**Supplementary Tables and Table Captions:**

Table S1. Image analogies in 3x3 matrix problems. A 3x3 matrix reasoning problem has eight matrix entries (which we label from left-to-right, top-to-bottom, as A through H) and one blank space in the bottom right corner. This table lists all of the image analogies that are considered by our computational simulation for solving these types of problems, divided by rows, columns, and diagonals, and also according to whether the induced transforms are unary, i.e. an image analogy of the form *A is to B as C is to what*, or binary, i.e. an image analogy of the form *A and B are to C as E and F are to what*.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | **Rows** | **Columns** | **Diagonals** | |
| **Unary** | A : B :: H : ?  B : C :: H : ?  D : E :: H : ?  E : F :: H : ?  G : H :: H : ?  A : C :: G : ?  D : F :: G : ? | A : D :: F : ?  D : G :: F : ?  B : E :: F : ?  E : H :: F : ?  C : F :: F : ?  A : G :: C : ?  B : H :: C : ? | F : G :: E : ?  G : B :: E : ?  H : C :: E : ?  C : D :: E : ?  A : E :: E : ?  F : B :: A : ?  H : D :: A : ? | F : H :: D : ?  H : A :: D : ?  G : C :: D : ?  C : E :: D : ?  B : D :: D : ?  F : A :: B : ?  G : E :: B : ? |
| **Binary** | A : B : C :: G : H : ?  D : E : F :: G : H : ? | A : D : G :: C : F : ?  B : E : H :: C : F : ? | F : G : B :: A : E : ?  H : C : D :: A : E : ? | F : H : A :: B : D : ?  G : C : E :: B : D : ? |