Functional Learning of Moderated Causality in Dynamic Systmes: Online Appendix

jonas.mago@gmx.de

August 2020

1 Free Responses

1.1 What was the effect of the background color?

1. "LIGHT AND DARK COLOR"
2. "it changes whether you go up or down with light or dark"
3. "no effect "
4. "Some were opposite control and some were not based on the border"
5. "It changed the way the slider reacted to the o and m buttons"
6. "It either allowed you to move the slider in the position of the mark or the opposite depending on the background color"
7. "white and black"
8. "It would reverse the relationship between the left slider position and the right slider position"
9. "The color would decide whether there was a positive or negative effect to the controls "
10. "Has changed"
11. "It brighten"
12. "The background color affected the responsiveness of the right slider from the movement of the left slider"
13. "Nothing I think so "
14. "Assisted me realize when i was earning points"
15. "I think when it was the darker shade the slider moved in the opposite direction in which you moved it"

16. "the background color made me feel like I had to raise or lower the slider sometimes"
17. "It is a multi-color effect"
18. "The background color determined how sensitive the buttons were in affecting the right slider"
19. "sometimes it reverse the correlation between the right and left sliders "
20. "blue"
21. "Seemed like it git harder to move when the screen is darker"
22. "I have no idea"
23. "Gray"
24. "Effected which direction the slider moved"
25. "background color There is no permanence"
26. "In some instances, when the background color darkened, I needed to push the button that was opposite of the direction I wanted to go"
27. "when the slider moves up or down the darkness of the background color changes"
28. "It seemed like the darker it got, it would make the sliders move in opposite directions "
29. "Background color is used for managing the sliders"
30. "It changed the direction that the O and M keys moved the right slider"
31. "red, bule, orange, green"
32. "It seemed like it was harder to line it up"
33. "black"
34. "Blue effect"
35. "It made iteasier"
36. "THE BACKGROUND COLOR IS GREY"
37. "It switched the way the right bar went when you moved the left"
38. "HIDE AND NONE HIDE SOME COLORS"
39. "black background effected the slider"
40. "grey color"

41. "black"
42. "blue"
43. "black"
44. "went light to datk"

1.2 What was the connection between the two sliders in the red condition? (Condition 2)

1. "THE CONNECTION BETWEEN THE TWO SLIDERS IS SAME"
2. "it changes whether you go up or down"
3. " i do not recognized it i just keep try to gold part 2nd slider "
4. "Opposite"
5. "the slider on the left went in opposite direction than the slider on right"
6. "I wasnt aware of what the slider correlation was depending on the background color"
7. "more different"
8. "The relationship between the sliders would get reversed as the background darkened then return to normal as it lightened"
9. "The slider would act as a guide giving an opposite effect"
10. "has been vary"
11. "connected"
12. "The green condition was the second most accurate and the left slider moved with a small bit of delay to the right slider"
13. "Different timely moved "
14. "As the right moved up the left also moved but they had a different pace of moving "
15. "i am not sure"
16. "it felt like I had to raise the slider"
17. "there is some different connection between two sliders"
18. "The slider was very sensitive and responded quickly"
19. "reverse on dark, normal on light "

20. "good"
21. "They seemed to mimic each other"
22. "I think the connection was one to one just delayed"
23. "Connection"
24. "Couldnt tell"
25. "sam red condition"
26. "They seemed to work in the opposite direction when the background was dark, which meant if I moved my slider up, the other slider would go down"
27. "the sliders sometimes move in the same direction"
28. "They moved in the same direction when it was white, opposite when black"
29. "up slider moving"
30. "The sliders moved around more for each press"
31. "red for rount sliders"
32. "It seem the hardest to stay in the middle"
33. "it is so hard"
34. "It is danger to move"
35. "It was slower"
36. "THE CONNECTION BETWEEN THE TWO SLIDERS IN RED CONDITION IS STOP "
37. "It gave you less room to slide at the top and bottom"
38. "IT IS COLOR CHANGED"
39. "It had little effect on the slider"
40. "press the m and o key slowly moved"
41. "may or may not influence the connection between the two sliders"
42. "red"
43. "not meet"
44. "i dont know"

1.3 What was the connection between the two sliders in the blue condition? (Condition 4)

1. "THE CONNECTION BETWEEN THEM ARE INDEPENDENT"
2. "it changes whether you go up or down"
3. " i do not recognized it i just keep try to gold part 2nd slider "
4. "Opposite"
5. "The sliders moved in the same direction"
6. "The slider moved in the opposite direction when the background got darker"
7. "different from gold bonus"
8. "The relationship between the sliders would get reversed as the background darkened then return to normal as it lightened"
9. "The slider would act as a positive effect"
10. "slightly vary between the sliders"
11. "slight connection"
12. "The green condition was the third most accurate and the left slider moved with a moderate bit of delay to the right slider"
13. "Same time same direction move"
14. "As one moved up the other moved down"
15. "i am not sure"
16. "it felt like I had to lower the slider"
17. "there is some connection between them"
18. "The slider was somewhat sensitive and there was a delay in response"
19. "normal "
20. "well"
21. "I dont remember it moving on the other side"
22. "I think this connection was also one to one with an even bigger delay"
23. "Two slider connection"
24. "Opposite direction"

25. "sam blue condition"
26. "They worked together, so if I sent my slider down, the other slider also went down, although I felt like they sometimes went in opposite directions"
27. "there is no relation"
28. "The slider on the left moved a little quicker than the one on the left "
29. "down slider moving"
30. "The sliders seemed to kind of follow the gold slider"
31. "bule for round sliders"
32. "It seemed to be the easiest of them all and was very good for the user"
33. "it is bad connection"
34. "It is good connection to move and bonus point"
35. "Iit was faster"
36. "THE CONNECTION BETWEEN THE TWO SLIDERS IN BLUE CONDITION IS TO MOVE"
37. "It switched the controls of the left bar"
38. "IT IS CAME YO NEAR BY"
39. "it had moderate effect on slider"
40. "normal moving the slide"
41. "target region moves up and down in a constant speed"
42. "blue"
43. "same"
44. "i dont know"

1.4 What was the connection between the two sliders in the orange condition? (Condition 3)

1. "THE CONNECTION BETWEEN THEM ARE DIFFERENT"
2. "I dont think this had any effect"
3. "if one moved another moved "
4. "Opposite"
5. "The orange condition caused the slider on the right to move with a delay"

6. "The slider moved in the opposite direction when the background got darker"
7. "literary different from gold bonus pay"
8. "The sliders always maintained the same relationship between the left moving up and the right moving up and same for moving down"
9. "The sliders would act together in tandem. "
10. "vary between the sliders"
11. "connection"
12. "The green condition was the third most accurate and the left slider moved with a lot of delay bit of delay to the right slider"
13. "Same time different direction move"
14. "The sliders moved in same direction"
15. "i am not sure"
16. "it felt like I had to keep the slider in the middle"
17. "there is no connection between two sliders"
18. "The slider was sensitive and the slider responded well"
19. "reverse on black, normal on grey"
20. "nice"
21. "Polar opposites"
22. "I think this connection randomly switched from one to one to inverse"
23. "Two slider connecting"
24. "Opposite direction"
25. "sam orange condition"
26. "Like the red condition, the sliders worked against each other"
27. "there is no relation"
28. "Not much connection, it was hard to get them to work together"
29. "orange condition is useful for following the conditions"
30. "The sliders would sometimes move in random directions"
31. "orane for round sliders"

32. "I didnt notice the connection on the orange"
33. "it is a good connection"
34. "It is good to loss of the move"
35. "slower "
36. "THE CONNECTION BETWEEN THE TWO SLIDERS IN ORANGE CONDITION IS TO CHANGE COLOR"
37. "It made the reaction time slow on the right bar"
38. "IT IS LEFT FEW DISTANCE FOR SLIDE"
39. "it had little effect on the slider"
40. "normal moving the slide between us"
41. "Earn bonus pay by keeping the right sliders in the gold region"
42. "orange"
43. "long gap"
44. "i dont know"

1.5 What was the connection between the two sliders in the green condition? (Condition 1)

1. "THE CONNECTION BETWEEN THEM DIFFERENT"
2. "it changes whether you go up or down delayed"
3. "bonus pay "
4. "Correlated"
5. "The sliders moved in the same direction but with decreased movement at the extremes"
6. "The slider moved the proper way no matter the background color"
7. "eligible to have gold bonus pay"
8. "The sliders always maintained the same relationship between the left moving up and the right moving up and same for moving down"
9. "They would act opposite"
10. "similar between the sliders"
11. "connection"

12. "The green condition was the most accurate and the left slider moved as close to possible as the right slider"
13. "same direction move"
14. "The bonus points were increasing "
15. "i am not sure"
16. "if felt like I had to raise and lower the slider"
17. "there is good connection between two sliders"
18. "The slider was somewhat sensitive and there was a slight delay in responsiveness"
19. "normal "
20. "well"
21. "I think it just moved up and down in a rhythm"
22. "I did not see this one"
23. "Bonus"
24. "same direction"
25. "sam green condition"
26. "They worked together the entire time, so if I sent my slider up, the other slider went up"
27. "both sliders make parallel movements"
28. "They were pretty straight forward, moving up and moving down together, though at a bit of a delay "
29. "This is a very hopeful condition and it may be up to make our bonus payment"
30. "The sliders moved more similarly to what I pressed."
31. "green for round sliders"
32. "Again one of the easier ones"
33. "good"
34. "Green condition is the bonus point"
35. "faster"

36. "THE CONNECTION BETWEEN THE TWO SLIDERS IN GREEN CONDITION IS CHANGE BACKGROUND COLOR"
37. "No change"
38. "GREEN DI VERY ACCURATE ANSWER AND GET BONUS"
39. "it had moderate effect on slider"
40. "one slide up and one was down"
41. "Earn bonus pay by keeping the right sliders in the gold region"
42. "green"
43. "meet same point"
44. "i dont know"

1.6 Do you have any other comments regarding the experiment?

1. "THIS EXPERIMENT IS INTERESTING ONE"
2. "no"
3. "no "
4. "None thanks"
5. "no"
6. "Very interesting Its not like any Ive done before"
7. "simply good"
8. "no"
9. "Fun time"
10. "Nice study"
11. "no"
12. "none"
13. "Nope"
14. "The task was enjoyable"
15. "none"
16. "I went based off feeling so I dont really remember what the specific connection was between the color and the two sliders"

17. "it was very interesting"
18. "no"
19. "no"
20. "very nice"
21. "none"
22. "No"
23. "Nice Experiment"
24. "None"
25. "i like the experiment"
26. "No"
27. "none"
28. "This was a fun one, thank you"
29. "good"
30. "No"
31. "i like this survey"
32. "No"
33. "none"
34. "It is really good experiment and very interesting"
35. "slower"
36. "NO COMMENTS"
37. "None"
38. "I WAS FELT VERY HAPPY TO TAKE THIS SURVEY"
39. "no"
40. "Good"
41. "color of the frame for each condition My Image"
42. "good to play"
43. "nice experiment"
44. "i never paid attention to color and effect"

1.7 Experiment 2: Free Responses

1.8 What was the effect of the background color?

1. "Made the square move up or down faster or not at all"
2. "changed the rate at how the right slider influenced the left"
3. "its indiferent for me "
4. "The effects of the background colors i would say to make it more difficult to move the up and down button "
5. "Blue"
6. "The background color changed each round"
7. "it seemed to change how much movement was needed by the left slider"
8. "Not sure"
9. "yellow"
10. "Certain colors made it more difficult to move up and down depending on the slider colors may have been weight or magnet strengths"
11. "green is the effect of the background colour"
12. "It determined the rule of the how the left slider affected the right "
13. "I think it was how strong the connection was and how often the orientation between the flipped"
14. "It changed the how the sliders would behave"
15. "it changed the correlation between the two sliders"
16. "It varied in how the sliders would affect each other, as well as the speed and responsiveness of the one slider to the other. "
17. "background color effect is good "
18. "the orange was kind of hard to work with but the others were ok"
19. "The effect that the left slider had on the right seemed to differ between trials Since the background color also changed between trials there may have been some connection there too"
20. "very effective background color"
21. "It affected how the right slider moved in relation to the left slider"
22. "It changed the way the slider on left affected gold area"

23. "Green it lightened over a period of time"
24. "The slider moved differently"
25. "certain colors made for opposite effects, such as the left slider going down making the right slider go up, etc"
26. "It determined how the slider interacted with the other"
27. "They got harder as they went along"
28. "It may have decided how the sliders worked in terms of direction relative to what buttons I pressed"
29. "Not exactly sure, the first and last color matched the left slider where O is up, M is down. The other two were a little more erratic. To me it seemed like depending on the background color, thats how the sliders were going to interact. "
30. "Blue and red"
31. "blue,green,red,orange "
32. "BLUE ORANGE GREEN RED"
33. "The background color effected the sporadic behavior of the right slider. Each background color had a different interaction between the left and right slider. "
34. "It changed the way the sliders related"

1.9 What was the connection between the two sliders in the red condition? (Condition 2)

1. "Stopped it from moving up"
2. "slow rate of change"
3. "i think the other slider help me with the control"
4. "Red condition would be that i had way less control over the movements and direction i wanted to go "
5. "Fair"
6. "It seemed like the O and M moved in the opposite directions that they should The O was to move up but it seemed to move the bar down while the M was to move down and seemed to move the bar up"
7. "i found that momentum is what moved the slider sometimes. it needed to be moved quickly"

8. "Hard to remember"
9. "to development "
10. "Red made it slightly difficult to go up and down but I didnt notice anything with the left slider"
11. "the connection between the two sliders in the red connection "
12. "It often went the opposite, up went down, down went up"
13. "a weak connection that went in the same direction throughout"
14. "They went in the same direction with the keys"
15. "this was more of a direct connection. if i moved the slider up it would have a direct connection to the other slider. this was the easiest condition"
16. "It seemed like they were connected directionally but maybe underresponsive "
17. "two sliders connection to be slow"
18. "i think it made the slider go the oppositeway"
19. "The left slider did control direction and magnitude of movement on the right but it was not 1 to 1 and seemed to have a lag that made it difficult to predict"
20. "The connection between two sliders is good"
21. "I cant remember"
22. "left slider seemed to change the direction of right slider randomly and difficult to control"
23. "Out of pay move slider"
24. "It seemed to be more in sync than some of the colors"
25. "this seemed random"
26. "It seemed to vary"
27. "It was hard to predict movement "
28. "It seemed to follow the same movement in general"
29. "This was round 1, if the left slider went up, so did the right, down on the left was down on the right. They were proportional to one another and directly related. "
30. "It is very danger"

31. "good"
32. "GOOD "
33. "The right slider would sometimes have a delayed reaction to the left slider and would at some points would have an inverse effect from the right slider. "
34. "I do not know."

1.10 What was the connection between the two sliders in the blue condition? (Condition 4)

1. "stopped it from moving down"
2. "fast rate of change"
3. "i dont think so"
4. "The blue condition was easy i never had a problem with controlling what way i wanted to move up or down"
5. "Low"
6. "It seemed like you needed to alternate using using the O and M keys to move the slider bar at all "
7. "not sure that i ever figured that one out"
8. "hard to remember"
9. "describes the level"
10. "Blue left almost no resistance whether the left slider was going up or down"
11. "the connection between the two sliders in the blue connection is control the left slider"
12. "The direction went as normal"
13. "A strong connection that went in the same direction throughout"
14. "They went in the same direction keys"
15. "this was a bit tricky. it seemed like it was an opposite correlation"
16. "They also seemed to be connected the right way by direction, but there was some overresponsiveness"
17. "two sliders connection to be different"
18. "i think the connection was that it always dragged the slider down"

19. "The left slider at times seemed to control the direction and magnitude of movement but at other times it seemed like changing direction was what shifted the direction of the right slider"
20. "When the the left slider move up then the right slider moves up When left slider moves down then the righr slider moves down"
21. "Cant remember"
22. "left slider moved right slider very slowly"
23. "Close to pay range"
24. "This one was pretty close"
25. "this seemed opposite"
26. "opposite movement "
27. "It was impossible to predict movement"
28. "Blue was switching back and forth between going opposite directions and not"
29. "This was round 3 for test, for me it seemed like the same thing as the orange condition. At some point there would be a flip where down on left is up on right and vice versa. At some point, both sliders would match again, up is up, down is down, but if you went too high on the left slider it would actually start moving the right slider down. "
30. "It is good and smooth"
31. "good"
32. "NICE"
33. "The right slider would sometimes have an inverse reaction to the left slider when it came to either the top or bottom sections"
34. "I do not know. "

1.11 What was the connection between the two sliders in the orange condition? (Condition 3)

1. "Not sure"
2. "medium rate of change"
3. "maybe i think its was positive for me "
4. "The orange condition i would say was the most difficult to control like i did not stand a chance like someone else was moving as i was trying to in the opposite direction"

5. "Good"
6. "I could not figure out any connection on the orange back ground"
7. "i think that it needed to be reset at the top or bottom before it would adjust to the side the slider was on"
8. "hard to remember"
9. "for differentiable"
10. "The orange made it almost impossible to move and the left would do the opposite of the right so if the left is up the right goes down"
11. "the connection between the two sliders in the orange connection is bonus pay region"
12. "It switched from opposite to normal several times "
13. "A weak connection that switched directions occasionally"
14. "They went in the opposite direction of the keys"
15. "this one it felt like sometimes there was a direct correlation and other times it was an opposite correlation"
16. "I was trying to work out when they went the opposite direction, it seemed like maybe when the gold was in the upper or lower half it would switch "
17. "two sliders connection to be speed"
18. "i think it made it kind of go opposite"
19. "This one behaved similarly to the blue condition in that the direction that the left slider influenced the right slider to move in seemed to change Sometimes it was right to move up on the left to move up on the right and sometimes it was the opposite"
20. "When the the left slider move up then the right slider moves up When left slider moves down then the righr slider moves down"
21. "Cant remember"
22. "The left slider would change back and forth how right would move opposite of what was expected"
23. "Out of the pay range"
24. "It was harder to get them lined up"
25. "this also seemed random"
26. "varying but mostly following with a lag"

27. "It was difficult to move it where I wanted it "
28. "Orange also felt like blue in which directions of the sliders would change relative to keys pressed"
29. "This was round 2 for me, this is where is got weird where at first it seemed like both sliders were directly related but then at some point, unsure if it was due to time or where the gold region was, the directions would be inverted. That is, down on the left would at some point mean up on the right. It would do that for a while and then switch back. "
30. "It is better"
31. "smooth"
32. "SMOTH"
33. "The right slider would have a delayed reaction to the right slider and would sometimes sporadically have an inverse relationship with the left slider. "
34. "I do not know"

1.12 What was the connection between the two sliders in the green condition? (Condition 1)

1. "Made it move as expected"
2. "more directly connected movement between the two sliders"
3. "i dont think so its was negative for me "
4. "Green condition was very easy to manage i had no problem getting the sliders to go the way i wanted to"
5. "Good"
6. "The O seem to move the slider up while the M moved it down There seemed to be a 1 to 1 relationship there"
7. "i think that it was pretty straightforward and it nearly directly affected the right slider"
8. "hard to remember "
9. "to indicate source"
10. "The green made it even harder to move than the orange and there ws more resistance between left AND rights there was much resistance if the left was on top the right went straight down and vise versa"

11. "the connection between the two sliders in the green conditions is the right slider to reach the bonus region. "
12. "The direction went as normal"
13. "A strong connection that switched directions occasionally"
14. "They went the opposite direction of the keys"
15. "this one was tricky as well it. it seemed to change sometimes but also was opposite correlation for the most part"
16. "There was also some opposite direction work around when the first slider was in the top or bottom half. "
17. "normal connection "
18. "i couldnt really tell what this one did"
19. "This was a lot closer to the red condition in that direction on the left seemed to match direction on the right throughout The movement was still not 1 to 1 and there was definitely lag"
20. "When the the left slider move up then the right slider moves up When left slider moves down then the righr slider moves down"
21. "Cant remember"
22. "The left slider worked predictably in how it affected right slider"
23. "Green position was the pay range"
24. "It seemed to be way off and harder"
25. "this seemed normal"
26. "followed but varied and with a lag"
27. "I think the easiest level to move it where I wanted it to go "
28. "Green felt like it followed the left slider somewhat closely"
29. "This was the final round for me, same exact thing as the red condition, O was up and M was down for both. "
30. "It is very perfect condition"
31. "good"
32. "EXCELLENT"
33. "The left and right slider would have a slight delayed reaction but for the most part was the easiest to control out of all other backgrounds. "
34. "They moved the same"

1.13 Do you have any other comments regarding the experiment?

1. "No"
2. "pretty confusing"
3. "very good and interesting survey"
4. "NA"
5. "Nothing"
6. "Everything functioned correctly but it was hard to figure out the connection between the O and M keys and the movement of the right slider"
7. "no"
8. "interesting"
9. "good experiences"
10. "I am sure there is more to the colors but I couldnt really figure it out"
11. "nothing"
12. "This was interesting, thank you"
13. "No"
14. "Orange and green were much harder to control"
15. "none"
16. "Thank you"
17. "nothing"
18. "no"
19. "These questions do not allow for punctuation which is a little awkward Otherwise I had no issues"
20. "none"
21. "None"
22. "no"
23. "Great study was so fun enjoyed doing it"
24. "none"
25. "I appreciate it"

26. "nothing to note"
27. "Fun experiment thank you"
28. "NA"
29. "None, seemed straightforward to me"
30. "Good experiment and very interesting"
31. "nice"
32. "NICE"
33. "Fun and interesting experiment. Would love to participate in more in the future"
34. "no"