

Identification of some factors influencing soil transfer on shoes

Denis Werner¹, Céline Burnier¹, Yingchao Yu², André R. Marolf¹, Yuanfeng Wang^{2,3}, Geneviève Massonnet^{1*}

¹ Ecole des sciences criminelles, University of Lausanne, Bâtiment Batochime, 1015 Lausanne-Dorigny, Switzerland

² Institute of Evidence Law and Forensic Science, China University of Political Science and Law, China

³ Key Laboratory of Evidence Science, Ministry of Education, China

* Corresponding author: Genevieve.Massonnet@unil.ch

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Table S1 – Raw data associated with the FFD experiments. The average for the centre points was used in the article.

Experiment	Design order	Experiment order	A – Profile [-]	B – Weight [kg]	C – Size [EUR]	D – Type of soil	E – Humidity [% w/w]	Amount of soil [g]
Center_point_01_Left	65	1	Medium (Nike® Air)	65	40	Mix 50/50 [% w/w]	40	57.54
Center_point_01_Right	65	1	Medium (Nike® Air)	65	40	Mix 50/50 [% w/w]	40	19.37
c_Left	5	2	Low (Converse® All Star)	50	42	Soil 1	25	18.77
c_Right	37	2	Low (Converse® All Star)	50	42	Soil 1	25	16.67
abd_Left	12	3	High (Swiss Military)	80	38	Soil 2	25	0.44
abd_Right	44	3	High (Swiss Military)	80	38	Soil 2	25	0.52
bce_Left	23	4	Low (Converse® All Star)	80	42	Soil 1	55	4.35
bce_Right	55	4	Low (Converse® All Star)	80	42	Soil 1	55	1.62
a_Left	2	5	High (Swiss Military)	50	38	Soil 1	25	12.88
a_Right	34	5	High (Swiss Military)	50	38	Soil 1	25	13.06
abe_Left	20	6	High (Swiss Military)	80	38	Soil 1	55	0.87
abe_Right	52	6	High (Swiss Military)	80	38	Soil 1	55	0.51
cd_Left	13	7	Low (Converse® All Star)	50	42	Soil 2	25	0.23
cd_Right	45	7	Low (Converse® All Star)	50	42	Soil 2	25	0.11
ae_Left	18	8	High (Swiss Military)	50	38	Soil 1	55	1.21
ae_Right	50	8	High (Swiss Military)	50	38	Soil 1	55	0.26
acd_Left	14	9	High (Swiss Military)	50	42	Soil 2	25	0.06
acd_Right	46	9	High (Swiss Military)	50	42	Soil 2	25	0.32
de_Left	25	10	Low (Converse® All Star)	50	38	Soil 2	55	3.29
de_Right	57	10	Low (Converse® All Star)	50	38	Soil 2	55	5.73
bcde_Left	31	11	Low (Converse® All Star)	80	42	Soil 2	55	7.65
bcde_Right	63	11	Low (Converse® All Star)	80	42	Soil 2	55	8.25
abcde_Left	32	12	High (Swiss Military)	80	42	Soil 2	55	3.91
abcde_Right	64	12	High (Swiss Military)	80	42	Soil 2	55	4.51
Center_point_03_Left	67	13	Medium (Nike® Air)	65	40	Mix 50/50 [% w/w]	40	65.57
Center_point_03_Right	67	13	Medium (Nike® Air)	65	40	Mix 50/50 [% w/w]	40	37.85
d_Left	9	14	Low (Converse® All Star)	50	38	Soil 2	25	0.04
d_Right	41	14	Low (Converse® All Star)	50	38	Soil 2	25	0.17
bc_Left	7	15	Low (Converse® All Star)	80	42	Soil 1	25	9.60
bc_Right	39	15	Low (Converse® All Star)	80	42	Soil 1	25	8.68
abcd_Left	16	16	High (Swiss Military)	80	42	Soil 2	25	0.06
abcd_Right	48	16	High (Swiss Military)	80	42	Soil 2	25	0.04
ac_Left	6	17	High (Swiss Military)	50	42	Soil 1	25	2.09
ac_Right	38	17	High (Swiss Military)	50	42	Soil 1	25	1.51
ab_Left	4	18	High (Swiss Military)	80	38	Soil 1	25	3.76
ab_Right	36	18	High (Swiss Military)	80	38	Soil 1	25	2.00
abce_Left	24	19	High (Swiss Military)	80	42	Soil 1	55	1.17
abce_Right	56	19	High (Swiss Military)	80	42	Soil 1	55	0.34
Center_point_05_Left	69	20	Medium (Nike® Air)	65	40	Mix 50/50 [% w/w]	40	64.26

Experiment	Design order	Experiment order	A – Profile [-]	B – Weight [kg]	C – Size [EUR]	D – Type of soil	E – Humidity [% w/w]	Amount of soil [g]
Center_point_05_Right	69	20	Medium (Nike® Air)	65	40	Mix 50/50 [% w/w]	40	56.62
ace_Left	22	21	High (Swiss Military)	50	42	Soil 1	55	1.03
ace_Right	54	21	High (Swiss Military)	50	42	Soil 1	55	0.42
cde_Left	29	22	Low (Converse® All Star)	50	42	Soil 2	55	2.75
cde_Right	61	22	Low (Converse® All Star)	50	42	Soil 2	55	5.22
ce_Left	21	23	Low (Converse® All Star)	50	42	Soil 1	55	5.70
ce_Right	53	23	Low (Converse® All Star)	50	42	Soil 1	55	2.70
bcd_Left	15	24	Low (Converse® All Star)	80	42	Soil 2	25	0.04
bcd_Right	47	24	Low (Converse® All Star)	80	42	Soil 2	25	0.06
ad_Left	10	25	High (Swiss Military)	50	38	Soil 2	25	0.05
ad_Right	42	25	High (Swiss Military)	50	38	Soil 2	25	0.09
abc_Left	8	26	High (Swiss Military)	80	42	Soil 1	25	1.41
abc_Right	40	26	High (Swiss Military)	80	42	Soil 1	25	1.02
Center_point_04_Left	68	27	Medium (Nike® Air)	65	40	Mix 50/50 [% w/w]	40	66.35
Center_point_04_Right	68	27	Medium (Nike® Air)	65	40	Mix 50/50 [% w/w]	40	51.54
e_Left	17	28	Low (Converse® All Star)	50	38	Soil 1	55	5.17
e_Right	49	28	Low (Converse® All Star)	50	38	Soil 1	55	1.89
be_Left	19	29	Low (Converse® All Star)	80	38	Soil 1	55	8.38
be_Right	51	29	Low (Converse® All Star)	80	38	Soil 1	55	2.11
bde_Left	27	30	Low (Converse® All Star)	80	38	Soil 2	55	1.48
bde_Right	59	30	Low (Converse® All Star)	80	38	Soil 2	55	7.89
acde_Left	30	31	High (Swiss Military)	50	42	Soil 2	55	0.53
acde_Right	62	31	High (Swiss Military)	50	42	Soil 2	55	1.30
ade_Left	26	32	High (Swiss Military)	50	38	Soil 2	55	0.94
ade_Right	58	32	High (Swiss Military)	50	38	Soil 2	55	1.76
l_Left	1	33	Low (Converse® All Star)	50	38	Soil 1	25	1.65
l_Right	33	33	Low (Converse® All Star)	50	38	Soil 1	25	2.23
abde_Left	28	34	High (Swiss Military)	80	38	Soil 2	55	1.34
abde_Right	60	34	High (Swiss Military)	80	38	Soil 2	55	3.00
b_Left	3	35	Low (Converse® All Star)	80	38	Soil 1	25	3.75
b_Right	35	35	Low (Converse® All Star)	80	38	Soil 1	25	5.03
Center_point_02_Left	66	36	Medium (Nike® Air)	65	40	Mix 50/50 [% w/w]	40	64.58
Center_point_02_Right	66	36	Medium (Nike® Air)	65	40	Mix 50/50 [% w/w]	40	38.68
bd_Left	11	37	Low (Converse® All Star)	80	38	Soil 2	25	0.08
bd_Right	43	37	Low (Converse® All Star)	80	38	Soil 2	25	0.04

Table S2 – Analysis of significance of the effects on the response after applying FFD to screen the factors. “NS”: Non-significant (p-value ≥ 0.05), “-”: weakly negative effect (p-value = [0.01:0.05]), “--”: moderately negative effect (p-value = [0.005:0.01]), “---”: highly negative effect (p-value < 0.005), “+”: weakly positive effect (p-value = [0.01:0.05]), “++”: moderately positive effect (p-value = [0.005:0.01]), “+++”: highly positive effect (p-value < 0.005).

Effects	Significance
Profile (A)	---
Weight (B)	NS
Size (C)	NS
Type of soil (D)	---
Humidity (E)	NS
Profile * Weight (AB)	NS
Profile * Size (AC)	-
Profile * Type of soil (AD)	NS
Profile * Humidity (AE)	NS
Weight * Size (BC)	NS
Weight * Type of soil (BD)	NS
Weight * Humidity (BE)	NS
Size * Type of soil (CD)	NS
Size * Humidity (CE)	NS
Type of soil * Humidity (DE)	+++
Profile * Weight * Size (ABC)	NS
Profile * Weight * Type of soil (ABD)	NS
Profile * Weight * Humidity (ABE)	NS
Profile * Size * Type of soil (ACD)	+
Profile * Size * Humidity (ACE)	+
Profile * Type of soil * Humidity (ADE)	NS
Weight * Size * Type of soil (BCD)	NS
Weight * Size * Humidity (BCE)	NS
Weight * Type of soil * Humidity (BDE)	NS
Size * Type of soil * Humidity (CDE)	NS

Table S3 – Raw data associated with the FCCD experiments. * The 32 experiments missing are presented in the table S1: design orders 1 to 32 and 33 to 64 respectively for left and right shoe. ** Outlier excludes for the right shoe.

Experiment	Design order*	Experiment order	A – Profile [-]	B – Weight [kg]	C – Size [EUR]	D – Type of soil	E – Humidity [% w/w]	Amount of soil on left shoe [g]	Amount of soil on right shoe [g]
Axial_A_high	1	13	High (Swiss Military)	62	40	Mix 50/50 [% w/w]	40	38.43	49.33
Axial_A_low	2	11	High (Swiss Military)	62	40	Mix 50/50 [% w/w]	40	36.85	36.97
Axial_B_high	3	10	Medium (Nike® Air)	72	40	Mix 50/50 [% w/w]	40	43.30	35.84
Axial_B_low	4	5	Medium (Nike® Air)	52	40	Mix 50/50 [% w/w]	40	33.49	35.29
Axial_C_high	5	8	Medium (Nike® Air)	62	42	Mix 50/50 [% w/w]	40	32.68	41.70
Axial_C_low	6	3	Medium (Nike® Air)	62	38	Mix 50/50 [% w/w]	40	43.96	49.08
Axial_D_high	7	12	Medium (Nike® Air)	62	40	Soil 2	40	1.75	8.08
Axial_D_low	8	1	Medium (Nike® Air)	62	40	Soil 1	40	8.62	14.23
Axial_E_high	9	4	Medium (Nike® Air)	62	40	Mix 50/50 [% w/w]	55	3.42	4.81
Axial_E_low	10	6	Medium (Nike® Air)	62	40	Mix 50/50 [% w/w]	25	0.68	0.42
Center_point_01	43	7	Medium (Nike® Air)	62	40	Mix 50/50 [% w/w]	40	34.62	29.17
Center_point_02	44	14	Medium (Nike® Air)	62	40	Mix 50/50 [% w/w]	40	36.84	27.59
Center_point_03	45	9	Medium (Nike® Air)	62	40	Mix 50/50 [% w/w]	40	34.33	42.20
Center_point_04	46	2	Medium (Nike® Air)	62	40	Mix 50/50 [% w/w]	40	33.55	53.41**