

# Plot results of GeomComp\_Compute.nb

---

## Preliminaries

```
In[ ]:= Clear["Global`*"]
```

Specify "GoldenRatio" or "Arithmetic"

```
In[ ]:= AbundSeries = "GoldenRatio";
```

## Load results and set export directory

```
Which[
  AbundSeries == "GoldenRatio",
    SetDirectory[FileNameJoin[{NotebookDirectory[], "../results/GoldenRatio/"}]] ,
  AbundSeries == "Arithmetic",
    SetDirectory[FileNameJoin[{NotebookDirectory[], "../results/Arithmetic/"}]]
]
```

```
files = FileNames["k*.txt"] (* Get list of all result files *)
Get[#] & /@ files; (* Load all their contents (variable definitions) *)
```

```
Which[
  AbundSeries == "GoldenRatio",
    SetDirectory[FileNameJoin[{NotebookDirectory[], "../figs/GoldenRatio/"}]] ,
  AbundSeries == "Arithmetic",
    SetDirectory[FileNameJoin[{NotebookDirectory[], "../figs/Arithmetic/"}]]
]
```

```
Out[ ]= /Users/marknovak/Git/aaaManuscripts/GeometricComplexity/mathematica/results/
GoldenRatio/F10xNmax
```

```
Out[ ]= {k1fixBWL1.txt, k1fixH1.txt, k1fixLR.txt, k1varBWL1.txt, k1varH1.txt, k1varLR.txt,
k2fixA0.txt, k2fixA1.txt, k2fixA3.txt, k2fixAGK.txt, k2fixAG.txt, k2fixCDA0.txt,
k2fixGB.txt, k2fixGIA.txt, k2fixGI.txt, k2fixH2.txt, k2fixH3.txt, k2fixHT2.txt,
k2fixHTb.txt, k2fixHT.txt, k2fixHV.txt, k2fixMM.txt, k2fixR.txt, k2fixSHb.txt,
k2fixSH.txt, k2varA0.txt, k2varA1.txt, k2varA3.txt, k2varAGK.txt, k2varAG.txt,
k2varCDA0.txt, k2varGB.txt, k2varGIA.txt, k2varGI.txt, k2varH2.txt,
k2varH3.txt, k2varHT2.txt, k2varHTb.txt, k2varHT.txt, k2varHV.txt, k2varMM.txt,
k2varR.txt, k2varSHb.txt, k2varSH.txt, k3fixA2.txt, k3fixAA.txt, k3fixBD.txt,
k3fixBWL2.txt, k3fixCM.txt, k3fixFHM.txt, k3fixH3R.txt, k3fixHLBb.txt,
k3fixHLB.txt, k3fixMHb.txt, k3fixMHc.txt, k3fixMH.txt, k3fixRGD.txt,
k3fixS3b.txt, k3fixS3.txt, k3fixSBB.txt, k3fixSSS.txt, k3fixTTA.txt, k3fixT.txt,
k3fixW.txt, k3varA2.txt, k3varAA.txt, k3varBD.txt, k3varBWL2.txt, k3varCM.txt,
k3varFHM.txt, k3varH3R.txt, k3varHLBb.txt, k3varHLB.txt, k3varMHb.txt,
k3varMHc.txt, k3varMH.txt, k3varRGD.txt, k3varS3b.txt, k3varS3.txt,
k3varSBB.txt, k3varSSS.txt, k3varTTA.txt, k3varT.txt, k3varW.txt, k4fixAAOR.txt,
k4fixBDOR.txt, k4fixCMOR.txt, k4varAAOR.txt, k4varBDOR.txt, k4varCMOR.txt}
```

```
Out[ ]= /Users/marknovak/Git/aaaManuscripts/GeometricComplexity/figs/GoldenRatio/F10xNmax
```

The data files each have four independent variables (*Nmax*, *Pmax*, number of prey levels, number of pred levels) and one response variable (*geometric complexity*).

```

In[ ]:= varH1 // TableForm
Out[ ]//TableForm=

```

21	1	5	1	2.90382
21	2	5	2	2.72879
21	3	5	3	2.6453
21	5	5	4	2.50881
21	8	5	5	2.38596
34	1	6	1	3.0838
34	2	6	2	2.91593
34	3	6	3	2.8382
34	5	6	4	2.71138
34	8	6	5	2.60083
55	1	7	1	3.27679
55	2	7	2	3.11436
55	3	7	3	3.04095
55	5	7	4	2.92128
55	8	7	5	2.81966
89	1	8	1	3.46971
89	2	8	2	3.31137
89	3	8	3	3.24125
89	5	8	4	3.12697
89	8	8	5	3.03197
144	1	9	1	3.66356
144	2	9	2	3.50845
144	3	9	3	3.44079
144	5	9	4	3.33061
144	8	9	5	3.24059
233	1	10	1	3.86143
233	2	10	2	3.70878
233	3	10	3	3.64309
233	5	10	4	3.53598
233	8	10	5	3.44975

## Convenience function to append complexity differences to independent variables

Denom\_ is the measure to which the Numer\_ measure is relativized.

**\*\*Note that only real part of complex numbers are returned (i.e. we ignore what are usually small imaginary parts)\*\***

```

In[ ]:= Relativize[dataDenom_, dataNumer_] :=
  Join[dataDenom[[All, {1, 2, 3, 4}]],
    Transpose[{Re[dataNumer[[All, 5]]] - dataDenom[[All, 5]]}, 2];
  (* Simply replaces division by subtraction *)

```

```

In[ ]:=

```

```
In[ ]:= blankplot = ListPlot[{0}, Axes → False, PlotStyle → None];
```

```
MyListLinePlot[
  data_,
  predVars_,
  axislabels_,
  plotlabel_,
  plotRange_,
  colors_] :=
ListLinePlot[
  Transpose[
    SplitBy[data, Part[#, predVars[[1]]] &][[All, All, {predVars[[1]], 5}]],
    ScalingFunctions → {"Log", "Linear"},
    ColorFunction → Function[{x, y},
      Which[y ≥ 0.02, colors[[1]], y ≤ -0.02, colors[[2]], True, colors[[3]]],
    ColorFunctionScaling → False,
    PlotRange → plotRange,
    PlotRangePadding → 0.05,
    PlotLegends → False,
    Axes → False,
    Frame → True,
    PlotStyle →
      LineStyle[1 ;; Length[DeleteDuplicates[data[[All, predVars[[2]]]]]],
    FrameLabel → axislabels,
    ImagePadding → {{60, 10}, {40, 20}},
    PlotRangeClipping → False,
    Epilog → {Text[Style[plotlabel, 12], Scaled[{0.5, 1.1}]]}
]
```

## Varying max abundance, varying number of levels

```

AxisFontSize = 10;
LegendFontSize = 12;
cm = 72 / 2.54;
colors1 = {GrayLevel[0.4], GrayLevel[0.4]};
colors2 = Append[ColorData[97, "ColorList"][[{1, 2}]], GrayLevel[0.4]];
LineStyle = {
  Dashing[{}],
  Dashing[{0.05, 0.01}],
  Dashed,
  DotDashed,
  Dotted
};
legend = SwatchLegend[colors2, {"More flexible", "Less flexible"},
  LegendMarkers → Graphics[{EdgeForm[Black], Rectangle[]}],
  LegendLabel → "Relative to baseline",
  LegendFunction → (Framed[#, RoundingRadius → 5] &), LegendMargins → 5];
legendplot = ListPlot[{0}, Axes → False,
  PlotStyle → None, PlotLegends → Placed[legend, {Center, Center}]];
In[ ]:= axislabelCompY = {"", Style["Geometric\ncomplexity", AxisFontSize]};
axislabelRelXY = {
  Style["Max. prey abundance ( $N_{max}$ )", AxisFontSize],
  Style["Difference", AxisFontSize]};
axislabelRelY = {"", Style["Difference", AxisFontSize]};
axislabelX = {Style["Max. prey abundance ( $N_{max}$ )", AxisFontSize], ""};
axislabelNone = {"", ""};
legendlabel = Style["Max. predator abundance ( $P_{max}$ )", LegendFontSize];
xrange = MinMax[varH1[All, 1]];

```

## k = 1 models

```

In[ ]:= k1varH1 = MyListLinePlot[
    varH1,
    {1, 2},
    axislabelCompY,
    "H1",
    {xrange, All},
    colors1
];
k1varH1vLR = MyListLinePlot[
    Relativize[varH1, varLR],
    {1, 2},
    axislabelRelY,
    "LR-H1",
    {xrange, All},
    colors2
];
k1varH1vBWL1 = MyListLinePlot[
    Relativize[varH1, varBWL1],
    {1, 2},
    axislabelRelXY,
    "BWL1-H1",
    {xrange, All},
    colors2
];

```

## k = 2 models

```

In[ ]:= k2varH2 = MyListLinePlot[
    varH2,
    {1, 2},
    axislabelCompY,
    "H2",
    {xrange, All},
    colors1
];
k2varH2vMM = MyListLinePlot[
    Relativize[varH2, varMM],
    {1, 2},
    axislabelRelY,
    "MM-H2",
    {xrange, All},
];

```

```

        colors2
    ];
k2varH2vHV = MyListLinePlot[
    Relativize[varH2, varHV],
    {1, 2},
    axislabelX,
    "HV-H2",
    {xrange, All},
    colors2
];
k2varH2vR = MyListLinePlot[
    Relativize[varH2, varR],
    {1, 2},
    axislabelX,
    "R-H2",
    {xrange, All},
    colors2
];
k2varH2vAG = MyListLinePlot[
    Relativize[varH2, varAG],
    {1, 2},
    axislabelRelY,
    "AG-H2",
    {xrange, All},
    colors2
];
k2varH2vCDA0 = MyListLinePlot[
    Relativize[varH2, varCDA0],
    {1, 2},
    axislabelRelY,
    "CDA0-H2",
    {xrange, All},
    colors2
];
k2varH2vGI = MyListLinePlot[
    Relativize[varH2, varGI],
    {1, 2},
    axislabelNone,
    "GI-H2",
    {xrange, All},
    colors2
];
k2varH2vGIA = MyListLinePlot[
    Relativize[varH2, varGIA],

```

```

    {1, 2},
    axislabelNone,
    "GIA-H2",
    {xrange, All},
    colors2
];
k2varH2vGB = MyListLinePlot[
  Relativize[varH2, varGB],
  {1, 2},
  axislabelNone,
  "GB-H2",
  {xrange, All},
  colors2
];
k2varH2vHT = MyListLinePlot[
  Relativize[varH2, varHT],
  {1, 2},
  axislabelRelY,
  "HT-H2",
  {xrange, All},
  colors2
];
k2varH2vHTb = MyListLinePlot[
  Relativize[varH2, varHTb],
  {1, 2},
  axislabelNone,
  "HTb-H2",
  {xrange, All},
  colors2
];
k2varH2vH3 = MyListLinePlot[
  Relativize[varH2, varH3],
  {1, 2},
  axislabelNone,
  "H3-H2",
  {xrange, All},
  colors2
];
k2varH2vAGK = MyListLinePlot[
  Relativize[varH2, varAGK],
  {1, 2},
  axislabelNone,
  "AGK-H2",
  {xrange, All},

```



```

        colors2
    ];
k2varH2vA0 = MyListLinePlot[
    Relativize[varH2, varA0],
    {1, 2},
    axislabelRelXY,
    "A0-H2",
    {xrange, All},
    colors2
];
k2varH2vA1 = MyListLinePlot[
    Relativize[varH2, varA1],
    {1, 2},
    axislabelRelY,
    "A1-H2",
    {xrange, All},
    colors2
];
k2varH2vA3 = MyListLinePlot[
    Relativize[varH2, varA3],
    {1, 2},
    axislabelNone,
    "A3-H2",
    {xrange, All},
    colors2
];
k2varH2vSH = MyListLinePlot[
    Relativize[varH2, varSH],
    {1, 2},
    axislabelNone,
    "SH-H2",
    {xrange, All},
    colors2
];
k2varH2vSHb = MyListLinePlot[
    Relativize[varH2, varSHb],
    {1, 2},
    axislabelNone,
    "SHb-H2",
    {xrange, All},
    colors2
];

```

## k = 3 models

```

In[ ]:= (* Prey-dependent models get compared to H3R *)
k3varH3R = MyListLinePlot[
  varH3R,
  {1, 2},
  axislabelCompY,
  "H3R",
  {xrange, All},
  colors1
];
k3varH3RvA2 = MyListLinePlot[
  Relativize[varH3R, varA2],
  {1, 2},
  axislabelRelY,
  "A2-H3R",
  {xrange, All},
  colors2
];
k3varH3RvHLB = MyListLinePlot[
  Relativize[varH3R, varHLB],
  {1, 2},
  axislabelNone,
  "HLB-H3R",
  {xrange, All},
  colors2
];
k3varH3RvHLBb = MyListLinePlot[
  Relativize[varH3R, varHLBb],
  {1, 2},
  axislabelNone,
  "HLBb-H3R",
  {xrange, All},
  colors2
];
k3varH3RvMH = MyListLinePlot[
  Relativize[varH3R, varMH],
  {1, 2},
  axislabelRelY,
  "MH-H3R",
  {xrange, All},
  colors2
];

```

```

k3varH3RvMHb = MyListLinePlot[
  Relativize[varH3R, varMHb],
  {1, 2},
  axislabelRelY,
  "MHb-H3R",
  {xrange, All},
  colors2
];
k3varH3RvMHc = MyListLinePlot[
  Relativize[varH3R, varMHc],
  {1, 2},
  axislabelRelY,
  "MHc-H3R",
  {xrange, All},
  colors2
];
k3varH3RvSSS = MyListLinePlot[
  Relativize[varH3R, varSSS],
  {1, 2},
  axislabelNone,
  "SSS-H3R",
  {xrange, All},
  colors2
];
k3varH3RvS3 = MyListLinePlot[
  Relativize[varH3R, varS3],
  {1, 2},
  axislabelNone,
  "AS-H3R",
  {xrange, All},
  colors2
];
k3varH3RvS3b = MyListLinePlot[
  Relativize[varH3R, varS3b],
  {1, 2},
  axislabelNone,
  "ASb-H3R",
  {xrange, All},
  colors2
];
k3varH3RvT = MyListLinePlot[
  Relativize[varH3R, varT],
  {1, 2},
  axislabelRelY,

```

```

    "T-H3R",
    {xrange, All},
    colors2
];
k3varH3RvFHM = MyListLinePlot[
    Relativize[varH3R, varFHM],
    {1, 2},
    axislabelNone,
    "FHM-H3R",
    {xrange, All},
    colors2
];
k3varH3RvBD = MyListLinePlot[
    Relativize[varH3R, varBD],
    {1, 2},
    axislabelNone,
    "BD-H3R",
    {xrange, All},
    colors2
];
(* Predator-dependent models get compared to BD *)
k3varBD = MyListLinePlot[
    varBD,
    {1, 2},
    axislabelCompY,
    "BD",
    {xrange, All},
    colors1
];
k3varBDvCM = MyListLinePlot[
    Relativize[varBD, varCM],
    {1, 2},
    axislabelRelY,
    "CM-BD",
    {xrange, All},
    colors2
];
k3varBDvAA = MyListLinePlot[
    Relativize[varBD, varAA],
    {1, 2},
    axislabelRelXY,
    "AA-BD",
    {xrange, All},
    colors2
];

```

```

];
k3varBDvSBB = MyListLinePlot[
  Relativize[varBD, varSBB],
  {1, 2},
  axislabelX,
  "SBB-BD",
  {xrange, All},
  colors2
];
k3varBDvBWL2 = MyListLinePlot[
  Relativize[varBD, varBWL2],
  {1, 2},
  axislabelX,
  "BWL2-BD",
  {xrange, All},
  colors2
];
k3varBDvW = MyListLinePlot[
  Relativize[varBD, varW],
  {1, 2},
  axislabelNone,
  "W-BD",
  {xrange, All},
  colors2
];
k3varBDvTTA = MyListLinePlot[
  Relativize[varBD, varTTA],
  {1, 2},
  axislabelRelY,
  "TTA-BD",
  {xrange, All},
  colors2
];
k3varBDvRGD = MyListLinePlot[
  Relativize[varBD, varRGD],
  {1, 2},
  axislabelNone,
  "RGD-BD",
  {xrange, All},
  colors2
];

```

**k = 4 models**

```

In[ ]:= k4varBDOR = MyListLinePlot[
    varBDOR,
    {1, 2},
    axislabelCompY,
    "BDOR",
    {xrange, All},
    colors1
];
k4varBDORvCMOR = MyListLinePlot[
    Relativize[varBDOR, varCMOR],
    {1, 2},
    axislabelRelY,
    "CMOR-BDOR",
    {xrange, All},
    colors2
];
k4varBDORvAAOR = MyListLinePlot[
    Relativize[varBDOR, varAAOR],
    {1, 2},
    axislabelX,
    "AAOR-BDOR",
    {xrange, All},
    colors2
];
k4varBDORvSN1 = MyListLinePlot[
    Relativize[varBDOR, varSN1],
    {1, 2},
    axislabelRelXY,
    "SN1-BDOR",
    {xrange, All},
    colors2
];
k4varBDORvSN2 = MyListLinePlot[
    Relativize[varBDOR, varSN2],
    {1, 2},
    axislabelX,
    "SN2-BDOR",
    {xrange, {-1, -3}}, (* {-1,-3} Because P=2 should be non-identifiable *)
    colors2
];

```

... Symbol: Symbol called with 0 arguments; 1 argument is expected.

... Symbol: Symbol called with 0 arguments; 1 argument is expected.

## Combined plots - Var

```
In[ ]:= LineStylevar = LineStyle[[1 ;; Length[DeleteDuplicates[varH1[[All, 2]]]]];
```

```
In[ ]:= k1Allvar =
  Legended[
    GraphicsGrid[{
      {k1varH1},
      {k1varH1vLR},
      {k1varH1vBWL1}
    },
    ImageSize → Large,
    Spacings → {0, -10}],
  Placed[
    LineLegend[
      Map[Directive, LineStylevar],
      DeleteDuplicates[varH1[[All, 2]]],
      LegendLabel → legendlabel,
      LegendLayout → "Row",
      Above]];
Export["GeomComp_var_k1.pdf", Show[k1Allvar, ImageSize → 9 cm]];
```

```
In[ ]:= k2Allvar =
  Legended[
    GraphicsGrid[{
      {k2varH2, k2varH2vMM, k2varH2vH3},
      {k2varH2vHT, k2varH2vGI, k2varH2vGIA},
      {k2varH2vA1, k2varH2vA3, k2varH2vSH},
      {k2varH2vAG, k2varH2vAGK, k2varH2vGB},
      {k2varH2vCDA0, k2varH2vR, k2varH2vHV},
      {k2varH2vA0, legendplot, blankplot}
    },
    ImageSize → Large,
    Spacings → {-40, -40}],
  Placed[
    LineLegend[
      Map[Directive, LineStylevar],
      DeleteDuplicates[varH1[[All, 2]]],
      LegendLabel → legendlabel,
      LegendLayout → "Row",
      Above]];
Export["GeomComp_var_k2.pdf", Show[k2Allvar]];
```

```

In[ ]:= k3Allvar =
  Legended[
    GraphicsGrid[{
      {k3varH3R, k3varH3RvA2, k3varH3RvHLB},
      {k3varH3RvMH, k3varH3RvS3, k3varH3RvSSS},
      {k3varH3RvT, k3varH3RvFHM, k3varH3RvBD},
      {k3varBD, k3varBDvTTA, k3varBDvRGD},
      {k3varBDvCM, k3varBDvW, k3varBDvSBB},
      {k3varBDvAA, k3varBDvBWL2, legendplot}
    },
    ImageSize → Large,
    Spacings → {-40, -40}],
  Placed[
    LineLegend[
      Map[Directive, LineStylevar],
      DeleteDuplicates[varH1[[All, 2]]],
      LegendLabel → legendlabel,
      LegendLayout → "Row",
      Above]];
Export["GeomComp_var_k3.pdf", k3Allvar];

In[ ]:= k4Allvar =
  Legended[
    GraphicsGrid[{
      {k4varBDOR, k4varBDORvCMOR, k4varBDORvAAOR},
      {k4varBDORvSN1, k4varBDORvSN2, legendplot}
    },
    ImageSize → Large,
    Spacings → {-40, -40}],
  Placed[
    LineLegend[
      Map[Directive, LineStylevar],
      DeleteDuplicates[varH1[[All, 2]]],
      LegendLabel → legendlabel,
      LegendLayout → "Row",
      Above]];
Export["GeomComp_var_k4.pdf", k4Allvar];

```



## Holling - vs. Michaelis-Menten forms

```

In[ ]:= kHvMMvar =
  Legended[
    GraphicsGrid[{
      {k2varH2vHT, k2varH2vHTb, blankplot},
      {k2varH2vSH, k2varH2vSHb, blankplot},
      {k3varH3RvS3, k3varH3RvS3b, blankplot},
      {k3varH3RvHLBb, k3varH3RvHLB, blankplot},
      {k3varH3RvMH, k3varH3RvMHb, k3varH3RvMHC}
    },
    ImageSize → Large,
    Spacings → {-40, -40}],
  Placed[
    LineLegend[
      Map[Directive, LineStylevar],
      DeleteDuplicates[varH1[[All, 2]]],
      LegendLabel → legendlabel,
      LegendLayout → "Row",
      Above]]];
Export["GeomComp_var_kX_HvMM.pdf", kHvMMvar];

```

---

## Fixed max abundances, varying number of levels

```

In[ ]:= axislabelCompY = {"", Style["Geometric\ncomplexity", AxisFontSize]};
axislabelRelXY = {
  Style["Prey levels ( $L_N$ )", AxisFontSize],
  Style["Difference", AxisFontSize]};
axislabelX = {Style["Prey levels ( $L_N$ )", AxisFontSize], ""};
legendlabel = Style["Predator levels ( $L_P$ )", LegendFontSize];
xrange = MinMax[fixH1[[All, 3]]];

```

## k = 1 models

```

In[ ]:= k1fixH1 = MyListLinePlot[
    fixH1,
    {3, 4},
    axislabelCompY,
    "H1",
    {xrange, All},
    colors1
];
k1fixH1vLR = MyListLinePlot[
    Relativize[fixH1, fixLR],
    {3, 4},
    axislabelRelY,
    "LR-H1",
    {xrange, All},
    colors2
];
k1fixH1vBWL1 = MyListLinePlot[
    Relativize[fixH1, fixBWL1],
    {3, 4},
    axislabelRelXY,
    "BWL1-H1",
    {xrange, All},
    colors2
];

```

## k = 2 models

```

In[ ]:= k2fixH2 = MyListLinePlot[
    fixH2,
    {3, 4},
    axislabelCompY,
    "H2",
    {xrange, All},
    colors1
];
k2fixH2vMM = MyListLinePlot[
    Relativize[fixH2, fixMM],
    {3, 4},
    axislabelRelY,
    "MM-H2",
    {xrange, All},
];

```

```

        colors2
    ];
k2fixH2vHV = MyListLinePlot[
    Relativize[fixH2, fixHV],
    {3, 4},
    axislabelX,
    "HV-H2",
    {xrange, All},
    colors2
];
k2fixH2vR = MyListLinePlot[
    Relativize[fixH2, fixR],
    {3, 4},
    axislabelX,
    "R-H2",
    {xrange, All},
    colors2
];
k2fixH2vAG = MyListLinePlot[
    Relativize[fixH2, fixAG],
    {3, 4},
    axislabelRelY,
    "AG-H2",
    {xrange, All},
    colors2
];
k2fixH2vCDA0 = MyListLinePlot[
    Relativize[fixH2, fixCDA0],
    {3, 4},
    axislabelRelY,
    "CDA0-H2",
    {xrange, All},
    colors2
];
k2fixH2vGI = MyListLinePlot[
    Relativize[fixH2, fixGI],
    {3, 4},
    axislabelNone,
    "GI-H2",
    {xrange, All},
    colors2
];
k2fixH2vGIA = MyListLinePlot[
    Relativize[fixH2, fixGIA],

```

```

    {3, 4},
    axislabelNone,
    "GIA-H2",
    {xrange, All},
    colors2
];
k2fixH2vGB = MyListLinePlot[
  Relativize[fixH2, fixGB],
  {3, 4},
  axislabelNone,
  "GB-H2",
  {xrange, All},
  colors2
];
k2fixH2vHT = MyListLinePlot[
  Relativize[fixH2, fixHT],
  {3, 4},
  axislabelRelY,
  "HT-H2",
  {xrange, All},
  colors2
];
k2fixH2vHTb = MyListLinePlot[
  Relativize[fixH2, fixHTb],
  {3, 4},
  axislabelRelY,
  "HTb-H2",
  {xrange, All},
  colors2
];
k2fixH2vH3 = MyListLinePlot[
  Relativize[fixH2, fixH3],
  {3, 4},
  axislabelNone,
  "H3-H2",
  {xrange, All},
  colors2
];
k2fixH2vAGK = MyListLinePlot[
  Relativize[fixH2, fixAGK],
  {3, 4},
  axislabelNone,
  "AGK-H2",
  {xrange, All},

```

```

        colors2
    ];
k2fixH2vA0 = MyListLinePlot[
    Relativize[fixH2, fixA0],
    {3, 4},
    axislabelRelXY,
    "A0-H2",
    {xrange, All},
    colors2
];
k2fixH2vA1 = MyListLinePlot[
    Relativize[fixH2, fixA1],
    {3, 4},
    axislabelRelY,
    "A1-H2",
    {xrange, All},
    colors2
];
k2fixH2vA3 = MyListLinePlot[
    Relativize[fixH2, fixA3],
    {3, 4},
    axislabelNone,
    "A3-H2",
    {xrange, All},
    colors2
];
k2fixH2vSH = MyListLinePlot[
    Relativize[fixH2, fixSH],
    {3, 4},
    axislabelNone,
    "SH-H2",
    {xrange, All},
    colors2
];

```

### k = 3 models

*In[ ]:=* (\* Prey-dependent models get compared to H3R \*)

```

In[ ]:= k3fixH3R = MyListLinePlot[
    fixH3R,
    {3, 4},
    axislabelCompY,
    "H3R",

```

```

    {xrange, All},
    colors1
];
k3fixH3RvA2 = MyListLinePlot[
  Relativize[fixH3R, fixA2],
  {3, 4},
  axislabelRelY,
  "A2-H3R",
  {xrange, All},
  colors2
];
k3fixH3RvHLB = MyListLinePlot[
  Relativize[fixH3R, fixHLB],
  {3, 4},
  axislabelNone,
  "HLB-H3R",
  {xrange, All},
  colors2
];
k3fixH3RvMH = MyListLinePlot[
  Relativize[fixH3R, fixMH],
  {3, 4},
  axislabelRelY,
  "MH-H3R",
  {xrange, All},
  colors2
];
k3fixH3RvSSS = MyListLinePlot[
  Relativize[fixH3R, fixSSS],
  {3, 4},
  axislabelNone,
  "SSS-H3R",
  {xrange, All},
  colors2
];
k3fixH3RvS3 = MyListLinePlot[
  Relativize[fixH3R, fixS3],
  {3, 4},
  axislabelNone,
  "AS-H3R",
  {xrange, All},
  colors2
];
k3fixH3RvT = MyListLinePlot[

```

```

    Relativize[fixH3R, fixT],
    {3, 4},
    axislabelRelY,
    "T-H3R",
    {xrange, All},
    colors2
];
k3fixH3RvFHM = MyListLinePlot[
    Relativize[fixH3R, fixFHM],
    {3, 4},
    axislabelNone,
    "FHM-H3R",
    {xrange, All},
    colors2
];
k3fixH3RvBD = MyListLinePlot[
    Relativize[fixH3R, fixBD],
    {3, 4},
    axislabelNone,
    "BD-H3R",
    {xrange, All},
    colors2
];
(* Predator-dependent models get compared to BD *)
k3fixBD = MyListLinePlot[
    fixBD,
    {3, 4},
    axislabelCompY,
    "BD",
    {xrange, All},
    colors1
];
k3fixBDvCM = MyListLinePlot[
    Relativize[fixBD, fixCM],
    {3, 4},
    axislabelRelY,
    "CM-BD",
    {xrange, All},
    colors2
];
k3fixBDvAA = MyListLinePlot[
    Relativize[fixBD, fixAA],
    {3, 4},
    axislabelRelXY,

```

```

    "AA-BD",
    {xrange, All},
    colors2
];
k3fixBDvSBB = MyListLinePlot[
    Relativize[fixBD, fixSBB],
    {3, 4},
    axislabelX,
    "SBB-BD",
    {xrange, All},
    colors2
];
k3fixBDvBWL2 = MyListLinePlot[
    Relativize[fixBD, fixBWL2],
    {3, 4},
    axislabelX,
    "BWL2-BD",
    {xrange, All},
    colors2
];
k3fixBDvW = MyListLinePlot[
    Relativize[fixBD, fixW],
    {3, 4},
    axislabelNone,
    "W-BD",
    {xrange, All},
    colors2
];
k3fixBDvTTA = MyListLinePlot[
    Relativize[fixBD, fixTTA],
    {3, 4},
    axislabelRelY,
    "TTA-BD",
    {xrange, All},
    colors2
];
k3fixBDvRGD = MyListLinePlot[
    Relativize[fixBD, fixRGD],
    {3, 4},
    axislabelNone,
    "RGD-BD",
    {xrange, All},
    colors2
];

```



## k = 4 models

```

In[ ]:= k4fixBDOR = MyListLinePlot[
    fixBDOR,
    {3, 4},
    axislabelCompY,
    "BDOR",
    {xrange, All},
    colors1
];
k4fixBDORvCMOR = MyListLinePlot[
    Relativize[fixBDOR, fixCMOR],
    {3, 4},
    axislabelRelY,
    "CMOR-BDOR",
    {xrange, All},
    colors2
];
k4fixBDORvAAOR = MyListLinePlot[
    Relativize[fixBDOR, fixAAOR],
    {3, 4},
    axislabelX,
    "AAOR-BDOR",
    {xrange, All},
    colors2
];
k4fixBDORvSN1 = MyListLinePlot[
    Relativize[fixBDOR, fixSN1],
    {3, 4},
    axislabelRelXY,
    "SN1-BDOR",
    {xrange, All},
    colors2
];
k4fixBDORvSN2 = MyListLinePlot[
    Relativize[fixBDOR, fixSN2],
    {3, 4},
    axislabelX,
    "SN2-BDOR",
    {xrange, {-1.5, -6}},
    colors2
];

```

... **Symbol**: Symbol called with 0 arguments; 1 argument is expected.

... **Symbol**: Symbol called with 0 arguments; 1 argument is expected.

## Combined plots - Fix

```
In[ ]:= LineStylefix = LineStyle[[1 ;; Length[DeleteDuplicates[fixH1[[All, 4]]]]]];
```

```
In[ ]:= k1Allfix =
  Legended[
    GraphicsGrid[{
      {k1fixH1},
      {k1fixH1vLR},
      {k1fixH1vBWL1}
    },
    ImageSize → Large,
    Spacings → {0, -10}],
  Placed[
    LineLegend[
      Map[Directive, LineStylefix],
      DeleteDuplicates[fixH1[[All, 4]]],
      LegendLabel → legendlabel,
      LegendLayout → "Row",
      Above]],
  Export["GeomComp_fix_k1.pdf", Show[k1Allfix, ImageSize → 9 cm]];
```

```
In[ ]:= k2Allfix =
  Legended[
    GraphicsGrid[{
      {k2fixH2, k2fixH2vMM, k2fixH2vH3},
      {k2fixH2vHT, k2fixH2vGI, k2fixH2vGIA},
      {k2fixH2vA1, k2fixH2vA3, k2fixH2vSH},
      {k2fixH2vAG, k2fixH2vAGK, k2fixH2vGB},
      {k2fixH2vCDA0, k2fixH2vR, k2fixH2vHV},
      {k2fixH2vA0, legendplot, blankplot}
    },
    ImageSize → Large,
    Spacings → {-40, -40}],
  Placed[
    LineLegend[
      Map[Directive, LineStylefix],
      DeleteDuplicates[fixH1[[All, 4]]],
      LegendLabel → legendlabel,
      LegendLayout → "Row",
      Above]],
  Export["GeomComp_fix_k2.pdf", Show[k2Allfix]];
```

```

In[ ]:= k3Allfix =
  Legended[
    GraphicsGrid[{
      {k3fixH3R, k3fixH3RvA2, k3fixH3RvHLB},
      {k3fixH3RvMH, k3fixH3RvS3, k3fixH3RvSSS},
      {k3fixH3RvT, k3fixH3RvFHM, k3fixH3RvBD},
      {k3fixBD, k3fixBDvTTA, k3fixBDvRGD},
      {k3fixBDvCM, k3fixBDvW, k3fixBDvSBB},
      {k3fixBDvAA, k3fixBDvBWL2, legendplot}
    },
    ImageSize → Large,
    Spacings → {-40, -40}],
    Placed[
      LineLegend[
        Map[Directive, LineStylefix],
        DeleteDuplicates[fixH1[[All, 4]]],
        LegendLabel → legendlabel,
        LegendLayout → "Row",
        Above]];
  Export["GeomComp_fix_k3.pdf", k3Allfix];

In[ ]:= k4Allfix =
  Legended[
    GraphicsGrid[{
      {k4fixBDOR, k4fixBDORvCMOR, k4fixBDORvAAOR},
      {k4fixBDORvSN1, k4fixBDORvSN2, legendplot}
    },
    ImageSize → Large,
    Spacings → {-40, -40}],
    Placed[
      LineLegend[
        Map[Directive, LineStylefix],
        DeleteDuplicates[fixH1[[All, 4]]],
        LegendLabel → legendlabel,
        LegendLayout → "Row",
        Above]];
  Export["GeomComp_fix_k4.pdf", k4Allfix];

```