

Behavior is Everything – Towards Representing Concepts with Sensorimotor Contingencies

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Supplementary Material

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1 Figures

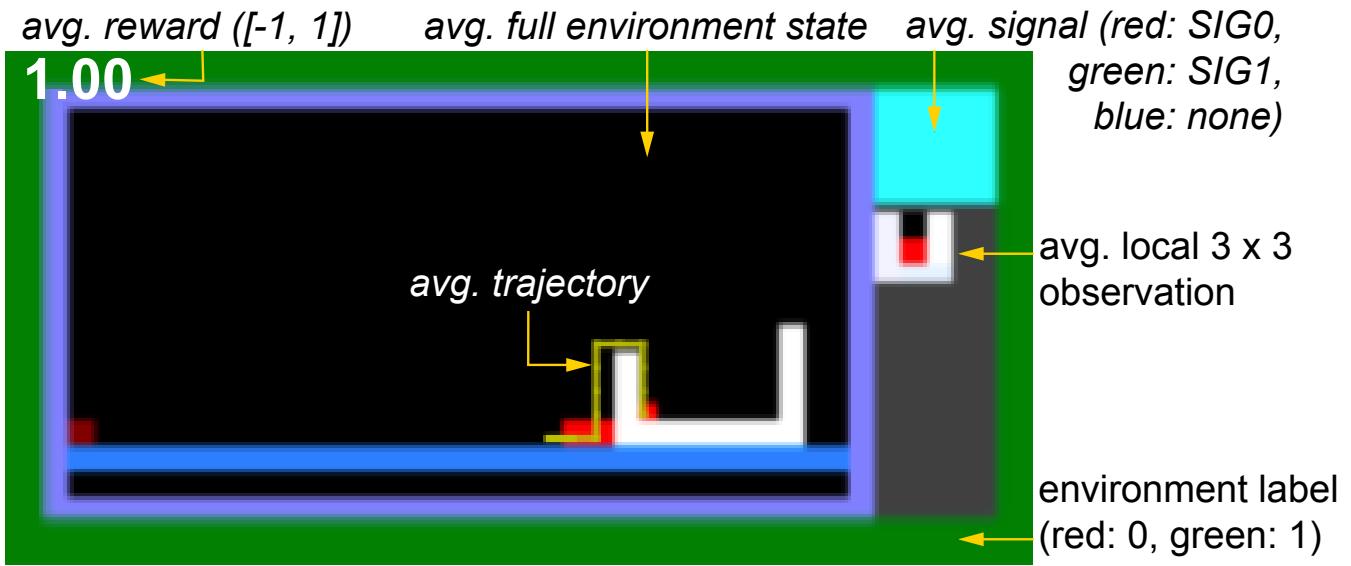
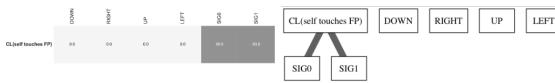
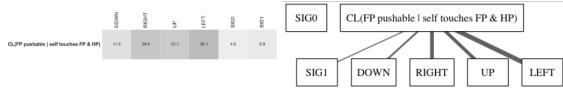


Figure S1: Annotated example environment, as used in the main text.

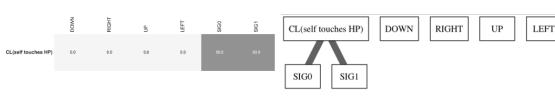
CL(self touches FP)



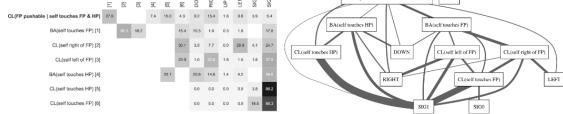
CL(FP pushable | self touches FP & HP) (flat)



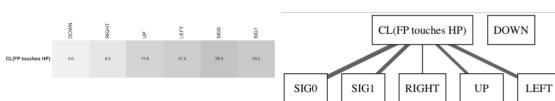
CL(self touches HP)



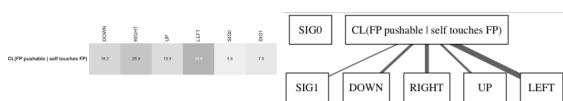
CL(FP pushable | self touches FP & HP) (hier)



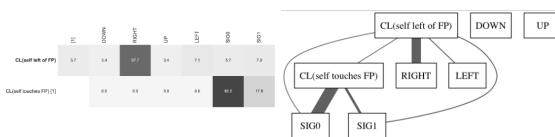
CL(FP touches HP)



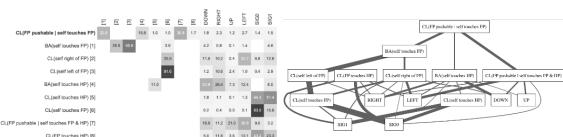
CL(FP pushable | self touches FP) (flat)



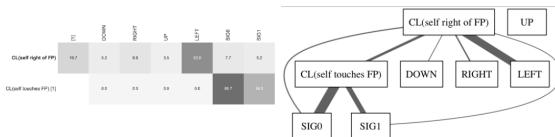
CL(self left of FP)



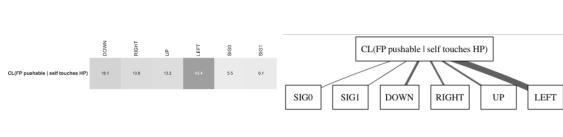
CL(FP pushable | self touches FP) (hier)



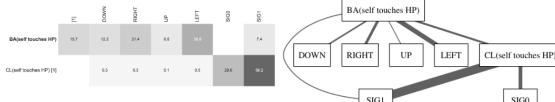
CL(self right of FP)



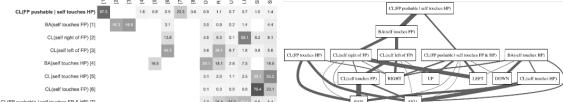
CL(FP pushable | self touches HP) (flat)



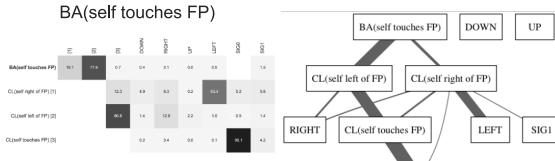
BA(self touches HP)



CL(FP pushable | self touches HP) (hier)



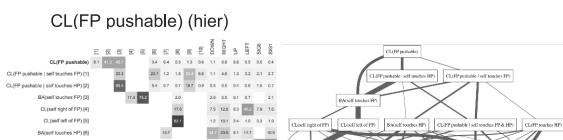
BA(self touches FP)

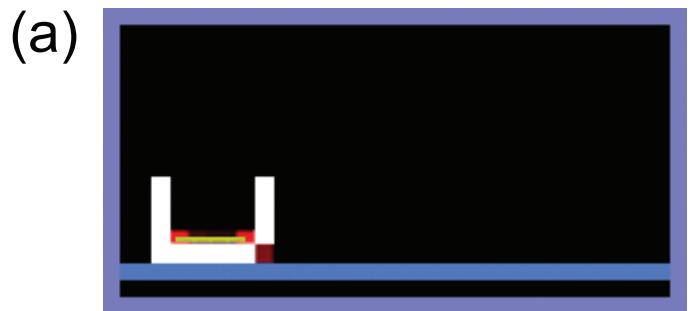


CL(FP pushable) (flat)

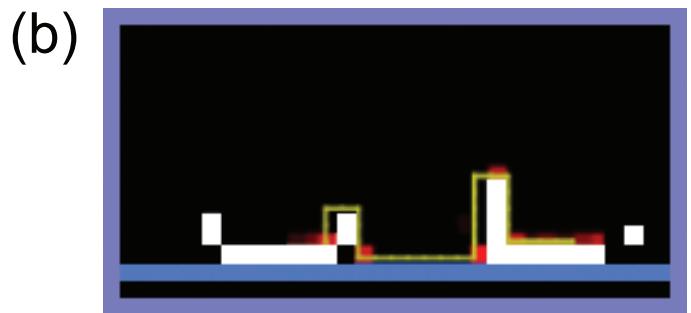


CL(FP pushable) (hier)

Figure S2: Call graphs (in both adjacency matrix and graph formats) for each *pushable* curriculum SMC. Left column shows option SMCs available to the hierarchical form of the classification SMCs on the right. Adjacency matrix values are weighted by relative time spent executing the action. *CL*: classify; *BA*: bring-about; *FP*: floor pixel; *HP*: hover pixel.



cl_self-in-container_vs_noncontainer



ba_self-in-container_from_between-potential-containers

- SMC**
-
- 1: *cl_self-in-left-corner_vs_on-hline*
 - 2: *cl_self-in-right-corner_vs_on-hline*
 - 3: *ba_self-in-potential-container_from_left-touches-on-floor*
 - 4: *ba_self-in-potential-container_from_right-touches-on-floor*
 - 5: *ba_self-on-something_from_directly-above*
 - 6: *ba_self-ontop-object_from_left-touches-on-floor*
 - 7: *ba_self-touches-target_from_right-on-floor_with_right-nontarget*

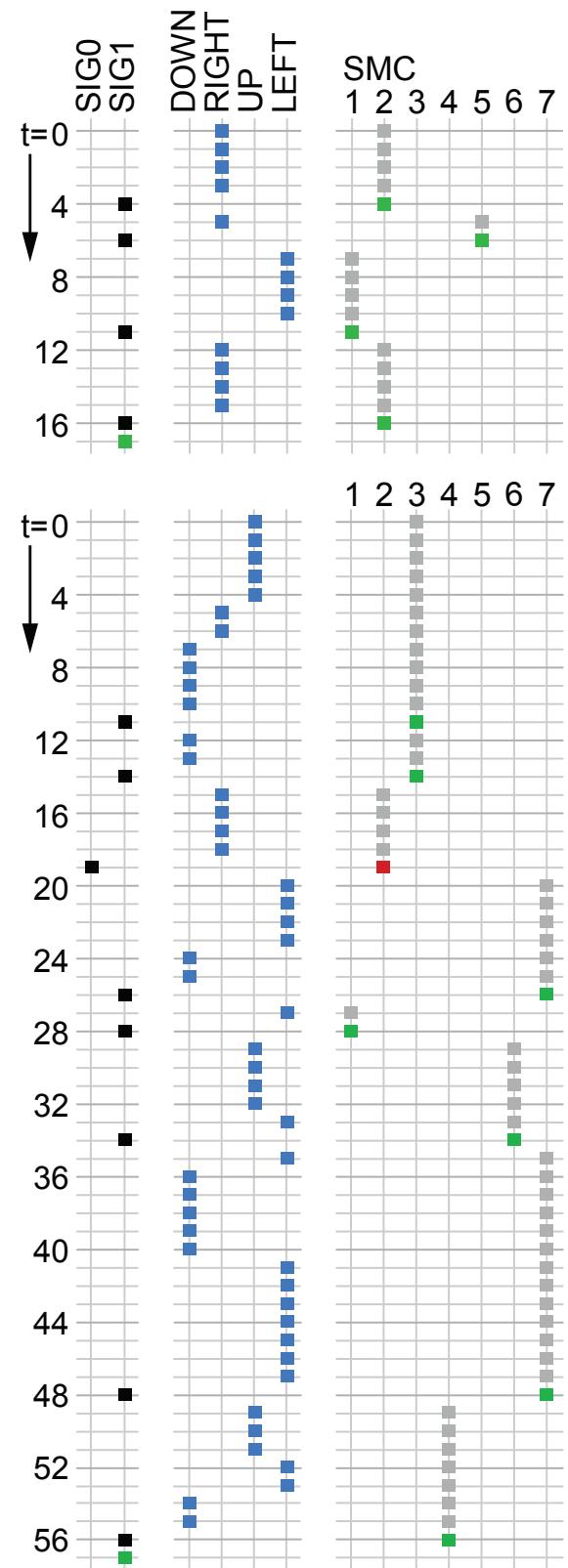


Figure S3: full-page reproduction of Figure 1

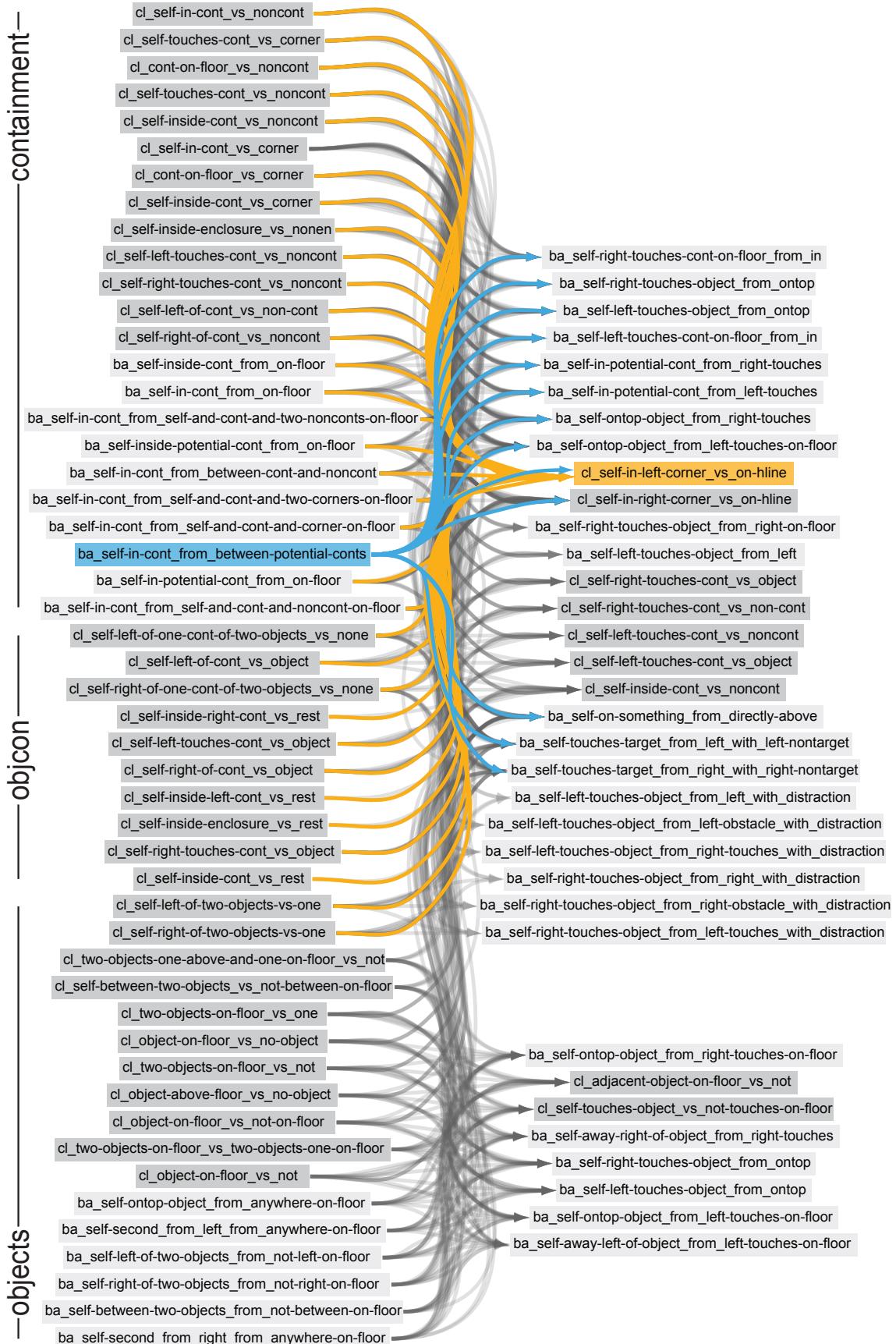


Figure S4: full-page reproduction of Figure 2

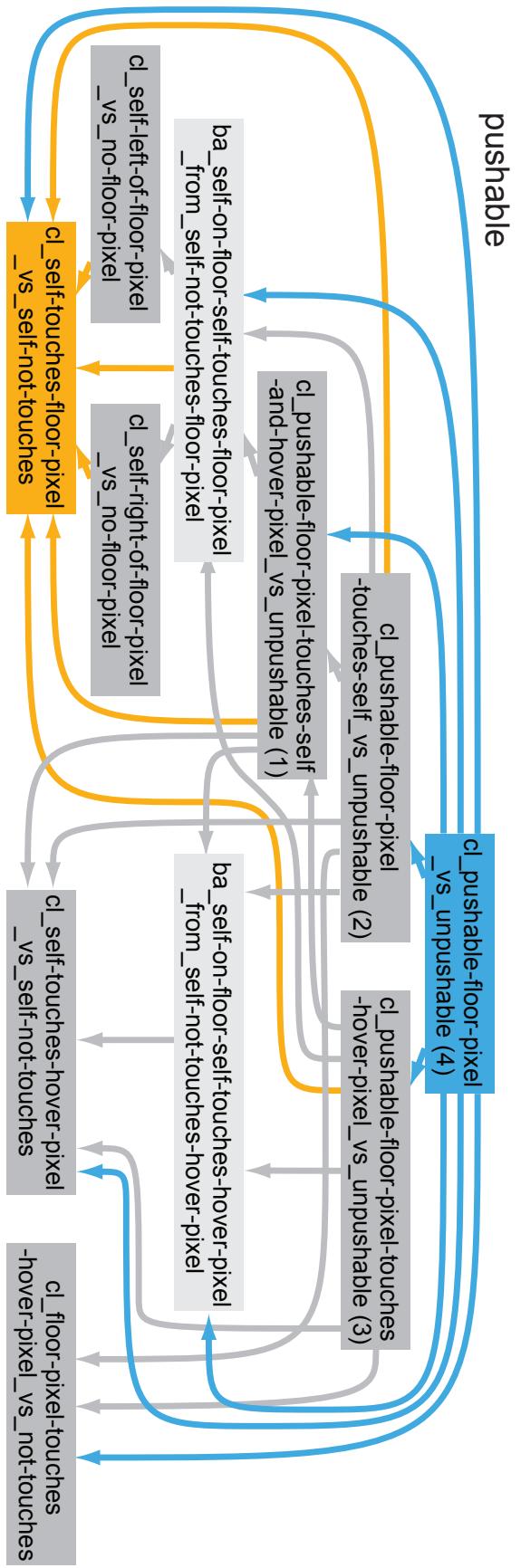


Figure S5: full-page reproduction of Figure 3

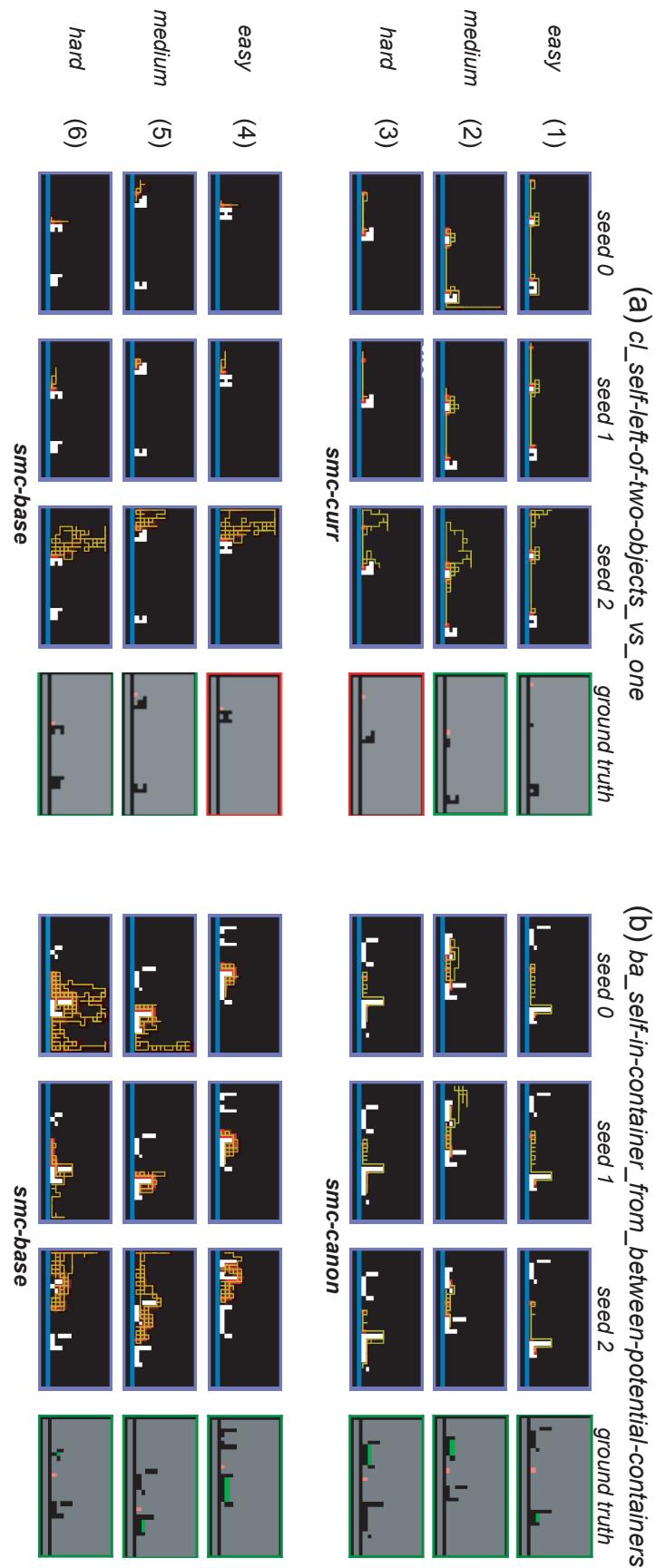


Figure S6: full-page reproduction of Figure 4

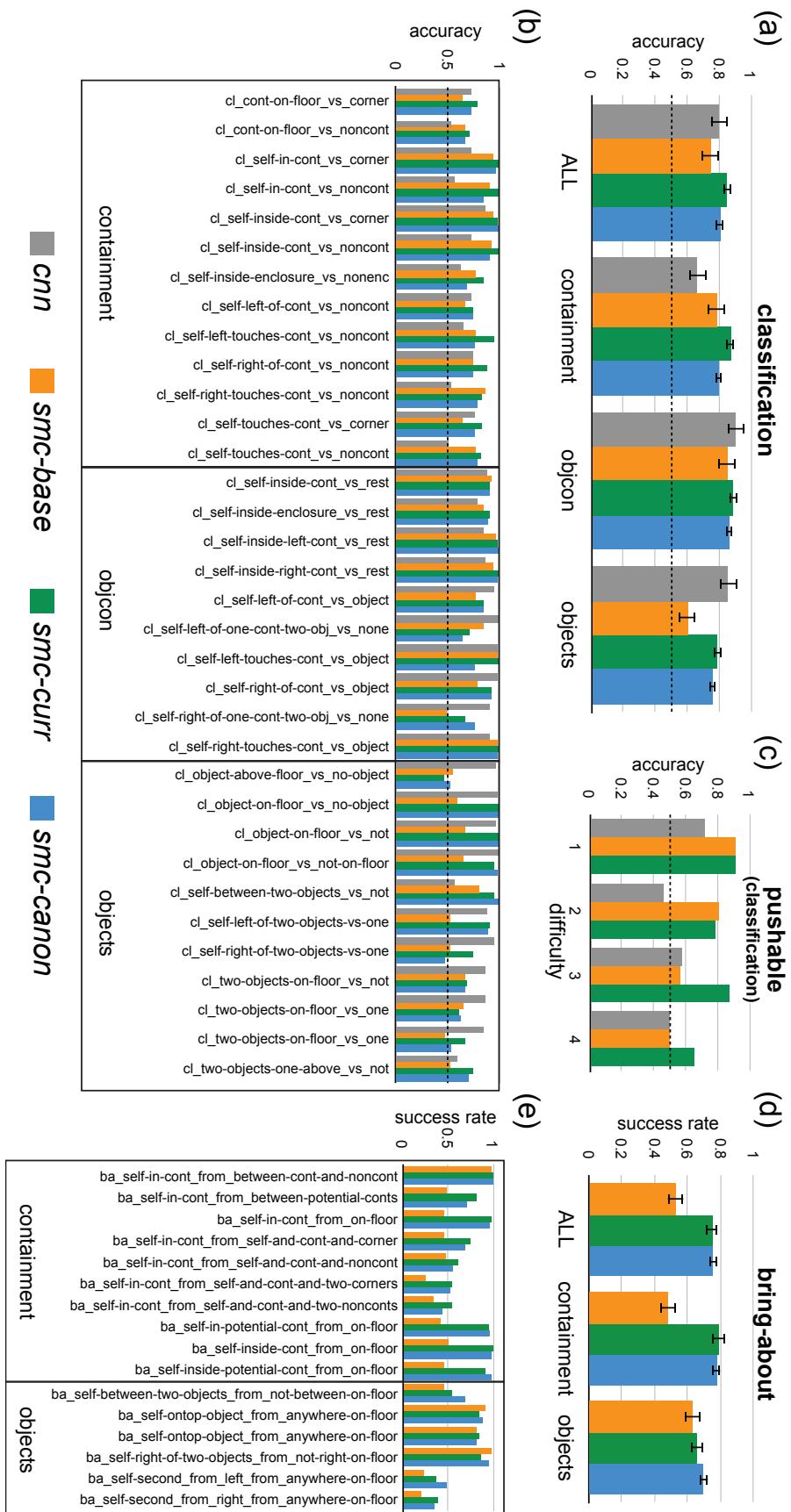


Figure S7: full-page reproduction of Figure 5

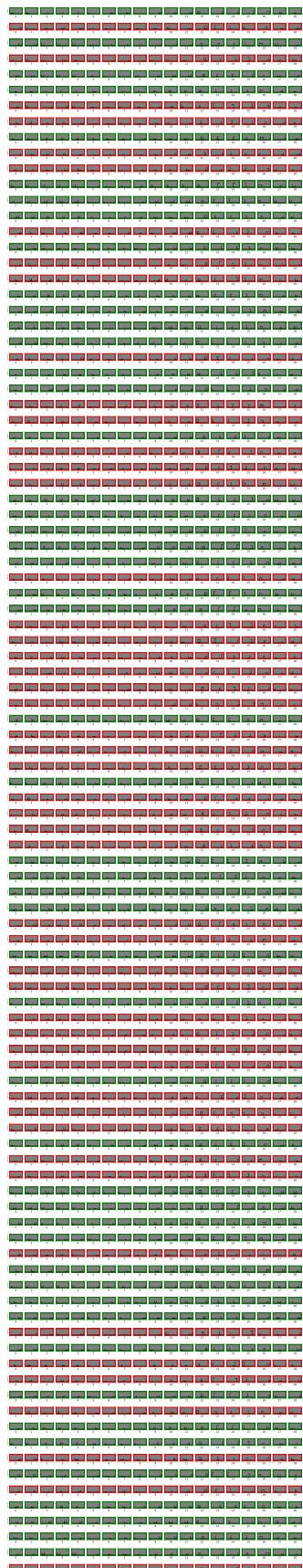


Figure S8: all *con-class* environments

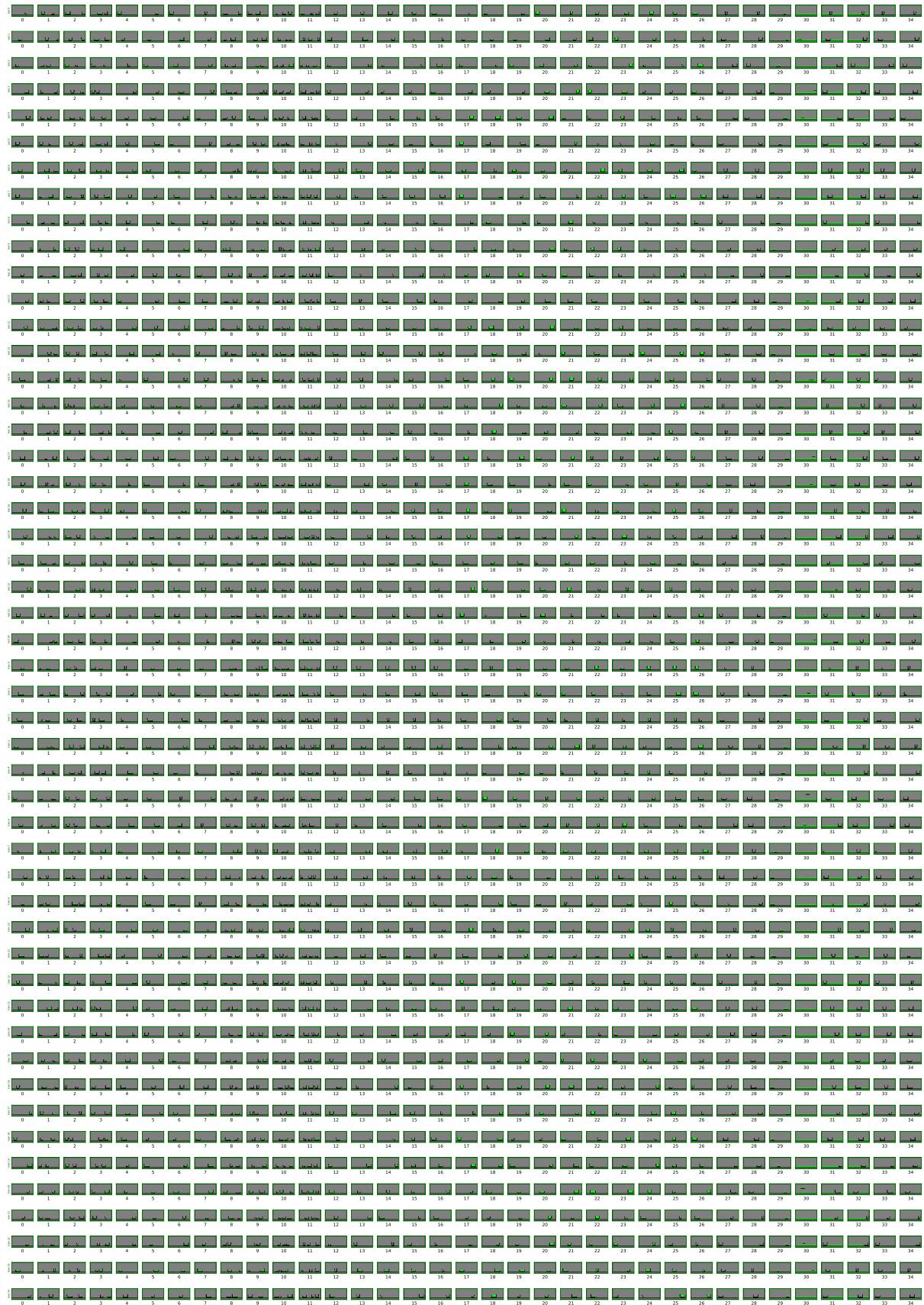


Figure S9: all *con-sig* environments



Figure S10: all *obj-con-class* environments



Figure S11: all *objects-class* environments

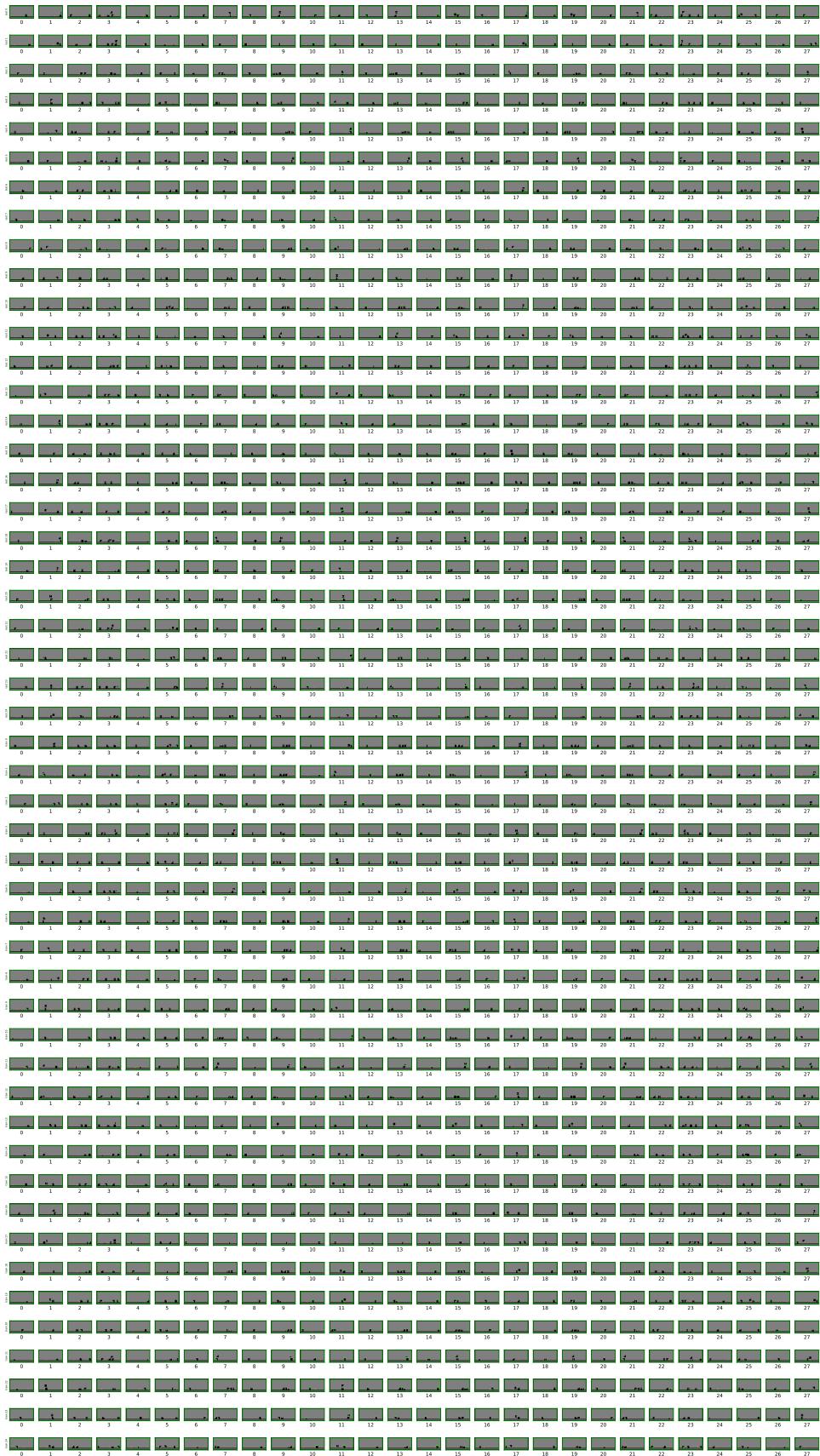


Figure S12: all *objects-dist-sig* environments

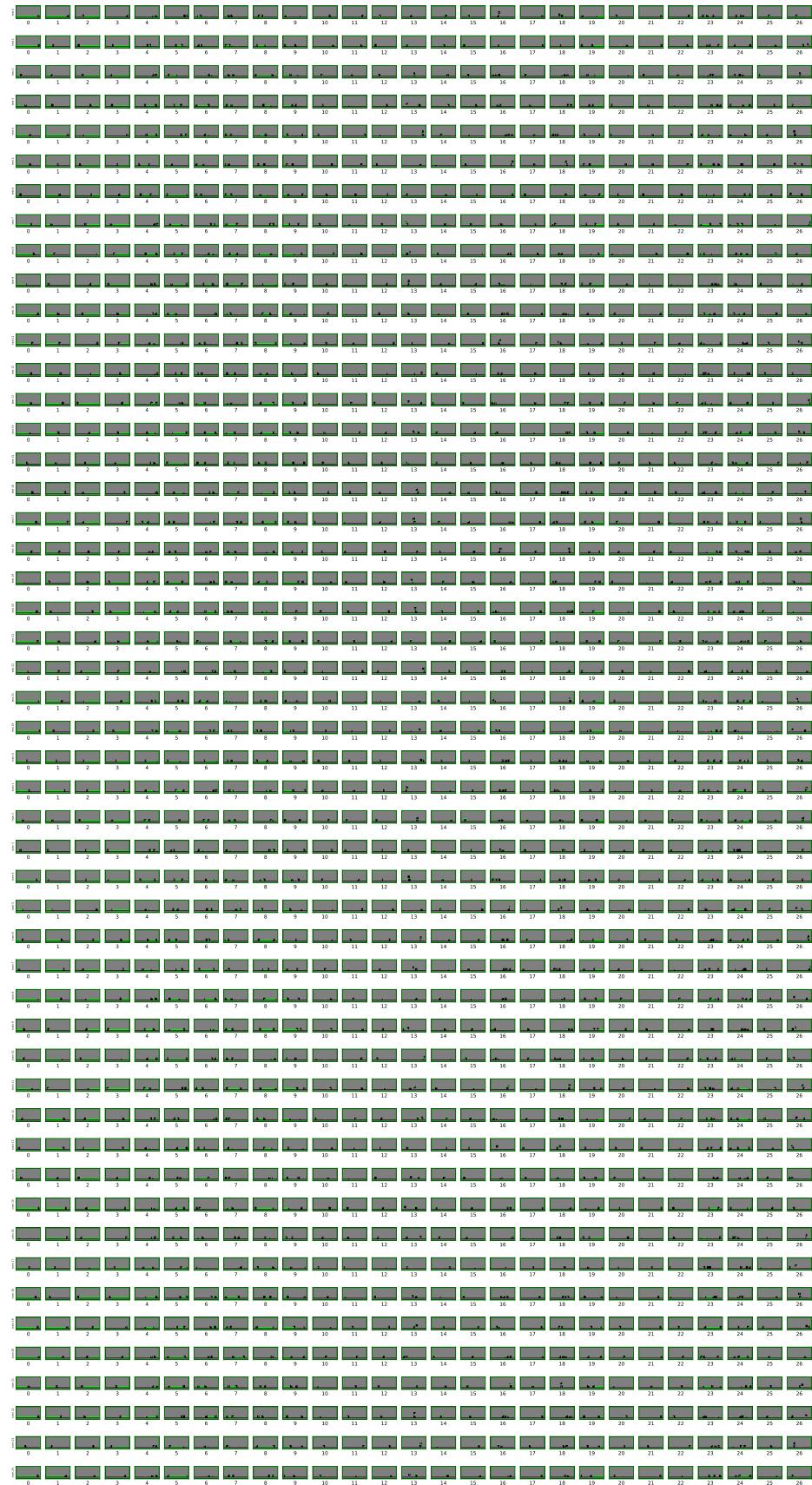


Figure S13: all *objects-sig* environments

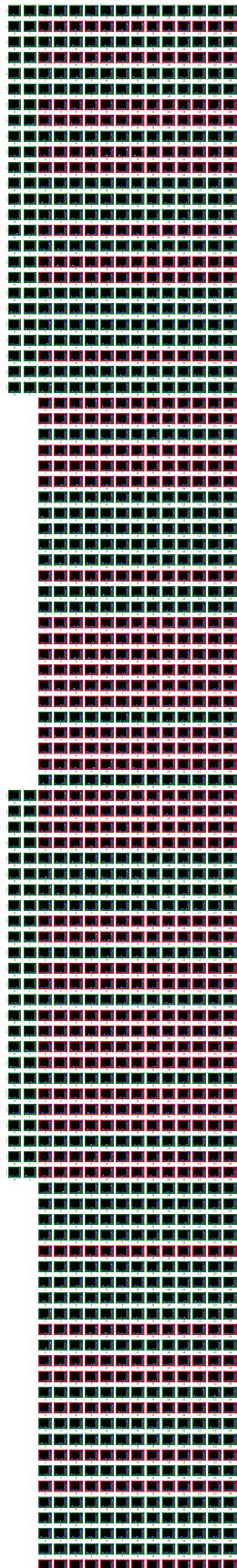


Figure S14: all *pushable-pixels* environments



Figure S15: all *search-sig* environments

2 CNN Comparison

The CNN model we used in Sec. 5 consists of two conv layers with 3×3 kernel and ReLu units, each followed by a 2×2 max-pooling layer. The conv layer feature sizes are 8 and 16, respectively. In order to deal with scarce data, we use $l2$ regularization on all weights. On top of the conv layers, we use 1 FC layer with 16 units.

3 Dataset Logic

3.1 con-class

cl_container-on-floor_vs_corner concept: container-on-floor: $\exists f, x \mid floor(f) \wedge container(x) \wedge on_top(x, f)$

generator: bfaw-self-and-container-on-floor: $\exists f, x, self \mid floor(f) \wedge blue(f) \wedge white(x) \wedge container(x) \wedge on_top(x, f) \wedge on_top(self, f)$

generator: bfaw-self-and-corner-on-floor: $\exists f, x, self \mid floor(f) \wedge blue(f) \wedge white(x) \wedge lower_corner(x) \wedge on_top(x, f) \wedge on_top(self, f)$

cl_container-on-floor_vs_noncontainer concept: container-on-floor: $\exists f, x \mid floor(f) \wedge container(x) \wedge on_top(x, f)$

generator: bfaw-self-and-container-on-floor: $\exists f, x, self \mid floor(f) \wedge blue(f) \wedge white(x) \wedge container(x) \wedge on_top(x, f) \wedge on_top(self, f)$

generator: bfaw-self-and-noncontainer-on-floor: $\exists f, x, self \mid floor(f) \wedge blue(f) \wedge white(x) \wedge noncontainer(x) \wedge on_top(x, f) \wedge on_top(self, f)$

cl_self-in-container_vs_corner concept: self-in-container: $\exists x, self \mid container(x) \wedge inside_supported(self, x)$

generator: bfaw-self-in-container-on-floor: $\exists f, x, self \mid floor(f) \wedge blue(f) \wedge white(x) \wedge container(x) \wedge on_top(x, f) \wedge inside_supported(self, x)$

generator: bfaw-self-in-corner-on-floor: $\exists f, x, self \mid floor(f) \wedge blue(f) \wedge white(x) \wedge lower_corner(x) \wedge on_top(x, f) \wedge inside_supported(self, x)$

cl_self-in-container_vs_noncontainer concept: self-in-container: $\exists x, self \mid container(x) \wedge inside_supported(self, x)$

generator: bfaw-self-in-container-on-floor: $\exists f, x, self \mid floor(f) \wedge blue(f) \wedge white(x) \wedge container(x) \wedge on_top(x, f) \wedge inside_supported(self, x)$

generator: bfaw-self-in-noncontainer-on-floor: $\exists f, x, self \mid floor(f) \wedge blue(f) \wedge white(x) \wedge noncontainer(x) \wedge on_top(x, f) \wedge inside_supported(self, x)$

cl_self-in-container_vs_outside concept: self-in-container: $\exists x, self \mid container(x) \wedge inside_supported(self, x)$

generator: bfaw-self-in-container-on-floor: $\exists f, x, self \mid floor(f) \wedge blue(f) \wedge white(x) \wedge container(x) \wedge on_top(x, f) \wedge inside_supported(self, x)$

generator: bfaw-self-outside-container-on-floor: $\exists f, x, self \mid floor(f) \wedge blue(f) \wedge white(x) \wedge container(x) \wedge on_top(x, f) \wedge on_top(self, f)$

cl_self-in-corner_vs_on-hline concept: self-in-corner: $\exists x, self \mid corner(x) \wedge inside_supported(self, x)$

generator: bfaw-self-in-left-corner-on-floor: $\exists f, x, self \mid floor(f) \wedge blue(f) \wedge white(x) \wedge lower_left_corner(x) \wedge on_top(x, f) \wedge inside_supported(self, x)$

generator: bfaw-self-in-right-corner-on-floor: $\exists f, x, self \mid floor(f) \wedge blue(f) \wedge white(x) \wedge lower_right_corner(x) \wedge on_top(x, f) \wedge inside_supported(self, x)$

generator: bfaw-self-on-hline-on-floor: $\exists f, x, self \mid floor(f) \wedge blue(f) \wedge white(x) \wedge hline(x) \wedge on_top(x, f) \wedge on_top(self, x)$

cl_self-in-left-corner_vs_on-hline concept: self-in-left-corner: $\exists x, self \mid lower_left_corner(x) \wedge inside_supported(self, x)$

generator: bfaw-self-in-left-corner-on-floor: $\exists f, x, self \mid floor(f) \wedge blue(f) \wedge white(x) \wedge lower_left_corner(x) \wedge on_top(x, f) \wedge inside_supported(self, x)$

generator: bfaw-self-on-hline-on-floor: $\exists f, x, self \mid floor(f) \wedge blue(f) \wedge white(x) \wedge hline(x) \wedge on_top(x, f) \wedge on_top(self, x)$

cl_self-in-left-corner_vs_right-corner concept: self-in-left-corner: $\exists x, self \mid lower_left_corner(x) \wedge inside_supported(self, x)$

generator: bfaw-self-in-left-corner-on-floor: $\exists f, x, self \mid floor(f) \wedge blue(f) \wedge white(x) \wedge lower_left_corner(x) \wedge on_top(x, f) \wedge inside_supported(self, x)$

generator: bfaw-self-in-right-corner-on-floor: $\exists f, x, self \mid floor(f) \wedge blue(f) \wedge white(x) \wedge lower_right_corner(x) \wedge on_top(x, f) \wedge inside_supported(self, x)$

cl_self-touches-container_vs_corner concept: self-touches-container-on-floor: $\exists f, x, self \mid floor(f) \wedge container(x) \wedge on_top(x, f) \wedge on_top(self, f) \wedge touches(self, x)$

generator: `bfaw-self-touches-container-on-floor`: $\exists f, x, self \mid floor(f) \wedge blue(f) \wedge white(x) \wedge container(x) \wedge on_top(x, f) \wedge on_top(self, f) \wedge touches(self, x)$

generator: `bfa-w-self-touches-corner-on-floor`: $\exists f, x, self \quad | \quad floor(f) \wedge blue(f) \wedge white(x) \wedge lower_corner(x) \wedge on_top(x, f) \wedge touches(self, x) \wedge on_top(self, f)$

generator: bfa-w-self-left-touches-left-corner-on-floor: $\exists f, x, self \mid floor(f) \wedge blue(f) \wedge white(x) \wedge lower_left_corner(x) \wedge on_top(x, f) \wedge left_of(self, x) \wedge touches(self, x) \wedge on_top(self, f)$

generator: bfa-w-self-right-touches-right-corner-on-floor: $\exists f, x, self \mid floor(f) \wedge blue(f) \wedge white(x) \wedge lower_right_corner(x) \wedge on_top(x, f) \wedge right_of(self, x) \wedge touches(self, x) \wedge on_top(self, f)$

cl_self-touches-container_vs_noncontainer concept: self-touches-container-on-floor: $\exists f, x, self$

generator: bfaw-self-touches-container-on-floor: $\exists f, x, self \mid floor(f) \wedge blue(f) \wedge white(x) \wedge$

generator: bfwaw-self-touches-noncontainer-on-floor: $\exists f, x, self \mid floor(f) \wedge blue(f) \wedge white(x) \wedge$

noncontainer(*x*) \wedge *on_top*(*x*, *f*) \wedge *on_top*(*self*, *f*) \wedge *touches*(*self*, *x*)

3.2 coll-sig

ba-self-in-container-from-adjacent-on-floor concept: self-in-container: $\exists x, \text{self} \in x$ | container(x) \wedge inside_supported(self, x)

generator: draw-self-touches-container-on-floor. $\exists j, x, self \mid floor(j) \wedge blue(j) \wedge white(x) \wedge container(x) \wedge on_top(x, f) \wedge on_top(self, f) \wedge touches(self, x)$

ba_self-in-container_from_between-container-and-corner concept: self-in-container: $\exists x, \text{self}$
 $\text{container}(x) \wedge \text{inside_supported}(\text{self}, x)$

generator: bfw-self-between-container-and-corner-on-floor: $\exists f, x, y, self \mid floor(f) \wedge blue(f) \wedge white(x) \wedge white(y) \wedge container(x) \wedge lower_corner(y) \wedge on_top(x, f) \wedge on_top(y, f) \wedge on_top(self, f) \wedge \neg touches(x, y) \wedge h_between(self, x, y)$

generator: `bfa-w-self-between-corner-and-container-on-floor`: $\exists f, x, y, self \mid floor(f) \wedge blue(f) \wedge white(x) \wedge white(y) \wedge container(x) \wedge lower_corner(y) \wedge on_top(x, f) \wedge on_top(y, f) \wedge on_top(self, f) \wedge \neg touches(x, y) \wedge h_between(self, y, x)$

ba_self-in-container_from_between-container-and-noncontainer concept: self-in-container: $\exists x, \text{self-} \\ \text{container}(x) \wedge \text{inside_supported}(\text{self}, x)$

generator: `bfaw-self-between-container-and-noncontainer-on-floor`: $\exists f, x, y, self \mid floor(f) \wedge blue(f) \wedge white(x) \wedge white(y) \wedge container(x) \wedge noncontainer(y) \wedge on_top(x, f) \wedge on_top(y, f) \wedge on_top(self, f) \wedge \neg touches(x, y) \wedge h_between(self, x, y)$

ba_self-in-container_from_between-potential-containers concept: self-in-container: $\exists x, \text{self}$ |
 $\text{container}(x) \wedge \text{inside_supported}(\text{self}, x)$

generator: bfa-w-self-between-container-and-noncontainer-on-floor: $\exists f, x, y, self \mid floor(f) \wedge blue(f) \wedge white(x) \wedge white(y) \wedge container(x) \wedge noncontainer(y) \wedge on_top(x, f) \wedge on_top(y, f) \wedge on_top(self, f) \wedge \neg touches(x, y) \wedge h_between(self, x, y)$

generator: bfwaf-self-between-noncontainer-and-container-on-floor: $\exists f, x, y, self \mid floor(f) \wedge blue(f) \wedge white(x) \wedge white(y) \wedge container(x) \wedge noncontainer(y) \wedge on_top(x, f) \wedge on_top(y, f) \wedge on_top(self, f) \wedge \neg touches(x, y) \wedge h \ between(self, y, x)$

ba_self-in-container_from_directly-above **concept:** self-in-container: $\exists x, self \in x$ | container(x) \wedge inside_supported(sel,f,x)

generator: bfwaf-self-directly-above-container-on-floor: $\exists f, x, self \mid floor(f) \wedge blue(f) \wedge white(x) \wedge container(x) \wedge on_top(x, f) \wedge dir_above(self, x)$

ba_self-in-container_from_left-touches-on-floor concept: self-in-container: $\exists x, \text{self} \in \text{container}(x)$ | container(x) \wedge inside supported(sel f, x)

generator: bfwaf-self-left-touches-container-on-floor: $\exists f, x, self \mid floor(f) \wedge blue(f) \wedge white(x) \wedge container(x) \wedge on_top(x, f) \wedge on_top(self, f) \wedge touches(self, x) \wedge dir_left_of(self, x)$

ba_self-in-container_from_on-floor concept: self-in-container: $\exists x, self$ | $container(x)$ \wedge
 $inside\ supported(sel\ f, x)$

generator: bfw-self-and-container-on-floor: $\exists f, x, self \mid floor(f) \wedge blue(f) \wedge white(x) \wedge container(x) \wedge on_top(x, f) \wedge on_top(self, f)$

ba_self-in-container_from_right-touches-on-floor concept: self-in-container: $\exists x, \text{self} \mid \text{container}(x) \wedge \text{inside_supported}(\text{self}, x)$

generator: `bfaw-self-right-touches-container-on-floor`: $\exists f, x, self \mid floor(f) \wedge blue(f) \wedge white(x) \wedge container(x) \wedge on_top(x, f) \wedge on_top(self, f) \wedge touches(self, x) \wedge dir_right_of(self, x)$

ba_self-in-container_from-self-and-container-and-corner-on-floor concept: self-in-container: $\exists x, \text{self_in_container}(x) \wedge \text{inside_supported}(\text{self}, x)$

generator: bfaw-self-and-container-and-corner-on-floor: $\exists f, x, y, self \mid floor(f) \wedge blue(f) \wedge white(x) \wedge white(y) \wedge container(x) \wedge lower_corner(y) \wedge on_top(x, f) \wedge on_top(y, f) \wedge on_top(self, f) \wedge \neg touches(x, y)$

ba_self-in-container_from_self-and-container-and-noncontainer-on-floor concept: self-in-container:
 $\exists x, \text{self} \mid \text{container}(x) \wedge \text{inside_supported}(\text{self}, x)$

generator: `bfaw-self-and-container-and-noncontainer-on-floor`: $\exists f, x, y, self \quad | \quad floor(f) \wedge blue(f) \wedge white(x) \wedge white(y) \wedge container(x) \wedge noncontainer(y) \wedge on_top(x, f) \wedge on_top(y, f) \wedge on_top(self, f) \wedge \neg touches(x, y)$

ba_self-in-container_from-self-and-container-and-two-corners-on-floor concept: self-in-container: $\exists x, \text{self} | \text{container}(x) \wedge \text{inside_supported}(\text{self}, x)$

generator: `bfa-w-self-and-container-and-two-corners-on-floor`: $\exists f, x, y, z, self \mid floor(f) \wedge blue(f) \wedge white(x) \wedge white(y) \wedge white(z) \wedge container(x) \wedge lower_corner(y) \wedge lower_corner(z) \wedge on_top(x, f) \wedge on_top(y, f) \wedge on_top(z, f) \wedge on_top(self, f) \wedge \neg touches(x, y) \wedge \neg touches(y, z) \wedge \neg touches(x, z)$

ba_self-in-container_from-self-and-container-and-two-noncontainers-on-floor concept: self-in-container:
 $\exists x, self \mid container(x) \wedge inside_supported(self, x)$

generator: bfa-w-self-and-container-and-two-noncontainers-on-floor: $\exists f, x, y, z, self$
 $floor(f) \wedge blue(f) \wedge white(x) \wedge white(y) \wedge white(z) \wedge container(x) \wedge noncontainer(y) \wedge noncontainer(z) \wedge$
 $on_top(x, f) \wedge on_top(y, f) \wedge on_top(z, f) \wedge on_top(self, f) \wedge \neg touches(x, y) \wedge \neg touches(y, z) \wedge \neg touches(x, z)$

ba_self-in-potential-container_from_adjacent-on-floor concept: self-in-potential-container: $\exists x, \text{self_potential_container}(x) \wedge \text{inside_supported}(\text{self}, x)$

generator: bfaaw-self-touches-container-on-floor: $\exists f, x, self \quad floor(f) \wedge blue(f) \wedge white(x) \wedge container(x) \wedge on_top(x, f) \wedge on_top(self, f) \wedge touches(self, x)$

generator: bfa-w-self-touches-noncontainer-on-floor: $\exists f, x, self \mid floor(f) \wedge blue(f) \wedge white(x) \wedge noncontainer(x) \wedge on_top(x, f) \wedge on_top(self, f) \wedge touches(self, x)$

ba_self-in-potential-container_from_directly-above concept: self-in-potential-container: $\exists x, \text{self_in_potential_container}(x) \wedge \text{inside_supported}(\text{self}, x)$

generator: bfaw-self-directly-above-container-on-floor: $\exists f, x, self \mid floor(f) \wedge blue(f) \wedge white(x) \wedge container(x) \wedge on_top(x, f) \wedge dir_above(self, x)$

generator: bfwf-self-directly-above-noncontainer-on-floor: $\exists f, x, self \mid floor(f) \wedge blue(f) \wedge white(x) \wedge noncontainer(x) \wedge on_top(x, f) \wedge dir_above(self, x)$

ba_self-in-potential-container_from_left-touches-on-floor **concept:** self-in-potential-container: $\exists x, \text{self} \in \text{potential_container}(x) \wedge \text{inside_supported}(\text{self}, x)$

generator: bfaaw-self-left-touches-container-on-floor: $\exists f, x, self \mid floor(f) \wedge blue(f) \wedge white(x) \wedge container(x) \wedge on_top(x, f) \wedge on_top(self, f) \wedge touches(self, x) \wedge dir_left_of(self, x)$

generator: bfaaw-self-left-touches-noncontainer-on-floor: $\exists f, x, self \mid floor(f) \wedge blue(f) \wedge white(x) \wedge noncontainer(x) \wedge on_top(x, f) \wedge on_top(self, f) \wedge touches(self, x) \wedge dir_left_of(self, x)$

ba_self-in-potential-container_from_on-floor concept: self-in-potential-container: $\exists x, \text{self_container}(x) \wedge \text{inside_supported}(\text{self}, x)$

generator: bfaaw-self-and-container-on-floor: $\exists f, x, self \mid floor(f) \wedge blue(f) \wedge white(x) \wedge container(x) \wedge on_top(x, f) \wedge on_top(self, f)$

generator: `bfaW-self-and-noncontainer-on-floor`: $\exists f, x, self \quad | \quad floor(f) \wedge blue(f) \wedge white(x) \wedge noncontainer(x) \wedge on_top(x, f) \wedge on_top(self, f)$

ba_self-in-potential-container_from_right-touches-on-floor concept: self-in-potential-container:
 $\exists x, self \mid potential_container(x) \wedge inside_supported(self, x)$

generator: bfaaw-self-right-touches-container-on-floor: $\exists f, x, self \mid \text{floor}(f) \wedge \text{blue}(f) \wedge \text{white}(x) \wedge \text{container}(x) \wedge \text{on_top}(x, f) \wedge \text{on_top}(self, f) \wedge \text{touches}(self, x) \wedge \text{dir_right_of}(self, x)$

generator: `bfaw-self-right-touches-noncontainer-on-floor`: $\exists f, x, self \mid \text{floor}(f) \wedge \text{blue}(f) \wedge \text{white}(x) \wedge \text{noncontainer}(x) \wedge \text{on_top}(x, f) \wedge \text{on_top}(self, f) \wedge \text{touches}(self, x) \wedge \text{dir_right_of}(self, x)$

ba_self-inside-container_from_adjacent-on-floor concept: self-inside-container: $\exists x, \text{self} \mid \text{container}(x) \wedge \text{inside}(\text{self}, x)$

generator: bfaw-self-touches-container-on-floor: $\exists f, x, self \mid floor(f) \wedge blue(f) \wedge white(x) \wedge container(x) \wedge on_top(x, f) \wedge on_top(self, f) \wedge touches(self, x)$

ba_self-inside-container_from_directly-above concept: self-inside-container: $\exists x, \text{self} \mid \text{container}(x) \wedge \text{inside}(\text{self}, x)$

generator: `bfaw-self-directly-above-container-on-floor`: $\exists f, x, self \mid floor(f) \wedge blue(f) \wedge white(x) \wedge container(x) \wedge on_top(x, f) \wedge dir_above(self, x)$

ba_self-inside-container_from_left-touches-on-floor concept: self-inside-container: $\exists x, \text{self}$
 $\text{container}(x) \wedge \text{inside}(\text{self}, x)$

generator: `bfaw-self-left-touches-container-on-floor`: $\exists f, x, self \mid floor(f) \wedge blue(f) \wedge white(x) \wedge container(x) \wedge on_top(x, f) \wedge on_top(self, f) \wedge touches(self, x) \wedge dir_left_of(self, x)$

ba_self-inside-container_from_on-floor concept: self-inside-container: $\exists x, \text{self} \in \text{inside}(x)$ | container(x) \wedge

generator: `bfa-w-self-and-container-on-floor`: $\exists f, x, self \mid floor(f) \wedge blue(f) \wedge white(x) \wedge container(x) \wedge on_top(x, f) \wedge on_top(self, f)$

ba_self-inside-container_from_right-touches-on-floor concept: self-inside-container: $\exists x, \text{self-}container(x) \wedge \text{inside}(\text{self}, x)$

generator: bfa-w-self-right-touches-container-on-floor: $\exists f, x, self \mid floor(f) \wedge blue(f) \wedge white(x) \wedge container(x) \wedge on_top(x, f) \wedge on_top(self, f) \wedge touches(self, x) \wedge dir_right_of(self, x)$

ba_self-inside-potential-container_from_adjacent-on-floor concept: self-inside-potential-container:
 $\exists x, self \mid potential_container(x) \wedge inside(self, x)$

generator: `bfaw-self-touches-container-on-floor`: $\exists f, x, self \mid floor(f) \wedge blue(f) \wedge white(x) \wedge container(x) \wedge on_top(x, f) \wedge on_top(self, f) \wedge touches(self, x)$

generator: bfa-w-self-touches-noncontainer-on-floor: $\exists f, x, \text{self} \mid \text{floor}(f) \wedge \text{blue}(f) \wedge \text{white}(x) \wedge \text{noncontainer}(x) \wedge \text{on_top}(x, f) \wedge \text{on_top}(\text{self}, f) \wedge \text{touches}(\text{self}, x)$

ba_self-inside-potential-container_from_directly-above concept: $\exists x, self \mid potential_container(x) \wedge inside(self, x)$

generator: bfa-w-self-directly-above-container-on-floor: $\exists f, x, self \mid floor(f) \wedge blue(f) \wedge white(x) \wedge container(x) \wedge on_top(x, f) \wedge dir_above(self, x)$

generator: bbfaw-self-directly-above-noncontainer-on-floor: $\exists f, x, self \mid floor(f) \wedge blue(f) \wedge white(x) \wedge noncontainer(x) \wedge on_top(x, f) \wedge dir_above(self, x)$

ba_self-inside-potential-container_from_left-touches-on-floor concept: self-inside-potential-container:
 $\exists x, self \mid potential_container(x) \wedge inside(self, x)$

generator: bfwaf-self-left-touches-container-on-floor: $\exists f, x, \text{self} \mid \text{floor}(f) \wedge \text{blue}(f) \wedge \text{white}(x) \wedge \text{container}(x) \wedge \text{on_top}(x, f) \wedge \text{on_top}(\text{self}, f) \wedge \text{touches}(\text{self}, x) \wedge \text{dir_left_of}(\text{self}, x)$

generator: `bfa-w-self-left-touches-noncontainer-on-floor`: $\exists f, x, self \mid floor(f) \wedge blue(f) \wedge white(x) \wedge noncontainer(x) \wedge on_top(x, f) \wedge on_top(self, f) \wedge touches(self, x) \wedge dir_left_of(self, x)$

ba_self-inside-potential-container_from_on-floor concept: self-inside-potential-container: $\exists x, \text{self_potential_container}(x) \wedge \text{inside}(\text{self}, x)$

generator: bfa-w-self-and-container-on-floor: $\exists f, x, self \mid floor(f) \wedge blue(f) \wedge white(x) \wedge container(x) \wedge on_top(x, f) \wedge on_top(self, f)$

generator: `blaw-self-and-noncontainer-on-top`: $\exists j, x, set \quad | \quad floor(j) \wedge value(j) \wedge white(x) \wedge noncontainer(x) \wedge on_top(x, f) \wedge on_top(self, f)$

ba_self-inside-potential-container_from_right-touches-on-noor concept: self-inside-potential-container:
 $\exists x, \text{self} \mid \text{potential_container}(x) \wedge \text{inside}(\text{self}, x)$

generator: `brawl-self-right-touches-container-on-top`: $\exists f, x, self \mid \text{floor}(f) \wedge \text{blue}(f) \wedge \text{white}(x) \wedge \text{container}(x) \wedge \text{on_top}(x, f) \wedge \text{on_top}(self, f) \wedge \text{touches}(self, x) \wedge \text{dir_right_of}(self, x)$

generator: draw-self-right-touches-noncontainer-on-floor. $\exists f, x, self \mid floor(f) \wedge \text{white}(f) \wedge \text{white}(x) \wedge \text{noncontainer}(x) \wedge \text{on_top}(x, f) \wedge \text{on_top}(self, f) \wedge \text{touches}(self, x) \wedge \text{dir_right_of}(self, x)$

ba_self-left-touches-container-on-floor_from_in concept: self-left-touches-container-on-floor:
 $\exists f, x, self \mid floor(f) \wedge container(x) \wedge on_top(x, f) \wedge on_top(self, f) \wedge touches(self, x) \wedge dir_left_of(self, x)$

generator: $befor_self_in_container_on_floor; \exists f, x, self \mid floor(f) \wedge blue(f) \wedge white(x) \wedge container(x) \wedge$

generator: `braw-self-in-container-on-floor`: $\exists f, x, self \mid floor(f) \wedge blue(f) \wedge white(x) \wedge container(x) \wedge on_top(x, f) \wedge inside_supported(self, x)$

ba_self-left-touches-container-on-floor_from_inside concept: self-left-touches-container-on-floor:
 $\exists f, x, self \mid floor(f) \wedge container(x) \wedge on_top(x, f) \wedge on_top(self, f) \wedge touches(self, x) \wedge dir_left_of(self, x)$

generator: bfaw-self-inside-container-on-floor: $\exists f, x, self \mid floor(f) \wedge blue(f) \wedge white(x) \wedge container(x) \wedge on_top(x, f) \wedge inside(self, x)$

ba_self-on-hline_from_directly-above concept: self-on-hline: $\exists x, self \mid hline(x) \wedge on_top(self, x)$

generator: bfaw-self-directly-above-hline-on-floor: $\exists f, x, self \mid floor(f) \wedge blue(f) \wedge white(x) \wedge hline(x) \wedge on_top(x, f) \wedge dir_above(self, x)$

ba_self-on-something_from_directly-above concept: self-on-something: $\exists x, self \mid on_top(self, x)$

generator: bfaw-self-directly-above-hline: $\exists f, x, self \mid floor(f) \wedge blue(f) \wedge white(x) \wedge hline(x) \wedge dir_above(self, x)$

generator: bfaw-self-above-floor: $\exists f, self \mid floor(f) \wedge blue(f) \wedge dir_above(self, f)$

ba_self-outside-container_from_in concept: self-on-floor: $\exists f, self \mid floor(f) \wedge on_top(self, f)$

generator: bfaw-self-in-container-on-floor: $\exists f, x, self \mid floor(f) \wedge blue(f) \wedge white(x) \wedge container(x) \wedge on_top(x, f) \wedge inside_supported(self, x)$

ba_self-outside-container_from_inside concept: self-on-floor: $\exists f, self \mid floor(f) \wedge on_top(self, f)$

generator: bfaw-self-inside-container-on-floor: $\exists f, x, self \mid floor(f) \wedge blue(f) \wedge white(x) \wedge container(x) \wedge on_top(x, f) \wedge inside(self, x)$

ba_self-right-touches-container-on-floor_from_in concept: self-right-touches-container-on-floor:
 $\exists f, x, self \mid floor(f) \wedge container(x) \wedge on_top(x, f) \wedge on_top(self, f) \wedge touches(self, x) \wedge dir_right_of(self, x)$

generator: bfaw-self-in-container-on-floor: $\exists f, x, self \mid floor(f) \wedge blue(f) \wedge white(x) \wedge container(x) \wedge on_top(x, f) \wedge inside_supported(self, x)$

ba_self-right-touches-container-on-floor_from_inside concept: self-right-touches-container-on-floor:
 $\exists f, x, self \mid floor(f) \wedge container(x) \wedge on_top(x, f) \wedge on_top(self, f) \wedge touches(self, x) \wedge dir_right_of(self, x)$

generator: bfaw-self-inside-container-on-floor: $\exists f, x, self \mid floor(f) \wedge blue(f) \wedge white(x) \wedge container(x) \wedge on_top(x, f) \wedge inside(self, x)$

3.3 obj-con-class

cl_self-inside-container_vs_rest concept: self-inside-container: $\exists x, \text{self} \mid \text{container}(x) \wedge \text{inside}(\text{self}, x)$

generator: bfaw-self-inside-container-on-floor: $\exists f, x, \text{self} \mid \text{floor}(f) \wedge \text{blue}(f) \wedge \text{white}(x) \wedge \text{container}(x) \wedge \text{on_top}(x, f) \wedge \text{inside}(\text{self}, x)$

generator: bfaw-self-inside-noncontainer-on-floor: $\exists f, x, \text{self} \mid \text{floor}(f) \wedge \text{blue}(f) \wedge \text{white}(x) \wedge \text{noncontainer}(x) \wedge \text{on_top}(x, f) \wedge \text{inside}(\text{self}, x)$

generator: bfaw-self-inside-enclosure-on-floor: $\exists f, x, \text{self} \mid \text{floor}(f) \wedge \text{blue}(f) \wedge \text{white}(x) \wedge \text{enclosure}(x) \wedge \text{on_top}(x, f) \wedge \text{inside}(\text{self}, x)$

generator: bfaw-self-inside-nonclosure-on-floor: $\exists f, x, \text{self} \mid \text{floor}(f) \wedge \text{blue}(f) \wedge \text{white}(x) \wedge \text{nonclosure}(x) \wedge \text{on_top}(x, f) \wedge \text{inside}(\text{self}, x)$

generator: bfaw-self-inside-left-container-on-floor: $\exists f, x \mid \text{floor}(f) \wedge \text{blue}(f) \wedge \text{white}(x) \wedge \text{self}_{\text{insideleft}}\text{container}(x) \wedge \text{on_top}(x, f)$

generator: bfaw-self-inside-right-container-on-floor: $\exists f, x \mid \text{floor}(f) \wedge \text{blue}(f) \wedge \text{white}(x) \wedge \text{self}_{\text{insiderright}}\text{container}(x) \wedge \text{on_top}(x, f)$

cl_self-inside-enclosure_vs_rest concept: self-inside-enclosure: $\exists x, \text{self} \mid \text{enclosure}(x) \wedge \text{inside}(\text{self}, x)$

generator: bfaw-self-inside-container-on-floor: $\exists f, x, \text{self} \mid \text{floor}(f) \wedge \text{blue}(f) \wedge \text{white}(x) \wedge \text{container}(x) \wedge \text{on_top}(x, f) \wedge \text{inside}(\text{self}, x)$

generator: bfaw-self-inside-noncontainer-on-floor: $\exists f, x, \text{self} \mid \text{floor}(f) \wedge \text{blue}(f) \wedge \text{white}(x) \wedge \text{noncontainer}(x) \wedge \text{on_top}(x, f) \wedge \text{inside}(\text{self}, x)$

generator: bfaw-self-inside-enclosure-on-floor: $\exists f, x, \text{self} \mid \text{floor}(f) \wedge \text{blue}(f) \wedge \text{white}(x) \wedge \text{enclosure}(x) \wedge \text{on_top}(x, f) \wedge \text{inside}(\text{self}, x)$

generator: bfaw-self-inside-nonclosure-on-floor: $\exists f, x, \text{self} \mid \text{floor}(f) \wedge \text{blue}(f) \wedge \text{white}(x) \wedge \text{nonclosure}(x) \wedge \text{on_top}(x, f) \wedge \text{inside}(\text{self}, x)$

generator: bfaw-self-inside-left-container-on-floor: $\exists f, x \mid \text{floor}(f) \wedge \text{blue}(f) \wedge \text{white}(x) \wedge \text{self}_{\text{insideleft}}\text{container}(x) \wedge \text{on_top}(x, f)$

generator: bfaw-self-inside-right-container-on-floor: $\exists f, x \mid \text{floor}(f) \wedge \text{blue}(f) \wedge \text{white}(x) \wedge \text{self}_{\text{insiderright}}\text{container}(x) \wedge \text{on_top}(x, f)$

cl_self-inside-left-container_vs_rest concept: self-inside-left-container: $\exists x, self \mid left_container(x) \wedge inside(self, x)$

generator: bfaw-self-inside-container-on-floor: $\exists f, x, self \mid floor(f) \wedge blue(f) \wedge white(x) \wedge container(x) \wedge on_top(x, f) \wedge inside(self, x)$

generator: bfaw-self-inside-noncontainer-on-floor: $\exists f, x, self \mid floor(f) \wedge blue(f) \wedge white(x) \wedge noncontainer(x) \wedge on_top(x, f) \wedge inside(self, x)$

generator: bfaw-self-inside-enclosure-on-floor: $\exists f, x, self \mid floor(f) \wedge blue(f) \wedge white(x) \wedge enclosure(x) \wedge on_top(x, f) \wedge inside(self, x)$

generator: bfaw-self-inside-nonenclosure-on-floor: $\exists f, x, self \mid floor(f) \wedge blue(f) \wedge white(x) \wedge nonenclosure(x) \wedge on_top(x, f) \wedge inside(self, x)$

generator: bfaw-self-inside-left-container-on-floor: $\exists f, x \mid floor(f) \wedge blue(f) \wedge white(x) \wedge self_{inside_left_c}ontainer(x) \wedge on_top(x, f)$

generator: bfaw-self-inside-right-container-on-floor: $\exists f, x \mid floor(f) \wedge blue(f) \wedge white(x) \wedge self_{inside_right_c}ontainer(x) \wedge on_top(x, f)$

cl_self-inside-right-container_vs_rest concept: self-inside-right-container: $\exists x, self \mid right_container(x) \wedge inside(self, x)$

generator: bfaw-self-inside-container-on-floor: $\exists f, x, self \mid floor(f) \wedge blue(f) \wedge white(x) \wedge container(x) \wedge on_top(x, f) \wedge inside(self, x)$

generator: bfaw-self-inside-noncontainer-on-floor: $\exists f, x, self \mid floor(f) \wedge blue(f) \wedge white(x) \wedge noncontainer(x) \wedge on_top(x, f) \wedge inside(self, x)$

generator: bfaw-self-inside-enclosure-on-floor: $\exists f, x, self \mid floor(f) \wedge blue(f) \wedge white(x) \wedge enclosure(x) \wedge on_top(x, f) \wedge inside(self, x)$

generator: bfaw-self-inside-nonenclosure-on-floor: $\exists f, x, self \mid floor(f) \wedge blue(f) \wedge white(x) \wedge nonenclosure(x) \wedge on_top(x, f) \wedge inside(self, x)$

generator: bfaw-self-inside-left-container-on-floor: $\exists f, x \mid floor(f) \wedge blue(f) \wedge white(x) \wedge self_{inside_left_c}ontainer(x) \wedge on_top(x, f)$

generator: bfaw-self-inside-right-container-on-floor: $\exists f, x \mid floor(f) \wedge blue(f) \wedge white(x) \wedge self_{inside_right_c}ontainer(x) \wedge on_top(x, f)$

cl_self-left-of-container_vs_non-container concept: self-left-of-container-on-floor: $\exists f, x, self \mid floor(f) \wedge container(x) \wedge on_top(x, f) \wedge on_top(self, f) \wedge dir_left_of(self, x)$

generator: bfaw-self-left-of-container-on-floor: $\exists f, x, self \mid floor(f) \wedge blue(f) \wedge white(x) \wedge container(x) \wedge on_top(x, f) \wedge on_top(self, f) \wedge dir_left_of(self, x)$

generator: bfaw-self-left-of-noncontainer-on-floor: $\exists f, x, self \mid floor(f) \wedge blue(f) \wedge white(x) \wedge noncontainer(x) \wedge on_top(x, f) \wedge on_top(self, f) \wedge dir_left_of(self, x)$

cl_self-left-of-container_vs_object concept: self-left-of-container-on-floor: $\exists f, x, self \mid floor(f) \wedge container(x) \wedge on_top(x, f) \wedge on_top(self, f) \wedge dir_left_of(self, x)$

generator: bfaw-self-left-of-container-on-floor: $\exists f, x, self \mid floor(f) \wedge blue(f) \wedge white(x) \wedge container(x) \wedge on_top(x, f) \wedge on_top(self, f) \wedge dir_left_of(self, x)$

generator: bfaw-object-right-of-self-on-floor: $\exists f, x, self \mid floor(f) \wedge blue(f) \wedge white(x) \wedge small_blob(x) \wedge on_top(x, f) \wedge on_top(self, f) \wedge dir_right_of(x, self)$

cl_self-left-of-one-container-of-two-objects_vs_none concept: self-left-of-container-on-floor: $\exists f, x, self \mid floor(f) \wedge container(x) \wedge on_top(x, f) \wedge on_top(self, f) \wedge dir_left_of(self, x)$

generator: bfaw-self-left-of-container-and-object-on-floor: $\exists f, x, y, self \mid floor(f) \wedge blue(f) \wedge white(x) \wedge container(x) \wedge object(y) \wedge white(y) \wedge on_top(x, f) \wedge on_top(self, f) \wedge dir_left_of(self, x) \wedge on_top(y, f) \wedge dir_left_of(self, y) \wedge \neg touches(x, y)$

generator: bfaw-two-non-adjacent-objects-right-of-self-on-floor: $\exists f, x, y, self \mid floor(f) \wedge blue(f) \wedge white(x) \wedge white(y) \wedge small_blob(x) \wedge small_blob(y) \wedge on_top(x, f) \wedge on_top(y, f) \wedge on_top(self, f) \wedge dir_right_of(x, self) \wedge dir_right_of(y, self) \wedge \neg touches(x, y)$

cl_self-left-of-two-objects-vs-one concept: two-objects-and-self-on-floor: $\exists f, x, y, self \mid floor(f) \wedge on_top(x, f) \wedge on_top(y, f) \wedge on_top(self, f)$

generator: bfaw-two-non-adjacent-objects-right-of-self-on-floor: $\exists f, x, y, self \mid floor(f) \wedge blue(f) \wedge white(x) \wedge white(y) \wedge small_blob(x) \wedge small_blob(y) \wedge on_top(x, f) \wedge on_top(y, f) \wedge on_top(self, f) \wedge dir_right_of(x, self) \wedge dir_right_of(y, self) \wedge \neg touches(x, y)$

generator: bfaw-object-right-of-self-on-floor: $\exists f, x, self \mid floor(f) \wedge blue(f) \wedge white(x) \wedge small_blob(x) \wedge on_top(x, f) \wedge on_top(self, f) \wedge dir_right_of(x, self)$

3.4 objects-class

cl_adjacent-object-on-floor_vs_not concept: object-touches-self-on-floor: $\exists f, x, self \mid floor(f) \wedge on_top(x, f) \wedge on_top(self, f) \wedge touches(self, x)$

generator: bfaw-adjacent-object-and-self-on-floor: $\exists f, x, self \mid floor(f) \wedge blue(f) \wedge white(x) \wedge small_blob(x) \wedge on_top(x, f) \wedge on_top(self, f) \wedge touches(self, x)$

generator: bfaw-non-adjacent-object-and-self-on-floor: $\exists f, x, self \mid floor(f) \wedge blue(f) \wedge white(x) \wedge small_blob(x) \wedge on_top(x, f) \wedge on_top(self, f) \wedge \neg touches(self, x)$

generator: bfaw-self-on-floor-and-floating-object-adjacent: $\exists f, x, self \mid floor(f) \wedge blue(f) \wedge white(x) \wedge small_blob(x) \wedge on_top(self, f) \wedge above(x, f) \wedge touches(self, x) \wedge \neg touches(x, f)$

cl_object-above-floor_vs_no-object concept: object-above-floor: $\exists f, x \mid floor(f) \wedge above(x, f) \wedge \neg touches(x, f)$

generator: bfaw-self-on-floor-and-floating-object: $\exists f, x, self \mid floor(f) \wedge blue(f) \wedge white(x) \wedge small_blob(x) \wedge on_top(self, f) \wedge above(x, f) \wedge \neg touches(x, f)$

generator: bfaw-self-on-floor: $\exists f, self \mid floor(f) \wedge blue(f) \wedge on_top(self, f)$

cl_object-on-floor_vs_no-object concept: object-on-floor: $\exists f, x \mid floor(f) \wedge on_top(x, f)$

generator: bfaw-object-and-self-on-floor: $\exists f, x, self \mid floor(f) \wedge blue(f) \wedge white(x) \wedge small_blob(x) \wedge on_top(x, f) \wedge on_top(self, f)$

generator: bfaw-self-on-floor: $\exists f, self \mid floor(f) \wedge blue(f) \wedge on_top(self, f)$

cl_object-on-floor_vs_not concept: object-on-floor: $\exists f, x \mid floor(f) \wedge on_top(x, f)$

generator: bfaw-object-and-self-on-floor: $\exists f, x, self \mid floor(f) \wedge blue(f) \wedge white(x) \wedge small_blob(x) \wedge on_top(x, f) \wedge on_top(self, f)$

generator: bfaw-self-on-floor: $\exists f, self \mid floor(f) \wedge blue(f) \wedge on_top(self, f)$

generator: bfaw-self-on-floor-and-floating-object: $\exists f, x, self \mid floor(f) \wedge blue(f) \wedge white(x) \wedge small_blob(x) \wedge on_top(self, f) \wedge above(x, f) \wedge \neg touches(x, f)$

cl_object-on-floor_vs_not-on-floor concept: object-on-floor: $\exists f, x \mid floor(f) \wedge on_top(x, f)$

generator: bfaw-object-and-self-on-floor: $\exists f, x, self \mid floor(f) \wedge blue(f) \wedge white(x) \wedge small_blob(x) \wedge on_top(x, f) \wedge on_top(self, f)$

generator: bfaw-self-on-floor-and-floating-object: $\exists f, x, self \mid floor(f) \wedge blue(f) \wedge white(x) \wedge small_blob(x) \wedge on_top(self, f) \wedge above(x, f) \wedge \neg touches(x, f)$

cl_self-between-two-objects_vs_not-between-on-floor concept: two-objects-one-left-one-right-on-floor: $\exists f, x, y, self \mid floor(f) \wedge on_top(x, f) \wedge on_top(y, f) \wedge on_top(self, f) \wedge dir_left_of(x, self) \wedge dir_right_of(y, self)$

generator: bfaw-two-non-adjacent-objects-and-self-on-floor: $\exists f, x, y, self \mid floor(f) \wedge blue(f) \wedge white(x) \wedge white(y) \wedge small_blob(x) \wedge small_blob(y) \wedge on_top(x, f) \wedge on_top(y, f) \wedge on_top(self, f) \wedge \neg touches(x, y)$

cl_self-touches-object_vs_not-touches-on-floor concept: object-touches-self-on-floor: $\exists f, x, self \mid floor(f) \wedge on_top(x, f) \wedge on_top(self, f) \wedge touches(self, x)$

generator: bfaw-object-and-self-on-floor: $\exists f, x, self \mid floor(f) \wedge blue(f) \wedge white(x) \wedge small_blob(x) \wedge on_top(x, f) \wedge on_top(self, f)$

cl_two-objects-on-floor_vs_not concept: two-objects-on-floor: $\exists f, x, y \mid floor(f) \wedge on_top(x, f) \wedge on_top(y, f)$

generator: bfaw-two-non-adjacent-objects-and-self-on-floor: $\exists f, x, y, self \mid floor(f) \wedge blue(f) \wedge white(x) \wedge white(y) \wedge small_blob(x) \wedge small_blob(y) \wedge on_top(x, f) \wedge on_top(y, f) \wedge on_top(self, f) \wedge \neg touches(x, y)$

generator: bfaw-self-and-two-objects-one-on-floor: $\exists f, x, y, self \mid floor(f) \wedge blue(f) \wedge white(x) \wedge white(y) \wedge small_blob(x) \wedge small_blob(y) \wedge on_top(x, f) \wedge above(y, f) \wedge on_top(self, f) \wedge \neg touches(y, f) \wedge \neg touches(x, y)$

generator: bfaw-object-and-self-on-floor: $\exists f, x, self \mid floor(f) \wedge blue(f) \wedge white(x) \wedge small_blob(x) \wedge on_top(x, f) \wedge on_top(self, f)$

generator: bfaw-self-on-floor: $\exists f, self \mid floor(f) \wedge blue(f) \wedge on_top(self, f)$

cl_two-objects-on-floor_vs_one concept: two-objects-on-floor: $\exists f, x, y \mid floor(f) \wedge on_top(x, f) \wedge on_top(y, f)$

generator: bfaw-two-non-adjacent-objects-and-self-on-floor: $\exists f, x, y, self \mid floor(f) \wedge blue(f) \wedge white(x) \wedge white(y) \wedge small_blob(x) \wedge small_blob(y) \wedge on_top(x, f) \wedge on_top(y, f) \wedge on_top(self, f) \wedge \neg touches(x, y)$

generator: bfaw-object-and-self-on-floor: $\exists f, x, self \mid floor(f) \wedge blue(f) \wedge white(x) \wedge small_blob(x) \wedge on_top(x, f) \wedge on_top(self, f)$

cl_two-objects-on-floor_vs_two-objects-one-on-floor concept: two-objects-on-floor: $\exists f, x, y \mid floor(f) \wedge on_top(x, f) \wedge on_top(y, f)$

generator: bfa-w-two-non-adjacent-objects-and-self-on-floor: $\exists f, x, y, \text{self} \mid \text{floor}(f) \wedge \text{blue}(f) \wedge \text{white}(x) \wedge \text{white}(y) \wedge \text{small_blob}(x) \wedge \text{small_blob}(y) \wedge \text{on_top}(x, f) \wedge \text{on_top}(y, f) \wedge \text{on_top}(\text{self}, f) \wedge \neg \text{touches}(x, y)$

generator: bfaw-self-and-two-objects-one-on-floor: $\exists f, x, y, self \mid floor(f) \wedge blue(f) \wedge white(x) \wedge white(y) \wedge small_blob(x) \wedge small_blob(y) \wedge on_top(x, f) \wedge above(y, f) \wedge on_top(self, f) \wedge \neg touches(y, f) \wedge \neg touches(x, y)$

cl_two-objects-one-above-and-one-on-floor_vs_not concept: two-objects-one-on-floor-one-above-floor:
 $\exists f, x, y, self \mid floor(f) \wedge on_top(x, f) \wedge on_top(self, f) \wedge above(y, f) \wedge \neg touches(y, f)$

generator: bfwaw-self-and-two-objects-one-on-floor: $\exists f, x, y, self \mid floor(f) \wedge blue(f) \wedge white(x) \wedge white(y) \wedge small_blob(x) \wedge small_blob(y) \wedge on_top(x, f) \wedge above(y, f) \wedge on_top(self, f) \wedge \neg-touches(y, f) \wedge \neg-touches(x, y)$

generator: bfwf-two-objects-and-self-on-floor: $\exists f, x, y, \text{self} \mid \text{floor}(f) \wedge \text{blue}(f) \wedge \text{white}(x) \wedge \text{white}(y) \wedge \text{small_blob}(x) \wedge \text{small_blob}(y) \wedge \text{on_top}(x, f) \wedge \text{on_top}(y, f) \wedge \text{on_top}(\text{self}, f)$

generator: `bfaw-self-and-two-objects-above-floor`: $\exists f, x, y, self \mid \text{floor}(f) \wedge \text{blue}(f) \wedge \text{white}(x) \wedge \text{white}(y) \wedge \text{small_blob}(x) \wedge \text{small_blob}(y) \wedge \text{on_top}(self, f) \wedge \text{above}(x, f) \wedge \text{above}(y, f) \wedge \neg \text{touches}(x, f) \wedge \neg \text{touches}(y, f) \wedge \neg \text{touches}(x, y)$

be self-left touches ob-

generator: bfaw-object-and-self-on-floor: $\exists f. x. \text{self} \mid \text{floor}(f) \wedge \text{blue}(f) \wedge \text{white}(x) \wedge \text{small_blob}(x) \wedge \text{on_top}(x, f) \wedge \text{on_top}(\text{self}, f) \wedge \text{touches}(\text{self}, x) \wedge \text{dir_right_of}(x, \text{self})$

generator: Draw object and self on floor: $\exists_j, x, \text{obj}_j \models \text{floor}(j) \wedge \text{object}(j) \wedge \text{white}(x) \wedge \text{small_box}(x) \wedge \text{on_top}(x, f) \wedge \text{on_top}(\text{self}, f)$

ba-self-touches-object_from_anywhere-on-floor_with_distraction concept: slob-right-touches-self-on-floor:
 $\exists f, x, self \mid floor(f) \wedge small_blob(x) \wedge on_top(x, f) \wedge on_top(self, f) \wedge touches(self, x) \wedge dir_right_of(x, self)$
generator: b_fall object and self on floor: $\exists f, x, self \mid floor(f) \wedge blue(f) \wedge white(x) \wedge small_blob(x) \wedge$

generator: `baw-object-and-self-on-floor`: $\exists f, x, self \mid floor(f) \wedge blue(f) \wedge white(x) \wedge small_blob(x) \wedge on_top(x, f) \wedge on_top(self, f)$

generator: `braw-object-and-self-on-floor-with-distractor-floating`: $\exists j, a, x, self \mid \text{floor}(j) \wedge \text{blue}(f) \wedge \text{white}(x) \wedge \text{small_blob}(x) \wedge d_slob(d) \wedge \text{white}(d) \wedge \text{on_top}(x, f) \wedge \text{on_top}(self, f) \wedge \text{above}(d, f) \wedge \text{near}(d, self) \wedge \neg \text{touches}(d, f) \wedge \neg \text{touches}(d, x)$

generator: `bfaw-object-and-self-on-floor-with-distractor-floating-near`: $\exists f, d, x, self$ |
 $floor(f) \wedge blue(f) \wedge white(x) \wedge small_blob(x) \wedge d_slob(d) \wedge white(d) \wedge on_top(x, f) \wedge on_top(self, f) \wedge above(d, f) \wedge$
 $near(d, x) \wedge \neg touches(d, f) \wedge \neg touches(d, x)$

ba_self-left-touches-object_from_left-obstacle-on-floor concept: slob-right-touches-self-on-floor:
 $\exists f, x, self \mid floor(f) \wedge small_blob(x) \wedge on_top(x, f) \wedge on_top(self, f) \wedge touches(self, x) \wedge dir_right_of(x, self)$

generator: bfa-w-object-right-of-self-on-floor-with-distractor-in-between: $\exists f, g, x, self \mid floor(f) \wedge blue(f) \wedge white(x) \wedge small_blob(x) \wedge d_slob(g) \wedge white(g) \wedge on_top(x, f) \wedge on_top(self, f) \wedge dir_right_of(x, self) \wedge above(a, f) \wedge touches(a, f) \wedge \neg touches(a, x) \wedge h_between(a, self, x)$

ba_self-left-touches-object_from_left-obstacle-on-floor_with_distraction concept: slob-right-touches-self-on-floor:
 $\exists f \ x \ self \ f \ | \ floor(f) \wedge small_blob(x) \wedge on_top(x, f) \wedge on_top(self, f) \wedge touches(self, x) \wedge dir_right_of(x, self)$

generator: bfaaw-object-right-of-self-on-floor-with-distractors-in-between-left-floating:
 $\exists f, x, h, i, a, self \mid floor(f) \wedge blue(f) \wedge white(a) \wedge small_blob(a) \wedge d_slob(x) \wedge white(x) \wedge d_slob(h) \wedge white(h) \wedge$

$\neg s_j, x, r, i, g, sel\ f \wedge slot(j) \wedge slot(i) \wedge white(g) \wedge small_slot(g) \wedge d_slot(x) \wedge white(x) \wedge d_slot(r) \wedge white(r) \wedge$

generator: bfaaw-object-right-of-self-on-floor-with-distractors-in-between-left:
 $\exists f, g, h, x, self \mid floor(f) \wedge blue(f) \wedge white(x) \wedge small_blob(x) \wedge d_slob(g) \wedge white(g) \wedge d_slob(h) \wedge white(h) \wedge on_top(x, f) \wedge on_top(self, f) \wedge dir_right_of(x, self) \wedge above(g, f) \wedge touches(g, f) \wedge above(h, f) \wedge touches(h, f) \wedge dir_left_of(h, self) \wedge \neg touches(g, x) \wedge \neg touches(g, h) \wedge h_between(g, self, x)$

generator: bfa-w-object-right-of-self-on-floor-with-distractor-in-between: $\exists f, g, x, self \mid floor(f) \wedge blue(f) \wedge white(x) \wedge small_blob(x) \wedge d_slob(g) \wedge white(g) \wedge on_top(x, f) \wedge on_top(self, f) \wedge dir\ right\ of(x, self) \wedge above(q, f) \wedge touches(q, f) \wedge \neg touches(q, x) \wedge h\ between(q, self, x)$

ba_self-left-touches-object_from_left-on-floor concept: slob-right-touches-self-on-floor: $\exists f, x, self \mid floor(f) \wedge small_blob(x) \wedge on_top(x, f) \wedge on_top(sel\ f, f) \wedge touches(sel\ f, x) \wedge dir_right_of(x, sel\ f)$

generator: $\text{bfaw-object-right-of-self-on-floor} : \exists f, x, self \mid \text{floor}(f) \wedge \text{blue}(f) \wedge \text{white}(x) \wedge \text{small_blob}(x) \wedge \text{on_top}(x, f) \wedge \text{on_top}(\text{self}, f) \wedge \text{dir_right_of}(x, \text{self})$

ba_self-right-touches-object_from_right-obstacle-on-floor concept: slob-left-touches-self-on-floor:
 $\exists f, x, self \mid floor(f) \wedge small_blob(x) \wedge on_top(x, f) \wedge on_top(self, f) \wedge touches(self, x) \wedge dir_left_of(x, self)$

generator: bfaw-object-left-of-self-on-floor-with-distractor-in-between: $\exists f, g, x, self \mid floor(f) \wedge blue(f) \wedge white(x) \wedge small_blob(x) \wedge d_slob(g) \wedge white(g) \wedge on_top(x, f) \wedge on_top(self, f) \wedge dir_left_of(x, self) \wedge above(g, f) \wedge touches(g, f) \wedge \neg touches(g, x) \wedge h_between(g, x, self)$

ba_self-right-touches-object_from_right-obstacle-on-floor_with_distraction concept: slob-left-touches-self-on-floor:
 $\exists f, x, self \mid floor(f) \wedge small_blob(x) \wedge on_top(x, f) \wedge on_top(self, f) \wedge touches(self, x) \wedge dir_left_of(x, self)$

generator: bfaw-object-left-of-self-on-floor-with-distractors-in-between-right-floating:
 $\exists f, x, h, i, g, self \mid floor(f) \wedge blue(f) \wedge white(g) \wedge small_blob(g) \wedge d_slob(x) \wedge white(x) \wedge d_slob(h) \wedge white(h) \wedge d_slob(i) \wedge white(i) \wedge on_top(g, f) \wedge on_top(self, f) \wedge dir_left_of(g, self) \wedge above(x, f) \wedge touches(x, f) \wedge above(h, f) \wedge touches(h, f) \wedge dir_right_of(h, self) \wedge above(i, f) \wedge near(i, g) \wedge \neg touches(i, f) \wedge \neg touches(i, g) \wedge \neg touches(g, x) \wedge \neg touches(x, h) \wedge h_between(x, g, self)$

generator: bfaw-object-left-of-self-on-floor-with-distractors-in-between-right:
 $\exists f, g, h, x, self \mid floor(f) \wedge blue(f) \wedge white(x) \wedge small_blob(x) \wedge d_slob(g) \wedge white(g) \wedge d_slob(h) \wedge white(h) \wedge on_top(x, f) \wedge on_top(self, f) \wedge dir_left_of(x, self) \wedge above(g, f) \wedge touches(g, f) \wedge above(h, f) \wedge touches(h, f) \wedge dir_right_of(h, self) \wedge above(i, f) \wedge \neg touches(g, x) \wedge \neg touches(g, h) \wedge h_between(g, x, self)$

generator: bfaw-object-left-of-self-on-floor-with-distractor-in-between: $\exists f, g, x, self \mid floor(f) \wedge blue(f) \wedge white(x) \wedge small_blob(x) \wedge d_slob(g) \wedge white(g) \wedge on_top(x, f) \wedge on_top(self, f) \wedge dir_left_of(x, self) \wedge above(g, f) \wedge touches(g, f) \wedge \neg touches(g, x) \wedge h_between(g, x, self)$

ba_self-right-touches-object_from_right-on-floor concept: slob-left-touches-self-on-floor: $\exists f, x, self \mid floor(f) \wedge small_blob(x) \wedge on_top(x, f) \wedge on_top(self, f) \wedge touches(self, x) \wedge dir_left_of(x, self)$

generator: bfaw-object-left-of-self-on-floor: $\exists f, x, self \mid floor(f) \wedge blue(f) \wedge white(x) \wedge small_blob(x) \wedge on_top(x, f) \wedge on_top(self, f) \wedge dir_left_of(x, self)$

ba_self-right-touches-object_from_right-on-floor_with_distraction concept: slob-left-touches-self-on-floor:
 $\exists f, x, self \mid floor(f) \wedge small_blob(x) \wedge on_top(x, f) \wedge on_top(self, f) \wedge touches(self, x) \wedge dir_left_of(x, self)$

generator: bfaw-object-left-of-self-on-floor-with-distractors-touches-right-floating-between:
 $\exists f, g, h, x, self \mid floor(f) \wedge blue(f) \wedge white(x) \wedge small_blob(x) \wedge d_slob(g) \wedge white(g) \wedge d_slob(h) \wedge white(h) \wedge on_top(x, f) \wedge on_top(self, f) \wedge dir_left_of(x, self) \wedge above(g, f) \wedge touches(g, f) \wedge touches(g, self) \wedge dir_right_of(g, self) \wedge above(h, f) \wedge near(h, f) \wedge right_of(h, x) \wedge left_of(h, g) \wedge \neg touches(h, f) \wedge \neg touches(h, x)$

generator: bfaw-object-left-of-self-on-floor-with-distractor-touches-right: $\exists f, g, x, self \mid floor(f) \wedge blue(f) \wedge white(x) \wedge small_blob(x) \wedge d_slob(g) \wedge white(g) \wedge on_top(x, f) \wedge on_top(self, f) \wedge dir_left_of(x, self) \wedge above(g, f) \wedge touches(g, f) \wedge touches(g, self) \wedge dir_right_of(g, self)$

generator: bfaw-object-left-of-self-on-floor-with-distractor-right: $\exists f, g, x, self \mid floor(f) \wedge blue(f) \wedge white(x) \wedge small_blob(x) \wedge d_slob(g) \wedge white(g) \wedge on_top(x, f) \wedge on_top(self, f) \wedge dir_left_of(x, self) \wedge above(g, f) \wedge touches(g, f) \wedge dir_right_of(g, self)$

ba_self-touches-object_from_anywhere-on-floor concept: slob-touches-self-on-floor: $\exists f, x, self \mid floor(f) \wedge small_blob(x) \wedge on_top(x, f) \wedge on_top(self, f) \wedge touches(self, x)$

generator: bfaw-object-and-self-on-floor: $\exists f, x, self \mid floor(f) \wedge blue(f) \wedge white(x) \wedge small_blob(x) \wedge on_top(x, f) \wedge on_top(self, f)$

ba_self-touches-object_from_anywhere-on-floor_with_distraction concept: slob-touches-self-on-floor:
 $\exists f, x, self \mid floor(f) \wedge small_blob(x) \wedge on_top(x, f) \wedge on_top(self, f) \wedge touches(self, x)$

generator: bfaw-object-and-self-on-floor: $\exists f, x, self \mid floor(f) \wedge blue(f) \wedge white(x) \wedge small_blob(x) \wedge on_top(x, f) \wedge on_top(self, f)$

generator: bfaw-object-and-self-on-floor-with-distractor-floating: $\exists f, d, x, self \mid floor(f) \wedge blue(f) \wedge white(x) \wedge small_blob(x) \wedge d_slob(d) \wedge white(d) \wedge on_top(x, f) \wedge on_top(self, f) \wedge above(d, f) \wedge near(d, self) \wedge \neg touches(d, f) \wedge \neg touches(d, x)$

generator: bfaw-object-and-self-on-floor-with-distractor-floating-near: $\exists f, d, x, self \mid floor(f) \wedge blue(f) \wedge white(x) \wedge small_blob(x) \wedge d_slob(d) \wedge white(d) \wedge on_top(x, f) \wedge on_top(self, f) \wedge above(d, f) \wedge near(d, x) \wedge \neg touches(d, f) \wedge \neg touches(d, x)$

3.6 objects-sig

ba_self-away-left-of-object_from_left-touches-on-floor concept: object-away-right-on-floor: $\exists f, x, self \mid floor(f) \wedge on_top(x, f) \wedge on_top(self, f) \wedge dir_right_of(x, self) \wedge \neg touches(self, x)$

generator: bfaw-right-adjacent-object-and-self-on-floor: $\exists f, x, self \mid floor(f) \wedge blue(f) \wedge white(x) \wedge small_blob(x) \wedge on_top(x, f) \wedge on_top(self, f) \wedge on_right(x, self)$

ba_self-away-left-of-object_from_touches-on-floor concept: object-away-right-on-floor: $\exists f, x, self \mid floor(f) \wedge on_top(x, f) \wedge on_top(self, f) \wedge dir_right_of(x, self) \wedge \neg touches(self, x)$

generator: `bfaw-adjacent-object-and-self-on-floor`: $\exists f, x, self \mid floor(f) \wedge blue(f) \wedge white(x) \wedge small_blob(x) \wedge on_top(x, f) \wedge on_top(self, f) \wedge touches(self, x)$

ba_self-away-right-of-object_from_right-touches-on-floor concept: object-away-left-on-floor: $\exists f, x, self \mid floor(f) \wedge on_top(x, f) \wedge on_top(self, f) \wedge dir_left_of(x, self) \wedge \neg touches(self, x)$

generator: bfa-w-left-adjacent-object-and-self-on-floor: $\exists f, x, self \mid floor(f) \wedge blue(f) \wedge white(x) \wedge small_blob(x) \wedge on_top(x, f) \wedge on_top(self, f) \wedge on_left(x, self)$

ba_self-away-right-of-object_from_touches-on-floor concept: object-away-left-on-floor: $\exists f, x, self$
 $floor(f) \wedge on_top(x, f) \wedge on_top(self, f) \wedge dir_left_of(x, self) \wedge \neg touches(self, x)$

generator: bfa-w-adjacent-object-and-self-on-floor: $\exists f, x, self \mid floor(f) \wedge blue(f) \wedge white(x) \wedge small_blob(x) \wedge on_top(x, f) \wedge on_top(self, f) \wedge touches(self, x)$

ba_self-between-two-objects_from_left-on-floor concept: two-objects-one-left-one-right-on-floor:
 $\exists f, x, y, self \mid floor(f) \wedge on_top(x, f) \wedge on_top(y, f) \wedge on_top(self, f) \wedge dir_left_of(x, self) \wedge dir_right_of(y, self)$

generator: `bfaw-two-non-adjacent-objects-right-of-self-on-floor`: $\exists f, x, y, self \mid floor(f) \wedge blue(f) \wedge white(x) \wedge white(y) \wedge small_blob(x) \wedge small_blob(y) \wedge on_top(x, f) \wedge on_top(y, f) \wedge on_top(self, f) \wedge dir_right_of(x, self) \wedge dir_right_of(y, self) \wedge \neg touches(x, y)$

ba_self-between-two-objects_from_left-touches-on-floor concept: two-objects-one-left-one-right-on-floor:
 $\exists f, x, y, self \mid floor(f) \wedge on_top(x, f) \wedge on_top(y, f) \wedge on_top(self, f) \wedge dir_left_of(x, self) \wedge dir_right_of(y, self)$

generator: `bfaw-two-non-adjacent-objects-right-of-adjacent-self-on-floor`: $\exists f, x, y, self \mid floor(f) \wedge blue(f) \wedge white(x) \wedge white(y) \wedge small_blob(x) \wedge small_blob(y) \wedge on_top(x, f) \wedge on_top(y, f) \wedge on_top(self, f) \wedge dir_right_of(x, y) \wedge on_right(y, self) \wedge \neg touches(x, y)$

ba-self-between-two-objects_from_not-between-on-floor concept: two-objects-one-left-one-right-on-floor:
 $\exists f, x, y, self \mid floor(f) \wedge on_top(x, f) \wedge on_top(y, f) \wedge on_top(self, f) \wedge dir_left_of(x, self) \wedge dir_right_of(y, self)$

generator: bbfaw-two-non-adjacent-objects-left-of-self-on-floor: $\exists f, x, y, self \mid \text{floor}(f) \wedge \text{blue}(f) \wedge \text{white}(x) \wedge \text{white}(y) \wedge \text{small_blob}(x) \wedge \text{small_blob}(y) \wedge \text{on_top}(x, f) \wedge \text{on_top}(y, f) \wedge \text{on_top}(self, f) \wedge \text{dir_left_of}(x, self) \wedge \text{dir_left_of}(y, self) \wedge \neg\text{touches}(x, y)$

generator: `bifaw-two-non-adjacent-objects-right-of-self-on-floor`: $\exists f, x, y, self \mid floor(f) \wedge blue(f) \wedge white(x) \wedge white(y) \wedge small_blob(x) \wedge small_blob(y) \wedge on_top(x, f) \wedge on_top(y, f) \wedge on_top(self, f) \wedge dir_right_of(x, self) \wedge dir_right_of(y, self) \wedge \neg touches(x, y)$

ba_self-between-two-objects_from_right-on-floor concept: two-objects-one-left-one-right-on-floor:
 $\exists f, x, y, self \mid floor(f) \wedge on_top(x, f) \wedge on_top(y, f) \wedge on_top(self, f) \wedge dir_left_of(x, self) \wedge dir_right_of(y, self)$

generator: draw-two-non-adjacent-objects-left-of-self-on-floor: $\exists f, x, y, self \mid floor(f) \wedge blue(f) \wedge white(x) \wedge white(y) \wedge small_blob(x) \wedge small_blob(y) \wedge on_top(x, f) \wedge on_top(y, f) \wedge on_top(self, f) \wedge dir_left_of(x, self) \wedge dir_left_of(y, self) \wedge \neg touches(x, y)$

ba-self-between-two-objects-from-right-touches-on-noor concept: two-objects-one-left-one-right-on-floor:
 $\exists f, x, y, self \mid floor(f) \wedge on_top(x, f) \wedge on_top(y, f) \wedge on_top(self, f) \wedge dir_left_of(x, self) \wedge dir_right_of(y, self)$

generator: draw-two-non-adjacent-objects-left-or-adjacent-self-on-floor: $\exists f, x, y, self \mid floor(f) \wedge blue(f) \wedge white(x) \wedge white(y) \wedge small_blob(x) \wedge small_blob(y) \wedge on_top(x, f) \wedge on_top(y, f) \wedge on_top(self, f) \wedge dir_left_of(x, y) \wedge on_left(y, self) \wedge \neg touches(x, y)$

ba-self-left-or-two-objects_from_not-left-on-floor concept: two-objects-somewhere-right-on-floor:
 $\exists f, x, y, self \mid floor(f) \wedge on_top(x, f) \wedge on_top(y, f) \wedge on_top(self, f) \wedge dir_right_of(x, self) \wedge dir_right_of(y, self)$

generator: `brawl-self-between-two-objects-on-floor`: $\exists f, x, y, self \mid floor(f) \wedge blue(f) \wedge white(x) \wedge white(y) \wedge small_blob(x) \wedge small_blob(y) \wedge on_top(x, f) \wedge on_top(y, f) \wedge on_top(self, f) \wedge dir_left_of(x, self) \wedge dir_right_of(y, self)$

generator: `brawl-two-non-adjacent-objects-right-of-self-on-floor`: $\exists f, x, y, u, self \mid floor(f) \wedge$

generator: `blaw-two-non-adjacent-objects-right-of-self-on-floor`: $\exists j, x, y, self \mid floor(j) \wedge blue(f) \wedge white(x) \wedge white(y) \wedge small_blob(x) \wedge small_blob(y) \wedge on_top(x, f) \wedge on_top(y, f) \wedge on_top(self, f) \wedge dir_right_of(x, self) \wedge dir_right_of(y, self) \wedge \neg touches(x, y)$

ba-self-touches-object_from-anywhere-on-floor concept: $\exists f, x, self | floor(f) \wedge small_blob(x) \wedge on_top(x, f) \wedge touches(self, x) \wedge dir_right_of(x, self)$

generator: $befor_object_and_self_on_floor; \exists f, x, self | floor(f) \wedge blue(f) \wedge white(x) \wedge small_blob(x) \wedge$

generator: `blaw-object-and-self-on-floor`: $\exists f, x, self \mid floor(f) \wedge blue(f) \wedge white(x) \wedge small_blob(x) \wedge on_top(x, f) \wedge on_top(self, f)$

ba_self-left-touches-object_from_ontop concept: slob-right-touches-self-on-floor: $\exists f, x, self \mid floor(f) \wedge small_blob(x) \wedge on_top(x, f) \wedge on_top(self, f) \wedge touches(self, x) \wedge dir_right_of(x, self)$

generator: bfaw-self-ontop-object-on-floor: $\exists f, x, self \mid floor(f) \wedge blue(f) \wedge white(x) \wedge small_blob(x) \wedge on_top(x, f) \wedge on_top(self, f)$

ba_self-left-touches-object_from_right-touches-on-floor concept: slob-right-touches-self-on-floor: $\exists f, x, self \mid floor(f) \wedge small_blob(x) \wedge on_top(x, f) \wedge on_top(self, f) \wedge touches(self, x) \wedge dir_right_of(x, self)$

generator: bfaw-left-adjacent-object-and-self-on-floor: $\exists f, x, self \mid floor(f) \wedge blue(f) \wedge white(x) \wedge small_blob(x) \wedge on_top(x, f) \wedge on_top(self, f) \wedge on_left(x, self)$

ba_self-ontop-object_from_anwhere-on-floor_with_distraction concept: self-ontop-slob-on-floor: $\exists f, x, self \mid small_blob(x) \wedge floor(f) \wedge on_top(x, f) \wedge on_top(self, x)$

generator: bfaw-object-and-self-on-floor: $\exists f, x, self \mid floor(f) \wedge blue(f) \wedge white(x) \wedge small_blob(x) \wedge on_top(x, f) \wedge on_top(self, f)$

generator: bfaw-object-and-self-on-floor-with-distractor-floating: $\exists f, d, x, self \mid floor(f) \wedge blue(f) \wedge white(x) \wedge small_blob(x) \wedge d_slob(d) \wedge white(d) \wedge on_top(x, f) \wedge on_top(self, f) \wedge above(d, f) \wedge near(d, self) \wedge \neg touches(d, f) \wedge \neg touches(d, x)$

generator: bfaw-object-and-self-on-floor-with-distractor-floating-near: $\exists f, d, x, self \mid floor(f) \wedge blue(f) \wedge white(x) \wedge small_blob(x) \wedge d_slob(d) \wedge white(d) \wedge on_top(x, f) \wedge on_top(self, f) \wedge above(d, f) \wedge near(d, x) \wedge \neg touches(d, f) \wedge \neg touches(d, x)$

ba_self-ontop-object_from_anywhere-on-floor concept: self-ontop-slob-on-floor: $\exists f, x, self \mid small_blob(x) \wedge floor(f) \wedge on_top(x, f) \wedge on_top(self, x)$

generator: bfaw-object-and-self-on-floor: $\exists f, x, self \mid floor(f) \wedge blue(f) \wedge white(x) \wedge small_blob(x) \wedge on_top(x, f) \wedge on_top(self, f)$

ba_self-ontop-object_from_left-touches-on-floor concept: self-ontop-slob-on-floor: $\exists f, x, self \mid small_blob(x) \wedge floor(f) \wedge on_top(x, f) \wedge on_top(self, x)$

generator: bfaw-left-adjacent-object-and-self-on-floor: $\exists f, x, self \mid floor(f) \wedge blue(f) \wedge white(x) \wedge small_blob(x) \wedge on_top(x, f) \wedge on_top(self, f) \wedge on_left(x, self)$

ba_self-ontop-object_from_left-touches-on-floor_with_distraction concept: self-ontop-slob-on-floor: $\exists f, x, self \mid small_blob(x) \wedge floor(f) \wedge on_top(x, f) \wedge on_top(self, x)$

generator: bfaw-left-adjacent-object-and-self-on-floor: $\exists f, x, self \mid floor(f) \wedge blue(f) \wedge white(x) \wedge small_blob(x) \wedge on_top(x, f) \wedge on_top(self, f) \wedge on_left(x, self)$

generator: bfaw-left-adjacent-object-and-self-on-floor-with-distractor-near-float: $\exists f, x, g, self \mid floor(f) \wedge blue(f) \wedge white(g) \wedge small_blob(g) \wedge d_slob(x) \wedge white(x) \wedge on_top(g, f) \wedge on_top(self, f) \wedge on_left(g, self) \wedge above(x, f) \wedge near(x, g) \wedge \neg touches(x, f) \wedge \neg touches(x, g)$

generator: bfaw-left-adjacent-object-and-self-on-floor-with-distractor-near-left: $\exists f, g, x, self \mid floor(f) \wedge blue(f) \wedge white(x) \wedge small_blob(x) \wedge d_slob(g) \wedge white(g) \wedge on_top(x, f) \wedge on_top(self, f) \wedge on_left(x, self) \wedge above(g, f) \wedge touches(g, f) \wedge dir_left_of(g, x) \wedge near(g, x) \wedge \neg touches(g, x)$

generator: bfaw-left-adjacent-object-and-self-on-floor-with-distractor-near-right: $\exists f, g, x, self \mid floor(f) \wedge blue(f) \wedge white(x) \wedge small_blob(x) \wedge d_slob(g) \wedge white(g) \wedge on_top(x, f) \wedge on_top(self, f) \wedge on_left(x, self) \wedge above(g, f) \wedge touches(g, f) \wedge dir_right_of(g, x) \wedge near(g, x) \wedge \neg touches(g, x)$

generator: bfaw-left-adjacent-object-and-self-on-floor-with-distractors-near: $\exists f, x, y, g, self \mid floor(f) \wedge blue(f) \wedge white(g) \wedge small_blob(g) \wedge d_slob(x) \wedge white(x) \wedge d_slob(y) \wedge white(y) \wedge on_top(g, f) \wedge on_top(self, f) \wedge on_left(g, self) \wedge above(x, f) \wedge touches(x, f) \wedge above(y, f) \wedge touches(y, f) \wedge dir_right_of(x, g) \wedge near(x, g) \wedge dir_left_of(y, g) \wedge near(y, g) \wedge \neg touches(x, g) \wedge \neg touches(y, g)$

ba_self-ontop-object_from_right-touches-on-floor concept: self-ontop-slob-on-floor: $\exists f, x, self \mid small_blob(x) \wedge floor(f) \wedge on_top(x, f) \wedge on_top(self, x)$

generator: bfaw-right-adjacent-object-and-self-on-floor: $\exists f, x, self \mid floor(f) \wedge blue(f) \wedge white(x) \wedge small_blob(x) \wedge on_top(x, f) \wedge on_top(self, f) \wedge on_right(x, self)$

ba_self-ontop-object_from_right-touches-on-floor_with_distraction concept: self-ontop-slob-on-floor: $\exists f, x, self \mid small_blob(x) \wedge floor(f) \wedge on_top(x, f) \wedge on_top(self, x)$

generator: bfaw-right-adjacent-object-and-self-on-floor: $\exists f, x, self \mid floor(f) \wedge blue(f) \wedge white(x) \wedge small_blob(x) \wedge on_top(x, f) \wedge on_top(self, f) \wedge on_right(x, self)$

generator: bfaw-right-adjacent-object-and-self-on-floor-with-distractor-near-float: $\exists f, x, g, self \mid floor(f) \wedge blue(f) \wedge white(g) \wedge small_blob(g) \wedge d_slob(x) \wedge white(x) \wedge on_top(g, f) \wedge on_top(self, f) \wedge on_right(g, self) \wedge above(x, f) \wedge near(x, g) \wedge \neg touches(x, f) \wedge \neg touches(x, g)$

generator: bfa-w-right-adjacent-object-and-self-on-floor-with-distractor-near-left:
 $\exists f, g, x, self \mid floor(f) \wedge blue(f) \wedge white(x) \wedge small_blob(x) \wedge d_slob(g) \wedge white(g) \wedge on_top(x, f) \wedge on_top(self, f) \wedge on_right(x, self) \wedge above(g, f) \wedge touches(g, f) \wedge dir_left_of(g, x) \wedge near(g, x) \wedge \neg touches(g, x)$

generator: bfa-w-right-adjacent-object-and-self-on-floor-with-distractor-near-right:
 $\exists f, g, x, self \mid floor(f) \wedge blue(f) \wedge white(x) \wedge small_blob(x) \wedge d_slob(g) \wedge white(g) \wedge on_top(x, f) \wedge on_top(self, f) \wedge on_right(x, self) \wedge above(g, f) \wedge touches(g, f) \wedge dir_right_of(g, x) \wedge near(g, x) \wedge \neg touches(g, x)$

generator: bfa-w-right-adjacent-object-and-self-on-floor-with-distractors-near:
 $\exists f, x, y, g, self \mid floor(f) \wedge blue(f) \wedge white(g) \wedge small_blob(g) \wedge d_slob(x) \wedge white(x) \wedge d_slob(y) \wedge white(y) \wedge on_top(g, f) \wedge on_top(self, f) \wedge on_right(g, self) \wedge above(x, f) \wedge touches(x, f) \wedge above(y, f) \wedge touches(y, f) \wedge dir_right_of(x, g) \wedge near(x, g) \wedge dir_left_of(y, g) \wedge near(y, g) \wedge \neg touches(x, g) \wedge \neg touches(y, g)$

ba_self-right-of-two-objects_from_not-right-on-floor concept: two-objects-somewhere-left-on-floor:
 $\exists f, x, y, self \mid floor(f) \wedge on_top(x, f) \wedge on_top(y, f) \wedge on_top(self, f) \wedge dir_left_of(x, self) \wedge dir_left_of(y, self)$

generator: bfa-w-self-between-two-objects-on-floor: $\exists f, x, y, self \mid floor(f) \wedge blue(f) \wedge white(x) \wedge white(y) \wedge small_blob(x) \wedge small_blob(y) \wedge on_top(x, f) \wedge on_top(y, f) \wedge on_top(self, f) \wedge dir_left_of(x, self) \wedge dir_right_of(y, self)$

generator: bfa-w-two-non-adjacent-objects-left-of-self-on-floor: $\exists f, x, y, self \mid floor(f) \wedge blue(f) \wedge white(x) \wedge white(y) \wedge small_blob(x) \wedge small_blob(y) \wedge on_top(x, f) \wedge on_top(y, f) \wedge on_top(self, f) \wedge dir_left_of(x, self) \wedge dir_left_of(y, self) \wedge \neg touches(x, y)$

ba_self-right-touches-object_from_anywhere-on-floor concept: slob-left-touches-self-on-floor:
 $\exists f, x, self \mid floor(f) \wedge small_blob(x) \wedge on_top(x, f) \wedge on_top(self, f) \wedge touches(self, x) \wedge dir_left_of(x, self)$

generator: bfa-w-object-and-self-on-floor: $\exists f, x, self \mid floor(f) \wedge blue(f) \wedge white(x) \wedge small_blob(x) \wedge on_top(x, f) \wedge on_top(self, f)$

ba_self-right-touches-object_from_left-touches-on-floor concept: slob-left-touches-self-on-floor:
 $\exists f, x, self \mid floor(f) \wedge small_blob(x) \wedge on_top(x, f) \wedge on_top(self, f) \wedge touches(self, x) \wedge dir_left_of(x, self)$

generator: bfa-w-right-adjacent-object-and-self-on-floor: $\exists f, x, self \mid floor(f) \wedge blue(f) \wedge white(x) \wedge small_blob(x) \wedge on_top(x, f) \wedge on_top(self, f) \wedge on_right(x, self)$

ba_self-right-touches-object_from_ontop concept: slob-left-touches-self-on-floor: $\exists f, x, self \mid floor(f) \wedge small_blob(x) \wedge on_top(x, f) \wedge on_top(self, f) \wedge touches(self, x) \wedge dir_left_of(x, self)$

generator: bfa-w-self-ontop-object-on-floor: $\exists f, x, self \mid floor(f) \wedge blue(f) \wedge white(x) \wedge small_blob(x) \wedge on_top(x, f) \wedge on_top(self, x)$

ba_self-second_from_left_from_anywhere-on-floor concept: one-object-left-two-objects-right-on-floor:
 $\exists f, x, y, z, self \mid floor(f) \wedge on_top(x, f) \wedge on_top(y, f) \wedge on_top(z, f) \wedge on_top(self, f) \wedge dir_left_of(x, self) \wedge dir_right_of(y, self) \wedge dir_right_of(z, self)$

generator: bfa-w-three-objects-and-self-on-floor: $\exists f, x, y, z, self \mid floor(f) \wedge blue(f) \wedge white(x) \wedge white(y) \wedge white(z) \wedge small_blob(x) \wedge small_blob(y) \wedge small_blob(z) \wedge on_top(x, f) \wedge on_top(y, f) \wedge on_top(z, f) \wedge on_top(self, f)$

ba_self-second_from_right_from_anywhere-on-floor concept: one-object-right-two-objects-left-on-floor:
 $\exists f, x, y, z, self \mid floor(f) \wedge on_top(x, f) \wedge on_top(y, f) \wedge on_top(z, f) \wedge on_top(self, f) \wedge dir_right_of(x, self) \wedge dir_left_of(y, self) \wedge dir_left_of(z, self)$

generator: bfa-w-three-objects-and-self-on-floor: $\exists f, x, y, z, self \mid floor(f) \wedge blue(f) \wedge white(x) \wedge white(y) \wedge white(z) \wedge small_blob(x) \wedge small_blob(y) \wedge small_blob(z) \wedge on_top(x, f) \wedge on_top(y, f) \wedge on_top(z, f) \wedge on_top(self, f)$

ba_self-touches-object_from_anywhere-on-floor concept: slob-touches-self-on-floor: $\exists f, x, self \mid floor(f) \wedge small_blob(x) \wedge on_top(x, f) \wedge on_top(self, f) \wedge touches(self, x)$

generator: bfa-w-object-and-self-on-floor: $\exists f, x, self \mid floor(f) \wedge blue(f) \wedge white(x) \wedge small_blob(x) \wedge on_top(x, f) \wedge on_top(self, f)$

ba_self-touches-object_from_anywhere-on-floor_with_distraction concept: slob-touches-self-on-floor:
 $\exists f, x, self \mid floor(f) \wedge small_blob(x) \wedge on_top(x, f) \wedge on_top(self, f) \wedge touches(self, x)$

generator: bfa-w-object-and-self-on-floor: $\exists f, x, self \mid floor(f) \wedge blue(f) \wedge white(x) \wedge small_blob(x) \wedge on_top(x, f) \wedge on_top(self, f)$

generator: bfa-w-object-and-self-on-floor-with-distractor-floating: $\exists f, d, x, self \mid floor(f) \wedge blue(f) \wedge white(x) \wedge small_blob(x) \wedge d_slob(d) \wedge white(d) \wedge on_top(x, f) \wedge on_top(self, f) \wedge above(d, f) \wedge near(d, self) \wedge \neg touches(d, f) \wedge \neg touches(d, x)$

generator: bfaaw-object-and-self-on-floor-with-distractor-floating-near: $\exists f, d, x, self \mid floor(f) \wedge blue(f) \wedge white(x) \wedge small_blob(x) \wedge d_slob(d) \wedge white(d) \wedge on_top(x, f) \wedge on_top(self, f) \wedge above(d, f) \wedge near(d, x) \wedge \neg touches(d, f) \wedge \neg touches(d, x)$

3.7 pushable

ba_self-on-floor-self-touches-floor-pixel_from_self-not-touches-floor-pixel concept: self-on-floor-touches-floor-pixel
 $\exists f, x, self \mid floor(f) \wedge pixel(x) \wedge on_top(x, f) \wedge on_top(self, f) \wedge touches(self, x)$

generator: self-on-floor-self-left-of-floor-pixel-three-hover-pixels: $\exists f, w, x, y, z, \text{self} \mid floor(f) \wedge blue(f) \wedge pixel(w) \wedge white(w) \wedge pixel(x) \wedge white(x) \wedge pixel(y) \wedge white(y) \wedge pixel(z) \wedge white(z) \wedge \neg pushable(x) \wedge \neg pushable(y) \wedge \neg pushable(z) \wedge \neg pushable(f) \wedge on_top(\text{self}, f) \wedge on_top(w, f) \wedge right_of(w, \text{self}) \wedge one_above(x, \text{self}) \wedge one_above(y, \text{self}) \wedge one_above(z, \text{self})$

generator: self-on-floor-self-right-of-floor-pixel-three-hover-pixels: $\exists f, w, x, y, z, \text{self} \mid \text{floor}(f) \wedge \text{blue}(f) \wedge \text{pixel}(w) \wedge \text{white}(w) \wedge \text{pixel}(x) \wedge \text{white}(x) \wedge \text{pixel}(y) \wedge \text{white}(y) \wedge \text{pixel}(z) \wedge \text{white}(z) \wedge \neg \text{pushable}(x) \wedge \neg \text{pushable}(y) \wedge \neg \text{pushable}(z) \wedge \neg \text{pushable}(f) \wedge \text{on_top}(\text{self}, f) \wedge \text{on_top}(w, f) \wedge \text{left_of}(w, \text{self}) \wedge \text{one_above}(x, \text{self}) \wedge \text{one_above}(y, \text{self}) \wedge \text{one_above}(z, \text{self})$

ba_self-on-floor-self-touches-hover-pixel_from_self-not-touches-hover-pixel concept: self-on-floor-touches-hover-pixel
 $\exists f, x, self \mid floor(f) \wedge pixel(x) \wedge on_top(self, f) \wedge below(self, x) \wedge touches(self, x)$

generator: self-on-floor-self-left-of-floor-pixel-three-hover-pixels: $\exists f, w, x, y, z, \text{self } | \text{floor}(f) \wedge \text{blue}(f) \wedge \text{pixel}(w) \wedge \text{white}(w) \wedge \text{pixel}(x) \wedge \text{white}(x) \wedge \text{pixel}(y) \wedge \text{white}(y) \wedge \text{pixel}(z) \wedge \text{white}(z) \wedge \neg \text{pushable}(x) \wedge \neg \text{pushable}(y) \wedge \neg \text{pushable}(z) \wedge \neg \text{pushable}(f) \wedge \text{on_top}(\text{self}, f) \wedge \text{on_top}(w, f) \wedge \text{right_of}(w, \text{self}) \wedge \text{one_above}(x, \text{self}) \wedge \text{one_above}(y, \text{self}) \wedge \text{one_above}(z, \text{self})$

generator: self-on-floor-self-right-of-floor-pixel-three-hover-pixels: $\exists f, w, x, y, z, \text{self} \mid \text{floor}(f) \wedge \text{blue}(f) \wedge \text{pixel}(w) \wedge \text{white}(w) \wedge \text{pixel}(x) \wedge \text{white}(x) \wedge \text{pixel}(y) \wedge \text{white}(y) \wedge \text{pixel}(z) \wedge \text{white}(z) \wedge \neg \text{pushable}(x) \wedge \neg \text{pushable}(y) \wedge \neg \text{pushable}(z) \wedge \neg \text{pushable}(f) \wedge \text{on_top}(\text{self}, f) \wedge \text{on_top}(w, f) \wedge \text{left_of}(w, \text{self}) \wedge \text{one_above}(x, \text{self}) \wedge \text{one_above}(y, \text{self}) \wedge \text{one_above}(z, \text{self})$

cl_floor-pixel-touches-hover-pixel_vs_not-touches concept: floor-pixel-touches-hover-pixel:
 $\exists f, x, y, self \mid floor(f) \wedge pixel(x) \wedge pixel(y) \wedge diff_color(self, x) \wedge on_top(x, f) \wedge one_above(y, x) \wedge touches(x, y)$

generator: self-on-floor-self-touches-floor-pixel-floor-pixel-touches-hover-pixel-two-hover-pi
 $\exists f, w, x, y, z, \text{self} \mid \text{floor}(f) \wedge \text{blue}(f) \wedge \text{pixel}(w) \wedge \text{white}(w) \wedge \text{pixel}(x) \wedge \text{white}(x) \wedge \text{pixel}(y) \wedge \text{white}(y) \wedge \text{pixel}(z) \wedge$

generator: self-on-floor-self-touches-floor-pixel-floor-pixel-not-touches-three-hover-

generator. self-on-floor-self-touches-floor-pixel-floor-pixel-not-touches-three-newer-pixels.
 $\exists f, w, x, y, z, self \mid floor(f) \wedge blue(f) \wedge pixel(w) \wedge white(w) \wedge pixel(x) \wedge white(x) \wedge pixel(y) \wedge white(y) \wedge pixel(z) \wedge white(z) \wedge \neg pushable(x) \wedge \neg pushable(y) \wedge \neg pushable(z) \wedge \neg pushable(f) \wedge on_top(self, f) \wedge on_top(w, f) \wedge touches(w, self) \wedge one_above(x, self) \wedge one_above(y, self) \wedge one_above(z, self) \wedge \neg touches(w, x) \wedge \neg touches(w, y) \wedge \neg touches(w, z)$

generator: self-on-floor-self-touches-hover-pixel-floor-pixel-touches-hover-pixel-two-
 $\exists f, w, x, y, z, \text{self} \mid \text{floor}(f) \wedge \text{blue}(f) \wedge \text{pixel}(w) \wedge \text{white}(w) \wedge \text{pixel}(x) \wedge \text{white}(x) \wedge \text{pixel}(y) \wedge \text{white}(y) \wedge \text{pixel}(z) \wedge$
 $\text{white}(z) \wedge \neg\text{pushable}(x) \wedge \neg\text{pushable}(y) \wedge \neg\text{pushable}(z) \wedge \neg\text{pushable}(f) \wedge \text{on_top}(\text{self}, f) \wedge \text{on_top}(w, f) \wedge$
 $\text{one_above}(x, \text{self}) \wedge \text{one_above}(y, \text{self}) \wedge \text{one_above}(z, \text{self}) \wedge \text{touches}(\text{self}, x) \wedge \text{touches}(w, x)$

generator: self-on-floor-self-touches-hover-pixel-floor-pixel-not-touches-three-hover-pixels:
 $\exists f, w, x, y, z, \text{self} \mid \text{floor}(f) \wedge \text{blue}(f) \wedge \text{pixel}(w) \wedge \text{white}(w) \wedge \text{pixel}(x) \wedge \text{white}(x) \wedge \text{pixel}(y) \wedge \text{white}(y) \wedge \text{pixel}(z) \wedge \text{white}(z) \wedge \neg \text{pushable}(x) \wedge \neg \text{pushable}(y) \wedge \neg \text{pushable}(z) \wedge \neg \text{pushable}(f) \wedge \text{on_top}(\text{self}, f) \wedge \text{on_top}(w, f) \wedge \text{one_above}(x, \text{self}) \wedge \text{one_above}(y, \text{self}) \wedge \text{one_above}(z, \text{self}) \wedge \text{touches}(\text{self}, x) \wedge \neg \text{touches}(w, x) \wedge \neg \text{touches}(w, y) \wedge \neg \text{touches}(w, z)$

cl_pushable-floor-pixel-touches-hover-pixel_vs_unpushable concept: pushable-object-exists: $\exists x$ |
 $pushable(x)$

generator: self-on-floor-floor-pixel-touches-hover-pixel-two-hover-pixels:
 $\exists f, w, x, y, z, self \mid floor(f) \wedge blue(f) \wedge pixel(w) \wedge white(w) \wedge pixel(x) \wedge white(x) \wedge pixel(y) \wedge white(y) \wedge pixel(z) \wedge white(z) \wedge \neg pushable(x) \wedge \neg pushable(f) \wedge \neg pushable(y) \wedge \neg pushable(z) \wedge on_top(self, f) \wedge on_top(w, f) \wedge one_above(x, w) \wedge touches(x, w) \wedge one_above(y, w) \wedge one_above(z, w)$

cl_pushable-floor-pixel-touches-self-and-hover-pixel_vs_unpushable concept: pushable-object-exists: $\exists x \mid pushable(x)$

generator: self-on-floor-self-touches-floor-pixel-hover-pixel-touches-floor-pixel-two-hover-pi
 $\exists f, w, x, y, z, self \mid floor(f) \wedge blue(f) \wedge pixel(w) \wedge white(w) \wedge pixel(x) \wedge white(x) \wedge pixel(y) \wedge white(y) \wedge pixel(z) \wedge$
 $white(z) \wedge \neg pushable(x) \wedge \neg pushable(f) \wedge \neg pushable(y) \wedge \neg pushable(z) \wedge on_top(self, f) \wedge on_top(w, f) \wedge$
 $touches(w, self) \wedge one_above(x, w) \wedge touches(x, w) \wedge one_above(y, w) \wedge one_above(z, w)$

$on_top(w, f) \wedge touches(w, self) \wedge one_above(x, self) \wedge one_above(y, self) \wedge one_above(z, self) \wedge \neg touches(self, x) \wedge \neg touches(self, y) \wedge \neg touches(self, z)$

generator: self-on-floor-self-not-touches-floor-pixel-self-touches-hover-pixel-two-hover-pixel
 $\exists f, w, x, y, z, self \mid floor(f) \wedge blue(f) \wedge pixel(w) \wedge white(w) \wedge pixel(x) \wedge white(x) \wedge pixel(y) \wedge white(y) \wedge pixel(z) \wedge white(z) \wedge \neg pushable(x) \wedge \neg pushable(y) \wedge \neg pushable(z) \wedge \neg pushable(f) \wedge on_top(self, f) \wedge on_top(w, f) \wedge one_above(x, self) \wedge one_above(y, self) \wedge one_above(z, self) \wedge touches(self, x) \wedge \neg touches(self, w)$

generator: self-on-floor-self-not-touches-floor-pixel-self-not-touches-three-hover-pixels:
 $\exists f, w, x, y, z, self \mid floor(f) \wedge blue(f) \wedge pixel(w) \wedge white(w) \wedge pixel(x) \wedge white(x) \wedge pixel(y) \wedge white(y) \wedge pixel(z) \wedge white(z) \wedge \neg pushable(x) \wedge \neg pushable(y) \wedge \neg pushable(z) \wedge \neg pushable(f) \wedge on_top(self, f) \wedge on_top(w, f) \wedge one_above(x, self) \wedge one_above(y, self) \wedge one_above(z, self) \wedge \neg touches(self, w) \wedge \neg touches(self, x) \wedge \neg touches(self, y) \wedge \neg touches(self, z)$

3.8 search-sig

ba_self-in-target-container_from_nontarget-container concept: self-in-target-container: $\exists x, self \mid target(x) \wedge container(x) \wedge inside_supported(self, x)$

generator: bfaw-self-and-two-containers-in-nontarget: $\exists f, x, y, self \mid floor(f) \wedge blue(f) \wedge white(x) \wedge white(y) \wedge container(x) \wedge container(y) \wedge target(y) \wedge \neg target(x) \wedge on_top(x, f) \wedge on_top(y, f) \wedge inside_supported(self, x) \wedge \neg touches(x, y)$

ba_self-touches-left-target_from_nontarget-container concept: self-at-target-on-floor: $\exists f, x, self \mid floor(f) \wedge target(x) \wedge on_top(x, f) \wedge on_top(self, f) \wedge touches(self, x)$

generator: bfaw-self-and-two-containers-in-right-nontarget: $\exists f, x, y, self \mid floor(f) \wedge blue(f) \wedge white(x) \wedge white(y) \wedge container(x) \wedge container(y) \wedge target(y) \wedge \neg target(x) \wedge on_top(x, f) \wedge on_top(y, f) \wedge inside_supported(self, x) \wedge right_of(x, y) \wedge \neg touches(x, y)$

ba_self-touches-right-target_from_nontarget-container concept: self-at-target-on-floor: $\exists f, x, self \mid floor(f) \wedge target(x) \wedge on_top(x, f) \wedge on_top(self, f) \wedge touches(self, x)$

generator: bfaw-self-and-two-containers-in-left-nontarget: $\exists f, x, y, self \mid floor(f) \wedge blue(f) \wedge white(x) \wedge white(y) \wedge container(x) \wedge container(y) \wedge target(y) \wedge \neg target(x) \wedge on_top(x, f) \wedge on_top(y, f) \wedge inside_supported(self, x) \wedge left_of(x, y) \wedge \neg touches(x, y)$

ba_self-touches-target_from_anywhere-on-floor concept: self-at-target-on-floor: $\exists f, x, self \mid floor(f) \wedge target(x) \wedge on_top(x, f) \wedge on_top(self, f) \wedge touches(self, x)$

generator: bfaw-self-left-of-target-on-floor: $\exists f, x, self \mid floor(f) \wedge blue(f) \wedge white(x) \wedge target(x) \wedge potential_container(x) \wedge on_top(x, f) \wedge on_top(self, f) \wedge dir_left_of(self, x)$

generator: bfaw-self-right-of-target-on-floor: $\exists f, x, self \mid floor(f) \wedge blue(f) \wedge white(x) \wedge target(x) \wedge potential_container(x) \wedge on_top(x, f) \wedge on_top(self, f) \wedge dir_right_of(self, x)$

ba_self-touches-target_from_left-on-floor concept: self-at-target-on-floor: $\exists f, x, self \mid floor(f) \wedge target(x) \wedge on_top(x, f) \wedge on_top(self, f) \wedge touches(self, x)$

generator: bfaw-self-left-of-target-on-floor: $\exists f, x, self \mid floor(f) \wedge blue(f) \wedge white(x) \wedge target(x) \wedge potential_container(x) \wedge on_top(x, f) \wedge on_top(self, f) \wedge dir_left_of(self, x)$

ba_self-touches-target_from_left-on-floor_with_left-nontarget concept: self-at-target-on-floor: $\exists f, x, self \mid floor(f) \wedge target(x) \wedge on_top(x, f) \wedge on_top(self, f) \wedge touches(self, x)$

generator: bfaw-self-left-of-target-and-right-of-nontarget-on-floor: $\exists f, x, y, self \mid floor(f) \wedge blue(f) \wedge white(x) \wedge white(y) \wedge target(x) \wedge potential_container(x) \wedge potential_container(y) \wedge \neg target(y) \wedge on_top(x, f) \wedge on_top(y, f) \wedge on_top(self, f) \wedge dir_left_of(self, x) \wedge dir_right_of(self, y) \wedge \neg near(x, y)$

ba_self-touches-target_from_left-on-floor_with_right-obstacle concept: self-at-target-on-floor: $\exists f, x, self \mid floor(f) \wedge target(x) \wedge on_top(x, f) \wedge on_top(self, f) \wedge touches(self, x)$

generator: bfaw-self-left-of-target-and-right-obstacle-on-floor: $\exists f, x, y, self \mid floor(f) \wedge blue(f) \wedge white(x) \wedge white(y) \wedge target(x) \wedge potential_container(x) \wedge potential_container(y) \wedge \neg target(y) \wedge on_top(x, f) \wedge on_top(y, f) \wedge on_top(self, f) \wedge dir_left_of(self, x) \wedge dir_left_of(self, y) \wedge dir_left_of(y, x) \wedge \neg near(x, y)$

ba_self-touches-target_from_nontarget-container concept: self-at-target-on-floor: $\exists f, x, self \mid floor(f) \wedge target(x) \wedge on_top(x, f) \wedge on_top(self, f) \wedge touches(self, x)$

generator: bfaw-self-and-two-containers-in-nontarget: $\exists f, x, y, self \mid floor(f) \wedge blue(f) \wedge white(x) \wedge white(y) \wedge container(x) \wedge container(y) \wedge target(y) \wedge \neg target(x) \wedge on_top(x, f) \wedge on_top(y, f) \wedge inside_supported(self, x) \wedge \neg touches(x, y)$

ba_self-touches-target_from_right-on-floor concept: self-at-target-on-floor: $\exists f, x, self \mid floor(f) \wedge target(x) \wedge on_top(x, f) \wedge on_top(self, f) \wedge touches(self, x)$

generator: bfa-w-self-right-of-target-on-floor: $\exists f, x, self \mid floor(f) \wedge blue(f) \wedge white(x) \wedge target(x) \wedge potential_container(x) \wedge on_top(x, f) \wedge on_top(self, f) \wedge dir_right_of(self, x)$

ba_self-touches-target_from_right-on-floor_with_left-obstacle concept: self-at-target-on-floor: $\exists f, x, self \mid floor(f) \wedge target(x) \wedge on_top(x, f) \wedge on_top(self, f) \wedge touches(self, x)$

generator: bfa-w-self-right-of-target-and-left-obstacle-on-floor: $\exists f, x, y, self \mid floor(f) \wedge blue(f) \wedge white(x) \wedge white(y) \wedge target(x) \wedge potential_container(x) \wedge potential_container(y) \wedge \neg target(y) \wedge on_top(x, f) \wedge on_top(y, f) \wedge on_top(self, f) \wedge dir_right_of(self, x) \wedge dir_right_of(self, y) \wedge dir_right_of(y, x) \wedge \neg near(x, y)$

ba_self-touches-target_from_right-on-floor_with_right-nontarget concept: self-at-target-on-floor: $\exists f, x, self \mid floor(f) \wedge target(x) \wedge on_top(x, f) \wedge on_top(self, f) \wedge touches(self, x)$

generator: bfa-w-self-right-of-target-and-left-of-nontarget-on-floor: $\exists f, x, y, self \mid floor(f) \wedge blue(f) \wedge white(x) \wedge white(y) \wedge target(x) \wedge potential_container(x) \wedge potential_container(y) \wedge \neg target(y) \wedge on_top(x, f) \wedge on_top(y, f) \wedge on_top(self, f) \wedge dir_right_of(self, x) \wedge dir_left_of(self, y) \wedge \neg near(x, y)$