Walker Ryan's Textures Skateboarding Part Analysis and Point Evaluation Using Tony Hawk's Pro Skater (THPS) Scoring Model

By NA

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1. Introduction to Walker Ryan and Textures Skate Video

Walker Ryan is a professional skateboarder, author, and personal fitness advocate with licensed Physical Therapist, Dr. Kyle Brown. Ryan's Textures part premiered in 2023, showcasing his continued progression in skateboarding and proving that innovation and talent do not have to have an inverse relationship with aging in the sport.

2. Analysis Steps

>*2a. Data Gathering*

Data for this project was derived from videos, blog posts, websites, and THPS 1 and 3 video game strategy guides. I reviewed Walker Ryan's Textures part for clip count, obstacles skated, trick types, tricks, and hold time for grinds, manuals, and grabs. Hold times were estimated with playing time shown on Youtube's online video player (see point one in appendix 1, for a table of data collected from Ryan's Textures part). In addition, I reviewed videos of someone playing THPS 1 and 3 in order to confirm trick scores and point multipliers for holding grinds, manuals, and grabs. IGN Entertainment Inc., StrategyWiki, and GameFAQs were blog posts / websites I referenced for determining THPS scoring model. Lastly, THPS 1 and 3 video game strategy guides were an additional substantiating source for elaborating the scoring model.

>2b. *Modeling Data and Visualizing Data*

Data was recorded as Comma-separated values (CSV) and read into Python for analysis and R for visualizations. Autodesk Autocad was used for creating a custom visualization. Furthermore, Veed was used to create GIFs and add text into select clips (1).

>2c. *Analyzing Data Using Tony Hawk's Pro Skater (THPS) Scoring Model*

THPS was first released in 1999. It was a game where you could skateboard, in multiple levels / maps, as a professional skateboarder either completing game objectives or freely skating. It was a large success that prompted multiple sequels and influenced some to start skateboarding, including myself.

For this paper I referenced multiple releases of THPS but focused my analysis on THPS 3 for point evaluations because quantity of tricks and corresponding base points were further defined in this release than before. In addition, I did not want to move too far from the original game and therefore the original scoring model.

Scoring is based on multiple factors. Points can derive from trick base scores, switch multipliers, spin multipliers, and holding grinds, manuals, and grabs. Base scores are the initial / minimum score for performing a trick. Base scores decrease as tricks are sequentially repeated (i.e. in a line) but in this video, Ryan did not perform the same trick consecutively therefore this penalty is not applicable (2). Switch tricks earn an additional 20% on top of base scores. Spin multipliers increase score sub-totals at the following rates: 1.5 times for 180 degrees, 2 times for 360 degrees, 3 times for 540 degrees, 4 times for 720 degrees, and 6 times for 900 degrees. Lastly, holds are calculated based on the frame rate of the players television. At the time of THPS 3 game release in 2001, TVs could have operated at 50 frames per second (FPS), PAL TVs, or 60 FPS, NTSC TVs (3). For this paper I used PAL TV FPS to evaluate hold time scores. Meaning, for every second Ryan held a grind, manual, or grab, he accrued 50 additional points.

Therefore the formula for scoring clips, which could have contained one or more tricks, was

points = (base points * switch multiplier) + hold points

final results = points * max spin multipliers

3. Findings

In 47 total clips, Ryan skated seven different obstacles with ledges, stairs, and gaps being top three (see figure 1 for counts and percentage of each obstacle). He skated an average of 1.7 obstacles per clip which ranged from five, maximum, to one, minimum, obstacles (see point two in appendix 1, for a table of obstacle counts per clip).

Obstacle Counts

32.1%

28.2%

1.3%

5.1%

6.4%

12.8%

14.1%

Obstacle

■ Ledge (25)
■ Stairs (22)
■ Gap (11)
■ Manual Pad (10)
■ Flat (5)
■ Transition (4)
■ Rail (1)
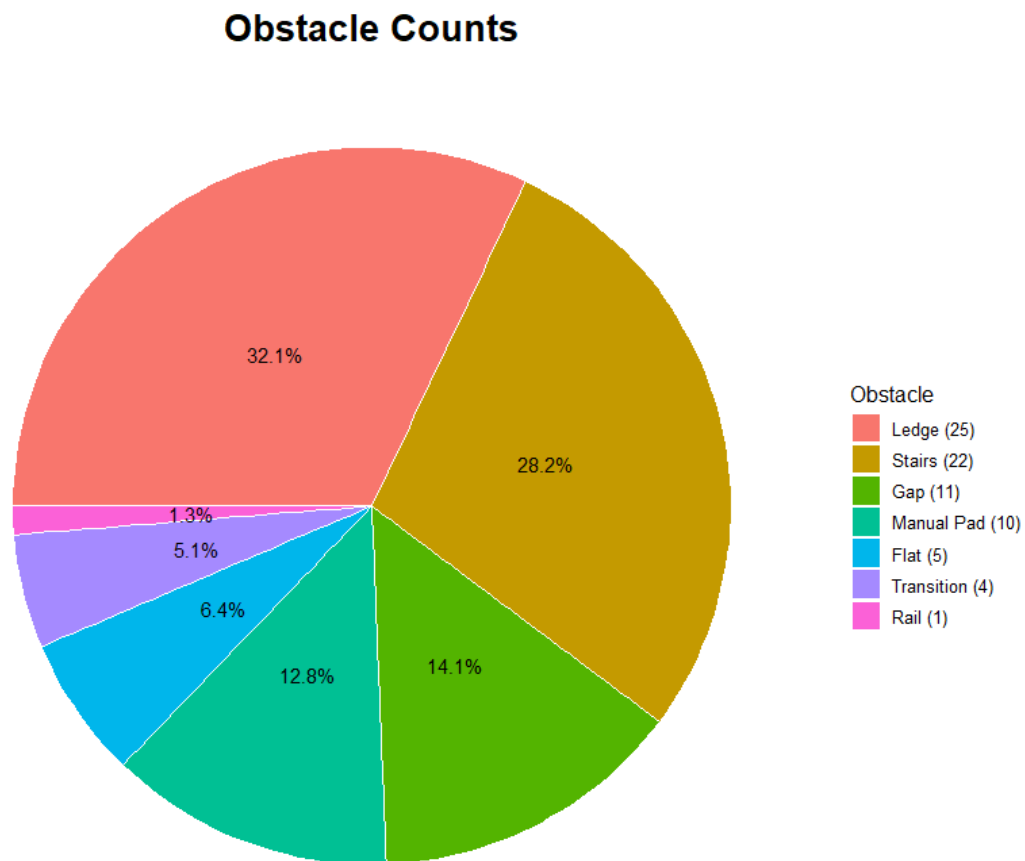
Figure 1

Ryan performed eight different trick types with flips, grinds, and ollies being top three (see figure 2 for counts and percentage of each trick type) (see point three in appendix 1, for a table of trick type counts per clip).
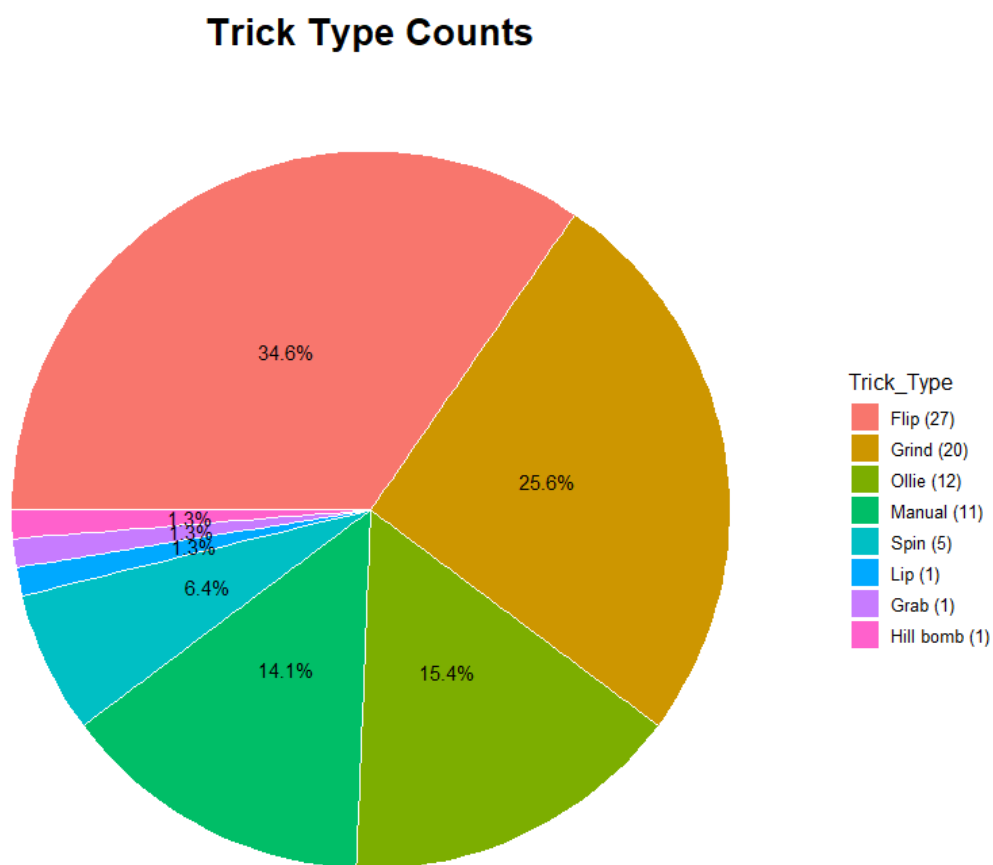
Trick Type Counts

Trick_Type
Flip (27)
Grind (20)
Ollie (12)
Manual (11)
Spin (5)
Lip (1)
Grab (1)
Hill bomb (1)

34.6%
25.6%
1.3%
1.3%
1.3%
6.4%
14.1%
15.4%

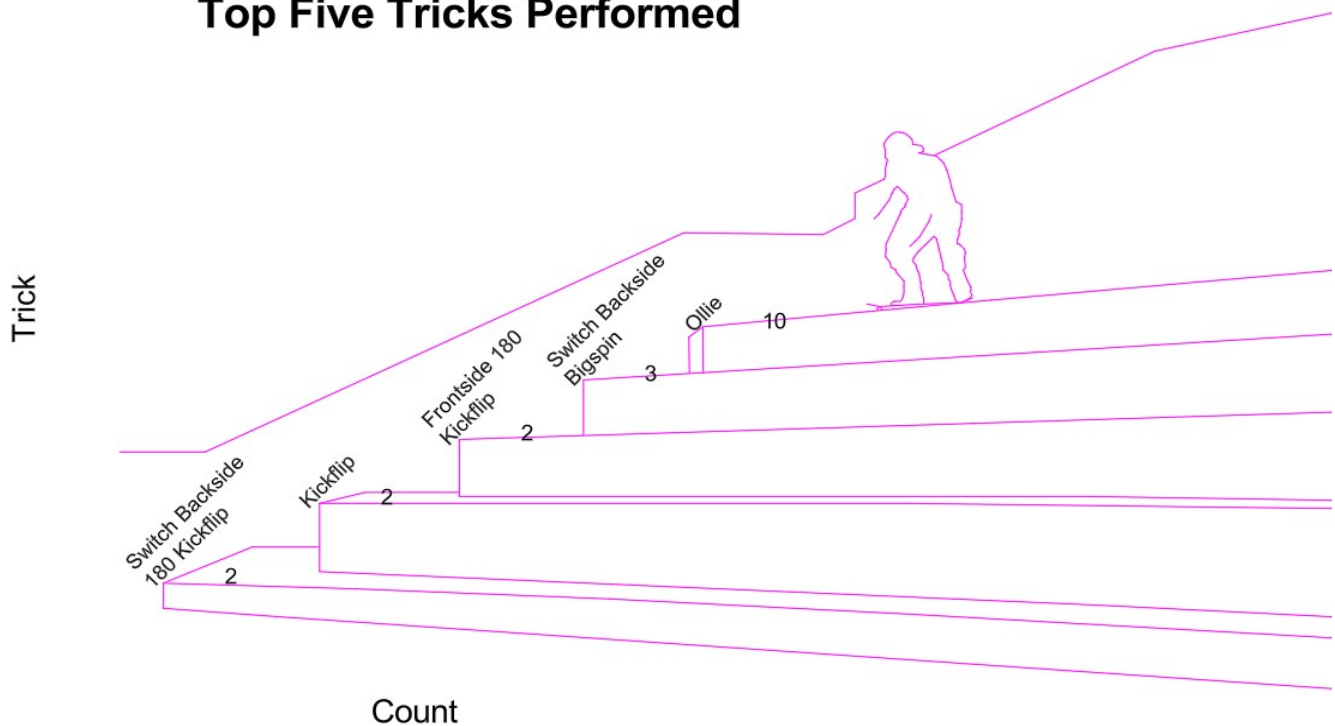Figure 2

Top Five Tricks Performed

Figure 3

Ryan completed 78 tricks in Textures, with majority of tricks being completed once, some tricks were repeated. Figure 3 shows top five tricks performed (see point four in appendix 1, for tables of tricks and counts).

Using THPS' scoring model, as explained previously, in 47 clips Ryan scored a grand total of 25,254.6 points (see table 1 for point summary statistics). Clip 40, backside 50-50 on a rail, was the lowest scoring clip worth 42 base points for a 50-50 and 25 additional points for holding the grind (link to cut of this clip). Clip 4, a line consisting of a melon, nose manual, 360 flip, and nollie frontside 180 heelflip, was the highest scoring clip worth 1,827 points (link to cut of this clip). In the case of clip 40, Ryan landed multiple tricks and the 180 spin multiplied his sub-total by 1.5 times, generating large gains. See appendix 1, point 6, for a table of points per clip and point 7 for a table of tricks, base points, etc. from which final points were derived.

Count	47
Mean	537.3
Standard Deviation	439.7
Min	67
25%	179.7
50%	400
75%	828.3
Max	1,827

Table 1

4. Next Steps

This project can be extended by analyzing more of Ryan's videos similar to what Jared Wilber did in Jenkem's article, *THIS DUDE STATISTICALLY ANALYZED EVERY JIM GRECO CLIP*. Furthermore, someone can develop or apply Street League Skateboarding's (SLS) scoring model to additional skateboarders' video clips. By applying SLS' model to more skateboarding (not just contest skateboarding), inherent biases may become evident. Additionally, developing a better understanding of the model would allow more precise forecasting of contest winners.

5. Notes

1. [Github repository with all backup files and code for this project.](#)

2. Base score decrease rates:

Trick performed once	100% base score
Trick performed twice	75% base score
Trick performed three times	50% base score
Trick performed four times	25% base score
Trick performed five or more times	10% base score

Note, tricks performed switch are still subject to 20% increase in base score prior to reduction for repeating.

3. I found discrepancies between sources for value when converting hertz (Hz) to FPS. Some sources showed 1:1 Hz to FPS conversion (50 Hz = 50 FPS), while others showed 2:1 Hz to FPS conversion (50 Hz = 25 FPS). For this paper I used 1:1 conversion.

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7. Appendix 1 Tables

1. Data collected from Ryan's Textures part:

Video	Clip	Obstacle	Trick Type	Trick	Hold Time Sec
Textures	1	Transition	Grind	Front 5-0	0.25
Textures	2	Transition	Lip	Back disaster	
Textures	3	Transition	Grind	Back blunt slide	0.25
Textures	4	Transition	Grab	Melon	1
Textures	4	Ledge	Manual	Nose manual	1
Textures	4	Flat	Flip	360 flip	
Textures	4	Flat	Flip	Nollie frontside heelflip	
Textures	5	Ledge	Ollie	Ollie	
Textures	5	Gap	Flip	Frontside shove-it	
Textures	5	Flat	Flip	Nollie heelflip	
Textures	5	Flat	Flip	Nollie 360 flip	
Textures	5	Ledge	Grind	Frontside noseblunt	0.5
Textures	6	Ledge	Grind	Backside nosegrind nollieflip out	0.75
Textures	7	Stairs	Spin	Switch backside 360	
Textures	8	Stairs	Flip	Switch backside bigflip	
Textures	9	Ledge	Grind	Backside tailslide shove-it out	0.25
Textures	9	Ledge	Grind	Frontside shove-it front nosegrind	0.25
Textures	9	Stairs	Flip	Frontside 180 kickflip	
Textures	10	Ledge	Grind	Switch shove-it backside 5-0 backside 180 out	1.25
Textures	11	Manual Pad	Manual	Switch backfoot impossible manual	1
Textures	12	Manual Pad	Manual	Manual to ollie gap to frontside lipside	1
Textures	12	Ledge	Grind	Frontside lipslide	0.25
Textures	12	Ledge	Grind	Frontside nosegrind to nollie backside flip out	0.25
Textures	13	Manual Pad	Manual	Nose manual to nollie backside 180 to switch backside crooked	2
Textures	13	Ledge	Grind	Switch backside crooked	0.25
Textures	14	Stairs	Flip	Kickflip	
Textures	15	Ledge	Ollie	Ollie	
Textures	15	Gap	Spin	Nollie backside 180	
Textures	15	Ledge	Grind	Switch backfoot impossible frontside noseslide	1
Textures	16	Manual Pad	Manual	Switch 360 flip manual	0.75
Textures	17	Ledge	Ollie	Ollie	
Textures	17	Gap	Flip	Backfoot impossible	
Textures	18	Ledge	Grind	Frontside noseblunt	0.25
Textures	19	Ledge	Ollie	Ollie	
Textures	19	Gap	Spin	Nollie backside 360	
Textures	20	Manual Pad	Manual	Manual kickflip out	3
Textures	20	Manual Pad	Manual	Nose manual	3
Textures	21	Stairs	Flip	Switch backside bigspin	
Textures	21	Stairs	Ollie	Ollie	
Textures	21	Stairs	Ollie	Ollie	
Textures	21	Stairs	Flip	Frontside shove-it	
Textures	22	Manual Pad	Manual	Switch kickflip to switch nose manual	2
Textures	23	Manual Pad	Manual	Nollie shove-it to nose manual nollie vairal kickflip out	1.25
Textures	24	Ledge	Grind	Nollie shove-it to frontside 5-0 to frontside 180 out	0.25
Textures	24	Ledge	Grind	Switch backside 270 to switch frontside tailslide to regular out	0.5
Textures	25	Ledge	Ollie	Ollie	
Textures	25	Ledge	Grind	Ollie gap to frontside tailslide to gap out to fakie	0.75
Textures	26	Ledge	Grind	Backside 50-50 to hippie jump out	1
Textures	27	Ledge	Ollie	Ollie	
Textures	27	Gap	Flip	Backside 180 kickflip	
Textures	28	Ledge	Ollie	Switch ollie	
Textures	28	Gap	Flip	Switch backside 180 kickflip	
Textures	29	Stairs	Spin	Switch frontside 180	
Textures	29	Stairs	Flip	Nollie frontside heelflip	
Textures	29	Stairs	Flip	Frontside 180 kickflip	
Textures	30	Stairs	Ollie	Ollie	
Textures	30	Ledge	Grind	Kickflip backside 50-50 to firecracker down stairs out	0.5
Textures	31	Gap	Ollie	Ollie	
Textures	31	Gap	Flip	Kickflip	

Textures	31Flat	Hill bomb	Hill bomb	
Textures	32Gap	Flip	Switch backfoot impossible	
Textures	33Ledge	Grind	Switch backside 180 to backside nosegrind	1.25
Textures	34Ledge	Grind	Fakie kickflip to switch backside nosegrind	1
Textures	35Manual Pad	Manual	Nose manual to nollie backside 180 kickflip out	1
Textures	36Manual Pad	Manual	Nose manual to hippie jump out	1.5
Textures	37Stairs	Flip	Switch backside 180 kickflip	
Textures	38Stairs	Flip	Nollie 360 flip	
Textures	39Gap	Flip	Switch 360 flip	
Textures	39Gap	Ollie	Switch ride off	
Textures	40Rail	Grind	Backside 50-50	0.5
Textures	41Stairs	Flip	Varial heelflip	
Textures	42Stairs	Spin	Frontside 180	
Textures	42Stairs	Flip	Switch backside bigspin	
Textures	43Stairs	Flip	Switch varial kickflip	
Textures	44Stairs	Flip	Switch backside bigspin	
Textures	45Stairs	Flip	Nollie backside bigspin	
Textures	46Stairs	Flip	Nollie backside 360 kickflip	
Textures	47Stairs	Flip	Switch backside 360 kickflip	

2. Obstacle counts per clip table:

Clip	Count
1	1
2	1
3	1
4	4
5	5
6	1
7	1
8	1
9	3
10	1
11	1
12	3
13	2
14	1
15	3
16	1
17	2
18	1
19	2
20	2
21	4
22	1
23	1
24	2
25	2
26	1
27	2
28	2
29	3
30	2
31	3
32	1
33	1
34	1
35	1
36	1
37	1
38	1
39	2
40	1
41	1
42	2
43	1
44	1
45	1
46	1
47	1
Total	78
AVG	1.7
Max	5
Min	1

3. Trick type counts per clip table:

Clip	Count
1	1
2	1
3	1
4	4
5	5
6	1
7	1
8	1
9	3
10	1
11	1
12	3
13	2
14	1
15	3
16	1
17	2
18	1
19	2
20	2
21	4
22	1
23	1
24	2
25	2
26	1
27	2
28	2
29	3
30	2
31	3
32	1
33	1
34	1
35	1
36	1
37	1
38	1
39	2
40	1
41	1
42	2
43	1
44	1
45	1
46	1
47	1
Total	78.0
AVG	1.7
Max	5
Min	1

4. Tricks and counts table:

Trick	Count
Ollie	10
Switch backside bigspin	3
Frontside 180 kickflip	2
Kickflip	2
Switch backside 180 kickflip	2
Frontside noseblunt	2
Frontside shove-it	2
Nollie 360 flip	2
Nollie frontside heelflip	2
Nose manual	2
Backside 50-50 to hippie jump out	1
Switch backside 180 to backside nosegrind	1
Ollie gap to frontside tailslide to gap out to fakie	1
Backside kickflip	1
Switch ollie	1
Switch backside 270 to switch frontside tailslide to regular out	1
Switch frontside 180	1
Kickflip backside 50-50 to firecracker down stairs out	1
Hill bomb	1
Switch backfoot impossible	1
Front 5-0	1
Fakie kickflip to switch backside nosegrind	1
Nose manual to nollie backside 180 kickflip out	1
Nollie shove-it to nose manual nollie vairal kickflip out	1
Nose manual to hippie jump out	1
Switch 360 flip	1
Switch ride off	1
Backside 50-50	1
Varial heelflip	1
Frontside 180	1
Switch varial kickflip	1
Nollie backside bigspin	1
Nollie backside 360 kickflip	1
Nollie shove-it to frontside 5-0 to frontside 180 out	1
Backfoot impossible	1
Switch kickflip to switch nose manual	1
Manual kickflip out	1
Back blunt slide	1
Melon	1
360 flip	1
Nollie heelflip	1
Backside nosegrind nollieflip out	1
Switch backside 360	1
Switch backside bigflip	1
Backside tailslide shove-it out	1
Frontside shove-it front nosegrind	1
Switch shove-it backside 5-0 backside 180 out	1
Switch backfoot impossible manual	1
Manual to ollie gap to frontside lipside	1
Frontside lipslide	1
Frontside nosegrind to nollie backside flip out	1
Nose manual to nollie backside 180 to switch backside crooked	1
Switch backside crooked	1
Nollie backside 180	1
Switch backfoot impossible frontside noseslide	1
Switch 360 flip manual	1
Back disaster	1
Nollie backside 360	1
Switch backside 360 kickflip	1

5. Trick counts per clip table:

Clip	Trick Count
1	1
2	1
3	1
4	4
5	5
6	1
7	1
8	1
9	3
10	1
11	1
12	3
13	2
14	1
15	3
16	1
17	2
18	1
19	2
20	2
21	4
22	1
23	1
24	2
25	2
26	1
27	2
28	2
29	3
30	2
31	3
32	1
33	1
34	1
35	1
36	1
37	1
38	1
39	2
40	1
41	1
42	2
43	1
44	1
45	1
46	1
47	1
Total	78
AVG	1.7
Max	5.0
Min	1.0

6. Points per clip table:

Clip	Sub-Total Points	Max Spin Multiplier	Final Points
1	112.5	1	112.500
2	800	1	800.000
3	137.5	1	137.500
4	1218	1.5	1827.000
5	1775	1	1775.000
6	446.5	1	446.500
7	43.2	2	86.400
8	621.6	1.5	932.400
9	676	1.5	1014.000
10	300.5	1.5	450.750
11	170	1	170.000
12	876	1.5	1314.000
13	480.5	1.5	720.750
14	100	1	100.000
15	571	1.5	856.500
16	637.5	1	637.500
17	100	1	100.000
18	162.5	1	162.500
19	236	2	472.000
20	400	1	400.000
21	721.6	1.5	1082.400
22	220	1	220.000
23	862.5	1	862.500
24	667.9	1.75	1168.825
25	187.5	1	187.500
26	242	1	242.000
27	118	1.5	177.000
28	141.6	1.5	212.400
29	457.6	1.5	686.400
30	167	1	167.000
31	100	1	100.000
32	120	1	120.000
33	193.1	1.5	289.650
34	270	1	270.000
35	368	1.5	552.000
36	225	1	225.000
37	121.6	1.5	182.400
38	700	1	700.000
39	600	1	600.000
40	67	1	67.000
41	300	1	300.000
42	639.6	1.5	959.400
43	360	1	360.000
44	621.6	1.5	932.400
45	718	1.5	1077.000
46	336	2	672.000
47	163.2	2	326.400

Formula for scoring tricks:

points = (base points * switch multiplier) + hold points

final results = points * max spin multipliers

If there were repeated tricks, points formula shall be updated to:
points = ((base points * repeating penalty) * switch multiplier) + hold points

7. Tricks, base points, etc table:

Clip Trick	Base Points	Switch Multiplier Base Pts	Spin Multiplier Trick Total	Hold Time Sec	PAL 50 FPS 50 PTS Sec	NTSC 60 FPS 60 PTS Sec	Total PAL Points	Total NTSC Points
1Frontside 5-0	100			0.25	50	60	12.5	15
2Back disaster	800				50	60	0	0
3Back blunt slide	125			0.25	50	60	12.5	15
4360 flip	500				50	60	0	0
4Frontside 180	18		1.5		50	60	0	0
4Heelflip	100				50	60	0	0
4Melon	300			1	50	60	50	60
4Nollie	200				50	60	0	0
4Nose manual	0			1	50	60	50	60
5360 flip	500				50	60	0	0
5360 flip	500				50	60	0	0
5Frontside noseblunt	150			0.5	50	60	25	30
5Frontside shove-it	100				50	60	0	0
5Heelflip	100				50	60	0	0
5Nollie	200				50	60	0	0
5Nollie	200				50	60	0	0
5Ollie	0				50	60	0	0
6Backside nosegrind	109			0.75	50	60	37.5	45
6Kickflip	100				50	60	0	0
6Nollie	200				50	60	0	0
7Switch backside 360	36	1.2	2		50	60	0	0
8Switch 360 flip	500	1.2			50	60	0	0
8Switch backside 180	18	1.2	1.5		50	60	0	0
9Backside tailslide	150			0.25	50	60	12.5	15
9Frontside 180	18		1.5		50	60	0	0
9Frontside nosegrind	183			0.25	50	60	12.5	15
9Frontside shove-it	100				50	60	0	0
9Kickflip	100				50	60	0	0
9Shove-it	100				50	60	0	0
10Backside 180	18		1.5		50	60	0	0
10Backside 5-0	100			1.25	50	60	62.5	75
10Switch shove-it	100	1.2			50	60	0	0
11Manual	0			1	50	60	50	60
11Switch backfoot impossible	100	1.2			50	60	0	0
12Backside 180	18		1.5		50	60	0	0
12Frontside lipslide	200			0.25	50	60	12.5	15
12Frontside nosegrind	183			0.25	50	60	12.5	15
12Kickflip	100				50	60	0	0
12Kickflip	100				50	60	0	0
12Manual	0			1	50	60	50	60
12Nollie	200				50	60	0	0
13Backside 180	18		1.5		50	60	0	0
13Nollie	200				50	60	0	0
13Nose manual	0			2	50	60	100	120
13Switch backside crooked	125	1.2		0.25	50	60	12.5	15
14Kickflip	100				50	60	0	0
15Backside 180	18		1.5		50	60	0	0
15Frontside noseslide	183			1	50	60	50	60
15Nollie	200				50	60	0	0
15Ollie	0				50	60	0	0
15Switch backfoot impossible	100	1.2			50	60	0	0
16Manual	0			0.75	50	60	37.5	45
16Switch 360 flip	500	1.2			50	60	0	0
17Backfoot impossible	100				50	60	0	0
17Ollie	0				50	60	0	0
18Frontside noseblunt	150			0.25	50	60	12.5	15
19Backside 360	36		2		50	60	0	0

19Nollie	200				50	60	0	0
19Ollie	0				50	60	0	0
20Kickflip	100				50	60	0	0
20Manual	0			3	50	60	150	180
20Nose manual	0			3	50	60	150	180
21Frontside shove-it	100				50	60	0	0
21Ollie	0				50	60	0	0
21Ollie	0				50	60	0	0
21Switch 360 shove-it	500	1.2			50	60	0	0
21Switch backside 180	18	1.2	1.5		50	60	0	0
22Switch kickflip	100	1.2			50	60	0	0
22Switch nose manual	0	1.2		2	50	60	100	120
23Nollie	200				50	60	0	0
23Nollie	200				50	60	0	0
23Nose manual	0			1.25	50	60	62.5	75
23Shove-it	100				50	60	0	0
23Varial kickflip	300				50	60	0	0
24Frontside 180	18		1.5		50	60	0	0
24Frontside 5-0	100			0.25	50	60	12.5	15
24Nollie	200				50	60	0	0
24Shove-it	100				50	60	0	0
24Switch backside 270	27	1.2	1.75		50	60	0	0
24Switch frontside tailslide	150	1.2		0.5	50	60	25	30
25Ollie	0				50	60	0	0
25Ollie gap to frontside tailslide to gap out to fakie	150			0.75	50	60	37.5	45
26Backside 50-50	42			1	50	60	50	60
26Hippie jump	150				50	60	0	0
27Backside 180	18		1.5		50	60	0	0
27Kickflip	100				50	60	0	0
27Ollie	0				50	60	0	0
28Switch backside 180	18	1.2	1.5		50	60	0	0
28Switch kickflip	100	1.2			50	60	0	0
28Switch ollie	0	1.2			50	60	0	0
29Frontside 180	18		1.5		50	60	0	0
29Frontside 180	18		1.5		50	60	0	0
29Heelflip	100				50	60	0	0
29Kickflip	100				50	60	0	0
29Nollie	200				50	60	0	0
29Switch frontside 180	18	1.2	1.5		50	60	0	0
30Backside 50-50	42			0.5	50	60	25	30
30Kickflip	100				50	60	0	0
30Ollie	0				50	60	0	0
31Hill bomb	0				50	60	0	0
31Kickflip	100				50	60	0	0
31Ollie	0				50	60	0	0
32Switch backfoot impossible	100	1.2			50	60	0	0
33Backside nosegrind	109			1.25	50	60	62.5	75
33Switch backside 180	18	1.2	1.5		50	60	0	0
34Fakie ollie	0				50	60	0	0
34Kickflip	100				50	60	0	0
34Switch backside nosegrind	100	1.2		1	50	60	50	60
35Backside 180	18		1.5		50	60	0	0
35Kickflip	100				50	60	0	0
35Nollie	200				50	60	0	0
35Nose manual	0			1	50	60	50	60
36Hippie jump	150				50	60	0	0
36Nose manual	0			1.5	50	60	75	90
37Kickflip	100				50	60	0	0
37Switch backside 180	18	1.2	1.5		50	60	0	0
38360 flip	500				50	60	0	0

38Nollie	200				50	60	0	0
39Switch 360 flip	500	1.2			50	60	0	0
39Switch ride off	0	1.2			50	60	0	0
40Backside 50-50	42			0.5	50	60	25	30
41Varial heelflip	300				50	60	0	0
42Frontside 180	18		1.5		50	60	0	0
42Switch 360 shove-it	500	1.2			50	60	0	0
42Switch backside 180	18	1.2	1.5		50	60	0	0
43Switch varial kickflip	300	1.2			50	60	0	0
44Switch 360 shove-it	500	1.2			50	60	0	0
44Switch backside 180	18	1.2	1.5		50	60	0	0
45360 shove-it	500				50	60	0	0
45Backside 180	18		1.5		50	60	0	0
45Nollie	200				50	60	0	0
46Backside 360	36		2		50	60	0	0
46Kickflip	100				50	60	0	0
46Nollie	200				50	60	0	0
47Switch backside 360	36	1.2	2		50	60	0	0
47Switch kickflip	100	1.2			50	60	0	0

8. Appendix 2 Code

https://github.com/NollieAnalysis/Walker-Ryans-Textures-Skateboarding-Part-Analysis-and-Point-Evaluation-Using-THPS-Scoring-Model/tree/main

Python code

```python
###########################
# count data for obstacles, trick types, and tricks
###########################



import pandas as pd

# Data setup
df = pd.read_csv("/walker-ryan-skate-part-tricks(Part-Analysis)(REV1)(CSV).csv")
print(df.head())

# Function to count something overall
def count_something_overall(df, category):
    counts_overall = df[category].value_counts().reset_index()
    counts_overall.columns = [category, "Count"]
    return counts_overall

# Function to count something per clip
def count_something_per_clip(df, category):
    clip_counts = df.groupby('Clip')[category].apply(lambda x:
x.dropna().count()).reset_index()
    clip_counts.columns = ['Clip', f'{category}_Count']
    return clip_counts

# Obstacles
obstacle_counts_overall = count_something_overall(df, 'Obstacle')
print(obstacle_counts_overall)

obstacle_counts_per_clip = count_something_per_clip(df, 'Obstacle')
print(obstacle_counts_per_clip)

# Trick Types
trick_type_counts_overall = count_something_overall(df, 'Trick_Type')
print(trick_type_counts_overall)

trick_type_counts_per_clip = count_something_per_clip(df, 'Trick_Type')
print(trick_type_counts_per_clip)

# Tricks
trick_counts_overall = count_something_overall(df, 'Trick')
print(trick_counts_overall)

trick_counts_per_clip = count_something_per_clip(df, 'Trick')
print(trick_counts_per_clip)


# combine obstacle, trick type, and tricks overall and per clip data into one data frame and
give option to save as CSV
obstacle_trick_types_tricks_dfs_combined = pd.concat(objs = [obstacle_counts_overall,
obstacle_counts_per_clip, trick_type_counts_overall, trick_type_counts_per_clip,
trick_counts_overall, trick_counts_per_clip], axis = 1)
print(obstacle_trick_types_tricks_dfs_combined)
print(obstacle_trick_types_tricks_dfs_combined.columns)
#obstacle_trick_types_tricks_dfs_combined.to_csv('obstacle_trick_types_tricks_dfs_combined.c
sv', index=False)
```

```python
###########################
# points for clips and overall score
###########################



import pandas as pd

# Load the data
tricks_data = pd.read_csv("/walker-ryan-part-tricks-and-holds-time(REV1)(COMBINED_DATA)
(CSV).csv")
print(tricks_data.head())


# Calculate the points
def calculate_final_points(row, use_pal=True):
    # Get the base points
    base_points = row['Base_Points'] if not pd.isna(row['Base_Points']) else 0
    switch_multiplier = row['Switch_Multiplier_Base_Pts'] if not
pd.isna(row['Switch_Multiplier_Base_Pts']) else 1
    spin_multiplier = row['Spin_Multiplier_Trick_Total'] if not
pd.isna(row['Spin_Multiplier_Trick_Total']) else 1
    hold_points = row['Total_PAL_Points'] if use_pal else row['Total_NTSC_Points']

    # Calculate the points
    points = (base_points * switch_multiplier) + hold_points

    return points, spin_multiplier
# If there were repeated tricks, points formula shall be updated to:
# points = ((base points * repeating penatly) * switch multiplier) + hold points

# Apply the function to calculate points and spin multipliers
tricks_data[['Points', 'Spin_Multiplier']] = tricks_data.apply(lambda row:
calculate_final_points(row), axis=1, result_type='expand')

# Group by Clip and calculate total points and max spin multiplier for each clip
final_results = tricks_data.groupby('Clip').apply(lambda x: pd.Series({
    'Total_Points': x['Points'].sum(),
    'Max_Spin_Multiplier': x['Spin_Multiplier'].max()
}))

# Adjust total points by the max spin multiplier
final_results['Final_Points'] = final_results['Total_Points'] *
final_results['Max_Spin_Multiplier']

# Print the results for each clip
print(final_results)
#final_results.to_csv('Final_Results_Points.csv', index= False)

# summary statistics of 'final_results'Walker
print(final_results['Final_Points'].describe())

# Calculate and print the overall point value
overall_points = final_results['Final_Points'].sum()
print(f"Overall Point Value: {overall_points}")

print(tricks_data[tricks_data['Clip'] == 4].iloc[:,:]) # clip 4 has highest overall score
print(tricks_data[tricks_data['Clip'] == 40].iloc[:,:]) # clip 40 has lowest overall score
print(tricks_data[tricks_data['Clip'] == 22].iloc[:,:]) # checking switch nose manual score
to make sure calculating correctly with zero base points. Correct with zero base points.
```

R code

```
#######################
# upload data
#######################

# packages = ggplot2 and tidyverse

obstacle_trick_types_tricks_counts_dfs_combined <-
read.csv("/obstacle_trick_types_tricks_counts_dfs_combined.csv")
head(obstacle_trick_types_tricks_counts_dfs_combined)
colnames(obstacle_trick_types_tricks_counts_dfs_combined)


#######################
# end upload data
#######################



#######################
# visuals for obstacle counts
#######################


# slice df for obstacle count overall
df_obstacle_count_overall <- obstacle_trick_types_tricks_counts_dfs_combined [1:7, c(1,2)]

# Sort data frame in descending order by count
df_obstacle_count_overall <- df_obstacle_count_overall[order(-
df_obstacle_count_overall$Count),]

# Set the order of the Trick_Type factor based on the sorted data and reverse it
df_obstacle_count_overall$Obstacle <- factor(df_obstacle_count_overall$Obstacle,
                                             levels =
rev(df_obstacle_count_overall$Obstacle))


head(df_obstacle_count_overall)


# pie chart (option 3)  ******************
# Sort data frame in descending order by count
df_obstacle_count_overall <- df_obstacle_count_overall %>%
  arrange(desc(Count))

# Calculate the percentage for each category
df_obstacle_count_overall <- df_obstacle_count_overall %>%
  mutate(Percentage = Count / sum(Count) * 100)

# Create a new label for the legend
df_obstacle_count_overall <- df_obstacle_count_overall %>%
  mutate(LegendLabel = paste0(Obstacle, " (", Count, ")"))

# Set the order of the Obstacle factor based on the sorted data
df_obstacle_count_overall$Obstacle <- factor(df_obstacle_count_overall$Obstacle, levels =
df_obstacle_count_overall$Obstacle)

# Plot using ggplot2
pie <- ggplot(df_obstacle_count_overall, aes(x = "", y = Count, fill = Obstacle)) +
  geom_bar(stat = "identity", width = 1, color = "white") + # Add white border for slices
  coord_polar(theta = "y", start = pi/2, direction = -1) + # Change to y for pie chart and
set start angle to 90 degrees (pi/2 radians) and clockwise direction
  labs(title = "Obstacle Counts", x = NULL, y = NULL) + # Add title and remove axis titles
```

```r
  theme_minimal() + # Apply minimal theme
  theme(axis.text.x = element_blank(), # Remove x-axis text
        axis.text.y = element_blank(), # Remove y-axis text
        axis.ticks = element_blank(), # Remove axis ticks
        panel.grid = element_blank(), # Remove grid lines
        plot.title = element_text(size = 20, face = "bold", hjust = 0.5), # Customize title
        legend.title = element_text(size = 12), # Customize legend title
        legend.text = element_text(size = 10)) + # Customize legend text
  scale_fill_manual(values = scales::hue_pal()
(length(unique(df_obstacle_count_overall$Obstacle))),
                    labels = df_obstacle_count_overall$LegendLabel) + # Ensure legend order
matches the data and include counts
  geom_text(aes(label = sprintf("%.1f%%", Percentage)), position = position_stack(vjust =
0.5)) # Add percentage labels inside pie slices

# Display pie chart
print(pie)


#######################
# end visuals for obstacle counts
#######################



#################
# visuals for trick types
#################


# slice df for trick type count overall
df_trick_type_count_overall <- obstacle_trick_types_tricks_counts_dfs_combined [1:8, c(5,6)]

# Sort data frame in descending order by count
df_trick_type_count_overall <- df_trick_type_count_overall[order(-
df_trick_type_count_overall$Count.1),]

# Set the order of the Trick_Type factor based on the sorted data
df_trick_type_count_overall$Trick_Type <- factor(df_trick_type_count_overall$Trick_Type,
                                                  levels =
rev(df_trick_type_count_overall$Trick_Type))
head(df_trick_type_count_overall)


# pie chart (option 3)  *******************
# Sort data frame in descending order by count
df_trick_type_count_overall <- df_trick_type_count_overall %>%
  arrange(desc(Count.1))

# Calculate the percentage for each category
df_trick_type_count_overall <- df_trick_type_count_overall %>%
  mutate(Percentage = Count.1 / sum(Count.1) * 100)

# Create a new label for the legend
df_trick_type_count_overall <- df_trick_type_count_overall %>%
  mutate(LegendLabel = paste0(Trick_Type, " (", Count.1, ")"))

# Set the order of the Obstacle factor based on the sorted data
df_trick_type_count_overall$Trick_Type <- factor(df_trick_type_count_overall$Trick_Type,
levels = df_trick_type_count_overall$Trick_Type)

# Plot using ggplot2
pie <- ggplot(df_trick_type_count_overall, aes(x = "", y = Count.1, fill = Trick_Type)) +
  geom_bar(stat = "identity", width = 1, color = "white") + # Add white border for slices
  coord_polar(theta = "y", start = pi/2, direction = -1) + # Change to y for pie chart and
set start angle to 90 degrees (pi/2 radians) and clockwise direction
```

```r
  labs(title = "Trick Type Counts", x = NULL, y = NULL) + # Add title and remove axis titles
  theme_minimal() + # Apply minimal theme
  theme(axis.text.x = element_blank(), # Remove x-axis text
        axis.text.y = element_blank(), # Remove y-axis text
        axis.ticks = element_blank(), # Remove axis ticks
        panel.grid = element_blank(), # Remove grid lines
        plot.title = element_text(size = 20, face = "bold", hjust = 0.5), # Customize title
        legend.title = element_text(size = 12), # Customize legend title
        legend.text = element_text(size = 10)) + # Customize legend text
  scale_fill_manual(values = scales::hue_pal()
(length(unique(df_trick_type_count_overall$Trick_Type))),
                    labels = df_trick_type_count_overall$LegendLabel) + # Ensure legend
order matches the data and include counts
  geom_text(aes(label = sprintf("%.1f%%", Percentage)), position = position_stack(vjust =
0.5)) # Add percentage labels inside pie slices

# Display pie chart
print(pie)


##################
# end visuals for trick types
##################
```