrftBl -0.937 0.043

ConditinTht -0.944 0.063 0.966

ConditinFrr -0.931 0.033 0.959 0.962

**Fourier**

mFourier=glmer(Presp~Disp+(1 | ID), data=subset(exp1, Condition == "Fourier"), family=binomial(link="logit"))

summary(mFourier)

Generalized linear mixed model fit by maximum likelihood (Laplace Approximation) ['glmerMod']

 Family: binomial ( logit )

Formula: Presp ~ Disp + (1 | ID)

 Data: subset(exp1, Condition == "Fourier")

 AIC BIC logLik deviance df.resid

 141.3 151.1 -67.7 135.3 189

Scaled residuals:

 Min 1Q Median 3Q Max

-0.6417 -0.6417 -0.1459 -0.1459 6.8557

Random effects:

 Groups Name Variance Std.Dev.

 ID (Intercept) 0 0

Number of obs: 192, groups: ID, 8

Fixed effects:

 Estimate Std. Error z value Pr(>|z|)

(Intercept) -3.8501 0.7146 -5.388 7.13e-08 \*\*\*

Disp 2.9628 0.7490 3.956 7.64e-05 \*\*\*

---

Signif. codes: 0 ‘\*\*\*’ 0.001 ‘\*\*’ 0.01 ‘\*’ 0.05 ‘.’ 0.1 ‘ ’ 1

Correlation of Fixed Effects:

 (Intr)

Disp -0.954

**Theta**

mTheta=glmer(Presp~Disp+(1 | ID), data=subset(exp1, Condition == "Theta"), family=binomial(link="logit"))

summary(mTheta)

Generalized linear mixed model fit by maximum likelihood (Laplace Approximation) ['glmerMod']

 Family: binomial ( logit )

Formula: Presp ~ Disp + (1 | ID)

 Data: subset(exp1, Condition == "Theta")

 AIC BIC logLik deviance df.resid

 201.7 211.5 -97.9 195.7 189

Scaled residuals:

 Min 1Q Median 3Q Max

-1.9681 -0.6171 -0.3268 0.5081 4.1833

Random effects:

 Groups Name Variance Std.Dev.

 ID (Intercept) 0.771 0.8781

Number of obs: 192, groups: ID, 8

Fixed effects:

 Estimate Std. Error z value Pr(>|z|)

(Intercept) -2.1237 0.4573 -4.644 3.41e-06 \*\*\*

Disp 1.8966 0.4019 4.719 2.37e-06 \*\*\*

---

Signif. codes: 0 ‘\*\*\*’ 0.001 ‘\*\*’ 0.01 ‘\*’ 0.05 ‘.’ 0.1 ‘ ’ 1

Correlation of Fixed Effects:

 (Intr)

Disp -0.611

**Drift Balanced**

mDrift=glmer(Presp~Disp+(1 | ID), data=subset(exp1, Condition == "Drift Balanced"), family=binomial(link="logit"))

summary(mDrift)

Generalized linear mixed model fit by maximum likelihood (Laplace Approximation) ['glmerMod']

 Family: binomial ( logit )

Formula: Presp ~ Disp + (1 | ID)

 Data: subset(exp1, Condition == "Drift Balanced")

 AIC BIC logLik deviance df.resid

 171.7 181.5 -82.9 165.7 189

Scaled residuals:

 Min 1Q Median 3Q Max

-1.2940 -0.5191 -0.2363 -0.1895 4.7061

Random effects:

 Groups Name Variance Std.Dev.

 ID (Intercept) 0.5601 0.7484

Number of obs: 192, groups: ID, 8

Fixed effects:

 Estimate Std. Error z value Pr(>|z|)

(Intercept) -2.7869 0.4994 -5.580 2.40e-08 \*\*\*

Disp 2.0153 0.4716 4.273 1.93e-05 \*\*\*

---

Signif. codes: 0 ‘\*\*\*’ 0.001 ‘\*\*’ 0.01 ‘\*’ 0.05 ‘.’ 0.1 ‘ ’ 1

Correlation of Fixed Effects:

 (Intr)

Disp -0.738

**Small Field**

mSmallF=glmer(Presp~Disp+(1 | ID), data=subset(exp1, Condition == "Small Field"), family=binomial(link="logit"))

Warning messages:

1: In checkConv(attr(opt, "derivs"), opt$par, ctrl = control$checkConv, :

 unable to evaluate scaled gradient

2: In checkConv(attr(opt, "derivs"), opt$par, ctrl = control$checkConv, :

 Hessian is numerically singular: parameters are not uniquely determined

-------------------Different conditions as default----------------

1. **Theta**

exp1$Condition=factor(exp1$Condition, levels=c("Theta","Small Field", "Drift Balanced", "Fourier"))

mvar2=glmer(Presp~Disp+Condition+(1 | ID), data=exp1, family=binomial(link="logit"))

summary(mvar2)

Generalized linear mixed model fit by maximum likelihood (Laplace Approximation) ['glmerMod']

 Family: binomial ( logit )

Formula: Presp ~ Disp + Condition + (1 | ID)

 Data: exp1

 AIC BIC logLik deviance df.resid

 522.3 550.2 -255.2 510.3 762

Scaled residuals:

 Min 1Q Median 3Q Max

-1.734 -0.417 -0.190 -0.031 32.251

Random effects:

 Groups Name Variance Std.Dev.

 ID (Intercept) 0.4444 0.6666

Number of obs: 768, groups: ID, 8

Fixed effects:

 Estimate Std. Error z value Pr(>|z|)

(Intercept) -2.1809 0.3507 -6.219 4.99e-10 \*\*\*

Disp 2.0386 0.2649 7.695 1.42e-14 \*\*\*

ConditionSmall Field -4.7752 1.0220 -4.672 2.98e-06 \*\*\*

ConditionDrift Balanced -0.5993 0.2677 -2.239 0.025188 \*

ConditionFourier -0.9837 0.2827 -3.479 0.000502 \*\*\*

---

Signif. codes: 0 ‘\*\*\*’ 0.001 ‘\*\*’ 0.01 ‘\*’ 0.05 ‘.’ 0.1 ‘ ’ 1

Correlation of Fixed Effects:

 (Intr) Disp CndtST CndtDB

Disp -0.534

CndtnSmllTr -0.053 -0.063

CndtnDrftBl -0.298 -0.077 0.125

ConditinFrr -0.261 -0.109 0.123 0.436

1. **Drift Balanced**

exp1$Condition=factor(exp1$Condition, levels=c("Drift Balanced", "Small Field", "Theta", "Fourier"))

mvar3=glmer(Presp~Disp+Condition+(1 | ID), data=exp1, family=binomial(link="logit"))

summary(mvar3)

Generalized linear mixed model fit by maximum likelihood (Laplace Approximation) ['glmerMod']

 Family: binomial ( logit )

Formula: Presp ~ Disp + Condition + (1 | ID)

 Data: exp1

 AIC BIC logLik deviance df.resid

 522.3 550.2 -255.2 510.3 762

Scaled residuals:

 Min 1Q Median 3Q Max

-1.734 -0.417 -0.190 -0.031 32.250

Random effects:

 Groups Name Variance Std.Dev.

 ID (Intercept) 0.4444 0.6666

Number of obs: 768, groups: ID, 8

Fixed effects:

 Estimate Std. Error z value Pr(>|z|)

(Intercept) -2.7802 0.3724 -7.466 8.26e-14 \*\*\*

Disp 2.0386 0.2649 7.695 1.42e-14 \*\*\*

ConditionSmall Field -4.1759 1.0235 -4.080 4.50e-05 \*\*\*

ConditionTheta 0.5993 0.2677 2.239 0.0252 \*

ConditionFourier -0.3844 0.2927 -1.313 0.1891

---

Signif. codes: 0 ‘\*\*\*’ 0.001 ‘\*\*’ 0.01 ‘\*’ 0.05 ‘.’ 0.1 ‘ ’ 1

Correlation of Fixed Effects:

 (Intr) Disp CndtST CndtnT

Disp -0.558

CndtnSmllTr -0.074 -0.043

ConditinTht -0.438 0.077 0.137

ConditinFrr -0.336 -0.036 0.134 0.494

1. **Fourier**

exp1$Condition=factor(exp1$Condition, levels=c("Fourier", "Drift Balanced", "Small Field", "Theta"))

mvar4=glmer(Presp~Disp+Condition+(1 | ID), data=exp1, family=binomial(link="logit"))

summary(mvar4)

Generalized linear mixed model fit by maximum likelihood (Laplace Approximation) ['glmerMod']

 Family: binomial ( logit )

Formula: Presp ~ Disp + Condition + (1 | ID)

 Data: exp1

 AIC BIC logLik deviance df.resid

 522.3 550.2 -255.2 510.3 762

Scaled residuals:

 Min 1Q Median 3Q Max

-1.734 -0.417 -0.190 -0.031 32.251

Random effects:

 Groups Name Variance Std.Dev.

 ID (Intercept) 0.4444 0.6667

Number of obs: 768, groups: ID, 8

Fixed effects:

 Estimate Std. Error z value Pr(>|z|)

(Intercept) -3.1646 0.3887 -8.141 3.93e-16 \*\*\*

Disp 2.0386 0.2649 7.695 1.42e-14 \*\*\*

ConditionDrift Balanced 0.3844 0.2927 1.313 0.189107

ConditionSmall Field -3.7915 1.0263 -3.694 0.000220 \*\*\*

ConditionTheta 0.9837 0.2827 3.479 0.000503 \*\*\*

---

Signif. codes: 0 ‘\*\*\*’ 0.001 ‘\*\*’ 0.01 ‘\*’ 0.05 ‘.’ 0.1 ‘ ’ 1

Correlation of Fixed Effects:

 (Intr) Disp CndtDB CndtST

Disp -0.561

CndtnDrftBl -0.431 0.036

CndtnSmllTr -0.094 -0.033 0.152

ConditinTht -0.492 0.109 0.568 0.153