

This supplemental corresponds to Appendix C. Specifically, it shows results for simulations with alpha = 0.4 and beta = 0.04. Immediately below are listed which outcome obtained for each of 1000 simulations. E.e. simulations 5, 23, 68, etc. were all outcome A. It seemed imprudent to make sweeping generalizations about all of the simulations that resulted in a particular outcome. Consequently, the supplement then shows, for the first ten simulations of each outcome, the signaling and behavior dispositions of the agents as they evolved over time. So, for outcome (i) the evolution over time of signaling and acting are shown for simulations 5, 23, 68, 69, 153, 343, 446, 459, 503, 511. While simulations were run for 8×10^4 timesteps, I have selected the range of timesteps most relevant to understanding each simulation. Thus if the graph ends prior to 8×10^4 timesteps, you should assume that whatever trends are shown in the figure are continued for the remainder of the simulation. Across all of the alpha and beta parameters investigated in section 3.7 of the paper, outcomes (xiv-xvii) were exceedingly rare *prima facie* it does not make sense how these simulations could occur. Thus, after completing the graphs for alpha = 0.4 and beta = 0.04 (none of which are for outcomes (xiv-xvii)), I then identified every occurrence of outcomes (xiv-xvii) for all alpha and beta values investigated and show the graphs over time for how the outcome obtained. For most of these, the graphs make sense once observed. However, starting with outcome (xv) on page 87, there were some simulations where two different strategy profiles amongst a type reinforced each other such that increasing the proportion of agents with one of the strategy profiles decreased its utility. How this can happen is explained on page 89. To understand this sort of outcome you need to calculate that the expected utility of each of the two strategy profiles is equal. While this is explained for the first occurrence of these symbiotic strategy profiles, in subsequent occurrences I merely copy-pasted the values from the spreadsheet in which I made the calculations, but did not copy down the formulas used to calculate the value of each cell in the spreadsheet. If you would like to see these formulas, the spreadsheets are available on request.

outcomes (i) starts on page 4:

[5, 23, 68, 69, 153, 343, 446, 459, 503, 511, 512, 522, 598, 669, 710, 788, 799, 831]

outcomes (ii):

[]

outcomes (iii):

[]

outcomes (iv) starts on page 14:

[0, 4, 12, 19, 22, 39, 42, 58, 63, 85, 91, 100, 102, 109, 113, 126, 129, 136, 143, 144, 146, 150, 164, 175, 177, 186, 187, 191, 196, 198, 201, 208, 222, 237, 243, 247, 254, 265, 271, 275, 284, 287, 288, 292, 294, 296, 310, 314, 316, 325, 338, 350, 352, 356, 365, 373, 381, 389, 394, 397, 401, 407, 427, 430, 437, 438, 452, 453, 457, 458, 472, 480, 481, 484, 487, 490, 498, 505, 517, 524, 527, 535, 539, 543, 546, 547, 551, 552, 555, 556, 558, 559, 567, 586, 587, 596, 610, 614, 615, 617, 621, 622, 629, 630, 633, 639, 647, 649, 654, 658, 666, 670, 682, 692, 693, 698, 702, 704, 706, 714, 715, 730, 736, 742, 744, 751, 759, 772, 782, 784, 791, 792, 793, 796, 812, 816,

817, 825, 837, 846, 847, 857, 869, 876, 883, 911, 918, 941, 945, 947, 964, 974, 975, 979, 980, 986, 987, 993, 998, 999]

outcomes (v) starts on page 24:

[32, 43, 67, 125, 133, 179, 188, 199, 200, 236, 396, 431, 445, 465, 466, 469, 493, 651, 703, 824, 832, 856, 873, 877, 951]

outcomes (vi):

[]

outcomes (vii):

[]

outcomes (viii) starts on page 34:

[1, 2, 3, 7, 8, 11, 13, 14, 16, 18, 20, 24, 27, 28, 29, 31, 33, 34, 36, 37, 41, 44, 45, 46, 48, 51, 52, 54, 56, 57, 59, 61, 62, 64, 65, 70, 71, 72, 73, 77, 80, 81, 83, 86, 88, 89, 93, 94, 95, 98, 99, 101, 103, 104, 105, 106, 108, 110, 111, 112, 115, 118, 119, 120, 121, 122, 123, 124, 127, 130, 131, 135, 139, 140, 141, 142, 147, 148, 149, 155, 158, 161, 162, 165, 166, 168, 169, 171, 172, 173, 174, 178, 181, 182, 183, 184, 185, 190, 192, 193, 195, 197, 202, 203, 205, 209, 211, 212, 215, 216, 217, 219, 220, 224, 225, 228, 229, 230, 232, 233, 234, 238, 240, 241, 244, 245, 246, 248, 249, 250, 252, 255, 256, 258, 260, 261, 262, 263, 264, 267, 268, 270, 272, 274, 278, 280, 281, 283, 285, 286, 289, 290, 291, 293, 295, 299, 300, 301, 302, 303, 305, 306, 307, 308, 309, 311, 315, 318, 319, 320, 321, 322, 324, 326, 327, 328, 329, 330, 332, 334, 335, 339, 341, 342, 344, 345, 346, 347, 348, 349, 351, 353, 354, 357, 360, 361, 362, 363, 367, 368, 370, 372, 374, 376, 377, 378, 379, 380, 382, 383, 384, 388, 390, 391, 398, 400, 403, 404, 405, 406, 408, 409, 411, 414, 415, 416, 417, 419, 422, 424, 425, 436, 440, 441, 444, 447, 448, 449, 450, 451, 454, 456, 462, 463, 464, 467, 468, 470, 471, 473, 474, 482, 483, 486, 488, 489, 491, 495, 497, 499, 500, 502, 506, 507, 510, 513, 514, 515, 516, 518, 519, 520, 525, 528, 529, 530, 531, 532, 533, 534, 536, 538, 540, 544, 545, 549, 553, 554, 561, 563, 564, 566, 568, 570, 571, 573, 574, 575, 578, 579, 580, 582, 583, 584, 585, 590, 592, 595, 597, 601, 604, 605, 606, 607, 608, 611, 612, 613, 618, 619, 620, 625, 626, 631, 632, 634, 635, 636, 638, 642, 645, 646, 648, 652, 653, 655, 659, 660, 661, 662, 663, 664, 665, 667, 673, 674, 676, 677, 678, 680, 683, 686, 687, 688, 689, 690, 694, 700, 705, 707, 709, 711, 712, 716, 718, 720, 721, 725, 726, 728, 729, 732, 733, 734, 735, 738, 739, 743, 745, 747, 748, 750, 752, 753, 754, 755, 756, 757, 760, 761, 762, 763, 764, 766, 768, 769, 770, 773, 775, 776, 778, 779, 780, 783, 785, 786, 787, 795, 797, 798, 800, 801, 802, 803, 804, 805, 807, 808, 809, 810, 813, 814, 818, 819, 820, 821, 822, 823, 826, 828, 829, 830, 833, 834, 835, 838, 840, 842, 844, 845, 848, 850, 853, 854, 858, 859, 860, 861, 863, 865, 866, 867, 868, 870, 871, 874, 875, 878, 879, 880, 881, 882, 884, 885, 887, 889, 891, 892, 893, 894, 895, 897, 901, 902, 904, 906, 908, 909, 910, 915, 916, 917, 919, 921, 922, 926, 927, 928, 932, 935, 937, 938, 943, 944, 946, 948, 949, 953, 955, 956, 957, 959, 960, 961, 962, 965, 966, 967, 968, 971, 972, 973, 977, 978, 981, 988, 990, 994, 995, 996, 997]

outcomes (ix) starts on page 47:

[92, 206, 637]

outcomes (x) starts on page 50:

[9]

outcomes (xi) starts on page 51:

[273, 443, 508, 696, 855, 929, 933]

outcomes (xii) starts on page 58:

[6, 17, 25, 26, 30, 35, 40, 47, 49, 50, 53, 60, 66, 78, 84, 90, 96, 107, 114, 117, 128, 134, 137, 138, 145, 151, 152, 156, 160, 163, 167, 170, 189, 194, 204, 207, 210, 214, 218, 221, 223, 226, 227, 231, 235, 242, 251, 253, 266, 279, 282, 297, 298, 304, 317, 323, 331, 333, 336, 337, 358, 359, 369, 385, 386, 387, 392, 393, 399, 402, 412, 418, 423, 426, 428, 429, 432, 433, 435, 439, 461, 475, 476, 477, 479, 485, 492, 494, 496, 501, 504, 526, 541, 542, 550, 557, 562, 565, 569, 576, 581, 588, 589, 591, 594, 599, 603, 609, 616, 624, 627, 641, 643, 657, 671, 672, 675, 679, 681, 695, 697, 699, 708, 717, 719, 722, 723, 727, 731, 737, 740, 746, 781, 790, 794, 806, 811, 815, 827, 841, 843, 851, 852, 862, 864, 872, 886, 890, 898, 899, 900, 912, 914, 920, 925, 931, 934, 936, 940, 950, 954, 958, 963, 982, 983, 989, 991]

outcomes (xiii) starts on page 68:

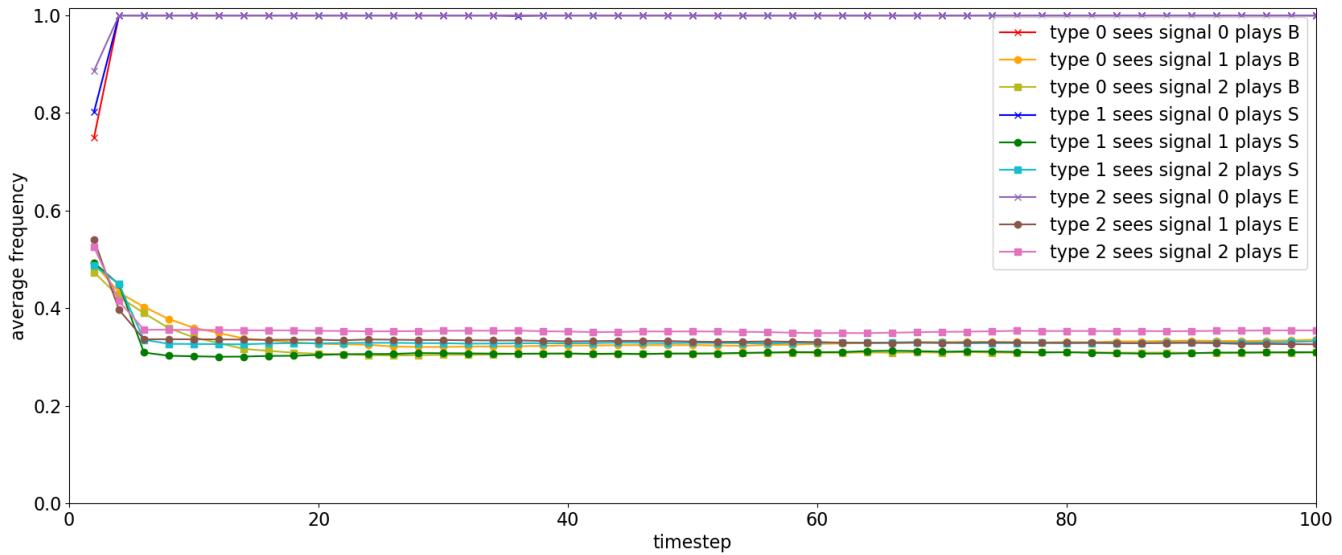
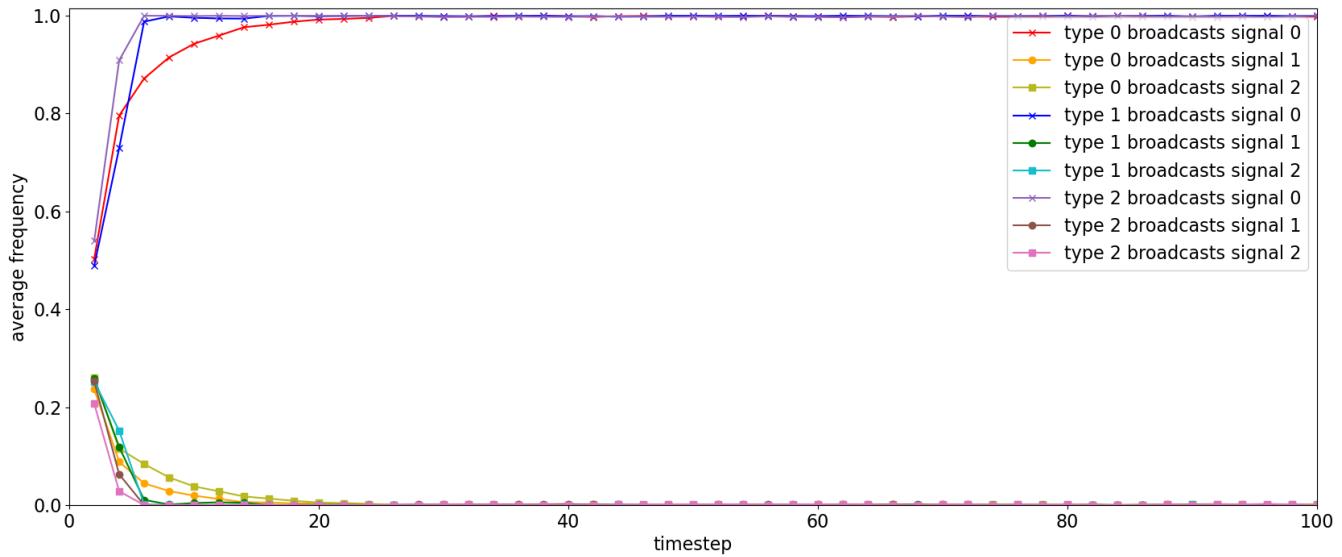
[10, 15, 21, 38, 55, 74, 75, 76, 79, 82, 87, 97, 116, 132, 154, 157, 159, 176, 180, 213, 239, 257, 259, 269, 276, 277, 312, 313, 340, 355, 364, 366, 371, 375, 395, 410, 413, 420, 421, 434, 442, 455, 460, 478, 509, 521, 523, 537, 548, 560, 572, 577, 593, 600, 602, 623, 628, 640, 644, 650, 656, 668, 684, 685, 691, 701, 713, 724, 741, 749, 758, 765, 767, 771, 774, 777, 789, 836, 839, 849, 888, 896, 903, 905, 907, 913, 923, 924, 930, 939, 942, 952, 969, 970, 976, 984, 985, 992]

outcomes (xiv-xvii):

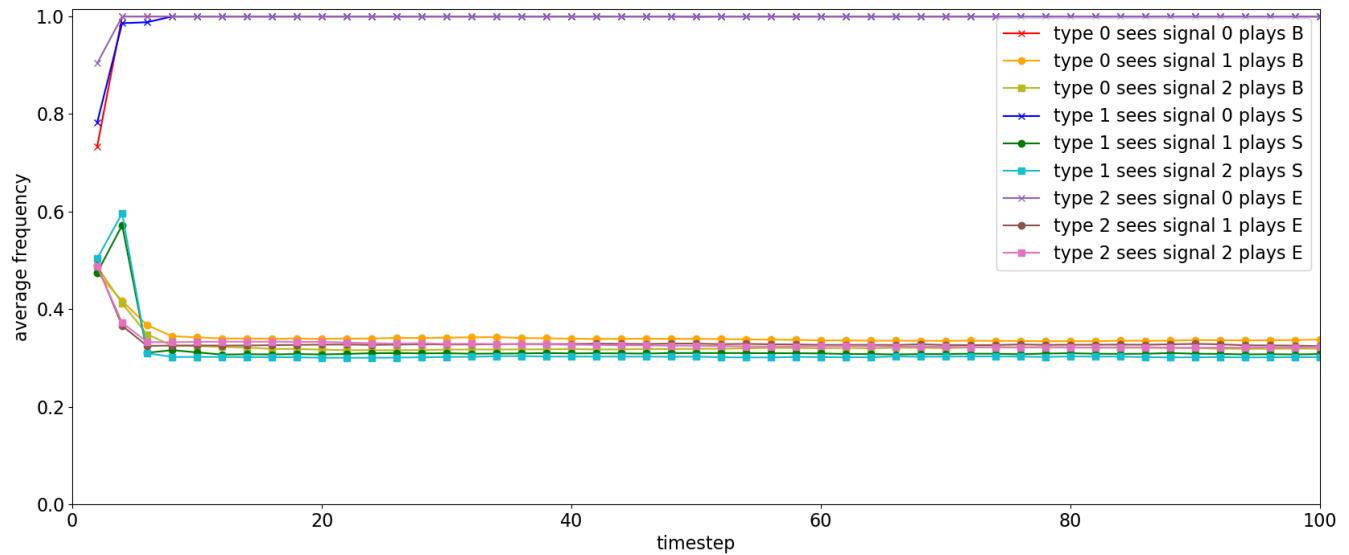
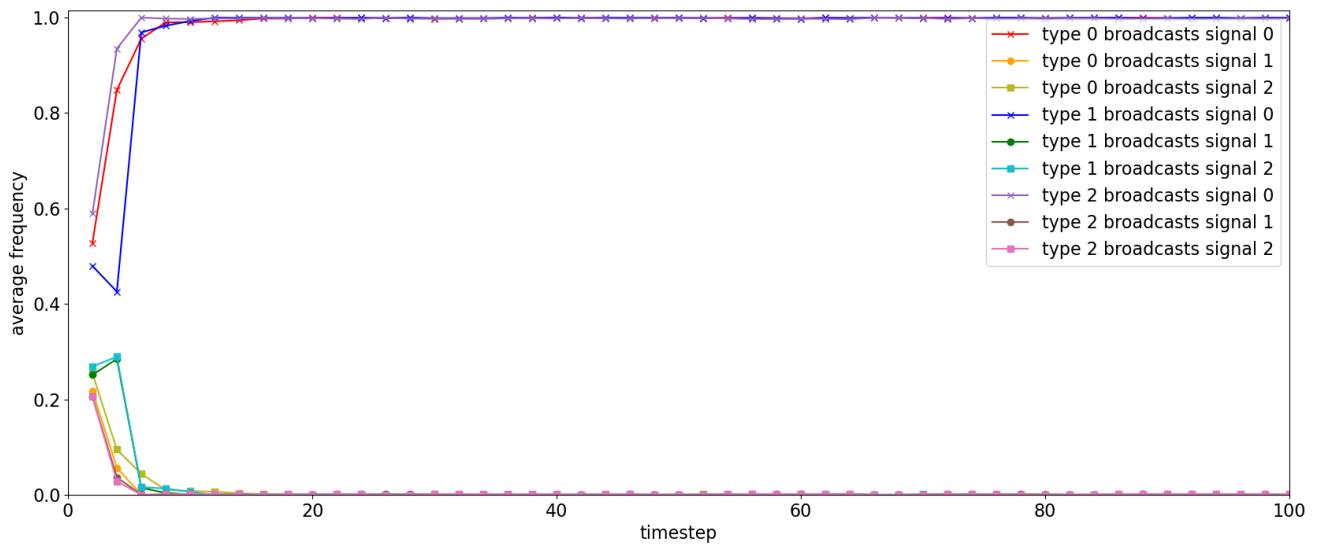
[]

outcomes (i):

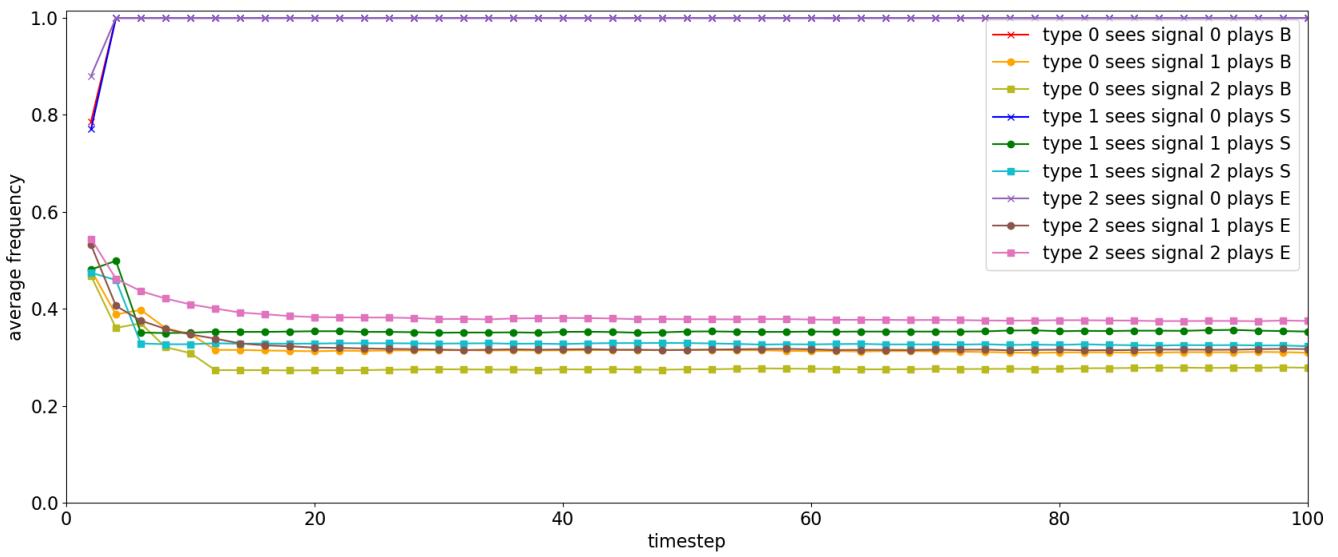
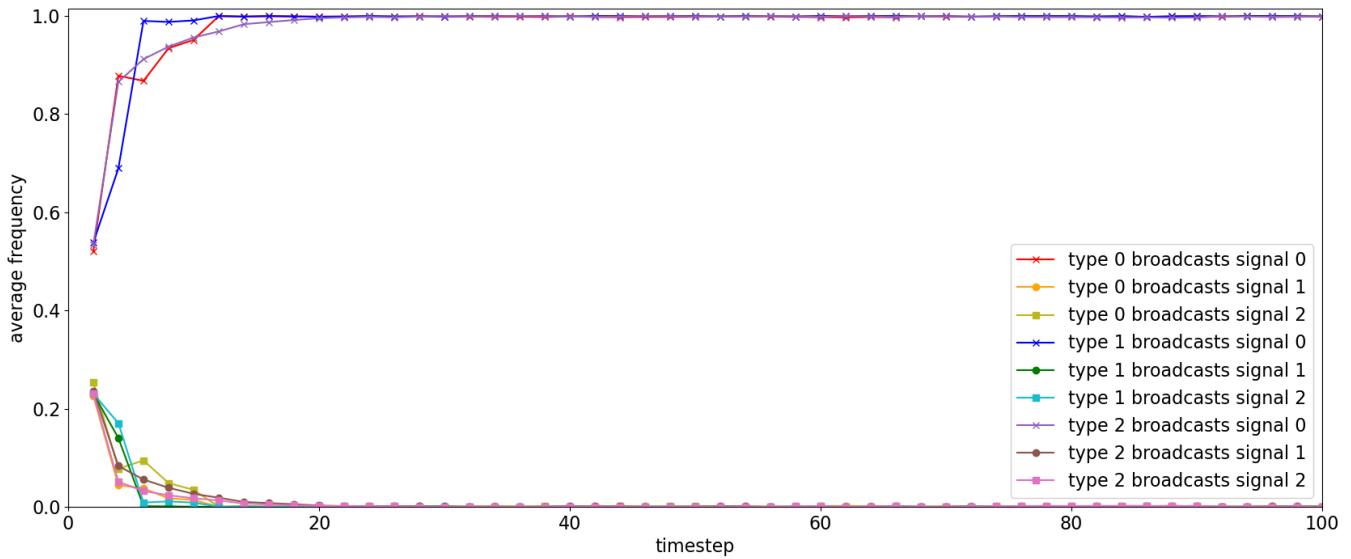
Run # 5



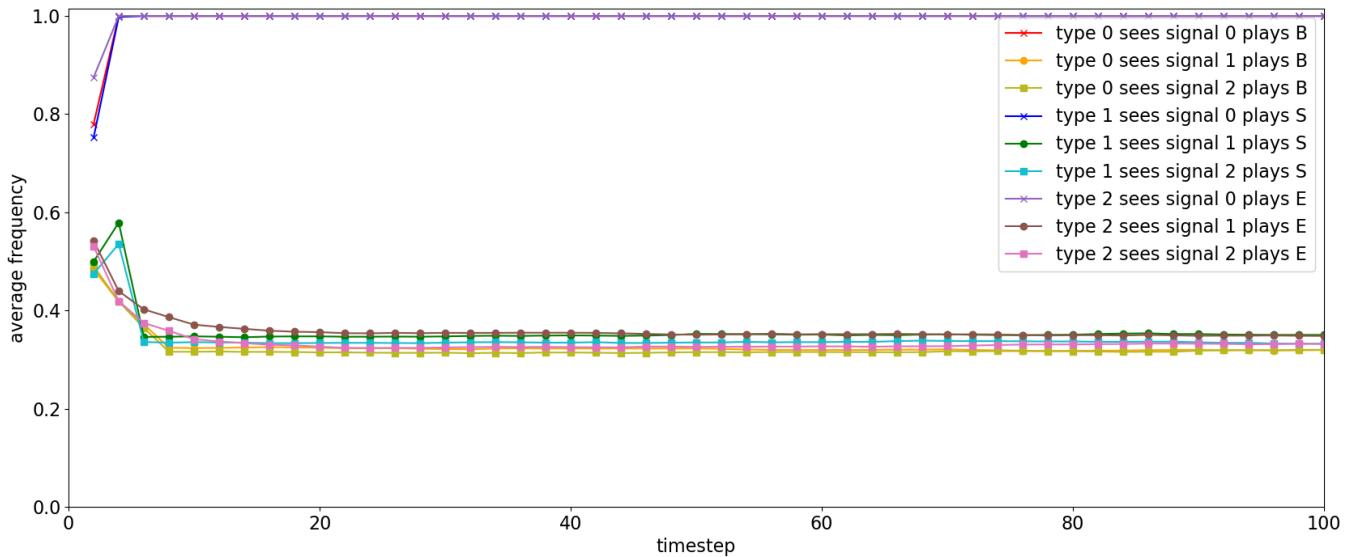
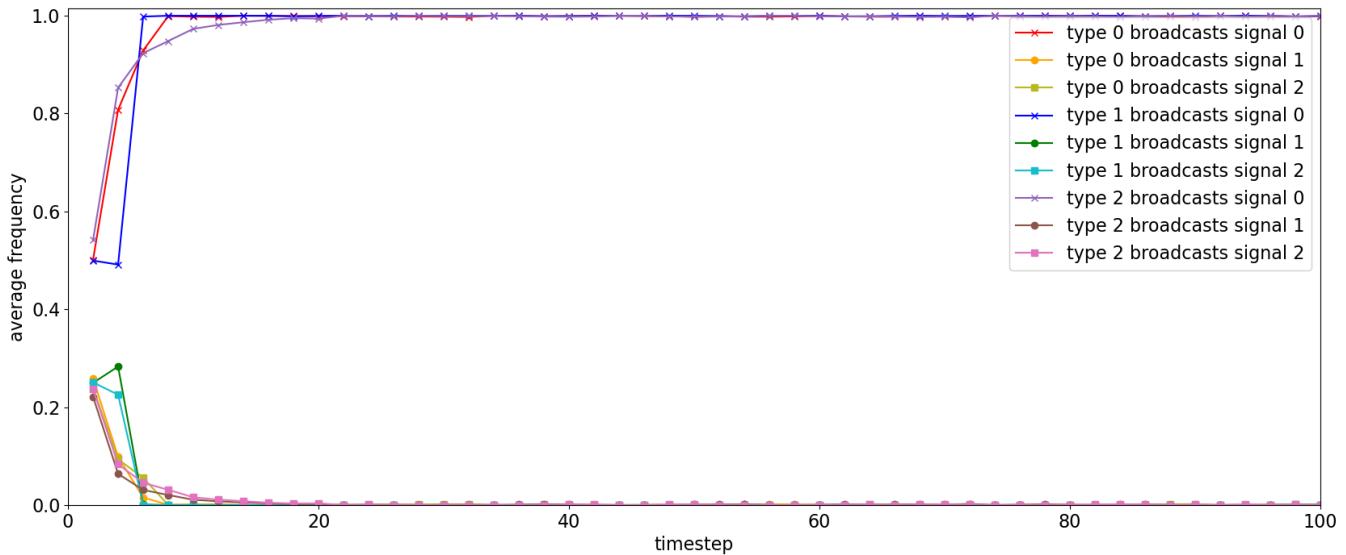
Run # 23



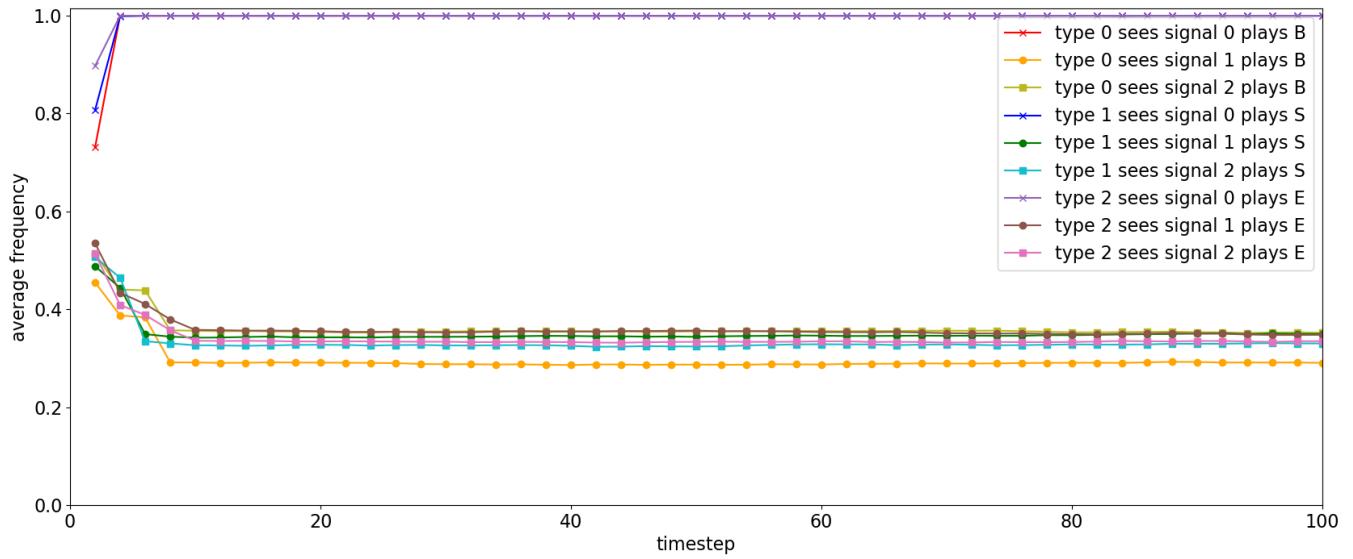
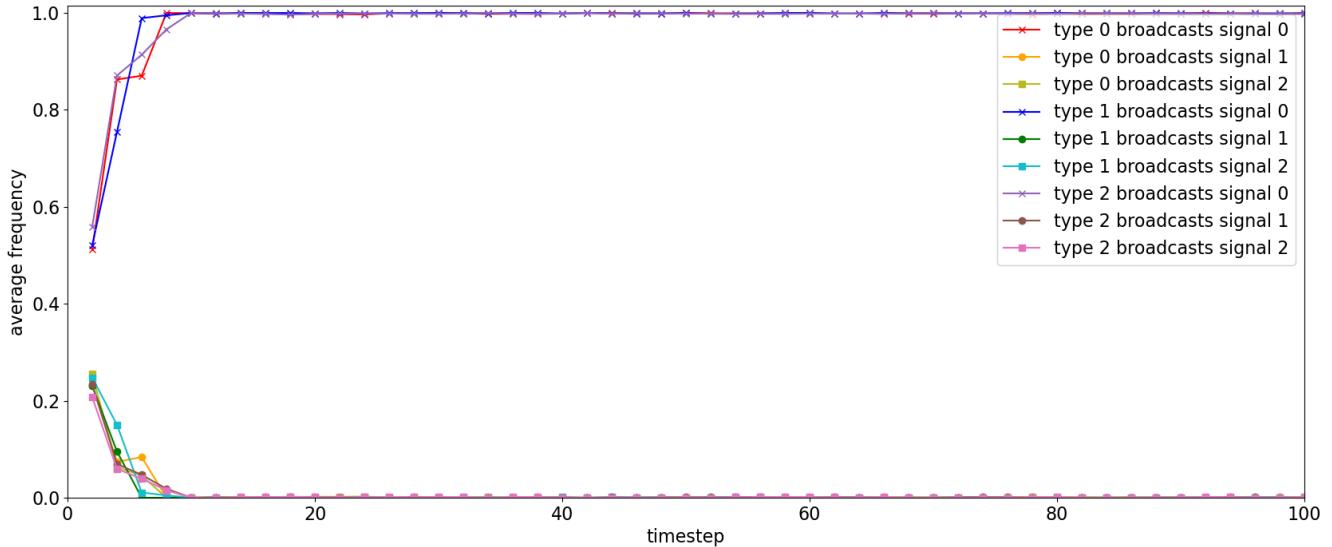
Run # 68



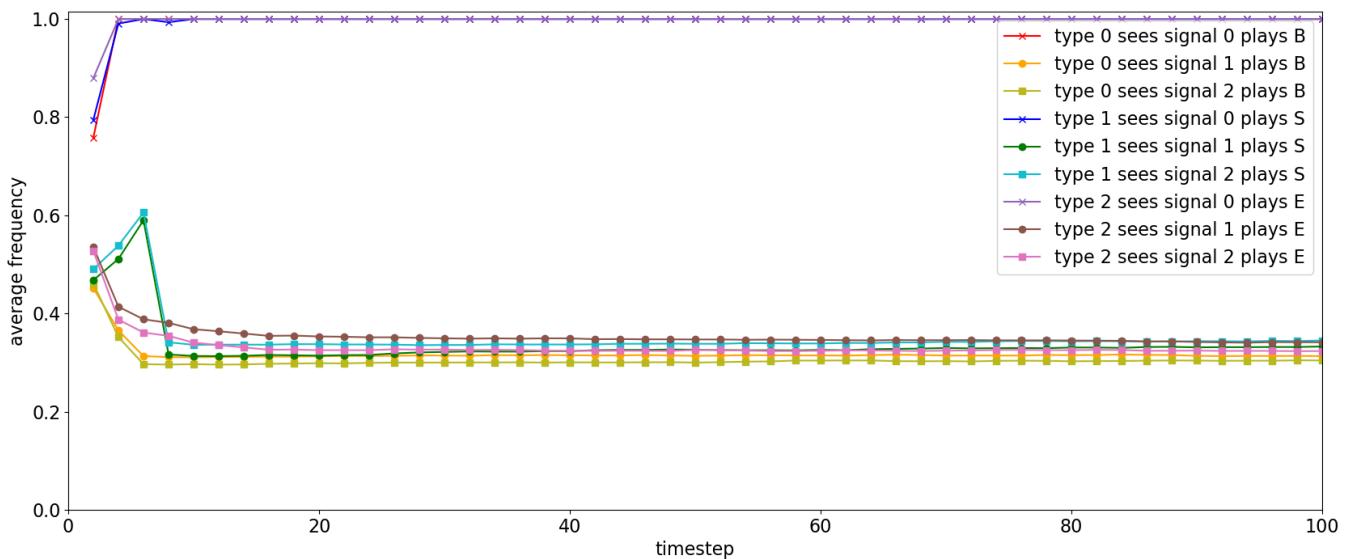
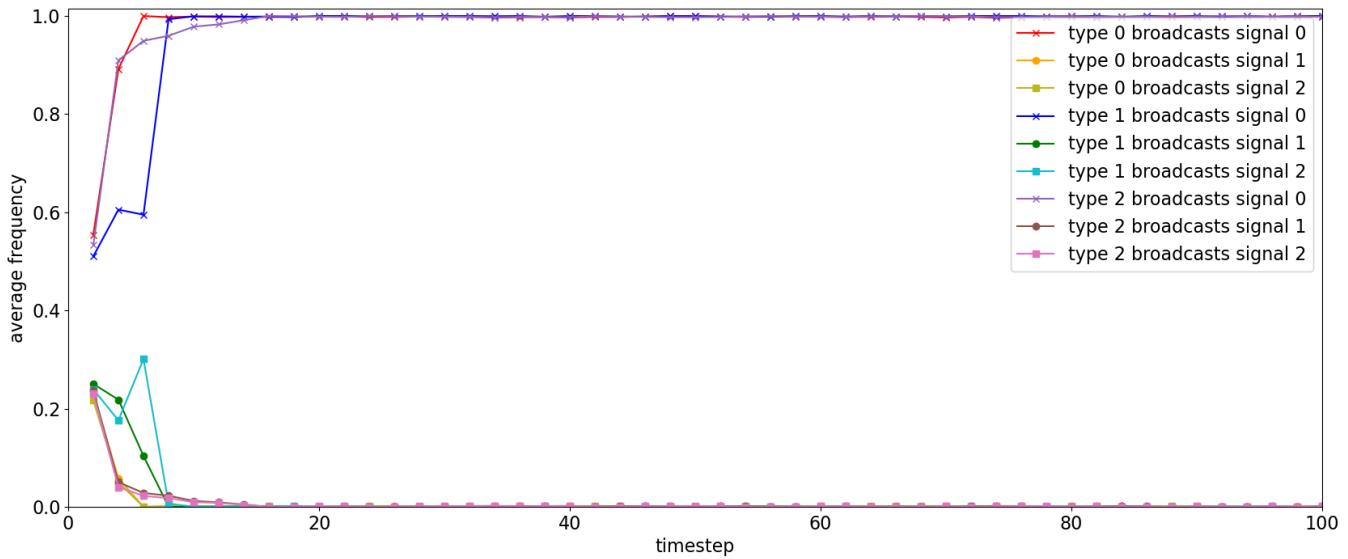
Run # 69



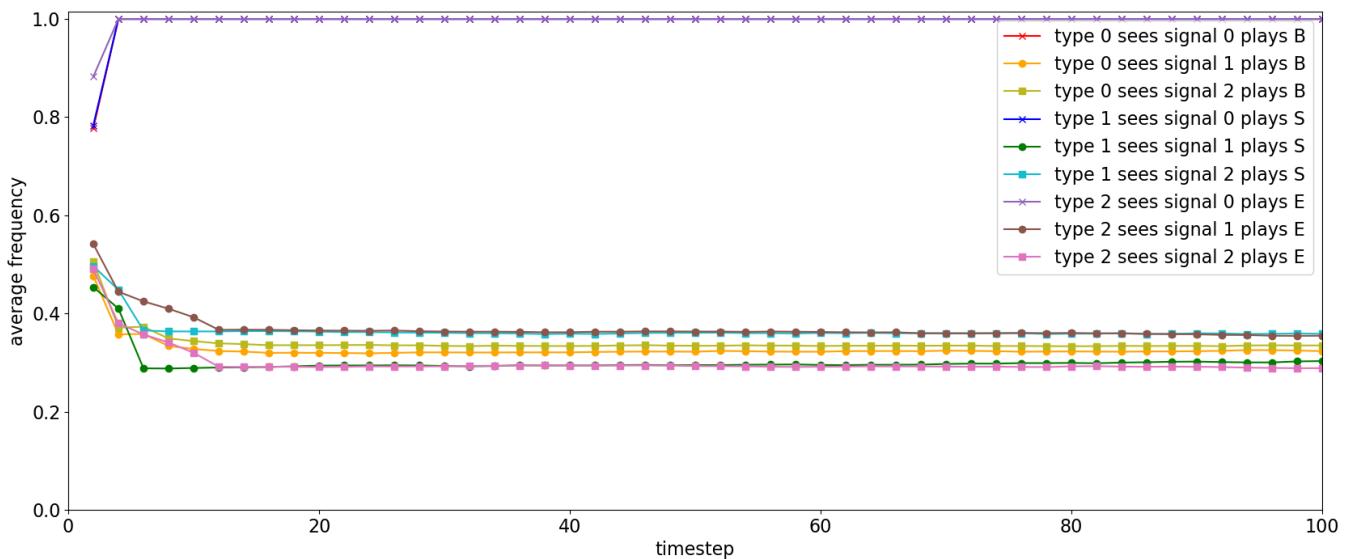
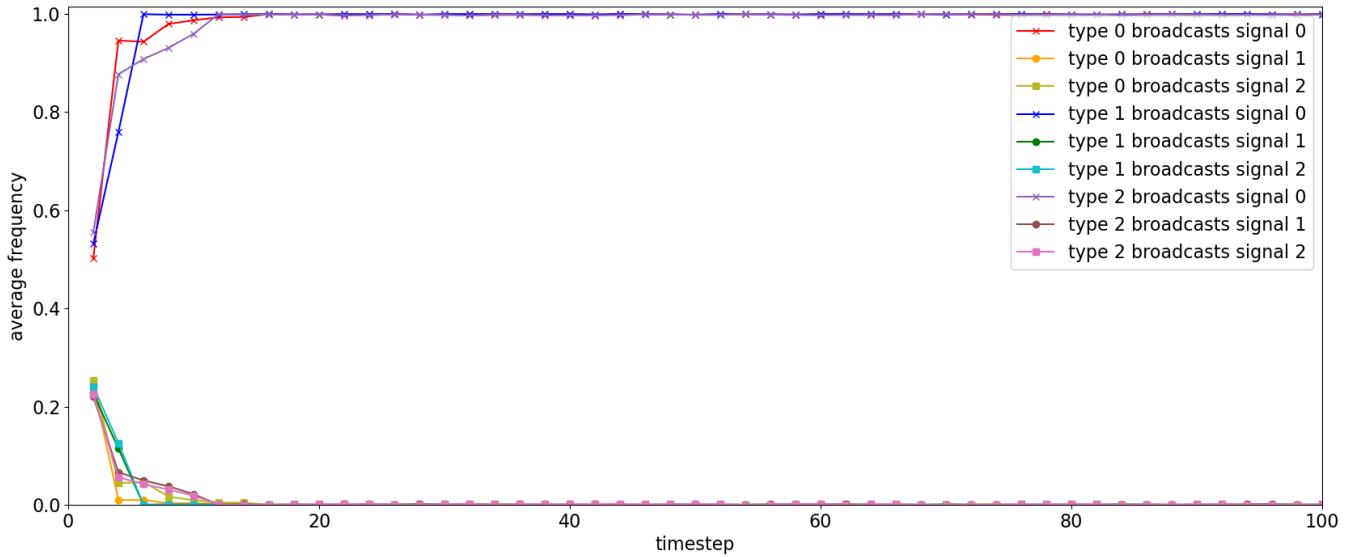
Run # 153



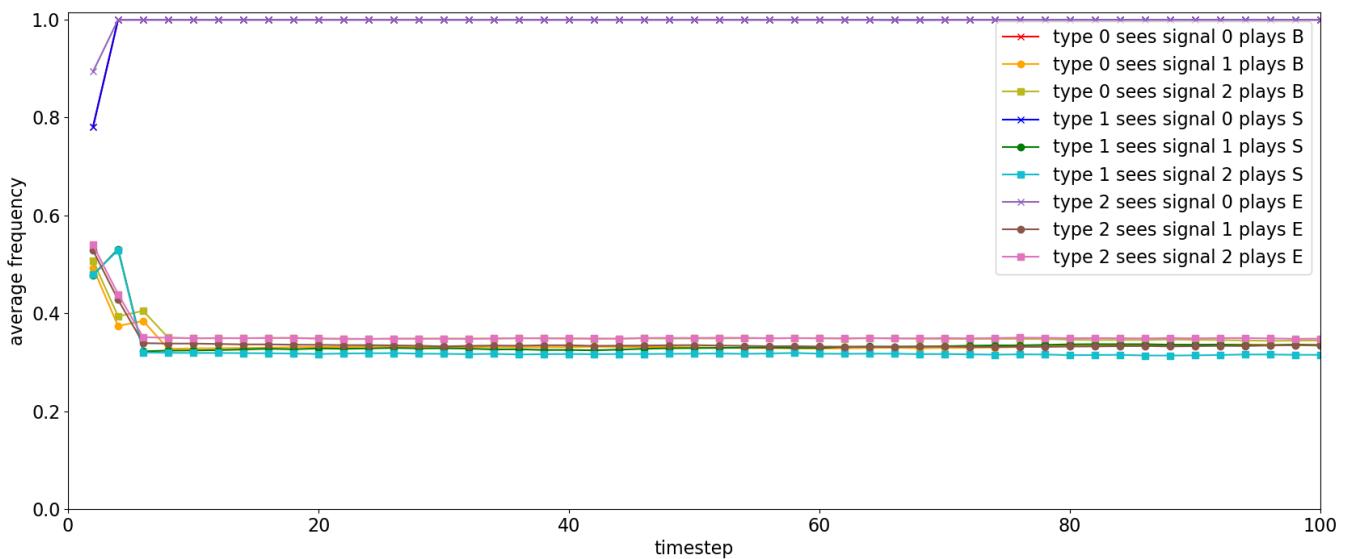
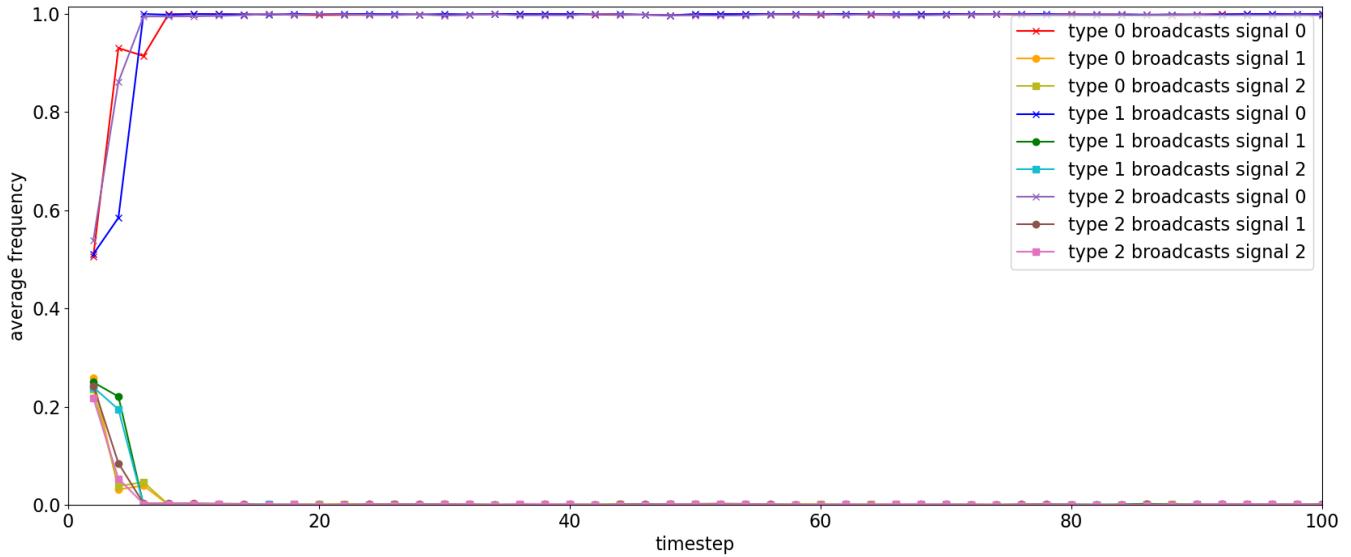
Run # 343



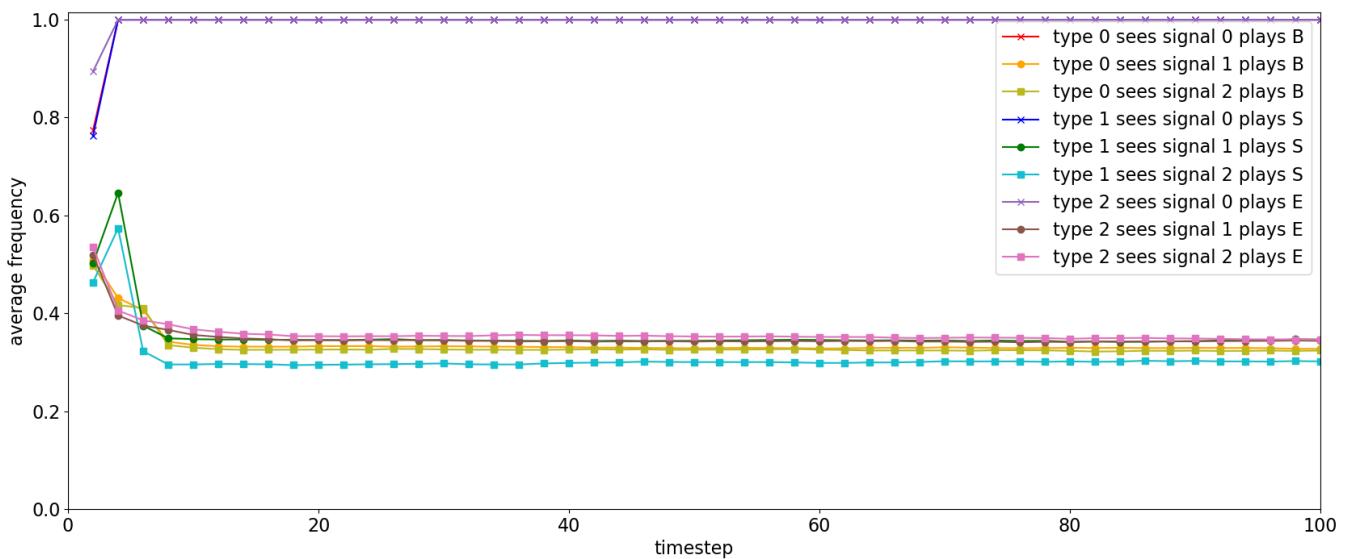
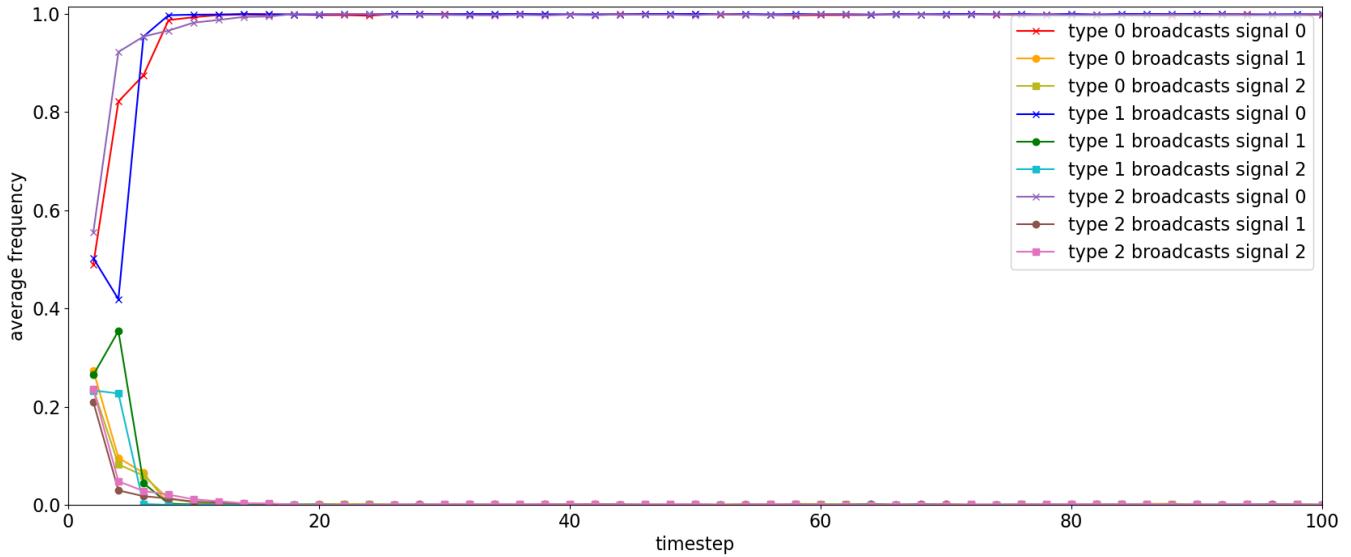
Run # 446



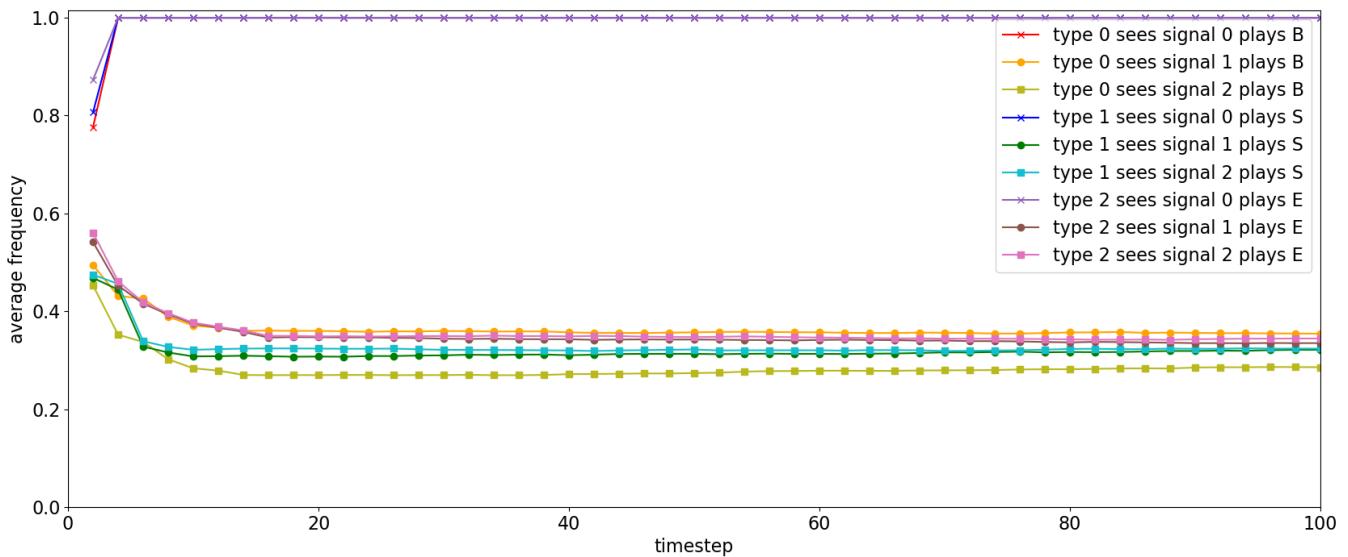
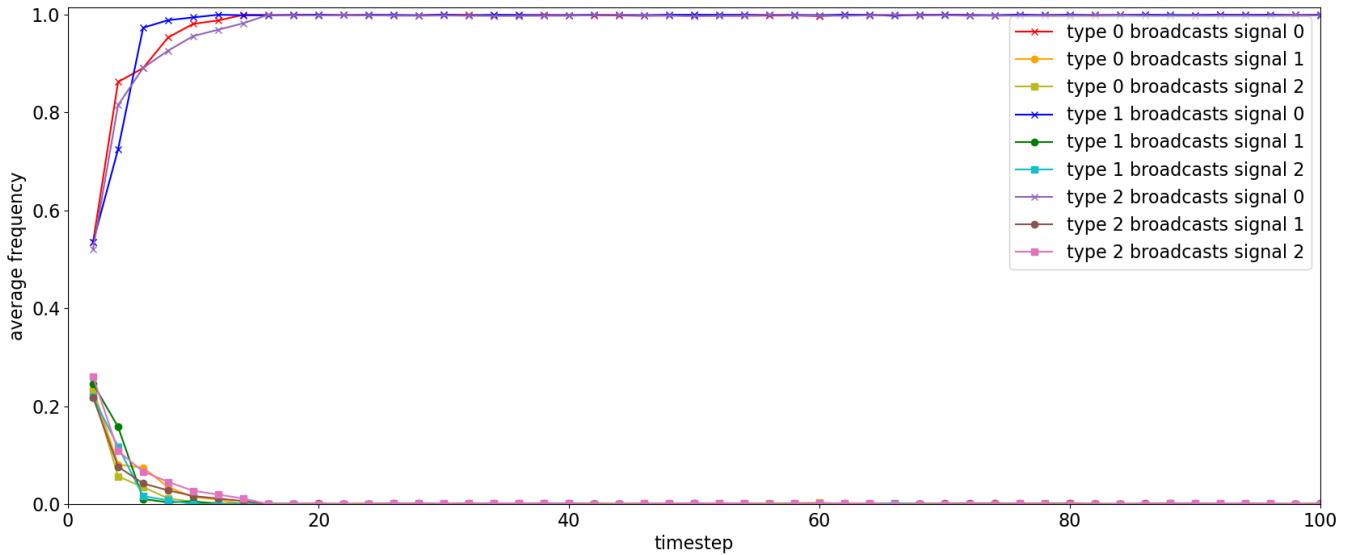
Run # 459



Run # 503

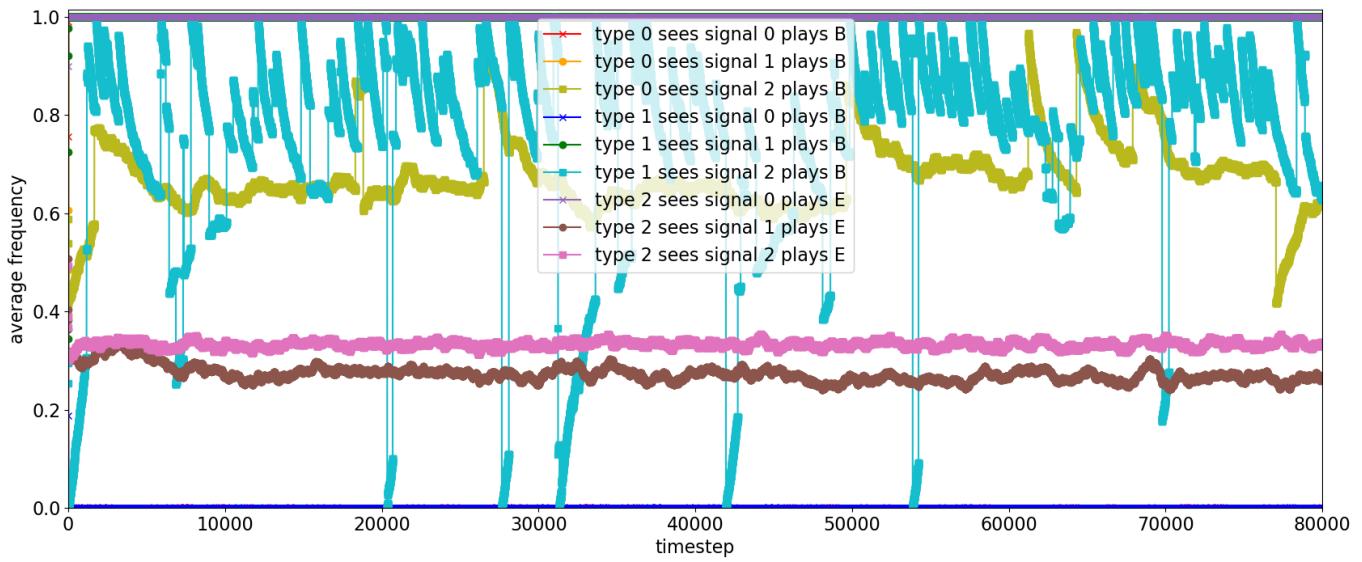
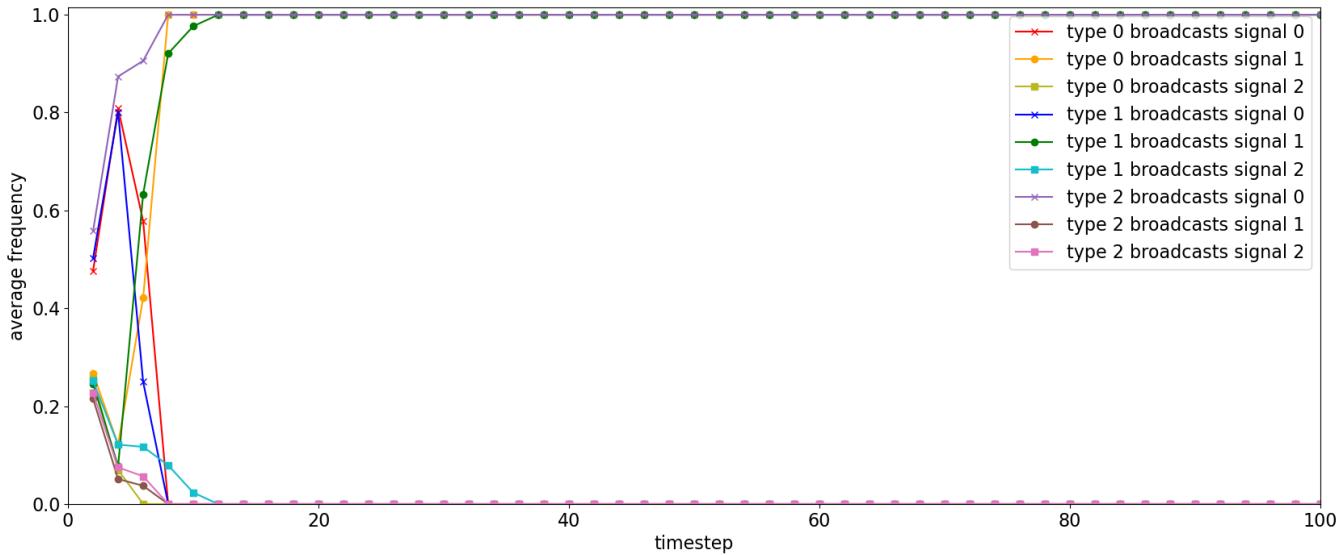


Run # 511

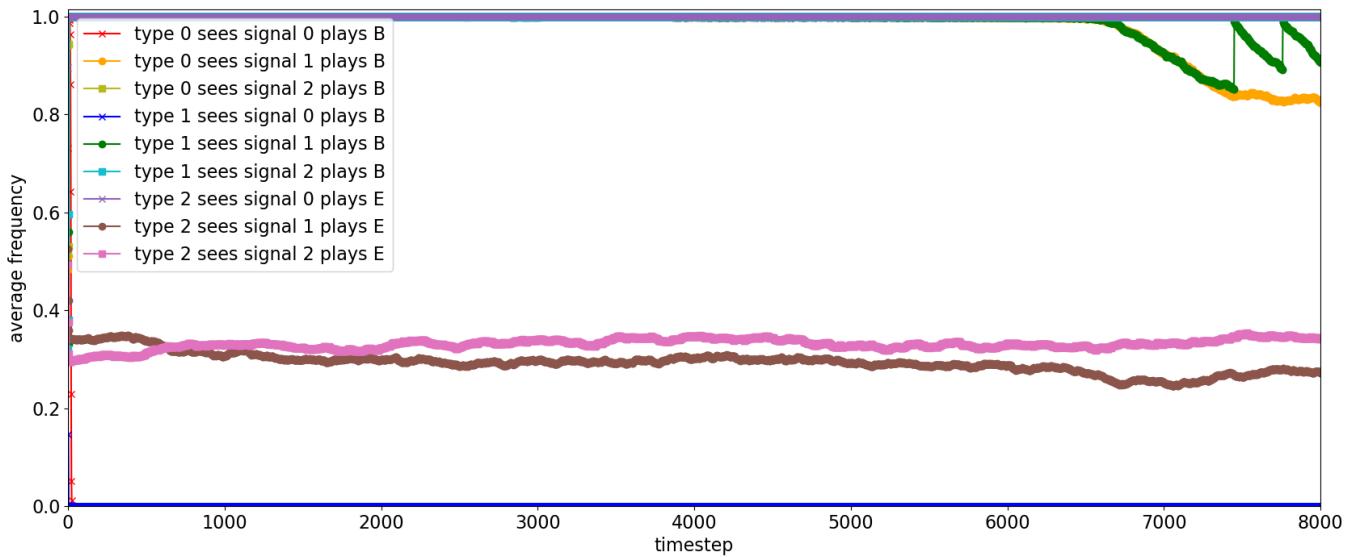
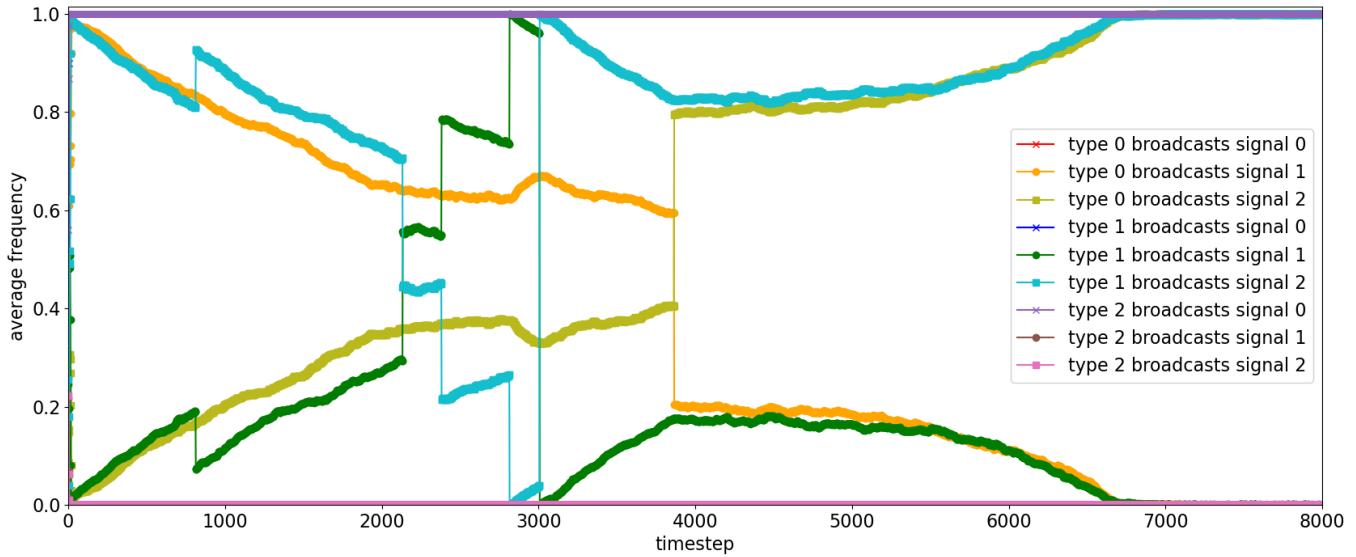


outcomes (iv): generally type 2 signaling 0 and types 0 and 1 sending same signal

Run # 0

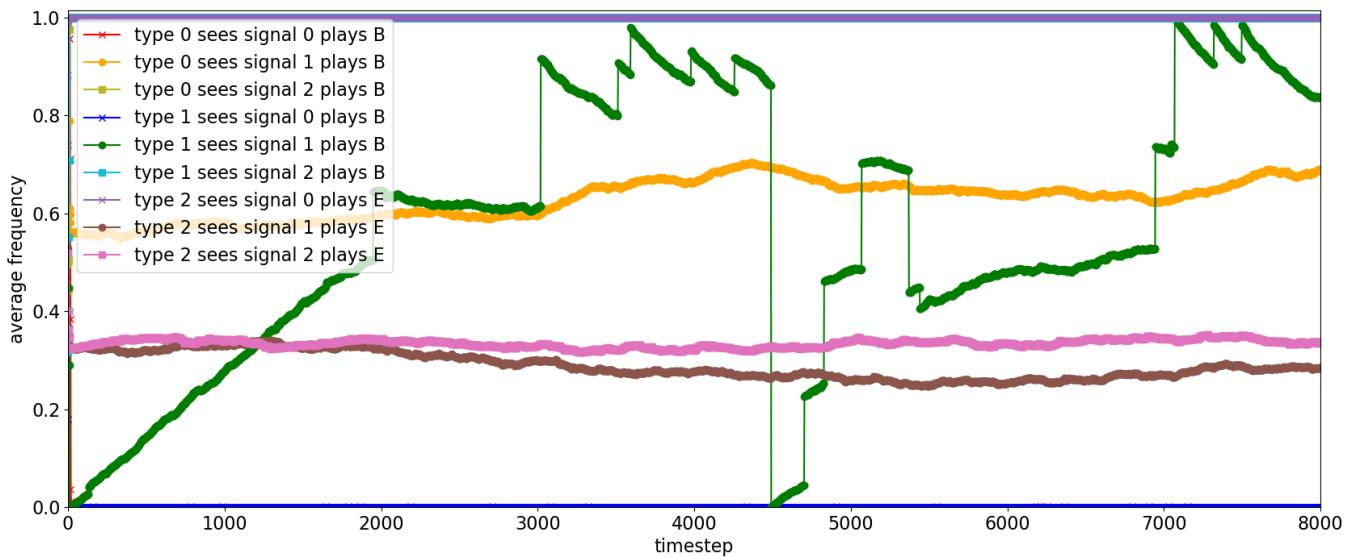
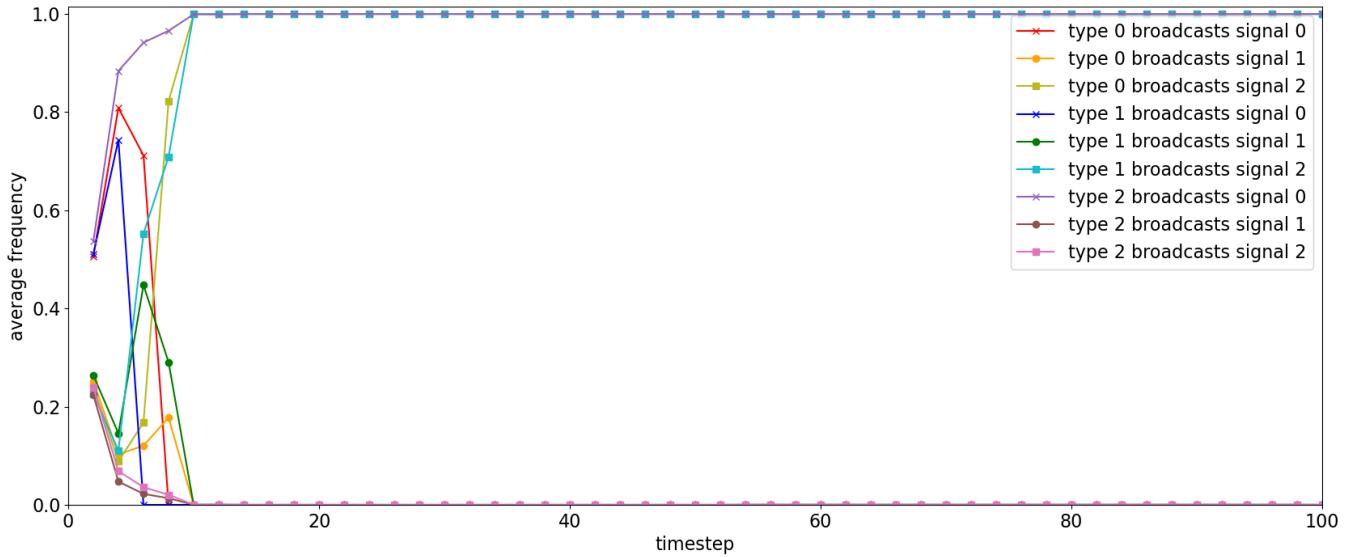


Run # 4

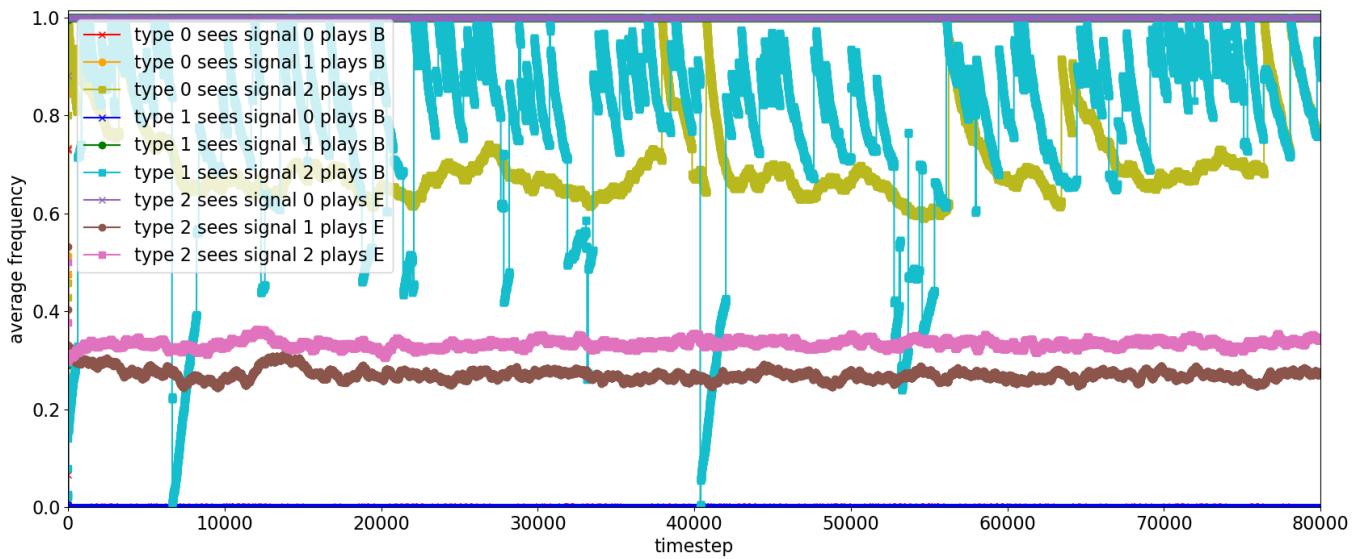
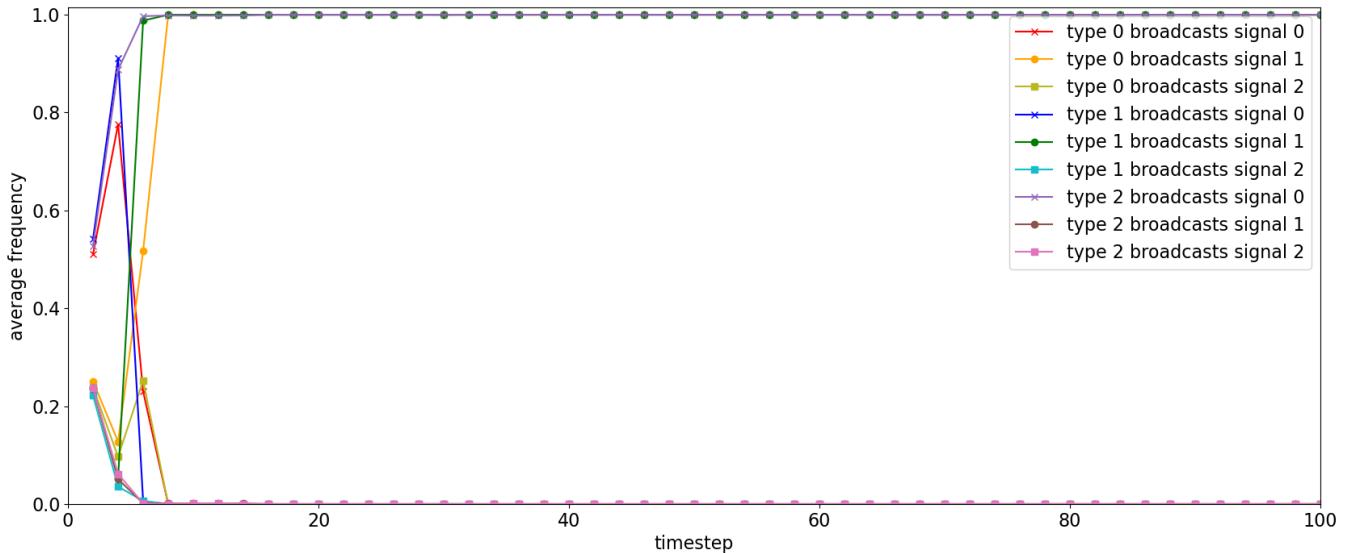


Continued drift in dispositions towards signals, but no further changes to signaling dispositions

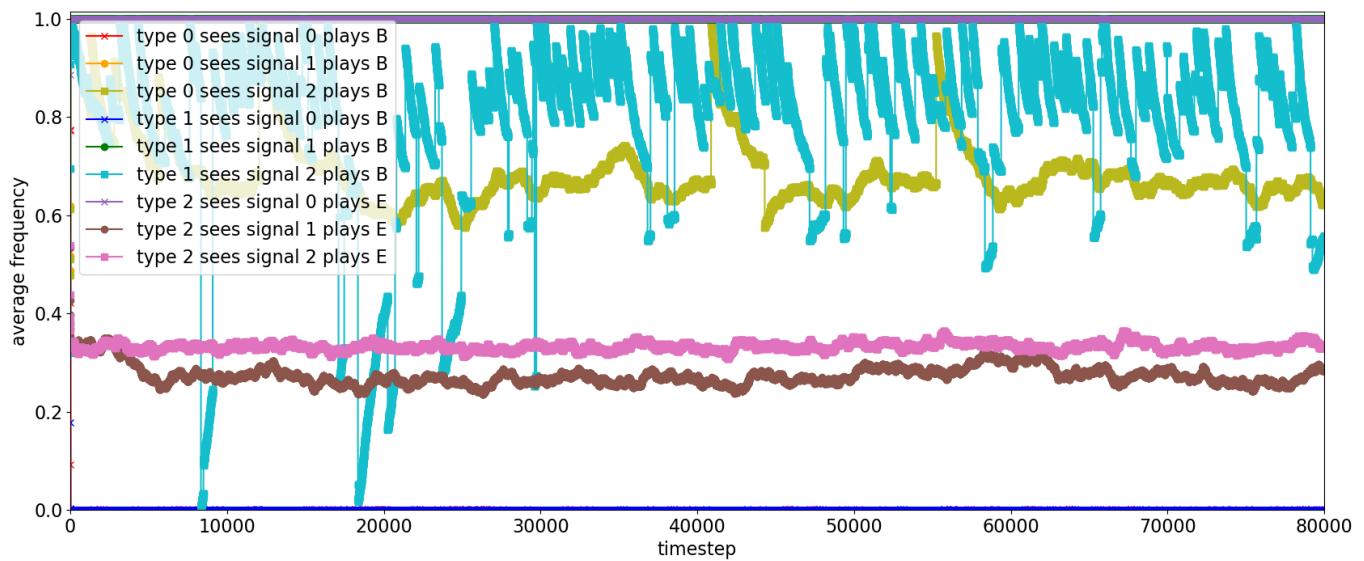
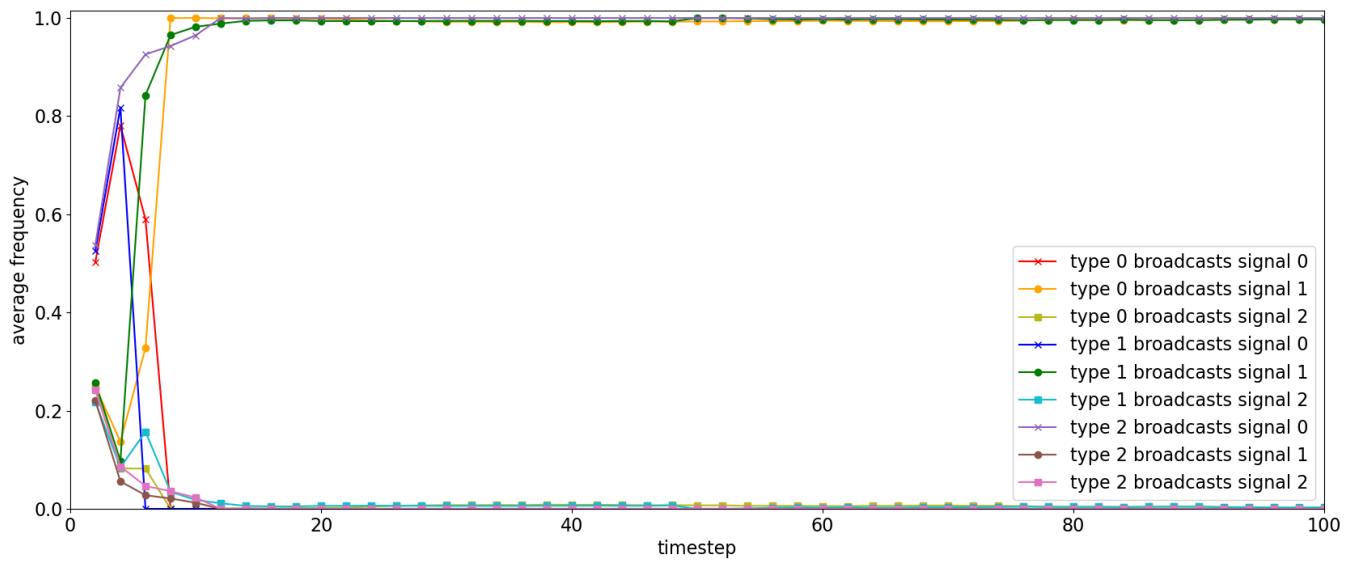
Run # 12



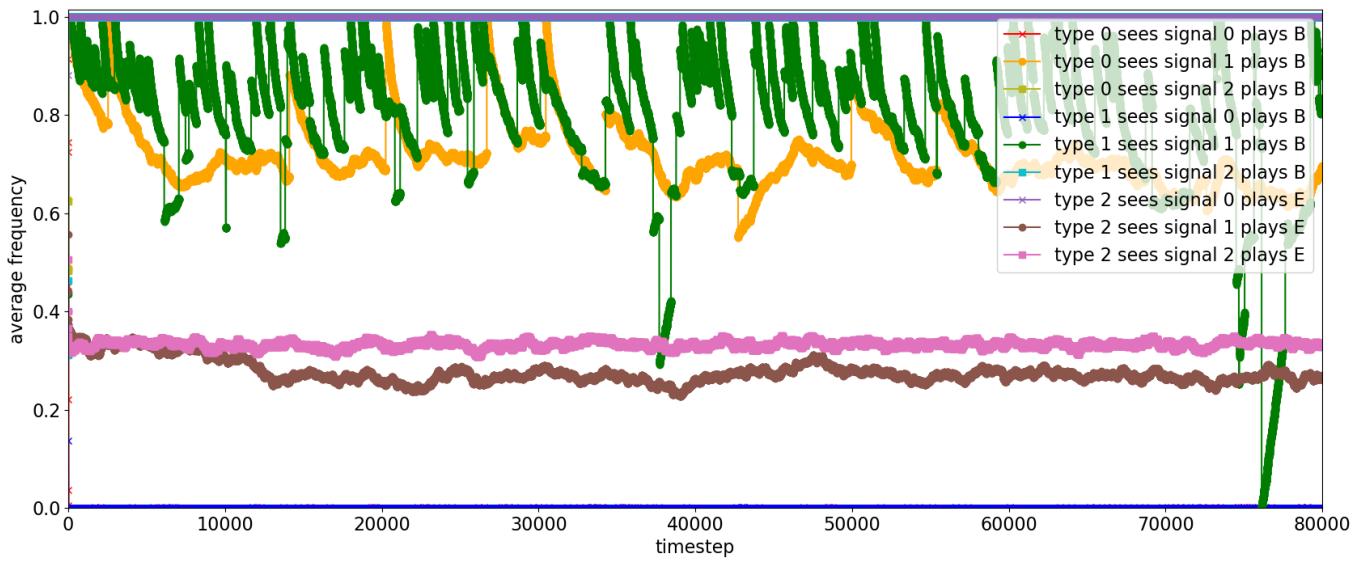
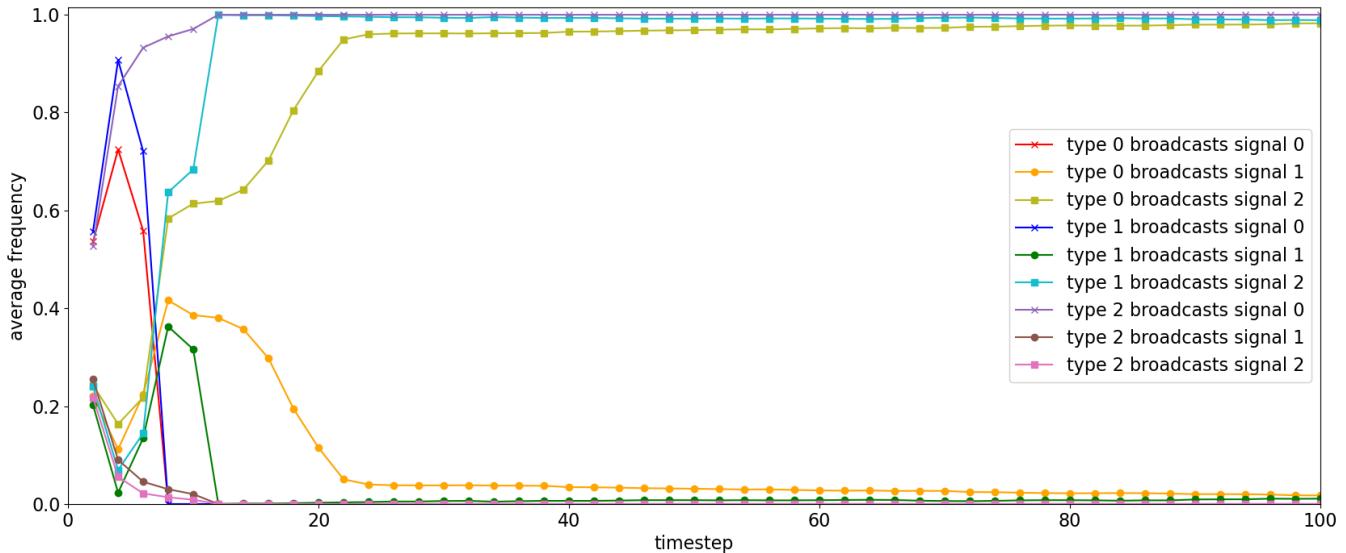
Run # 19



Run # 22

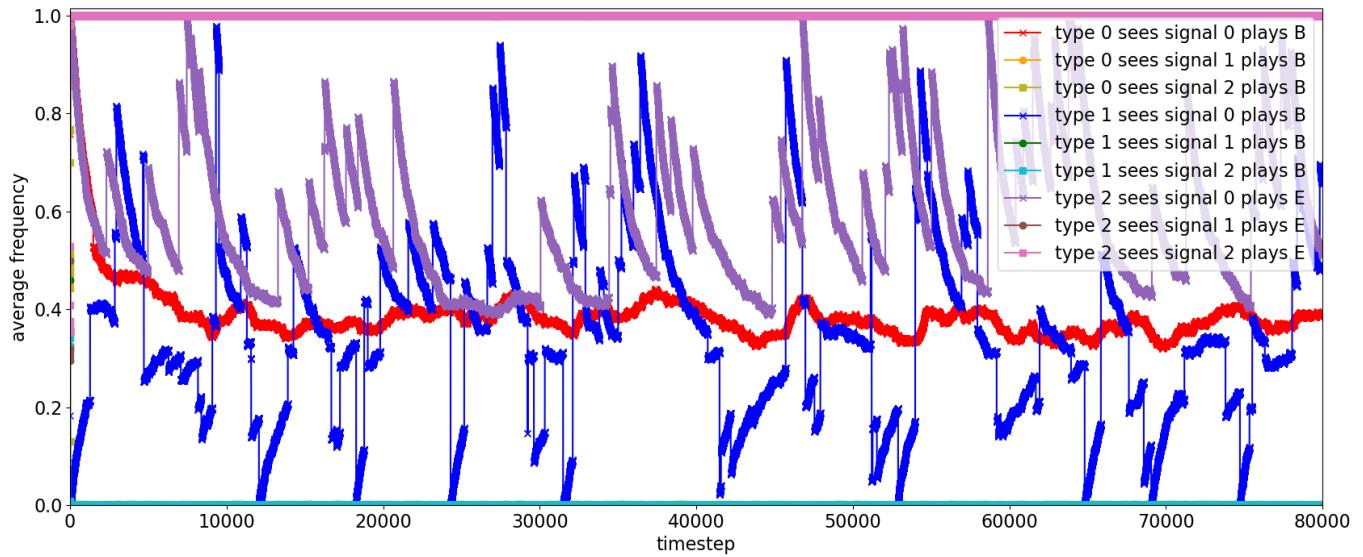
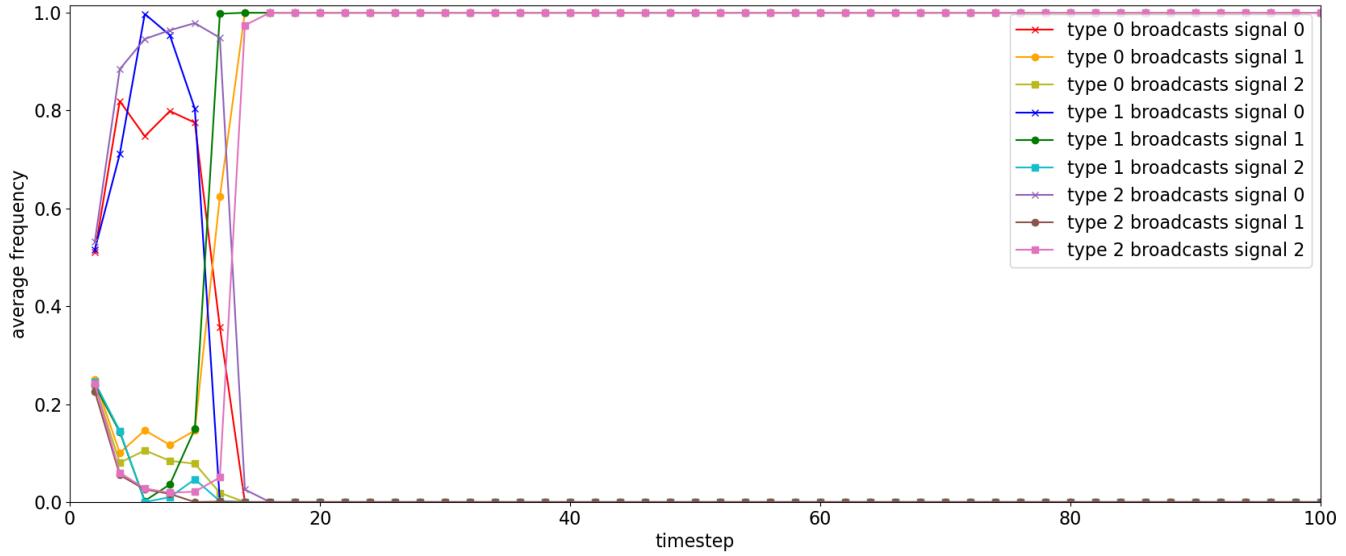


Run # 39

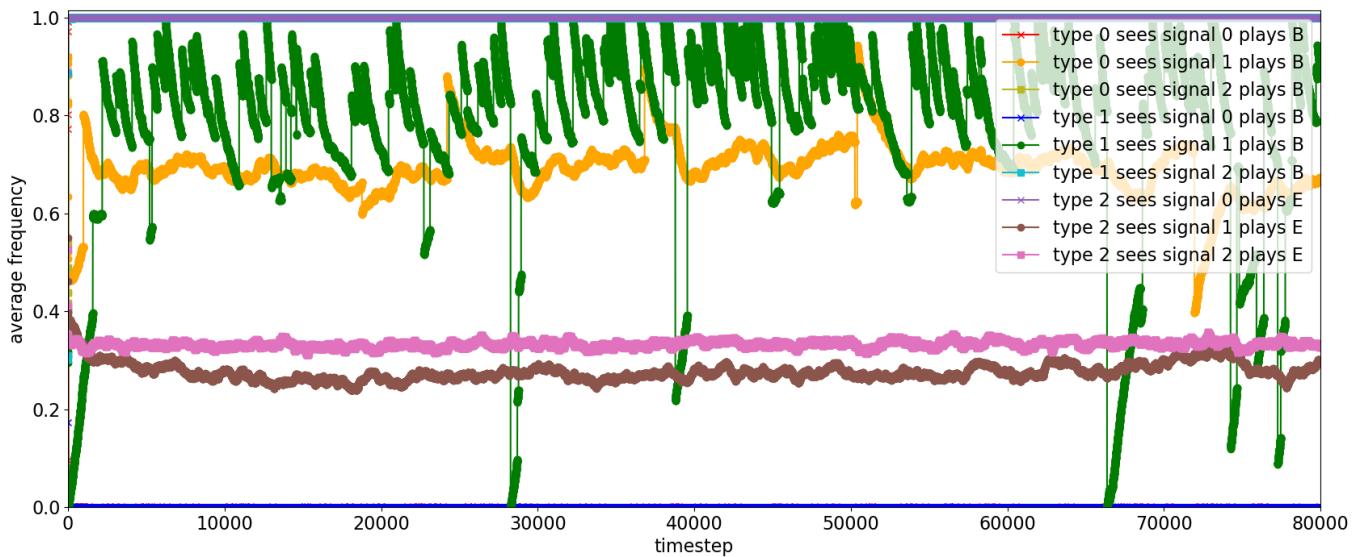
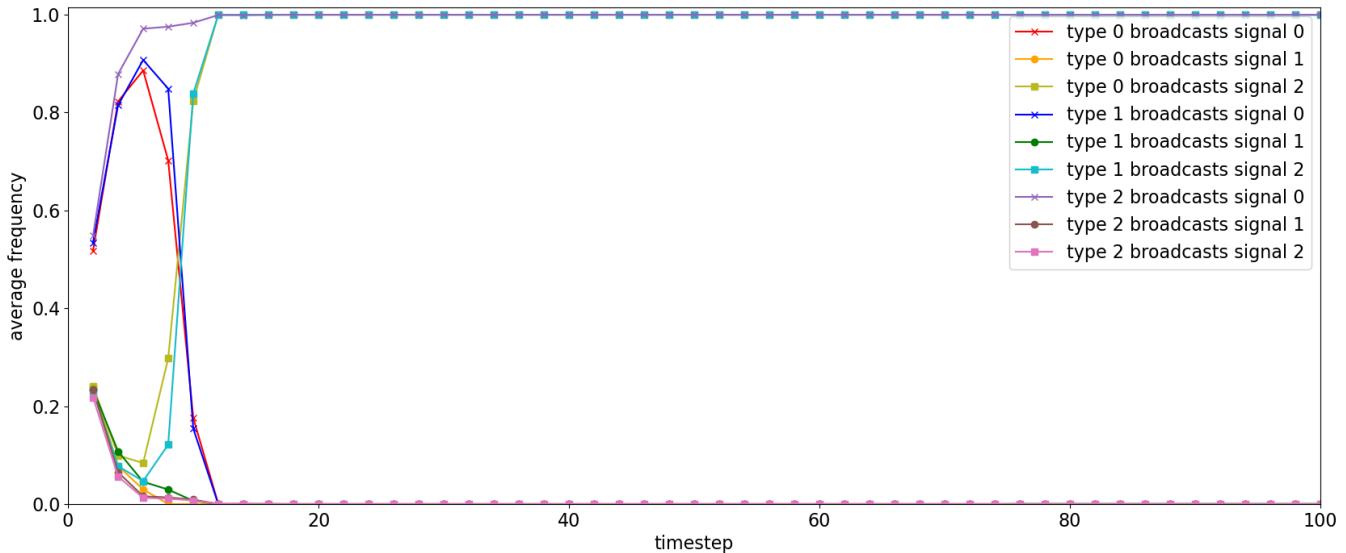


Run # 42

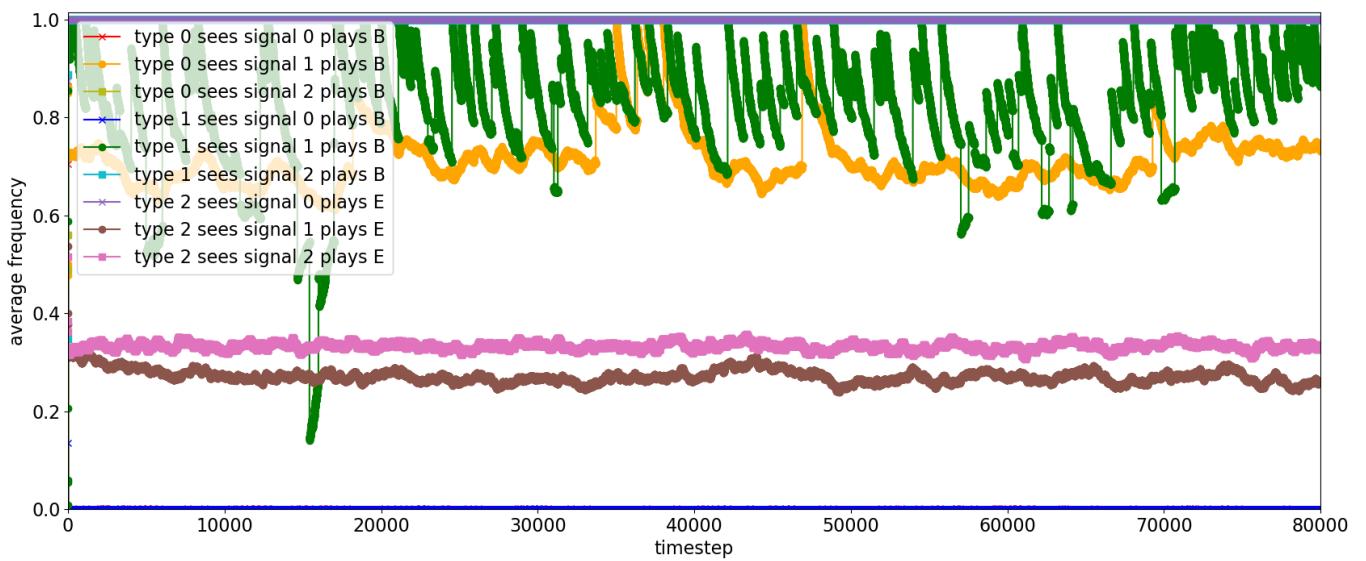
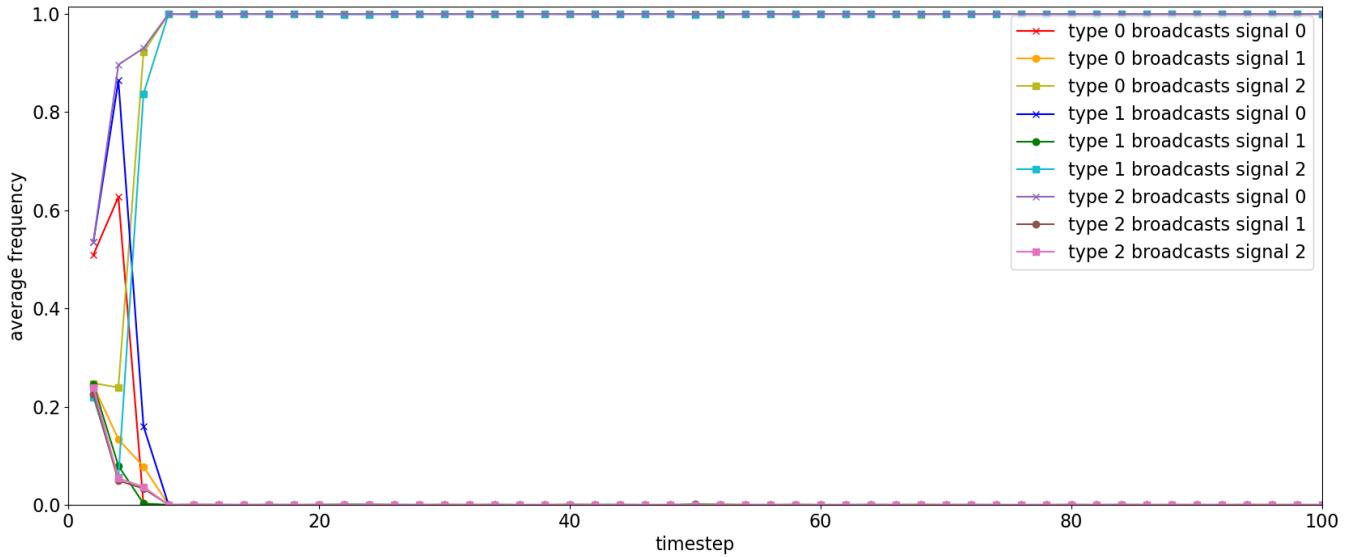
```
[[[ 0 3700 0]
 [ 0 2900 0]
 [ 0 0 3400]]]
```



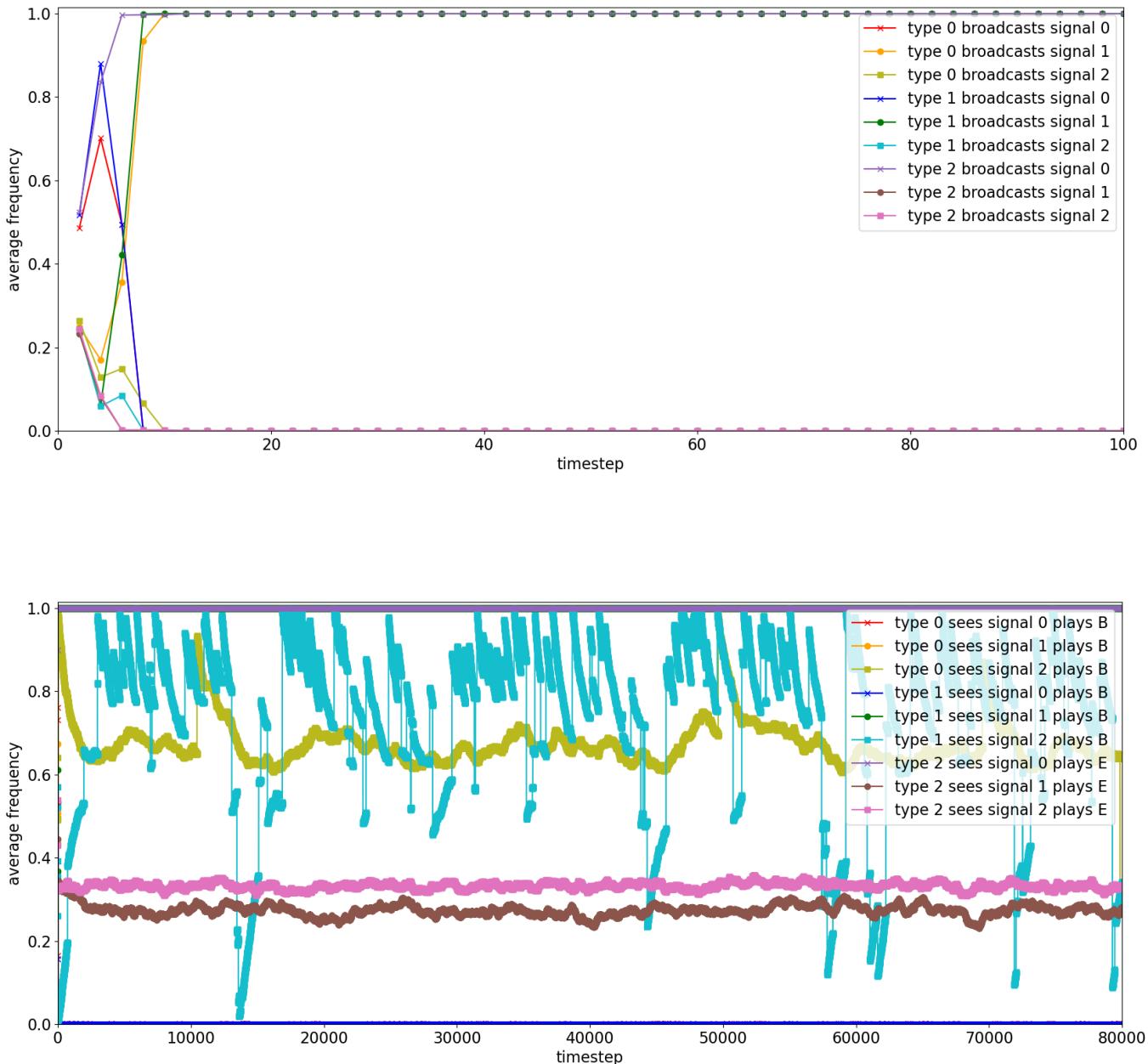
Run # 58



Run # 63

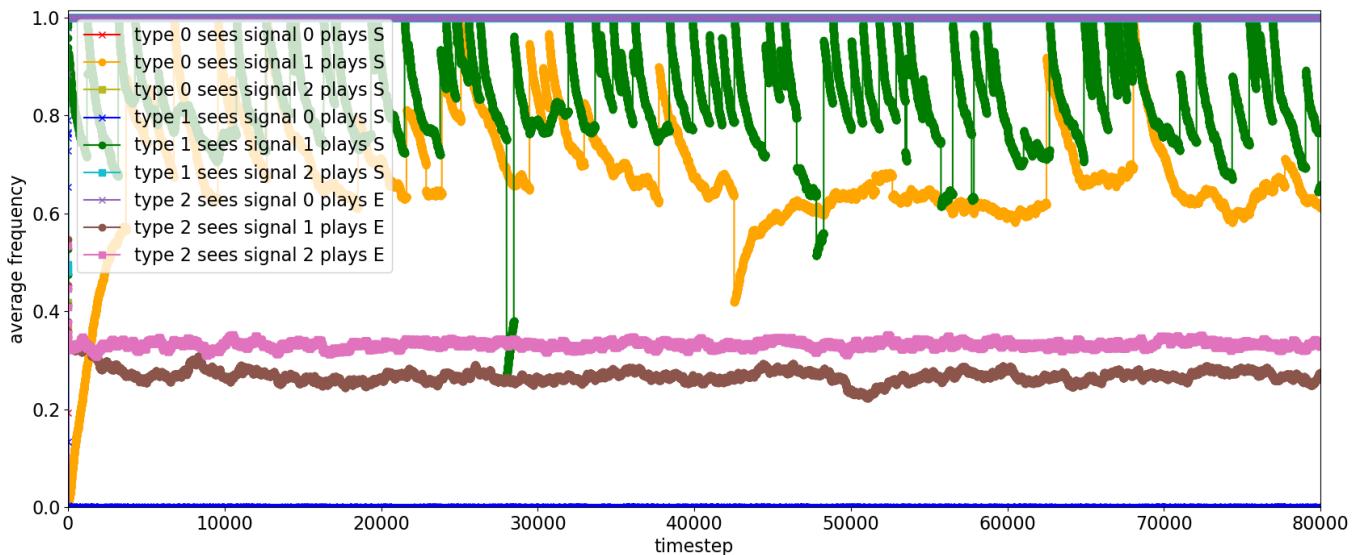
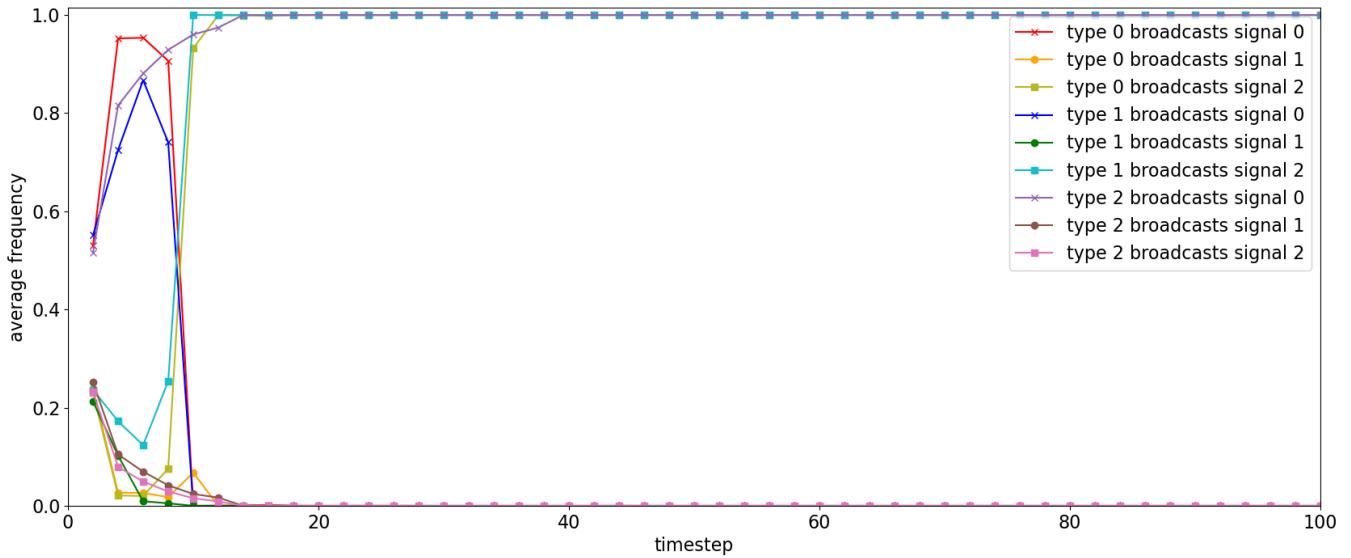


Run # 85

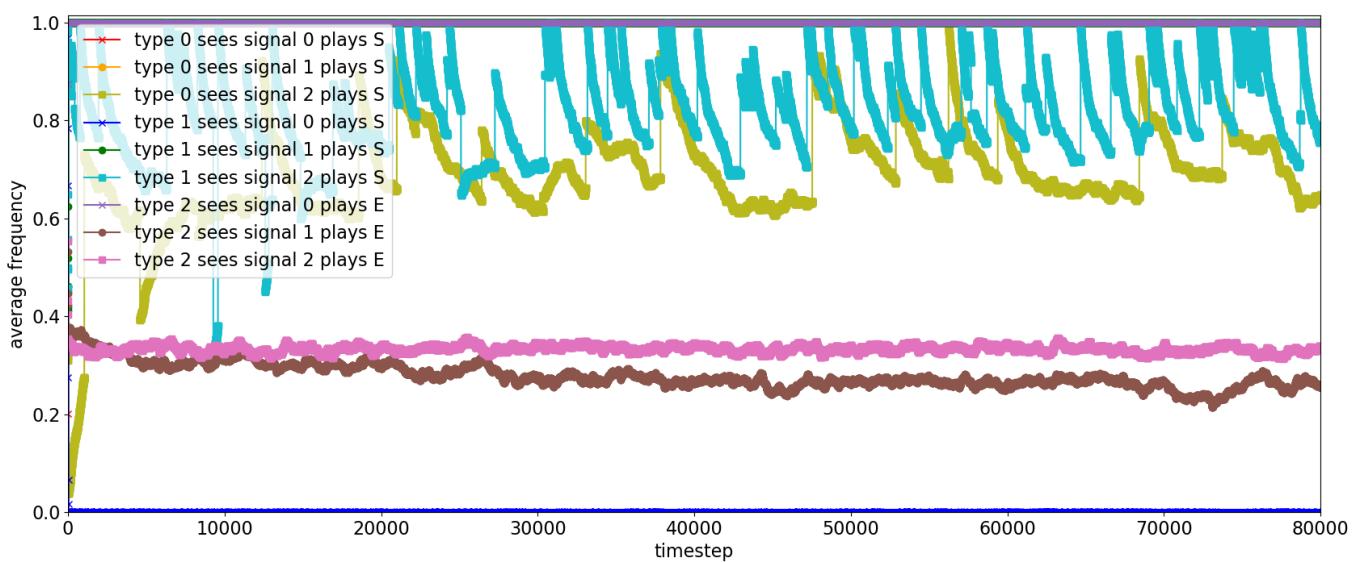
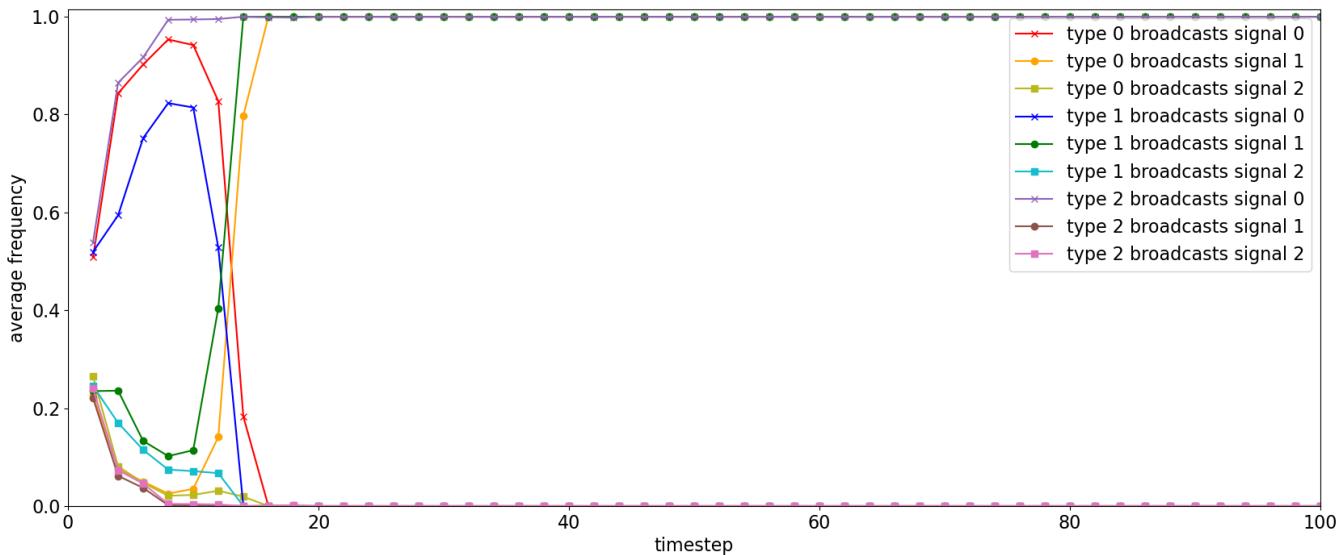


outcomes (v): sometimes type 2 signaling 0 and types 0 and 1 sending same signal, but also frequent cyclical behavior

Run # 32

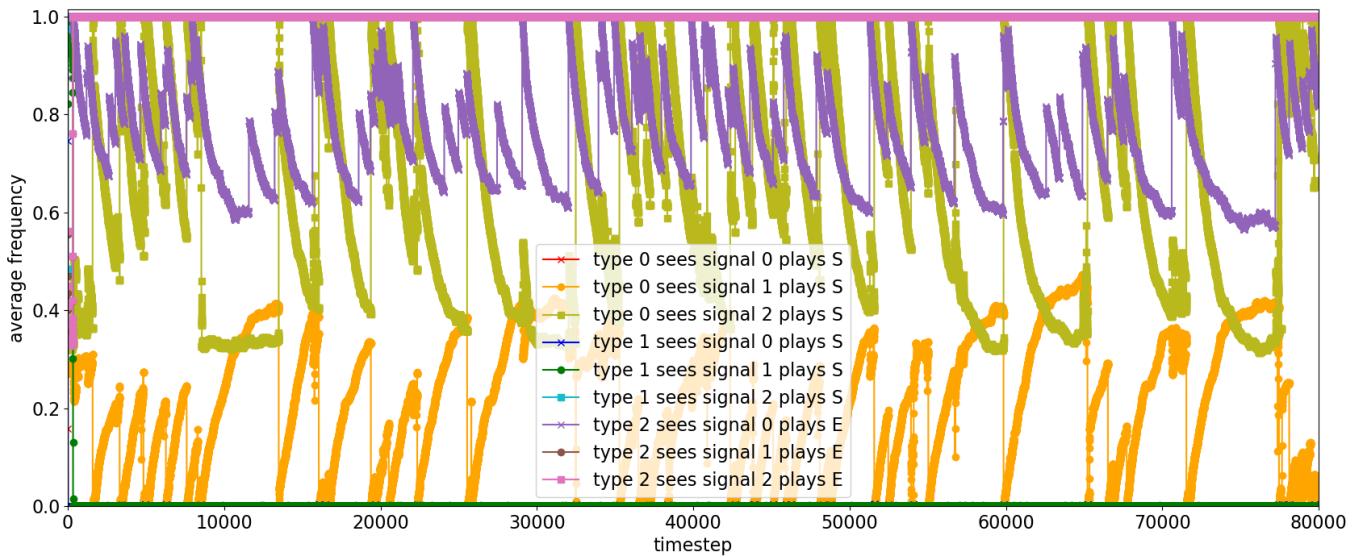
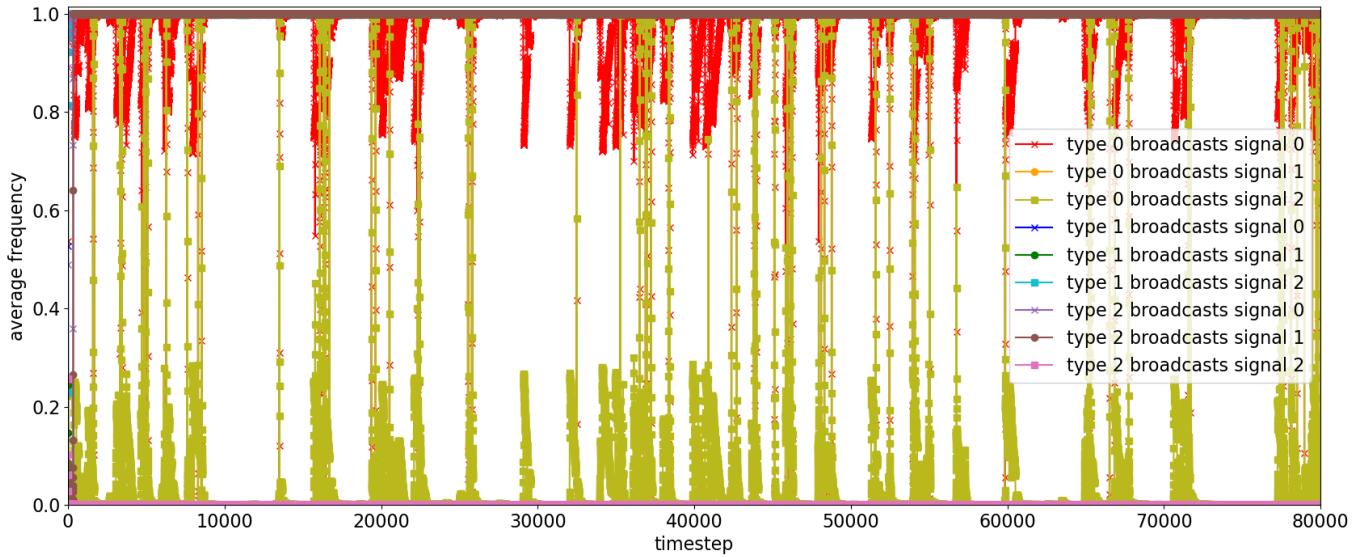


Run # 43

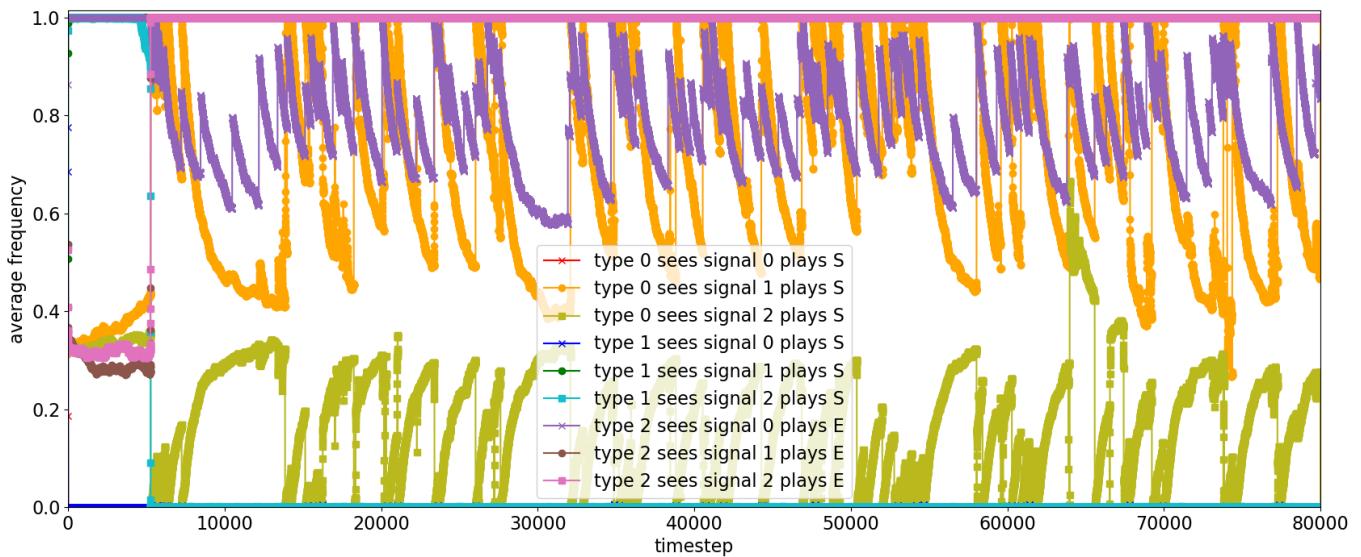
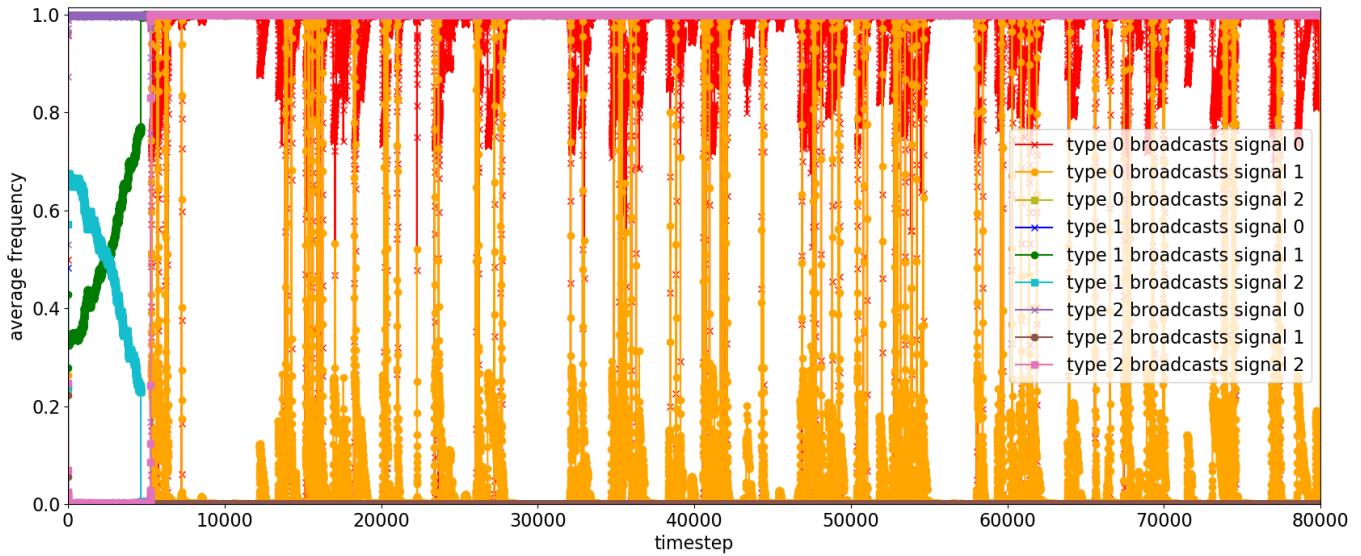


Run # 67

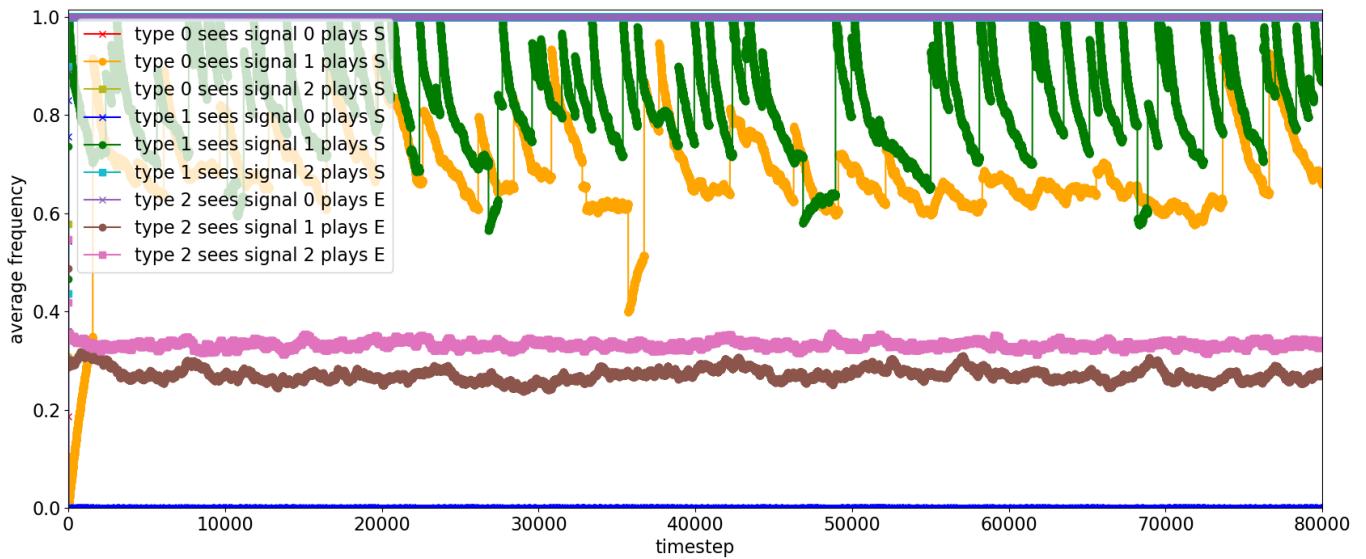
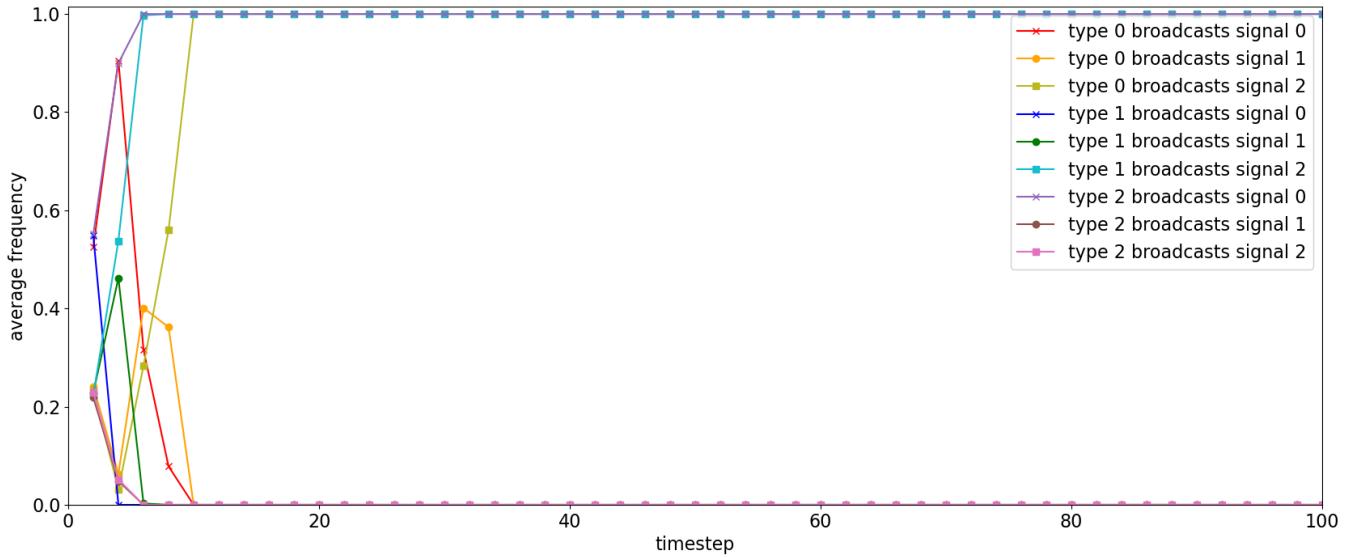
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[[[ 149  0 3551]
 [ 0   0 2900]
 [ 0 3400  0]]]
```



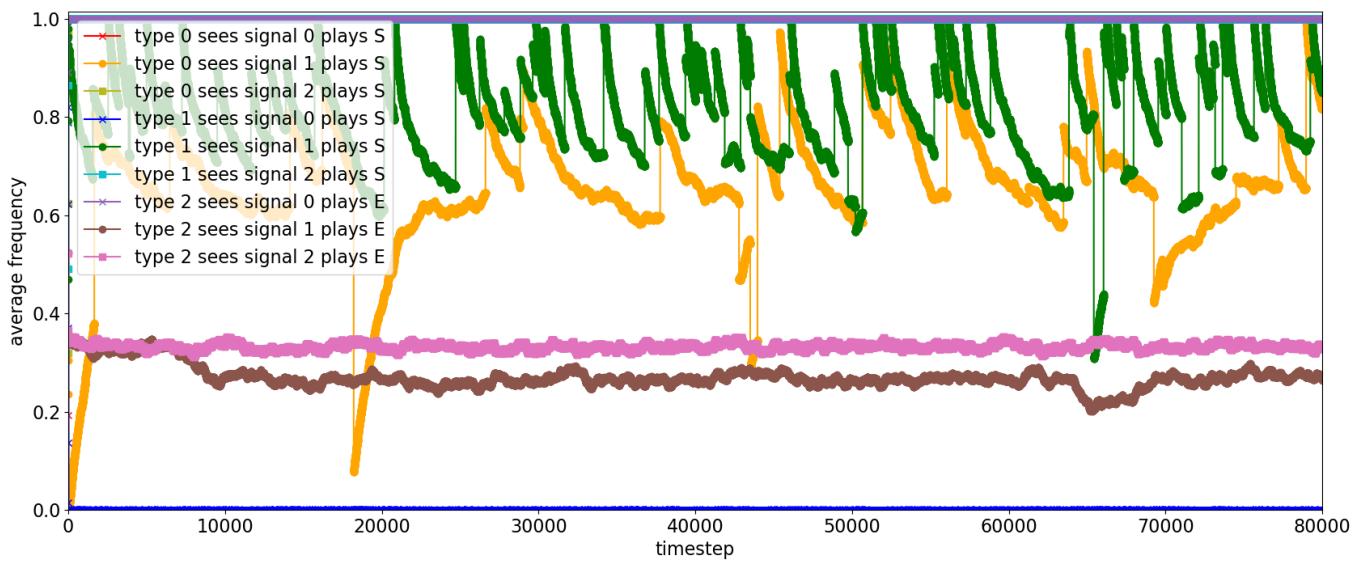
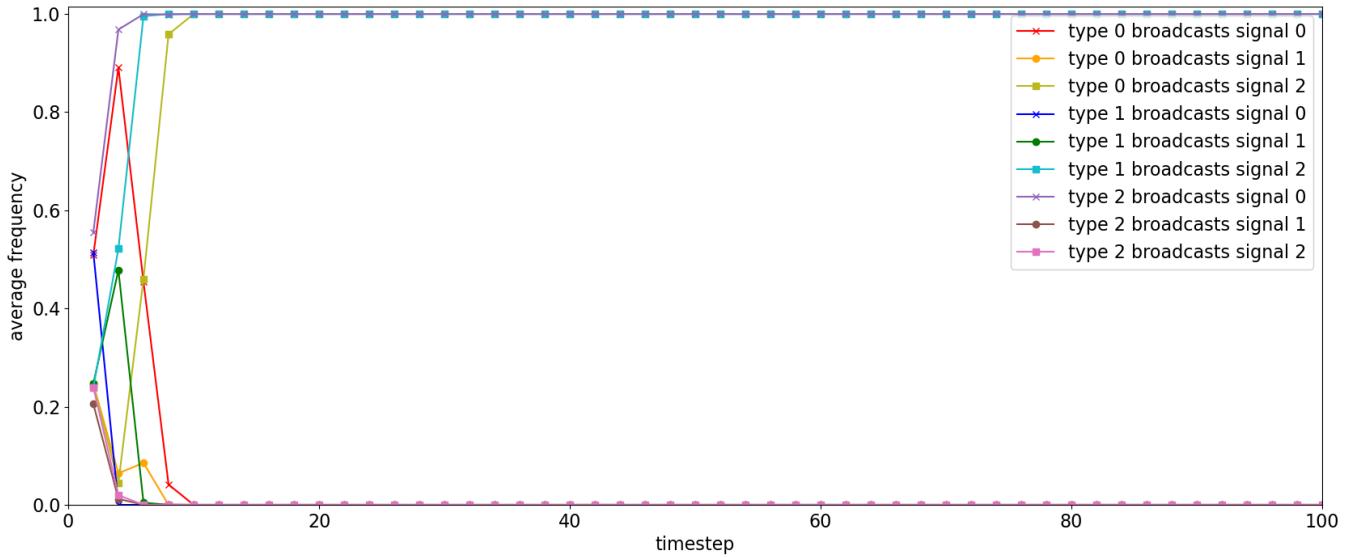
Run # 125
[[[11 3689 0]
[0 2900 0]
[0 0 3400]]]



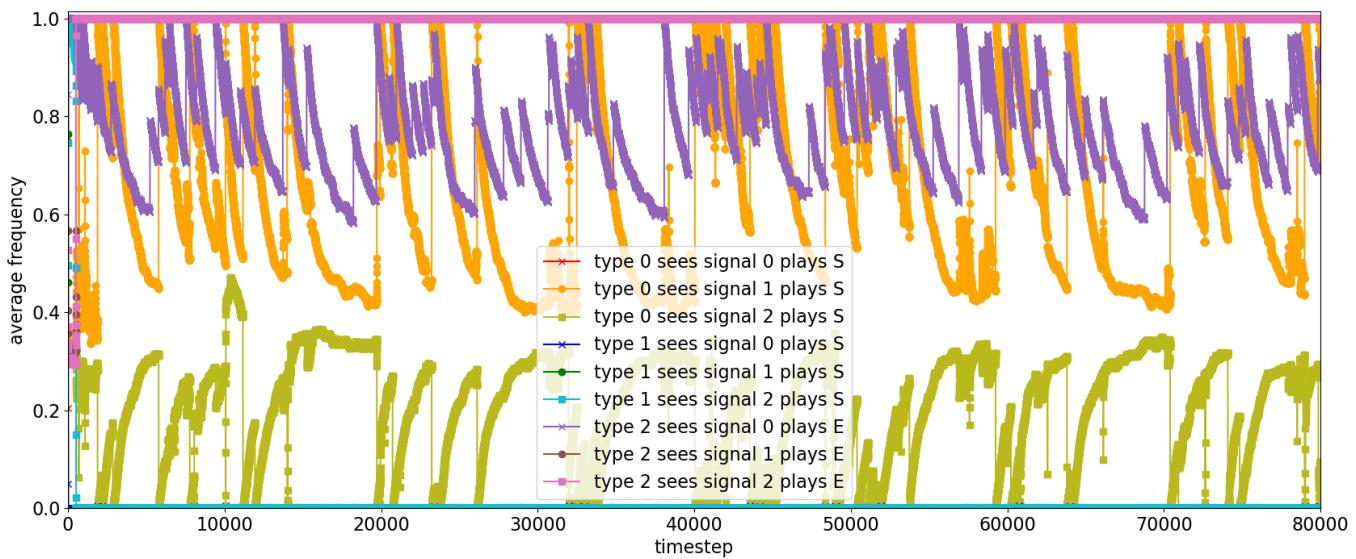
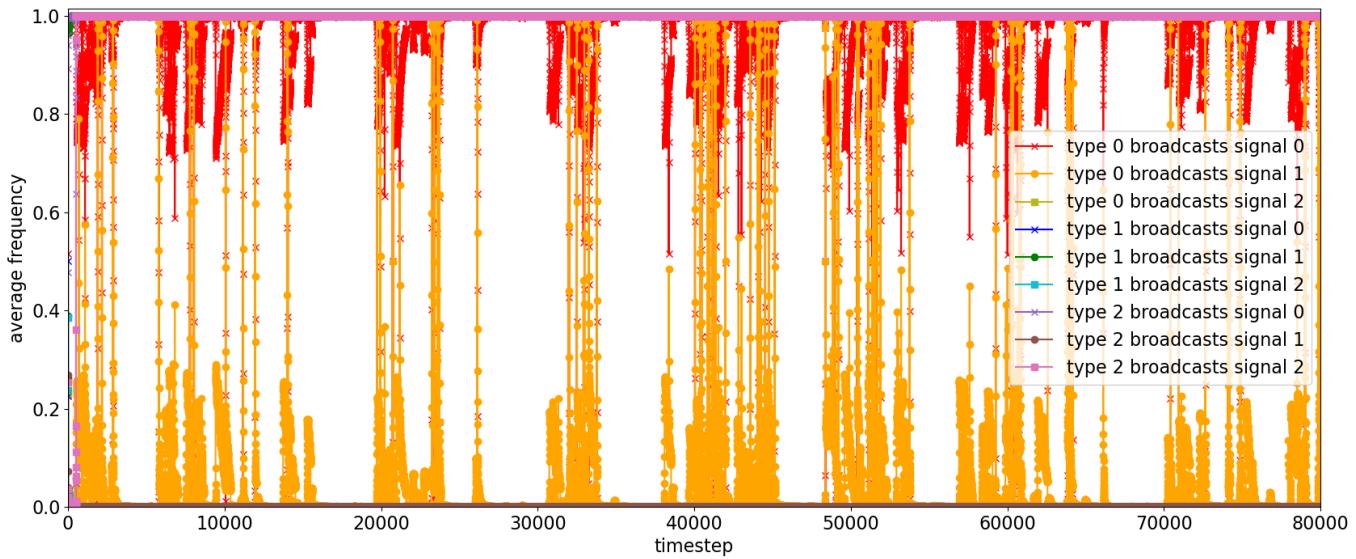
Run # 133



Run # 179

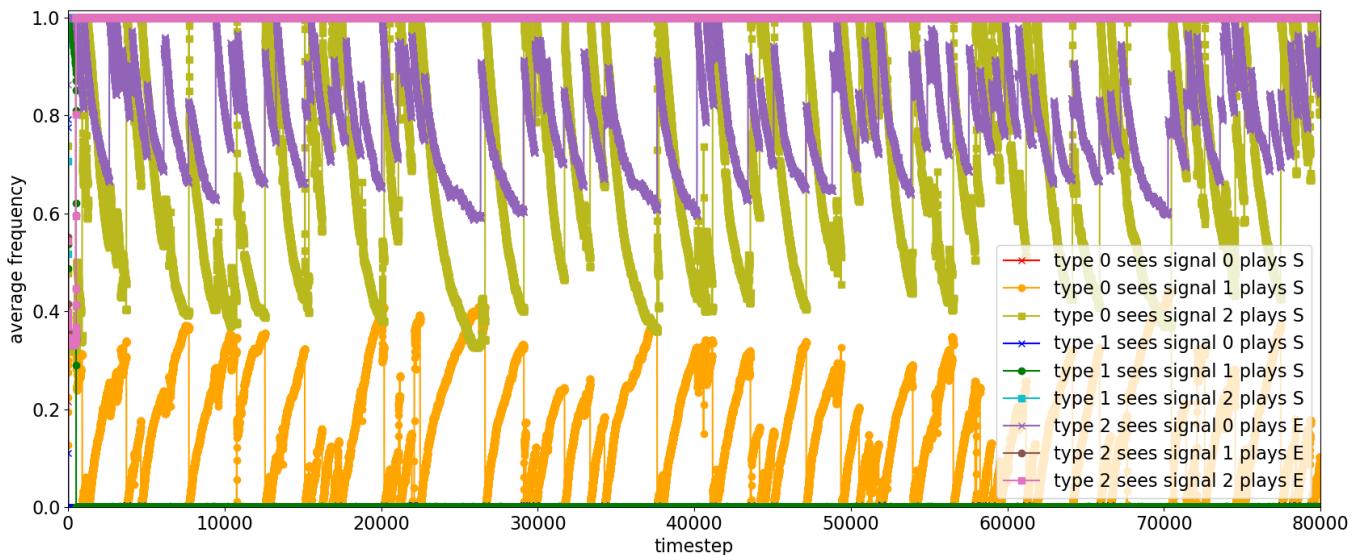
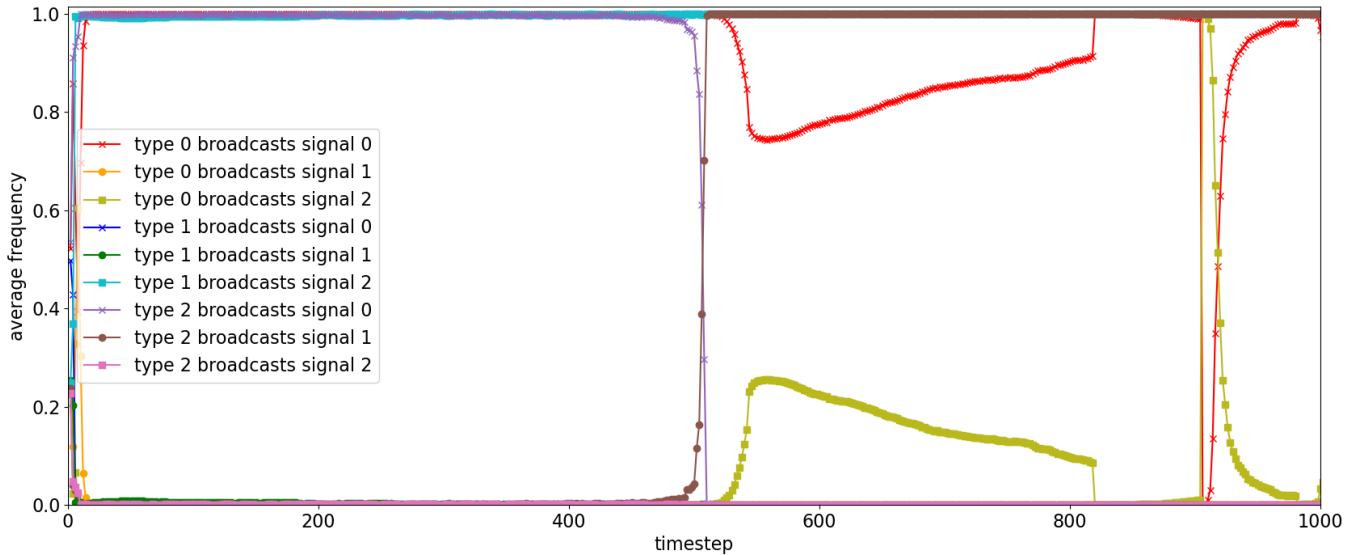


Run # 188
[[[1646 2054 0]
[0 2900 0]
[0 0 3400]]]



Run # 199
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[0 0 2900]
[0 3400 0]]]

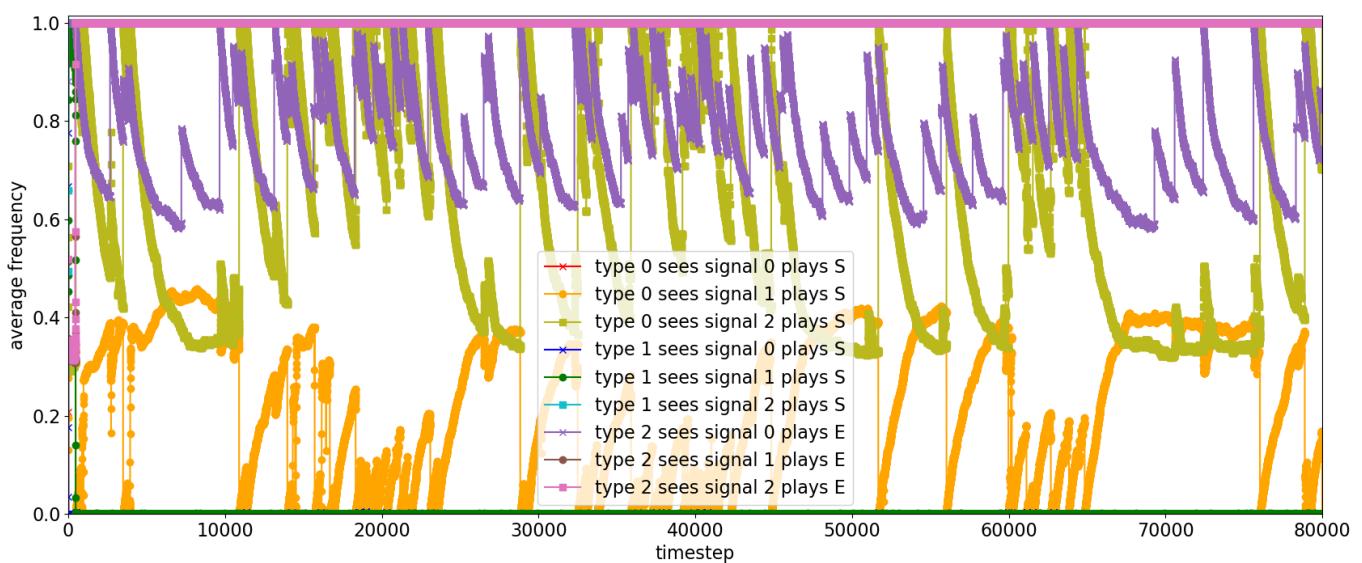
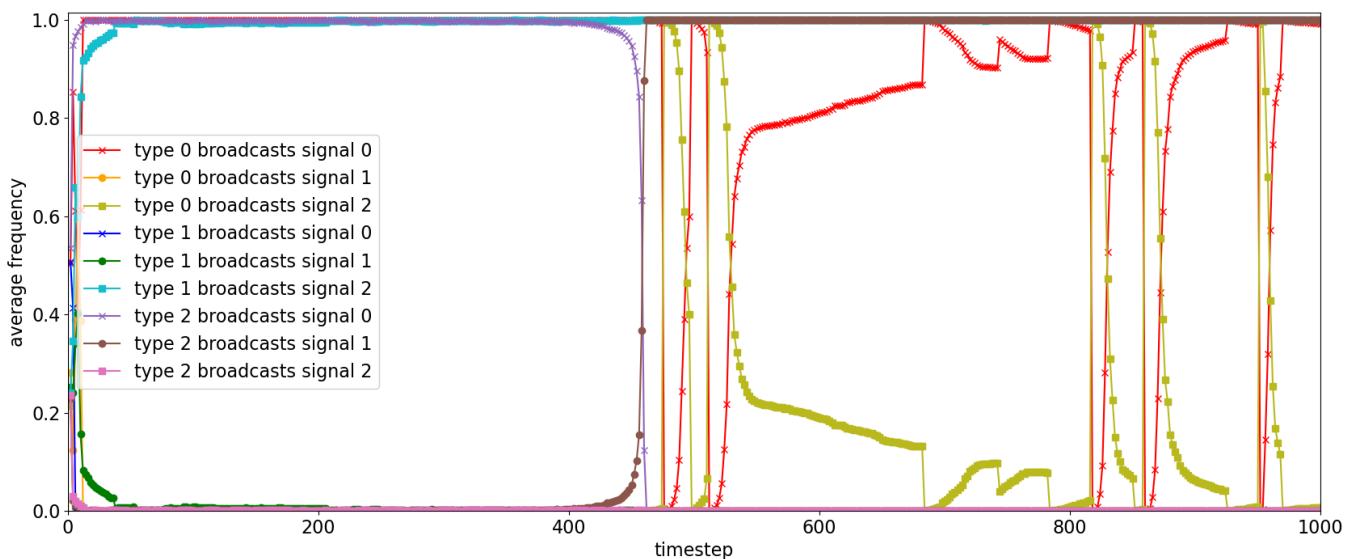
Type 0 continues oscillating between signal 0 and 2



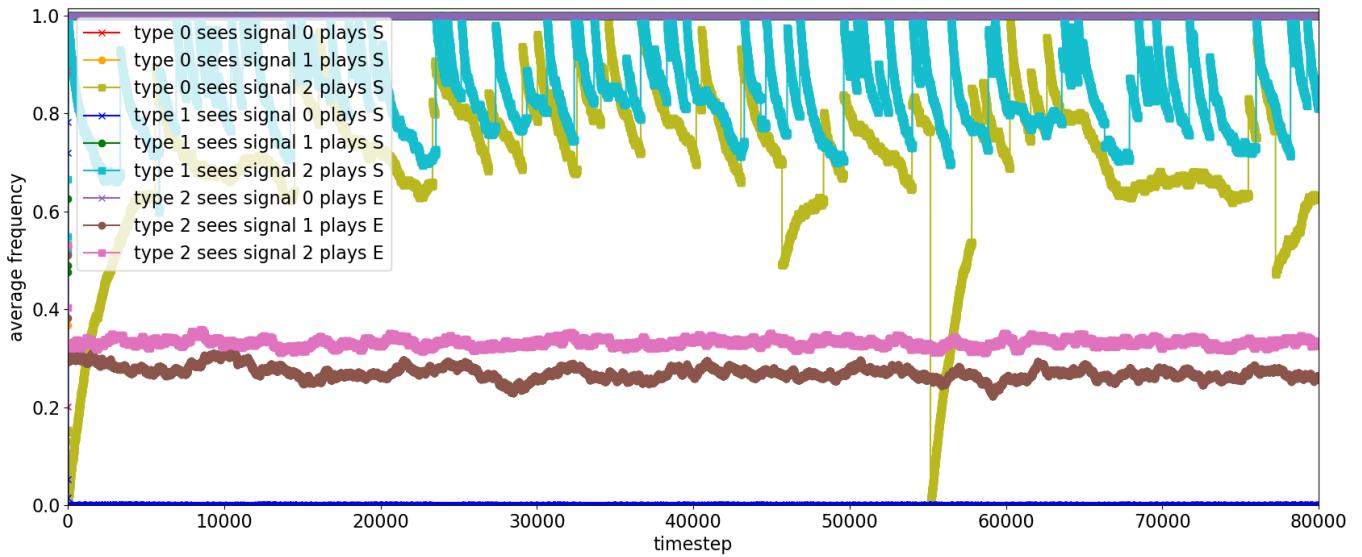
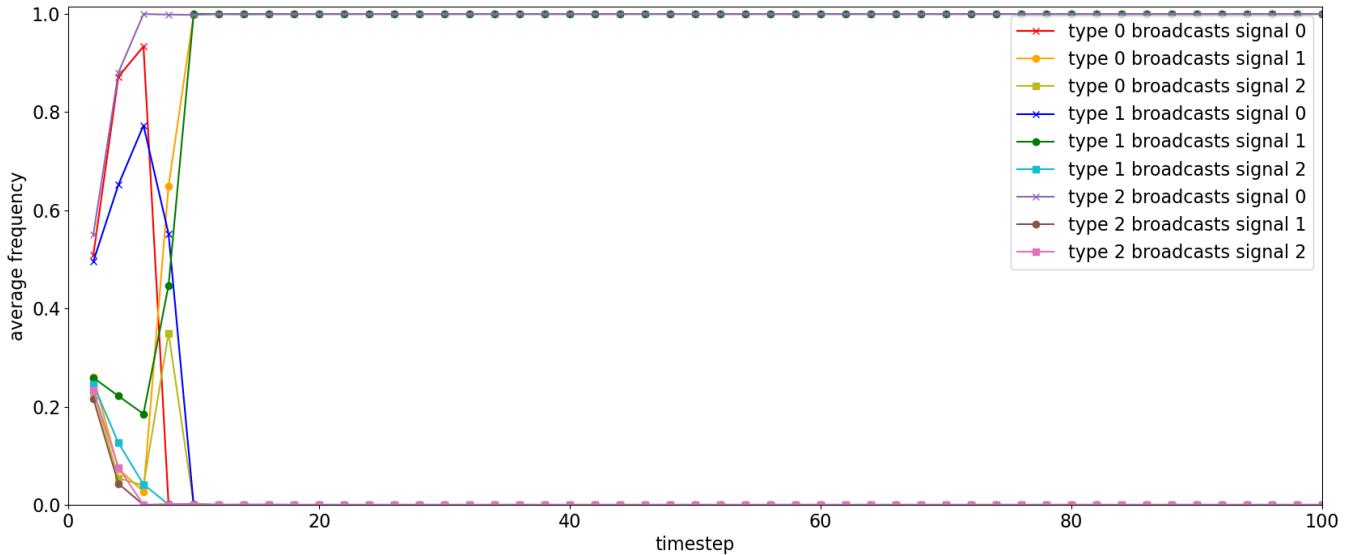
Run # 200

```
[[[ 177  0 3523]
 [ 0  0 2900]
 [ 0 3400  0]]]
```

Type 0 continues oscillating between signal 0 and 2



Run # 236



outcomes (viii): characterized by type 0 signaling 0

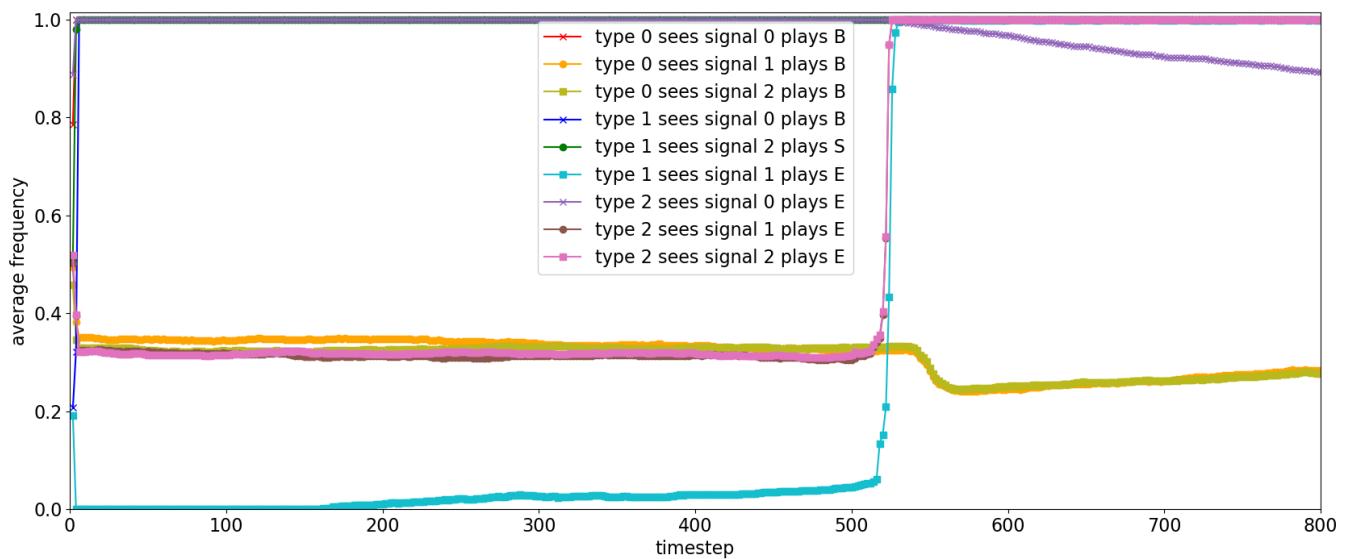
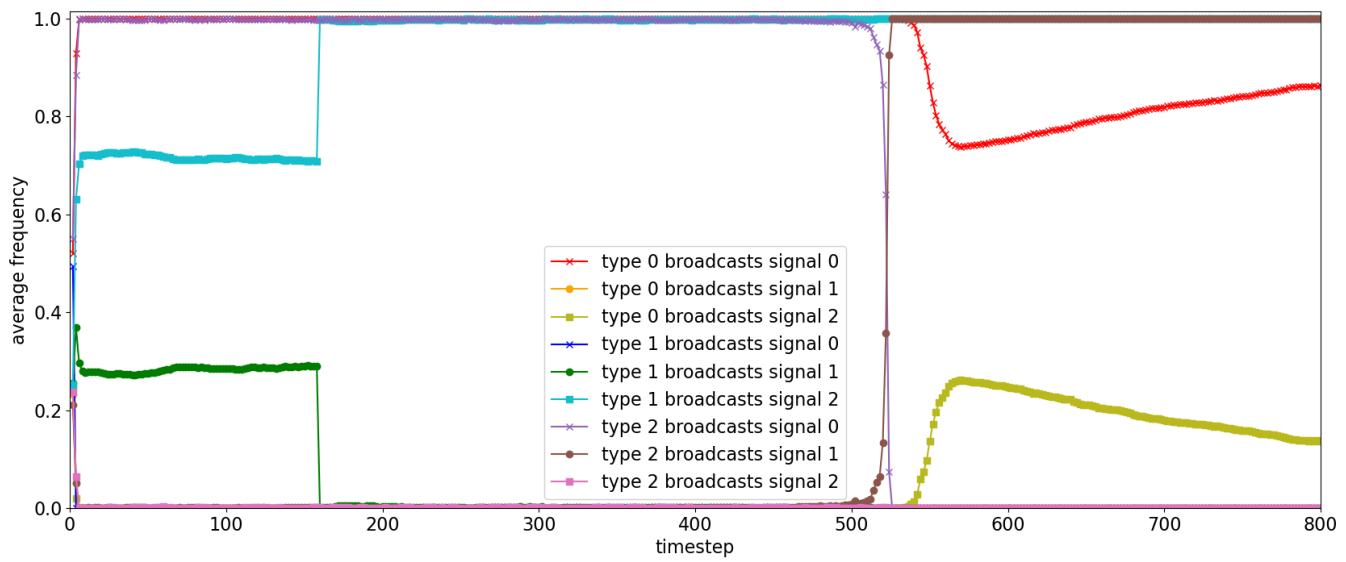
Run # 1

[[[3486 0 214]

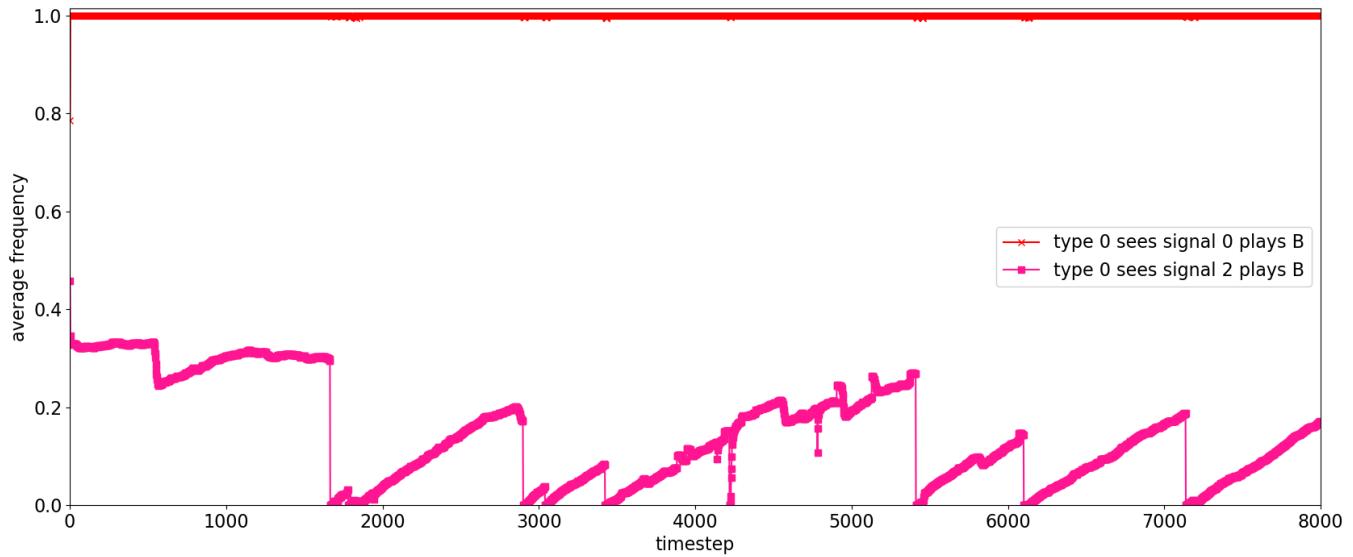
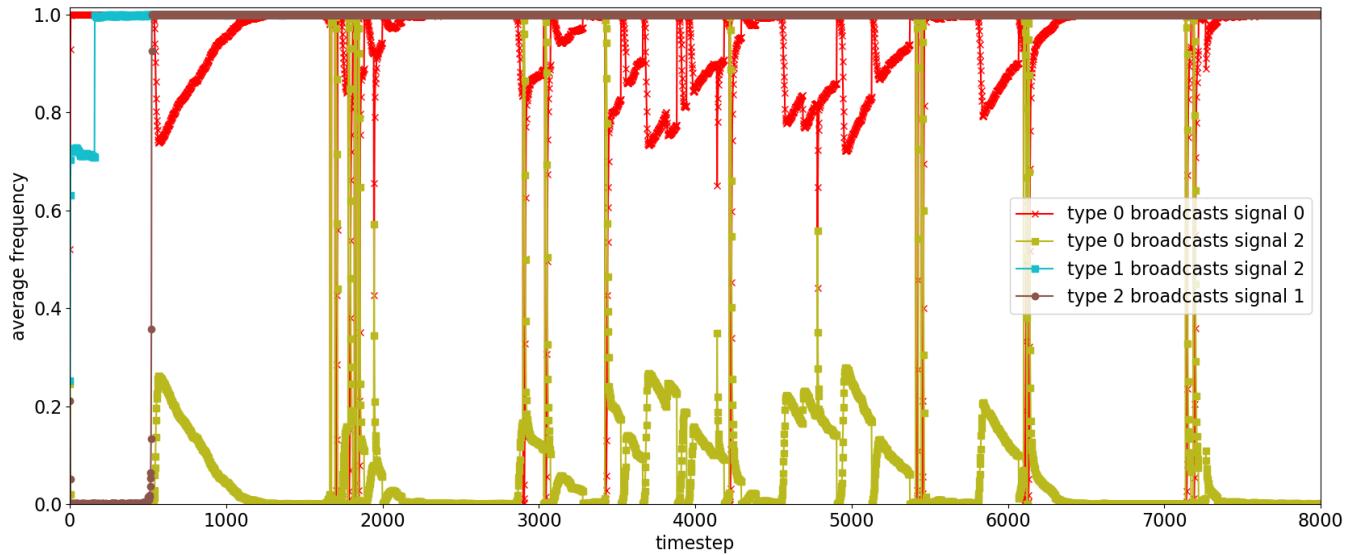
[1 0 2899]

[0 3400 0]]]

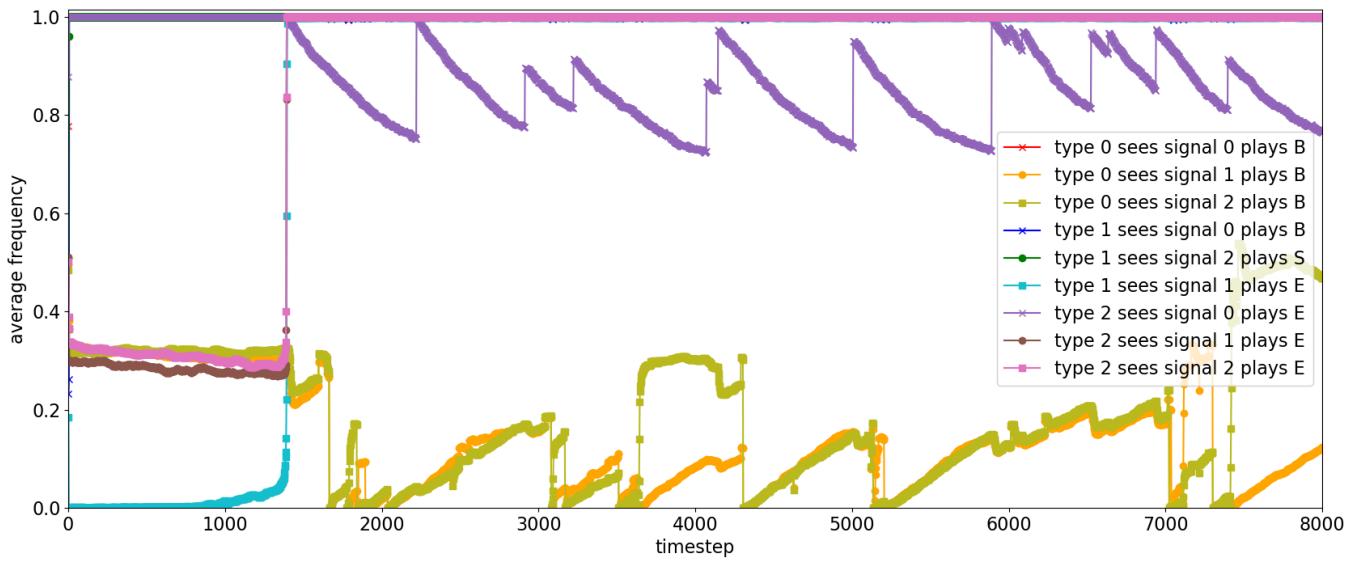
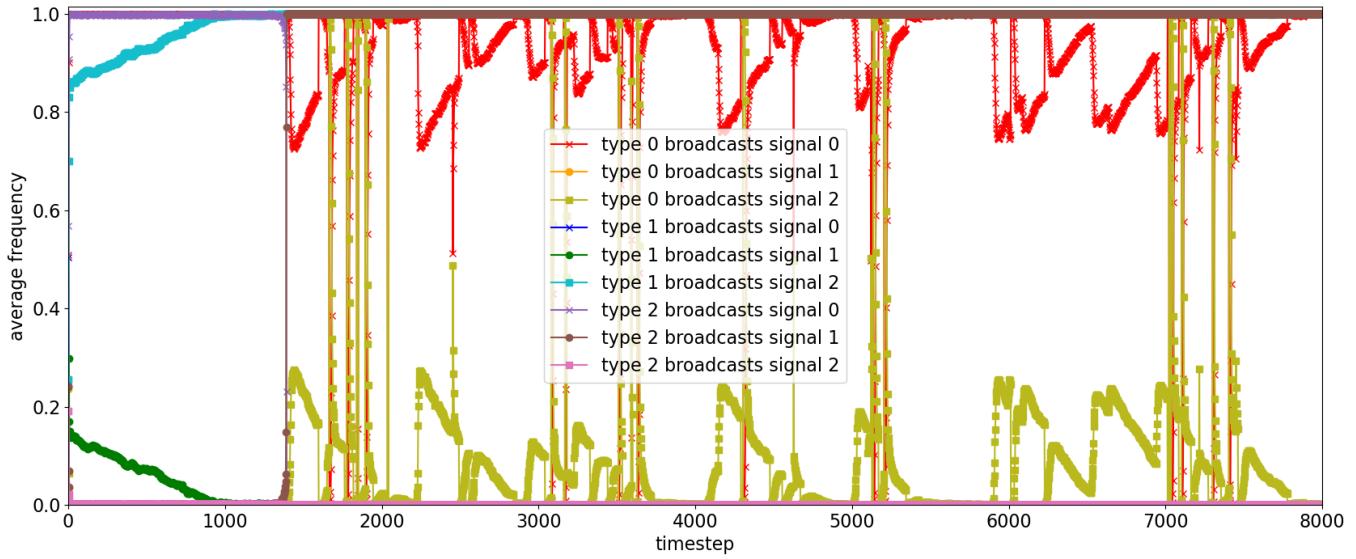
Continued type 0 fluctuations between signal 0 and 2



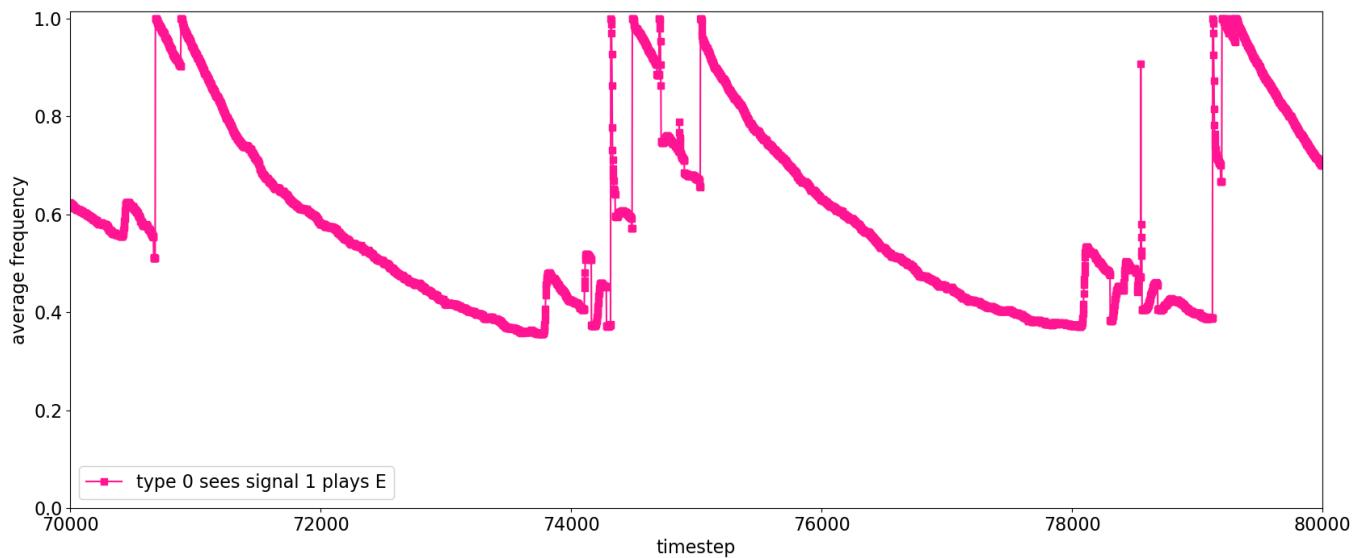
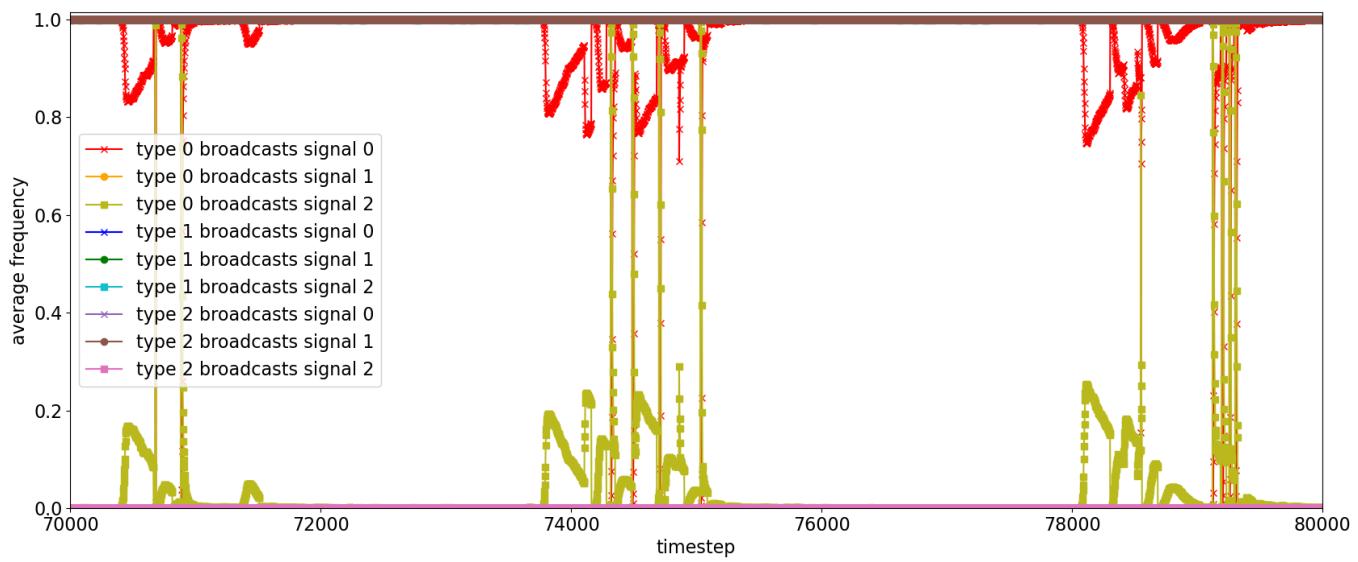
More of Run # 1



Run # 2

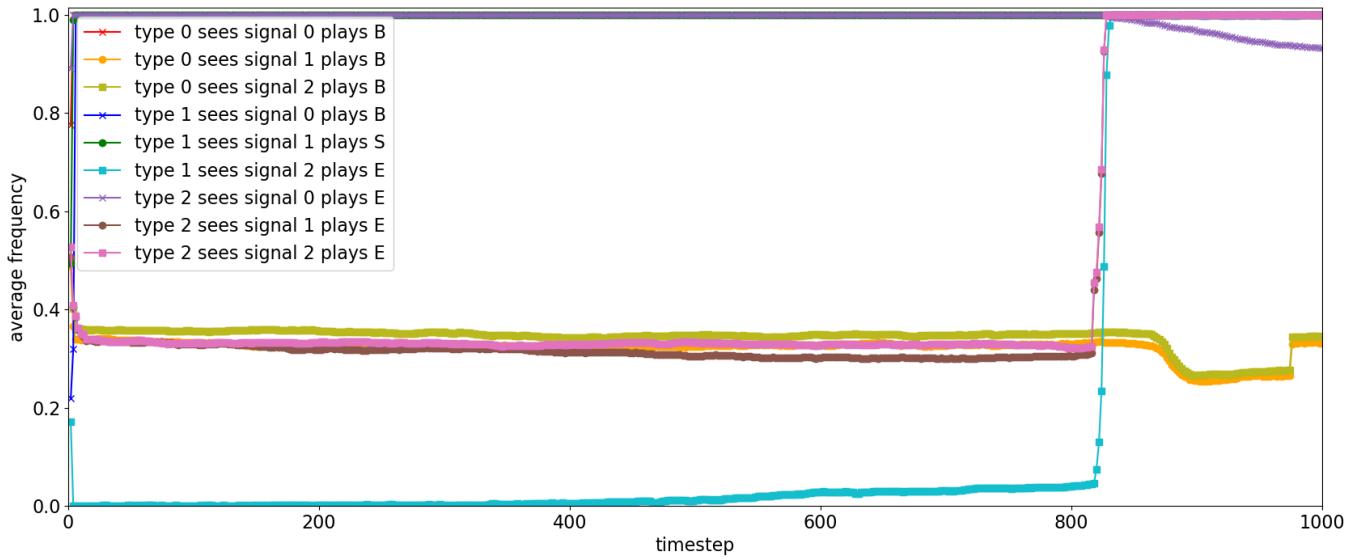
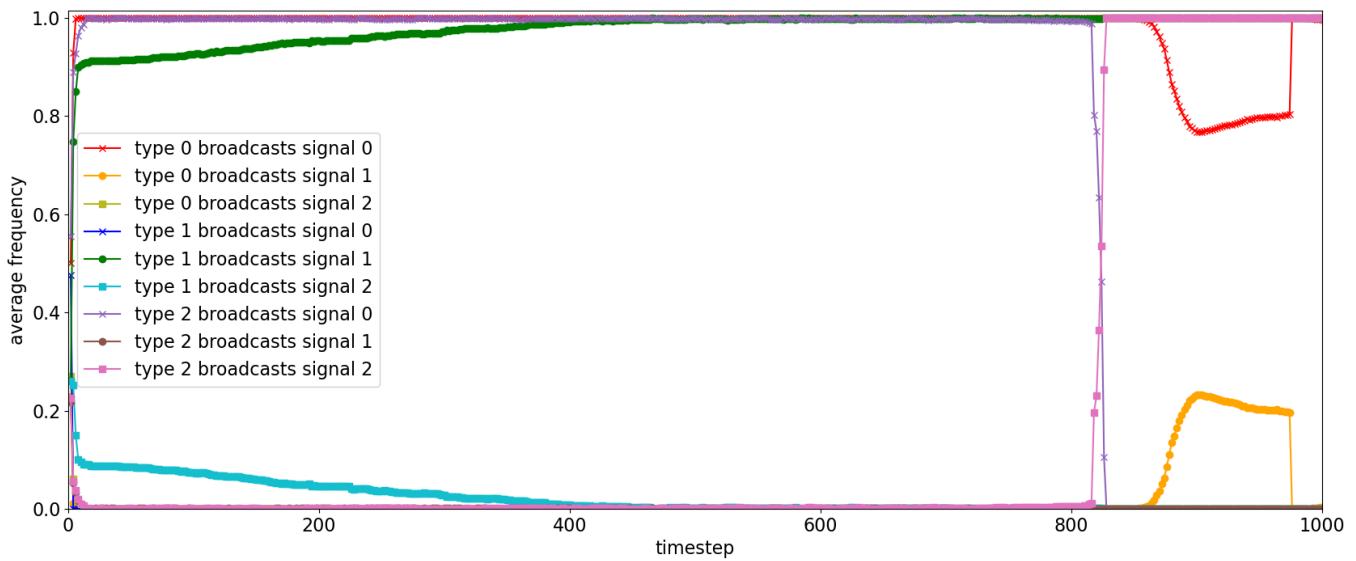


Run # 2 continued on the next page. It can look like type 0 is playing E when paired with type 2, but recall that since type 0 is signaling 0, that means type 0 is interacting with all agents as if they were signaling 0.

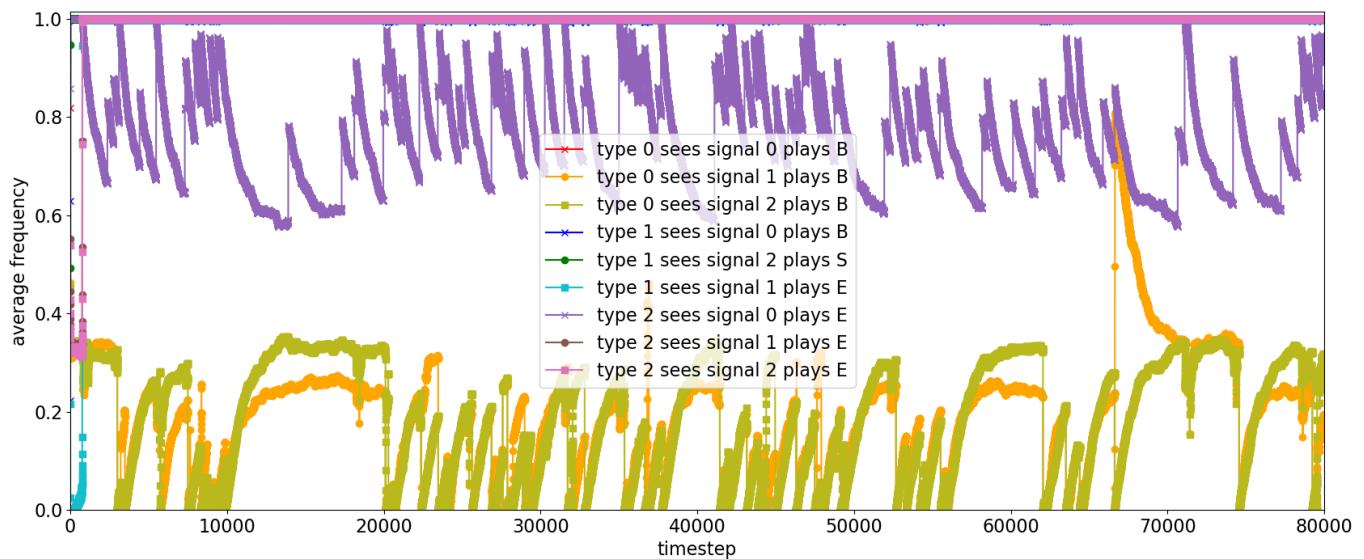
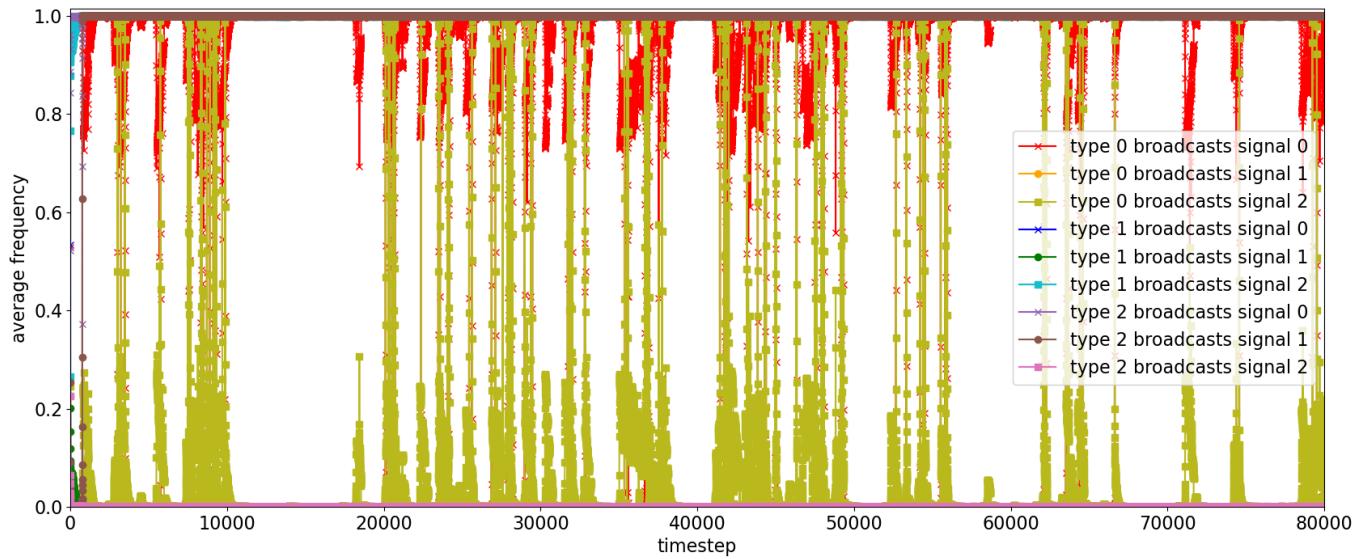


Run # 3

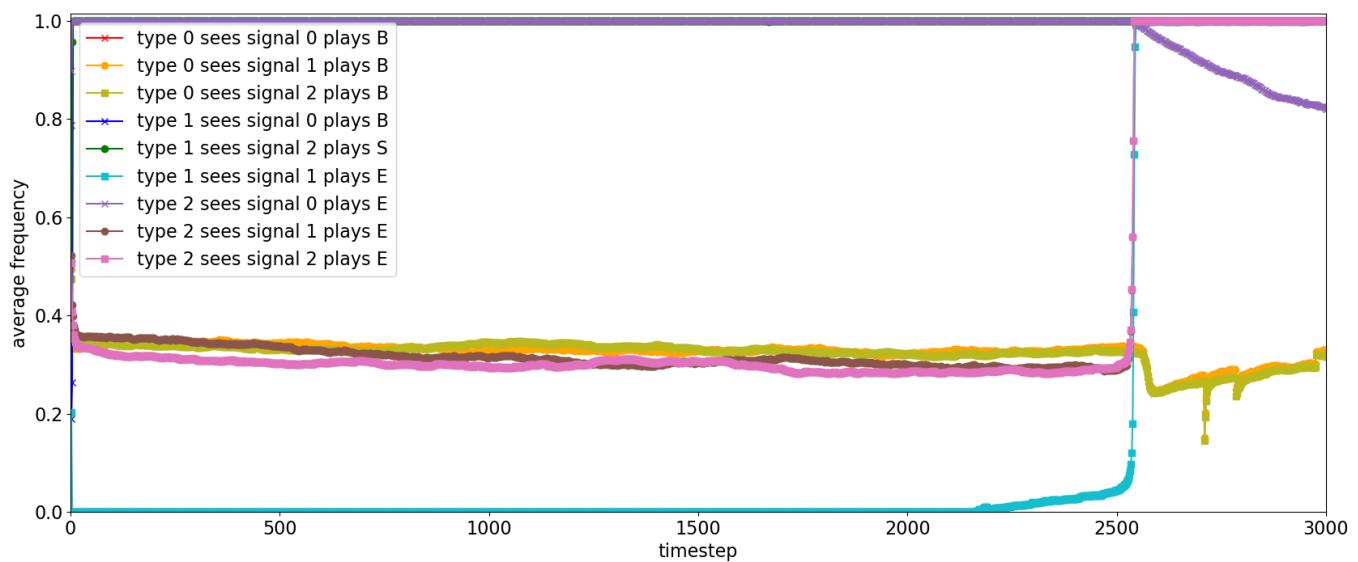
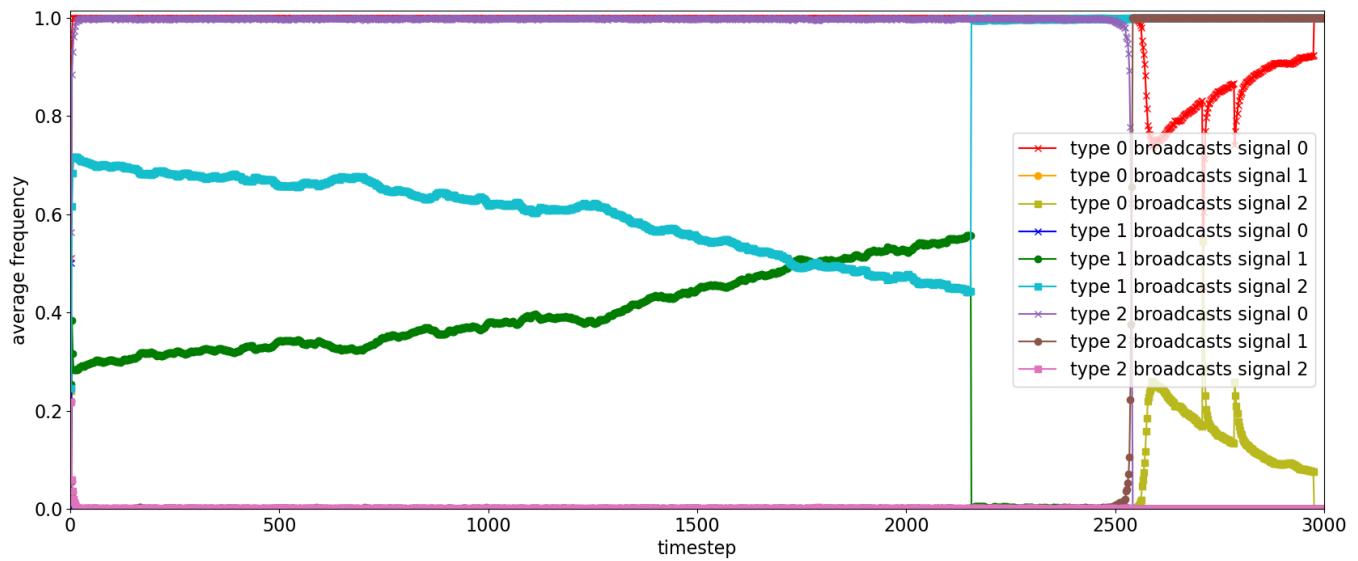
Type 0 signaling 0 vs signaling 1 fluctuations continue



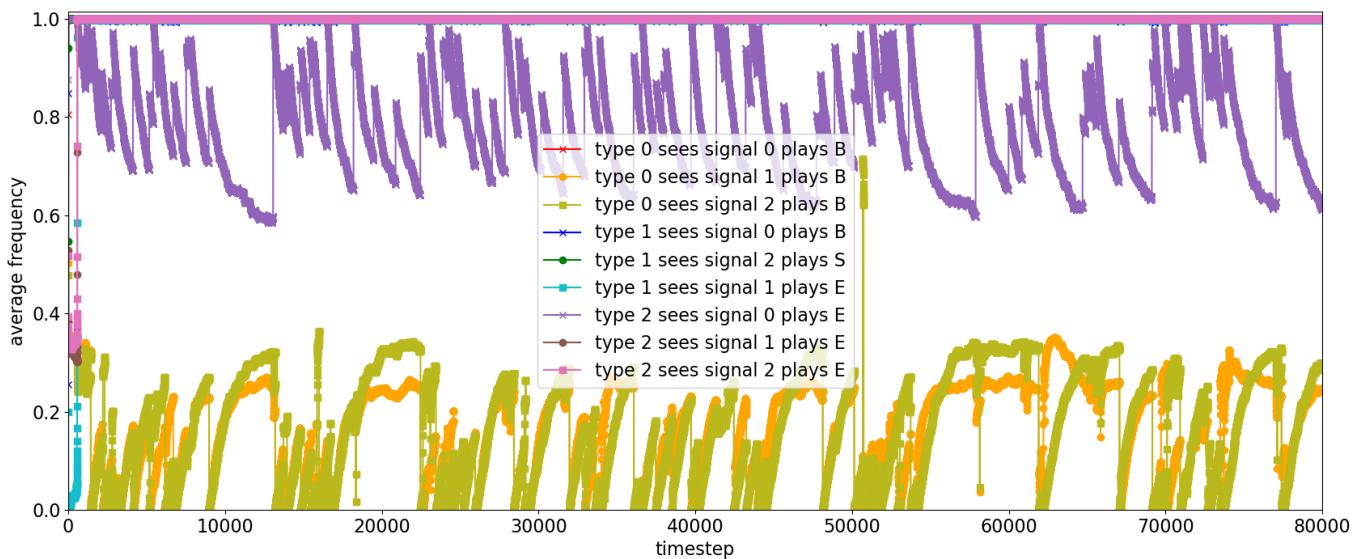
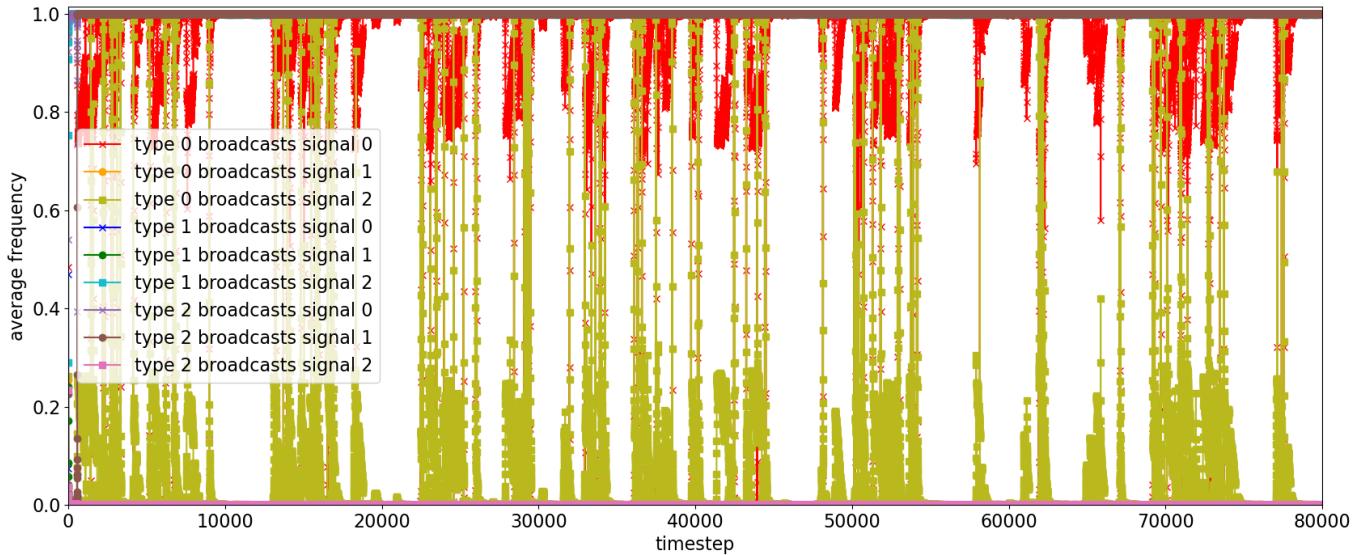
Run # 7



Run # 8

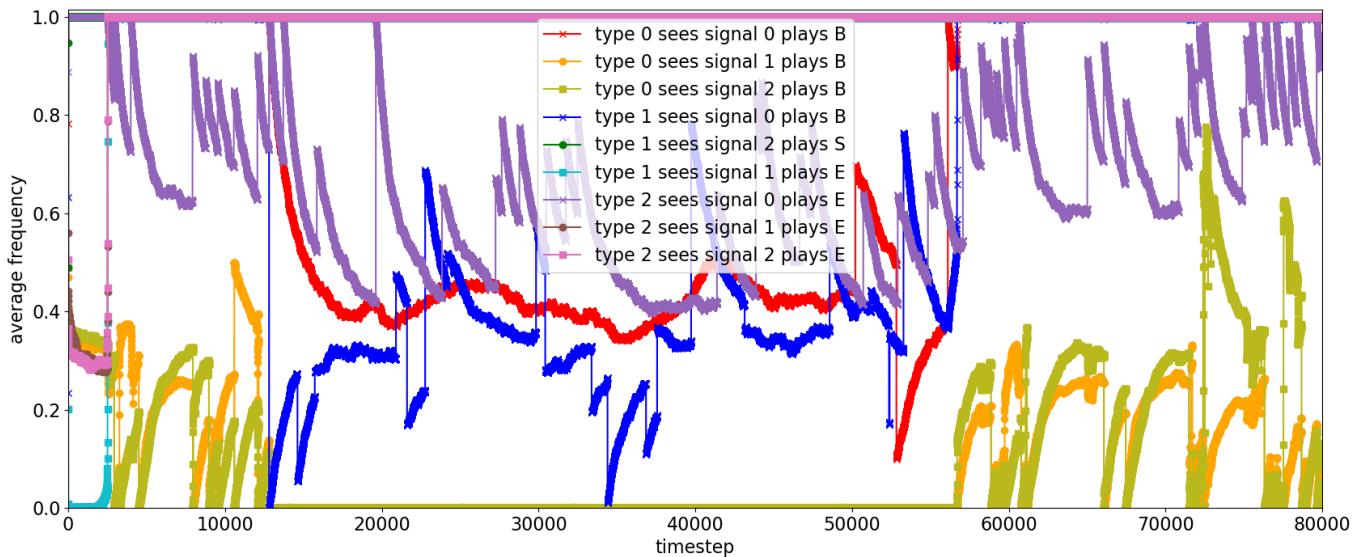
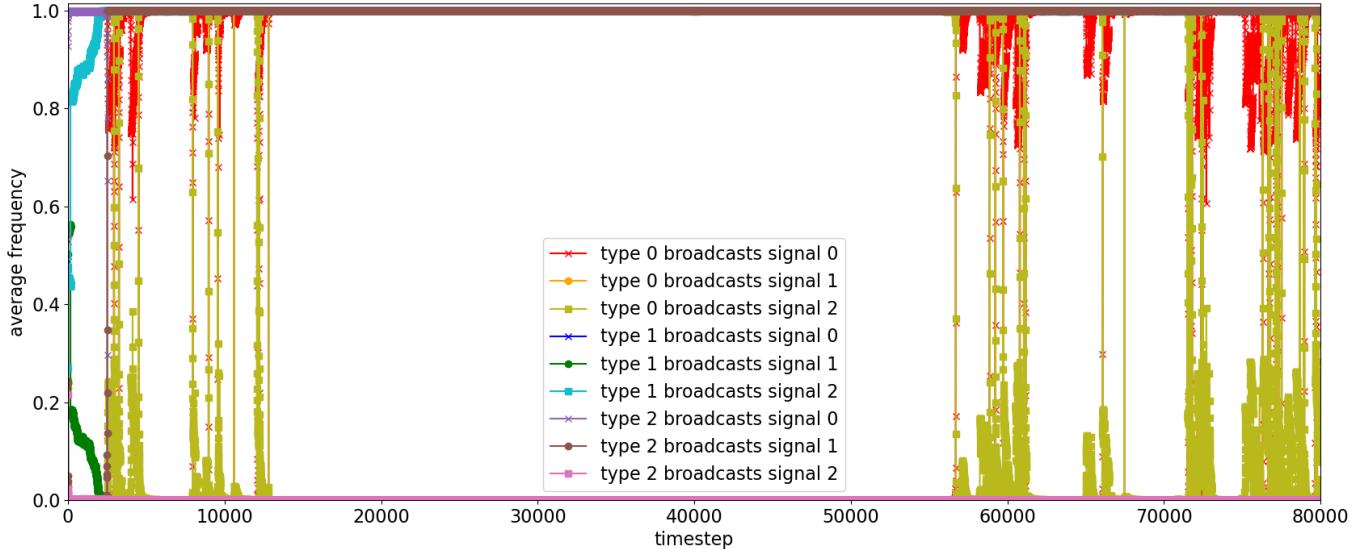


Run # 11

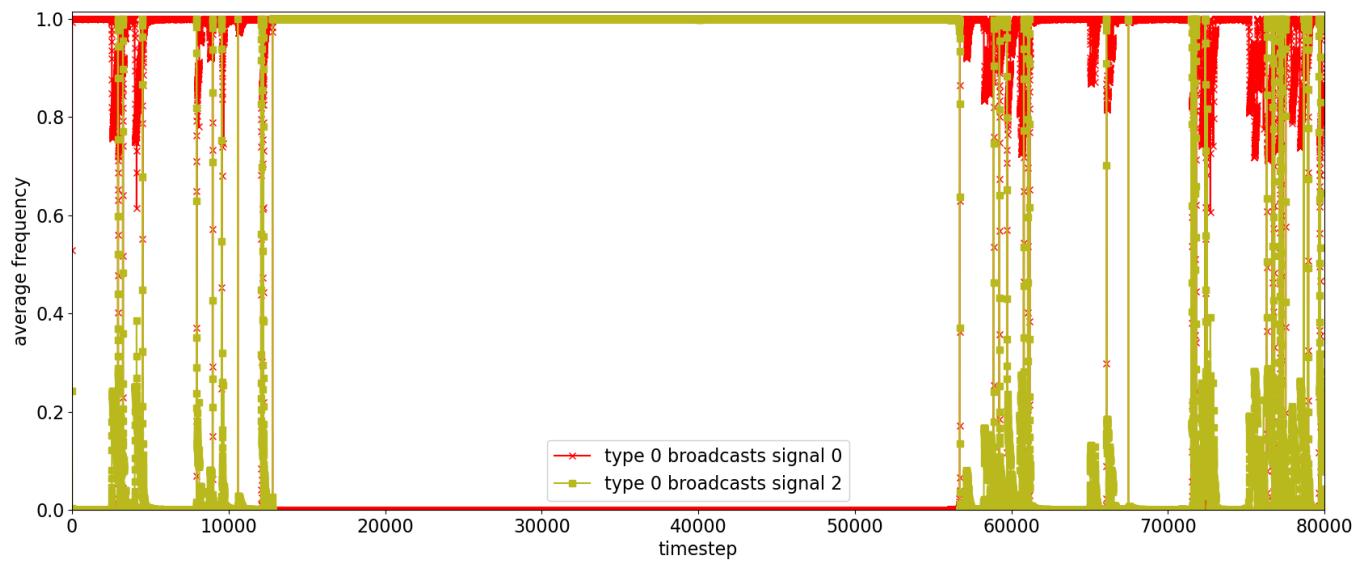


Run # 13

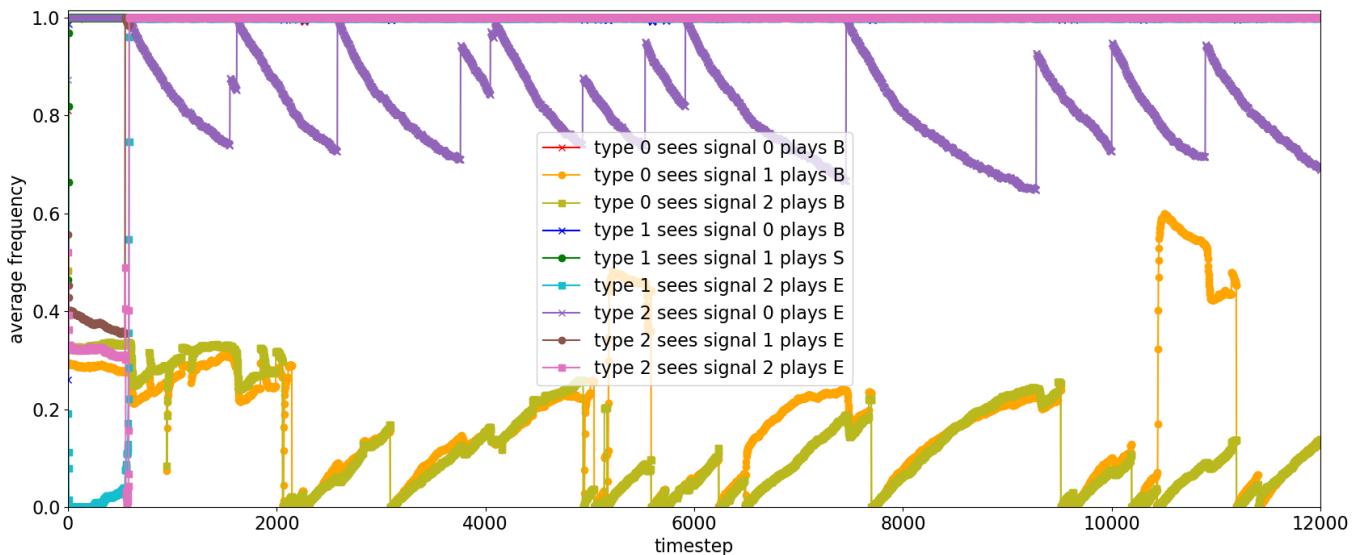
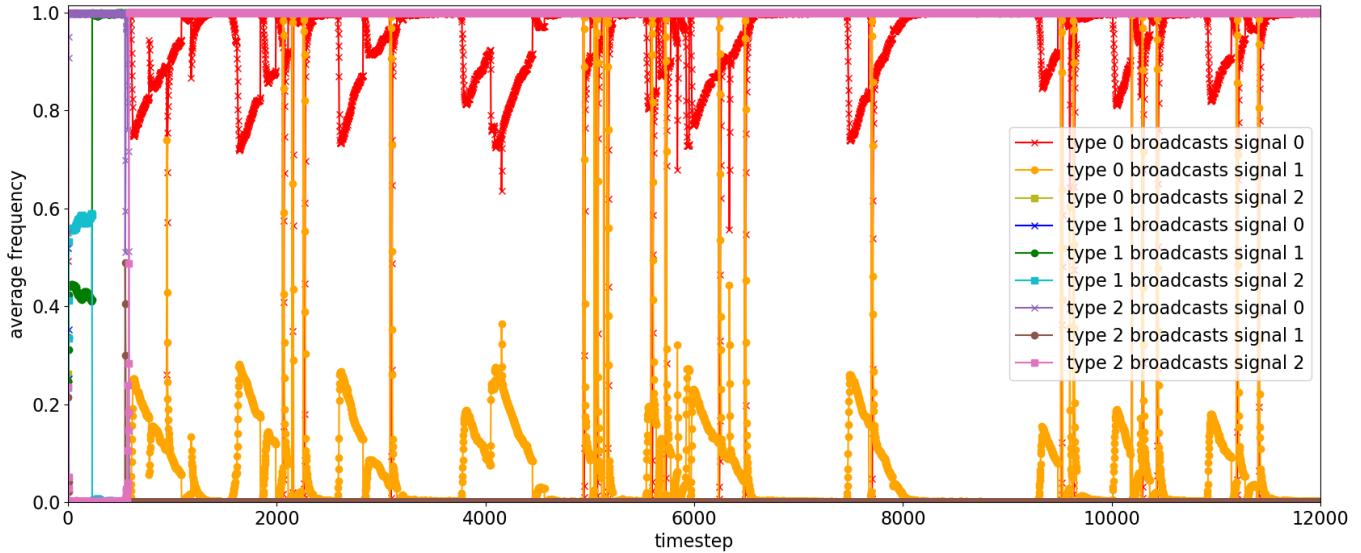
Serious fight between types 0 and 1 for what to do on signal 0



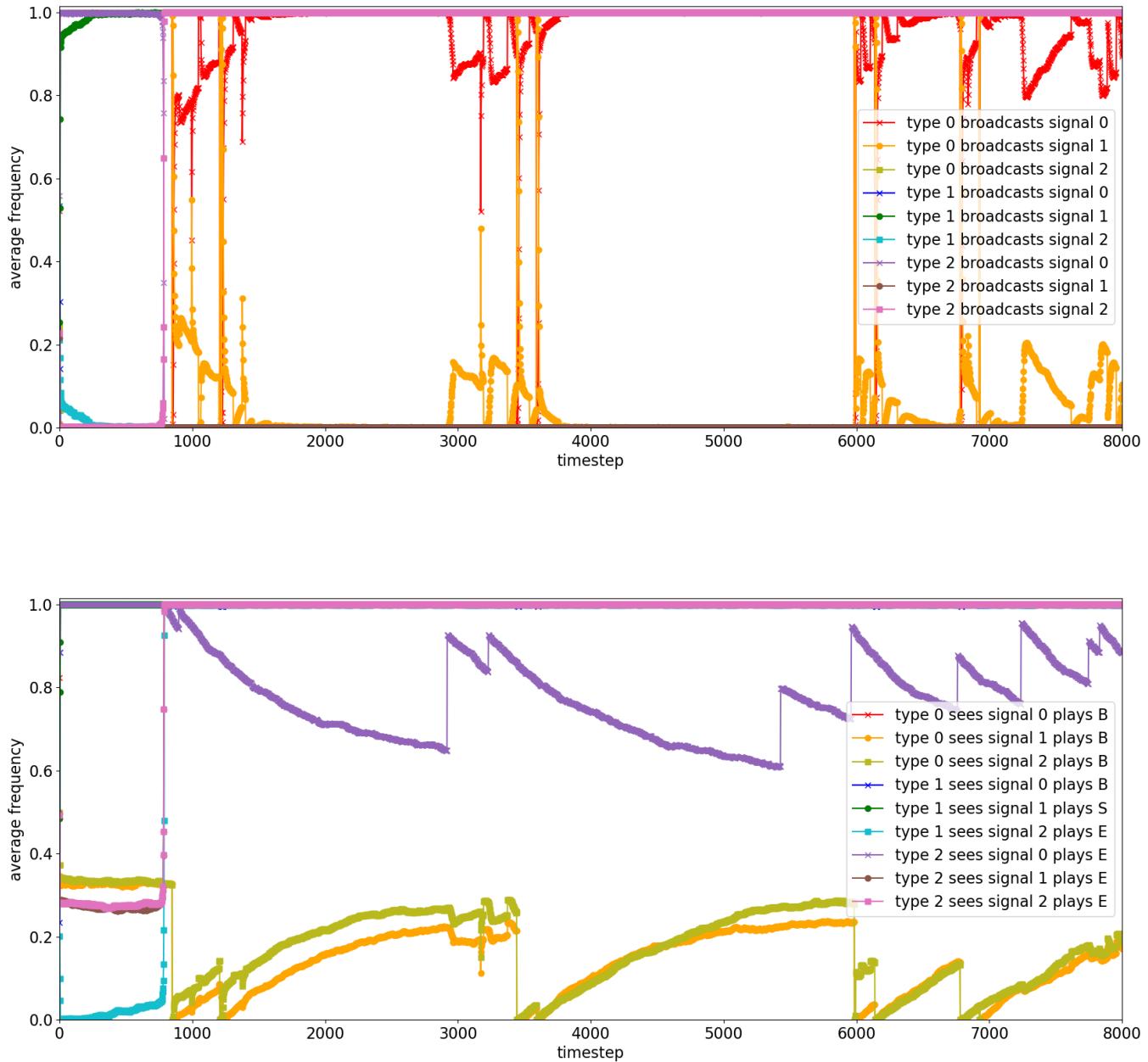
Run # 13 continued on next page



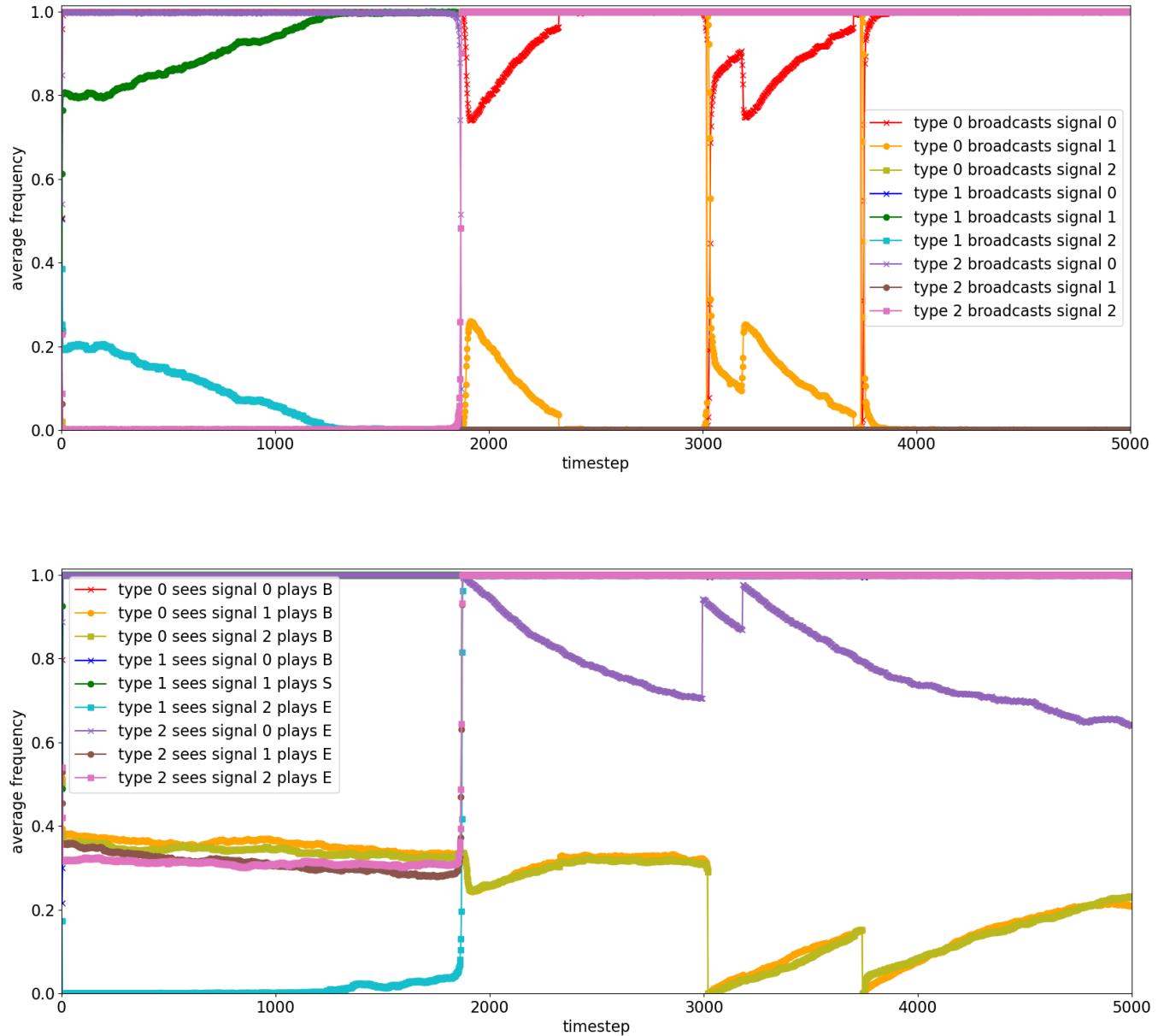
Run # 14



Run # 16

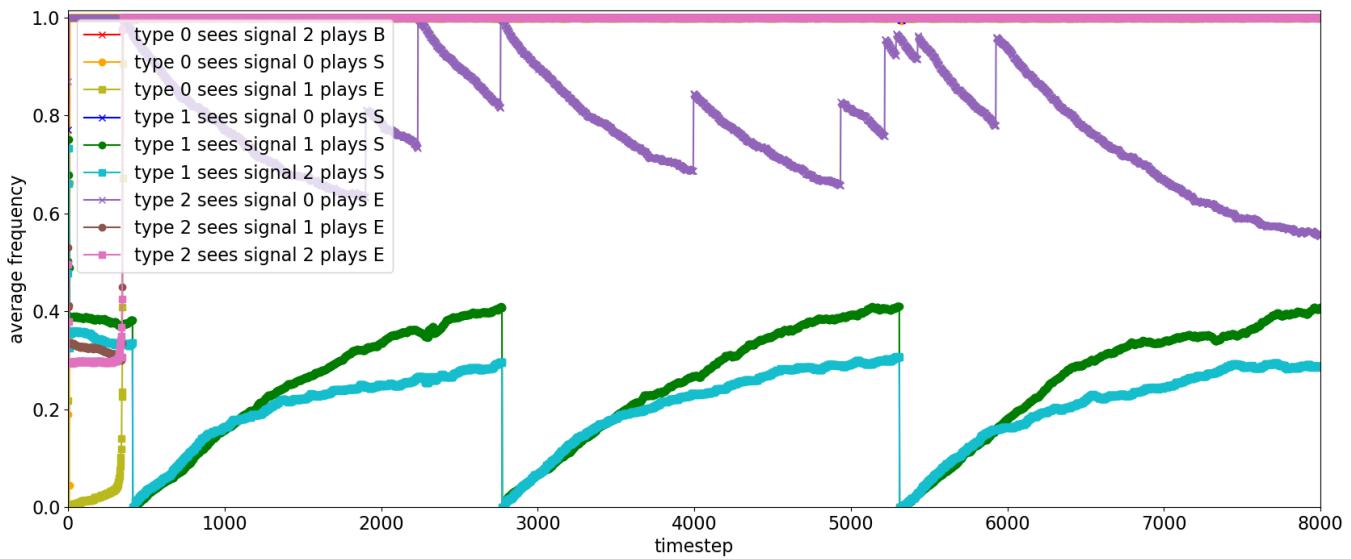
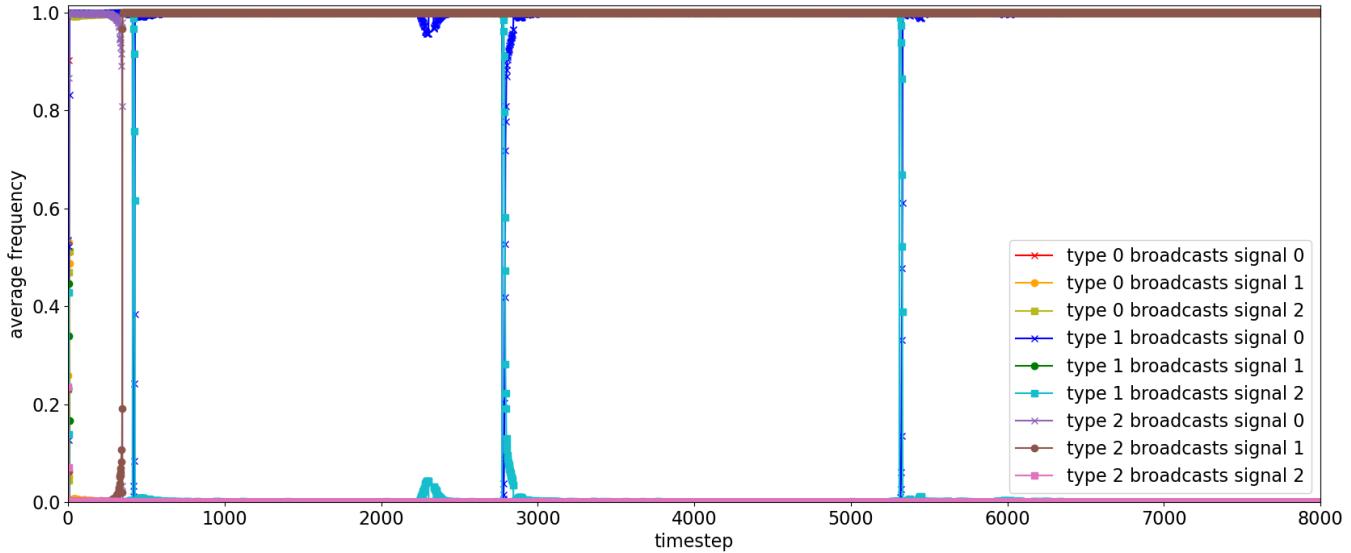


Run # 18

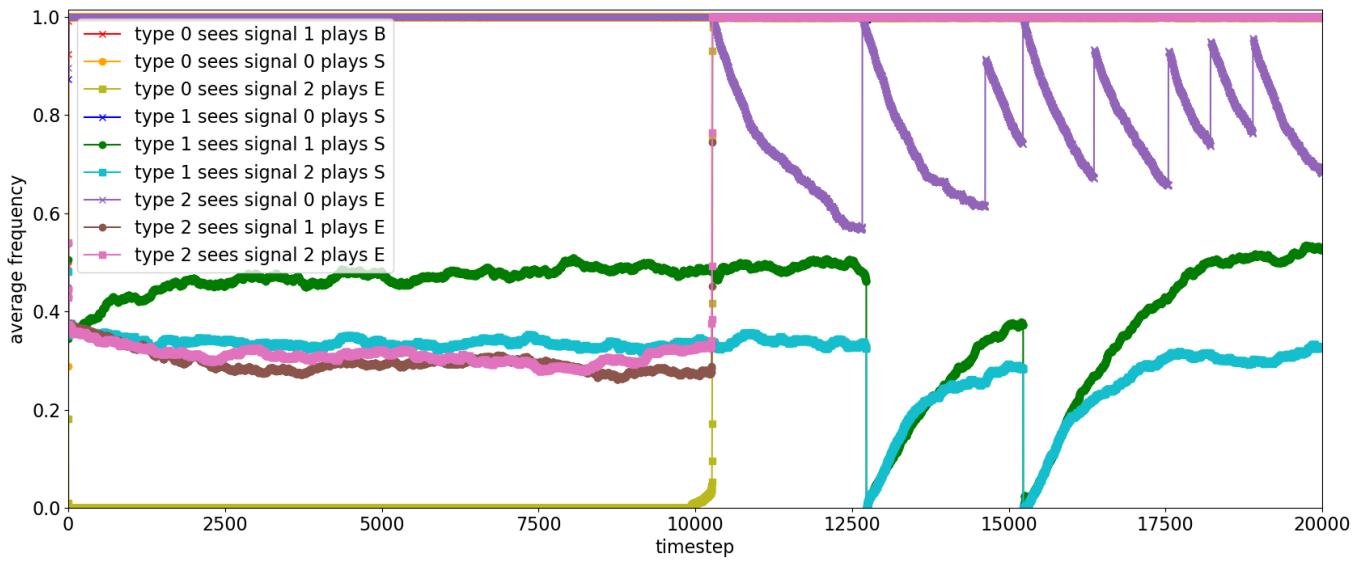
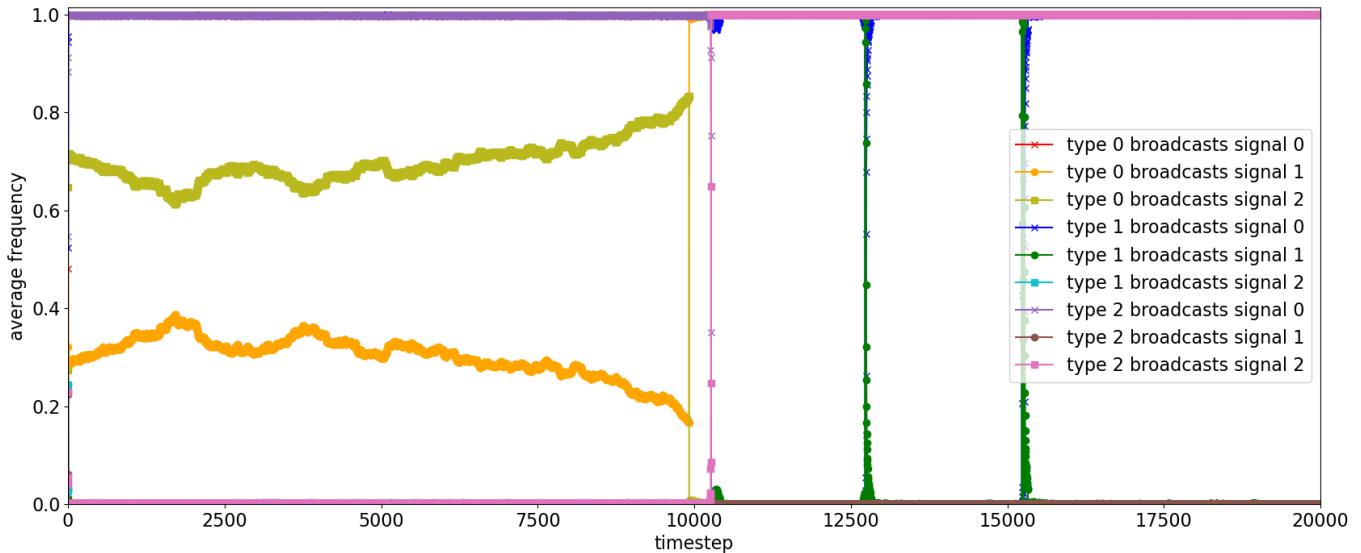


outcomes (ix): characterized by type 1 signaling 0

Run # 92

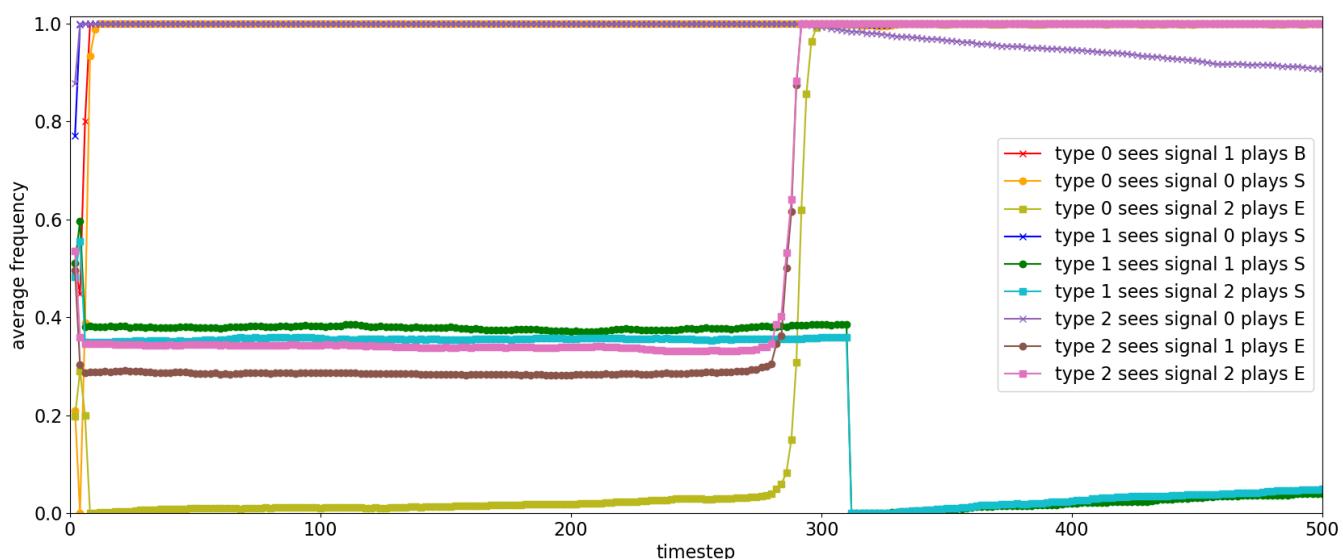
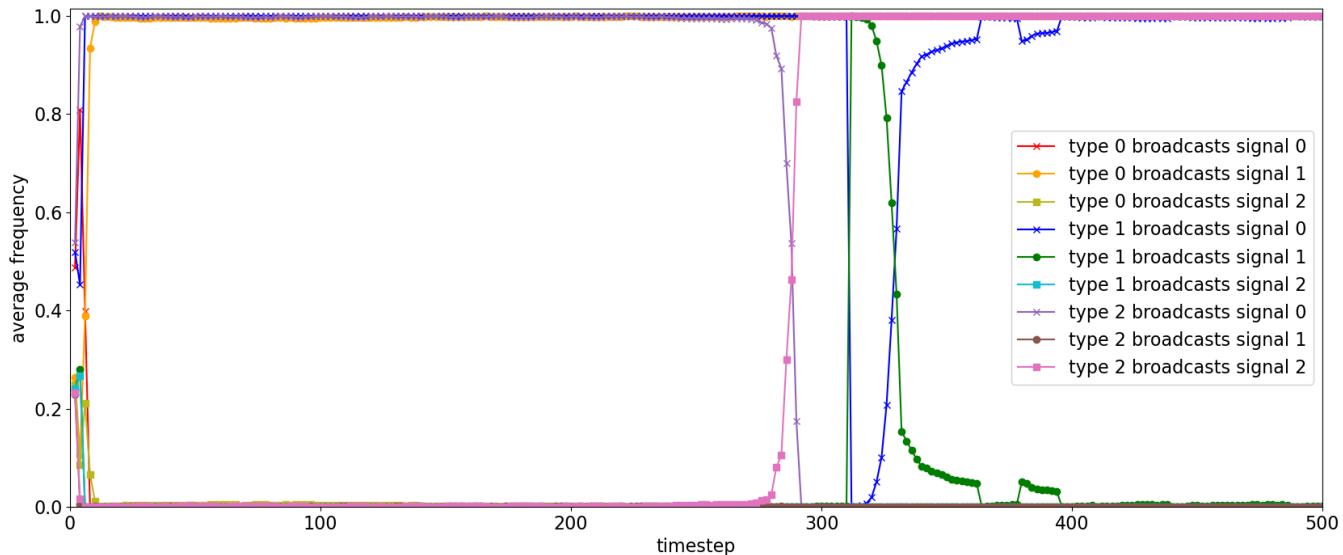


Run # 206



Run # 637

Like other runs with this outcome there are continued transient spikes of type 1 signaling 1 rather than 0



outcomes (x):

Run # 9

```
[[[ 0 403 3297]
 [ 0 2900 0]
 [3400 0 0]]]
```

