Guided or factual computer support for kidney patients with different experience levels and medical health situations: Preferences and usage

Underlying Analyses

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Contents

1 Introduction

This document presents inferential statitical analyses of participants, understanding, adherence, preference and attitude towards guided and factual communication style used in difference medical health sitations as reported in the paper:

Guided or factual computer support for kidney patients with different experience levels and medical health situations: Preferences and usage

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2 Data files

2.1 File results-upload.sav

Data files obtained from computer program is stored in SPSS file results-upload.sav.

Table 1: Fields and label from SPSS file results-upload.sav

variable	label
id	patient id
date	experiment date
group	patient experience level
gender	gender
age	age in year
edu	Dutch educational level
edu_other	educational level if chose 'other' in 'edu'
edu_int	transfered educational level into international form
work	work status
work_other	work status if chose 'other' in 'work'
job	job
work_hour	working hours per week
internet_use	internet use frequency
beenrenalpatient	been renal patient in year
tx_year	1st transplantation year
tx_month	1st tranplantation month
tx_years	years since transplantation
tx_months	months since transplantation
green_old_understand	if understand in 'alright' status with 'factual' style
green_old_do	if adhere in 'alright' status with 'factual' style
green_new_understand	if understand in 'alright' status with 'guided' style
green_new_do	if adhere in 'alright' status with 'guided' style
org_old_understand	if understand in 'mild concern' status with 'factual' style
org_old_do	if adhere in 'mild concern' status with 'factual' style
org_new_understand	if understand in 'mild concern' status with 'guided' style

variable	label
org_new_do	if adhere in 'mild concern' status with 'guided' style
red_old_understand	if understand in 'concern' status with 'factual' style
red_old_do	if adhere in 'concern' status with 'factual' style
red_new_understand	if understand in 'concern' status with 'guided' style
red_new_do	if adhere in 'concern' status with 'guided' style
green_old_follow	if understand and adhere in 'alright' status with 'factual' style
green_new_follow	if understand and adhere in 'alright' status with 'guided' style
org_old_follow	if understand and adhere in 'mild concern' status with 'factual' style
org_new_follow	if understand and adhere in 'mild concern' status with 'guided' style
red_old_follow	if understand and adhere in 'concern' status with 'factual' style
red_new_follow	if understand and adhere in 'concern' status with 'guided' style
org2m_old_understand	if understand in 'mild concern' status with 'factual' style and change style option
org2m_old_do	if adhere in 'mild concern' status with 'factual' style and change style option
org2m_new_understand	if understand in 'mild concern' status with 'guided' style and change style option
org2m_new_do	if adhere in 'mild concern' status with 'guided' style and change style option
green_old1_sug	patients' answer: what the system asked them to do, in 'alright' status with 'factual' style
green_old1_sug_other	patients' answer: what the system asked them to do, in 'alright' status with 'factual' style, if chose 'other' in 'green_old1_sug'
green_old2_selfDo	patients' answer: what they would do, in 'alright' status with 'factual' style
green_old3_reason	patients' answer: why they would do that, in 'alright' status with 'factual' style
GREEN1	patients' answer: why they would do that, in 'alright' status with 'factual' style
green_old4_manierPrettig	patients' answer: how much they liked the way that the system had supported them, in 'alright' status with 'factual' style
green_old5_infoClear	patients' answer: how effectively or ineffectively the information was presented, in 'alright' status with 'factual' style
green_old6_bezorgd	patients' answer: how worried or relaxed the information made them feel, in 'alright' status with 'factual' style

variable	label
green_old7_behandeldPrettig	patients' answer: with how much dignity they were treated by the system, in 'alright' status with 'factual' style
green_new1_sug	patients' answer: what the system asked them to do, in 'alright' status with 'guided' style
green_new2_selfDo	patients' answer: what they would do, in 'alright' status with 'guided' style
green_new3_reason	patients' answer: why they would do that, in 'alright' status with 'guided' style
GREEN0	patients' answer: why they would do that, in 'alright' status with 'guided' style
green_new4_manierPrettig	patients' answer: how much they liked the way that the system had supported them, in 'alright' status with 'guided' style
green_new5_infoClear	patients' answer: how effectively or ineffectively the information was presented, in 'alright' status with 'guided' style
green_new6_bezorgd	patients' answer: how worried or relaxed the information made them feel, in 'alright' status with 'guided' style
green_new7_behandeldPrettig	patients' answer: with how much dignity they were treated by the system, in 'alright' status with 'guided' style
org_old1_sug	patients' answer: what the system asked them to do, in 'mild concern' status with 'factual' style
org_old1_sug_other	patients' answer: what the system asked them to do, in 'mild concern' status with 'factual' style, if chose 'other' in 'green_old1_sug'
org_old2_selfDo	patients' answer: what they would do, in 'mild concern' status with 'factual' style
org_old2_selfDo_other	patients' answer: what they would do, in 'mild concern' status with 'factual' style, if chose 'other' in 'org_old2_sug'
org_old3_reason	patients' answer: why they would do that, in 'mild concern' status with 'factual' style
ORG_O0	patients' answer: why they would do that, in 'mild concern' status with 'factual' style
ORG_O1	patients' answer: why they would do that, in 'mild concern' status with 'factual' style
org_old4_manierPrettig	patients' answer: how much they liked the way that the system had supported them, in 'mild concern' status with 'factual' style
org_old5_infoClear	patients' answer: how effectively or ineffectively the information was presented, in 'mild concern' status with 'factual' style
org_old6_bezorgd	patients' answer: how worried or relaxed the information made them feel, in 'mild concern' status with 'factual' style
org_old7_behandeldPrettig	patients' answer: with how much dignity they were treated by the system, in 'mild concern' status with 'factual' style

variable	label
org_new1_sug	patients' answer: what the system asked them to do, in 'mild concern' status with 'guided' style
org_new2_selfDo	patients' answer: what they would do, in 'mild concern' status with 'guided' style
org_new2_selfDo_other	patients' answer: what they would do, in 'mild concern' status with 'guided' style, if chose 'other' in 'org_new2_sug'
org_new3_reason	patients' answer: why they would do that, in 'mild concern' status with 'guided' style
ORG_N0	patients' answer: why they would do that, in 'mild concern' status with 'guided' style
ORG_N1	patients' answer: why they would do that, in 'mild concern' status with 'guided' style
ORG_N2	patients' answer: why they would do that, in 'mild concern' status with 'guided' style
org_new4_manierPrettig	patients' answer: how much they liked the way that the system had supported them, in 'mild concern' status with 'guided' style
org_new5_infoClear	patients' answer: how effectively or ineffectively the information was presented, in 'mild concern' status with 'guided' style
org_new6_bezorgd	patients' answer: how worried or relaxed the information made them feel, in 'mild concern' status with 'guided' style
org_new7_behandeldPrettig	patients' answer: with how much dignity they were treated by the system, in 'mild concern' status with 'guided' style
red_old1_sug	patients' answer: what the system asked them to do, in 'concern' status with 'factual' style
red_old2_selfDo	patients' answer: what they would do, in 'concern' status with 'factual' style
red_old2_selfDo_other	patients' answer: what they would do, in 'concern' status with 'factual' style, if chose 'other' in 'red_old2_sug'
red_old3_reason	patients' answer: why they would do that, in 'concern' status with 'factual' style
RED_O0	patients' answer: why they would do that, in 'concern' status with 'factual' style
red_old4_manierPrettig	patients' answer: how much they liked the way that the system had supported them, in 'concern' status with 'factual' style
red_old5_infoClear	patients' answer: how effectively or ineffectively the information was presented, in 'concern' status with 'factual' style
red_old6_bezorgd	patients' answer: how worried or relaxed the information made them feel, in 'concern' status with 'factual' style
red_old7_behandeldPrettig	patients' answer: with how much dignity they were treated by the system, in 'concern' status with 'factual' style

variable	label
red_new1_sug	patients' answer: what the system asked them to do, in 'concern' status with 'guided' style
red_new2_selfDo	patients' answer: what they would do, in 'concern' status with 'guided' style
red_new2_selfDo_other	patients' answer: what they would do, in 'concern' status with 'guided' style, if chose 'other' in 'red_new2_sug'
red_new3_reason	patients' answer: why they would do that, in 'concern' status with 'guided' style
RED_N0	patients' answer: why they would do that, in 'concern' status with 'guided' style
RED_N1	patients' answer: why they would do that, in 'concern' status with 'guided' style
red_new4_manierPrettig	patients' answer: how much they liked the way that the system had supported them, in 'concern' status with 'guided' style
red_new5_infoClear	patients' answer: how effectively or ineffectively the information was presented, in 'concern' status with 'guided' style
red_new6_bezorgd	patients' answer: how worried or relaxed the information made them feel, in 'concern' status with 'guided' style
red_new7_behandeldPrettig	patients' answer: with how much dignity they were treated by the system, in 'concern' status with 'guided' style
org2m_old1_sug	patients' answer: what the system asked them to do, in 'mild concern' status with 'factual' style and change style option
org2m_old2_selfDo	patients' answer: what they would do, in 'mild concern' status with 'factual' style and change style option
org2m_old3_reason	patients' answer: why they would do that, in 'mild concern' status with 'factual' style and change style option
ORG2M2	patients' answer: why they would do that, in 'mild concern' status with 'factual' style and change style option
org2m_old4_manierPrettig	patients' answer: how much they liked the way that the system had supported them, in 'mild concern' status with 'factual' style and change style option
org2m_old5_infoClear	patients' answer: how effectively or ineffectively the information was presented, in 'mild concern' status with 'factual' style and change style option
org2m_old6_bezorgd	patients' answer: how worried or relaxed the information made them feel, in 'mild concern' status with 'factual' style and change style option

variable	label
org2m_old7_behandeldPrettig	patients' answer: with how much dignity they were treated by the system, in 'mild concern' status with 'factual' style and change style option
org2m_new1_sug	patients' answer: what the system asked them to do, in 'mild concern' status with 'guided' style and change style option
org2m_new2_selfDo	patients' answer: what they would do, in 'mild concern' status with 'guided' style and change style option
org2m_new2_selfDo_other	patients' answer: what they would do, in 'mild concern' status with 'guided' style, if chose 'other' in 'org2m_new2_sug' and change style option
org2m_new3_reason	patients' answer: why they would do that, in 'mild concern' status with 'guided' style and change style option
ORG2M0	patients' answer: why they would do that, in 'mild concern' status with 'guided' style and change style option
ORG2M1	patients' answer: why they would do that, in 'mild concern' status with 'guided' style and change style option
org2m_new4_manierPrettig	patients' answer: how much they liked the way that the system had supported them, in 'mild concern' status with 'guided' style and change style option
org2m_new5_infoClear	patients' answer: how effectively or ineffectively the information was presented, in 'mild concern' status with 'guided' style and change style option
org2m_new6_bezorgd	patients' answer: how worried or relaxed the information made them feel, in 'mild concern' status with 'guided' style and change style option
org2m_new7_behandeldPrettig	patients' answer: with how much dignity they were treated by the system, in 'mild concern' status with 'guided' style and change style option
green_pre	preference of the 2 styles in 'alright' status
org_pre	preference of the 2 styles in 'mild concern' status
red_pre	preference of the 2 styles in 'concern' status
green_pra_old_tip	if clicked 'did you know' link in 'alright' stastus with 'factual' style when practise with the system
green_pra_old_learnMore	if clicked 'learn more' link in 'alright' stastus with 'factual' style when practise with the system
green_pra_old_algorithm	if clicked the link to algorithem in 'alright' stastus with 'factual' style when practise with the system

variable	label
green_pra_new_tip	if clicked 'did you know' link in 'alright' stastus with 'guided' style when practise with the system
green_pra_new_learnMore	if clicked 'learn more' link in 'alright' stastus with 'guided' style when practise with the system
green_pra_new_algorithem	if clicked the link to algorithem in 'alright' stastus with 'guided' style when practise with the system
green_old_tip	if clicked 'did you know' link in 'alright' stastus with 'factual' style
green_old_learnMore	if clicked 'learn more' link in 'alright' stastus with 'factual' style
green_old_algorithm	if clicked the link to algorithem in 'alright' stastus with 'factual' style
green_new_tip	if clicked 'did you know' link in 'alright' stastus with 'guided' style
green_new_learnMore	if clicked 'learn more' link in 'alright' stastus with 'guided' style
green_new_algorithm	if clicked the link to algorithem in 'alright' stastus with 'guided' style
org_old_learnMore	if clicked 'learn more' link in 'mild concern' stastus with 'factual' style
org_old_algorithm	if clicked the link to algorithem in 'mild concern' stastus with 'factual' style
org_new_learnKidney	if clicked the link to explanation of current renal status in 'mild concern' stastus with 'guided' style
org_new_learnKidney_facts	if clicked the link to fact of current renal status in 'mild concern' stastus with 'guided' style
org_new_learnOtherFactor	if clicked the link to explanation of possible factors of current situation in 'mild concern' stastus with 'guided' style
red_old_learnMore	if clicked 'learn more' link in 'concern' stastus with 'factual' style
red_old_algorithm	if clicked the link to algorithem in 'concern' stastus with 'factual' style
red_new_learnMore	if clicked 'learn more' link in 'concern' stastus with 'guided' style
red_new_learnFacts	if clicked the link to algorithem in 'concern' stastus with 'guided' style
org_old2m_switch	if switched the style in 'mild concern' status with 'factual' style and change style option
org_old2m_learnMore	if clicked 'learn more' link in 'mild concern' stastus with 'factual' style and change style option
org_old2m_algorithm	if clicked the link to algorithem in 'mild concern' stastus with 'factual' style and change style option

variable	label
org_new2m_switch	if switched the style in ‘mild concern’ status with ‘guided’ style and change style option and change style option
org_new2m_learnKidney	if clicked the link to explanation of current renal status in ‘mild concern’ stastus with ‘guided’ style and change style option
org_new2m_learnKidney_facts	if clicked the link to fact of current renal status in ‘mild concern’ stastus with ‘guided’ style and change style option
org_new2m_algorithm	if clicked the link to algorithem in ‘mild concern’ stastus with ‘guided’ style and change style option
org_new2m_learnFactor	if clicked the link to explanation of current renal status in ‘mild concern’ stastus with ‘guided’ style and change style option
green_old_learnMore_or	‘green_pra_old_learnMore’ or ‘green_old_learnMore’
green_new_learnMore_or	‘green_pra_new_learnMore’ or ‘green_new_learnMore’
org_switch_unpref	if switch in unpreferred mode
org_switch_nopref	if switch the style when the patient has no preference
valid	id~=401 and id~=32 (FILTER)
valid_group_1	group=-1 and valid=1 (FILTER)
valid_group0	group=-1 and valid=1 (FILTER)
valid_group1	group=-1 and valid=1 (FILTER)

2.2 File results_questionnaire_preference_long.sav

Preference data is stored in the SPSS file results_questionnaire_preference_long.sav.

Table 2: Fields and label from SPSS file results_questionnaire_preference_long.sav

variable	label
id	identification participant
group	participant group (less experienced, experienced with no system experience, experienced)
renal	medical health situation(green, org, red)
preference	preference for one of two communication style ranging from -10 to +10, whereby -10 stands for extremely preferring the guided style, and 10 stands for exstremely preferring the factual style

2.3 File results_questionnaire_attitude_long.sav

Attitude data is stored in the SPSS file results_questionnaire_attitude_long.sav. This long format file processed from file from results-upload.sav, and also include data imputation for missing data when it come to attitude data.

Table 3: Fields and label from SPSS file results_questionnaire_attitude_long.sav

variable	label
id	identification participant
renal	medical health situation(green, orange, red)
group	participant group (less experienced, experienced with no system experience, experienced)
mode	mode of the user interface, (guided, factutal, factual with switch, guided with switch)
attitude	attitude towards user interface, from -10 extremely negative to +10 extremely positive
gender	gender, (female, male)
age	age in years
edu	participant's highest level of education (other, Basisschool, WO master, HBO/WO Bachelor, Lager beroepsonderwijs/MAVO/MULO, Middelbaar beroepsonderwijs, HAVO/HBS)
edu_other	description of education, if not in list
work	work status (parttime, gepensioneerd, fulltime, huishouden, Arbeidsongeschikt)
work_other	description of work status, if not in list
job	description (last) job
work_hour	number of weekly working hours
internet_use	internet use (daily, weekly,)
beenrenalpatient	number of months(?) after transpant operation
tx_year	1st transplantation year
tx_month	1st transplantation month
tx_years	years since transplantation
tx_months	months since transplantation

2.4 File results_tip_long.sav

SPSS file long format with data about the number of clicks in alright condition on the link 'did you know'.

Table 4: Fields and label from SPSS file results_tip_long.sav

variable	label
id	
date	
group	
gender	
age	
edu	

variable	label
edu_other	
EDU_O0	
work	
WORK0	
work_other	
job	
JOB0	
work_hour	
internet_use	
beenrenalpatient	been renal patient
tx_year	
tx_month	
tx_years	
tx_months	
mode	
tip	
valid	id ~= 32 and id ~= 401 (FILTER)

3 Participants

3.1 Missing data

Two patients (no 32 and 401) are excluded from the analysis, as one quitted half way she found the experiment too complect to finish, and another patient did not bring his reading glassess and could hardly see the content of the monitors.

3.2 Participants profile

Table 5: Participants profile (continued below)

Participants	Less experienced	Intermediate experience	Full experienced	Total
Number, n	16	15	18	49
–Male, n(%)	12 (75 %)	5 (33.3 %)	10 (55.6 %)	27 (55.1 %)
Age				
–Mean (SD)	52.8 (13.1)	55.6 (12)	58.1 (13.2)	55.6 (12.7)
–Range	24 - 69	32 - 72		
Education				
–Median	secondary	secondary		
Months since transplantation				
–Mean (SD)	5.3 (1.1)	121.9 (154.7)		
–Range	3 - 7	16 - 444		

Full experienced	Total
27 - 79	24 - 79
secondary	secondary
37 (55)	52.6 (101.9)
14 - 255	3 - 444

4 Results reported in Section Data preparation and data analysis

4.1 Reliability test attitude scores

Data from file results-upload.sav was transformed from width format to long format. Also question 4 about how much participants liked the way that the system had support them was transformed from 1 to 7 scale to -10 to +10 scale to mach the question 5, 6 and 7. Reliability analysis on Q4 (like), Q5 (info), Q6 (worried), and Q7 (dignity), shows acceptable reliability level (cronback alpha >.7).

```
##
## Reliability analysis
## Call: alpha(x = subset(l_d, select = c("like_r", "info", "worried",
##     "dignity")))
##
##   raw_alpha std.alpha G6(smc) average_r S/N   ase mean  sd median_r
##       0.73      0.76    0.76      0.44 3.1 0.028  5.1 3.1     0.43
##
##  lower alpha upper     95% confidence boundaries
## 0.67 0.73 0.78
##
##  Reliability if an item is dropped:
##         raw_alpha std.alpha G6(smc) average_r S/N alpha se var.r med.r
## like_r       0.64      0.68    0.70      0.42 2.1    0.039 0.110  0.27
## info         0.59      0.62    0.59      0.36 1.7    0.043 0.054  0.27
## worried      0.86      0.86    0.82      0.67 6.1    0.014 0.012  0.62
## dignity      0.54      0.58    0.54      0.32 1.4    0.048 0.056  0.18
##
##  Item statistics
##           n raw.r std.r r.cor r.drop mean  sd
## like_r  290  0.75  0.79  0.68   0.57  6.9 3.7
## info    290  0.82  0.84  0.83   0.66  6.5 4.0
## worried 290  0.60  0.54  0.27   0.24  1.1 5.1
## dignity 290  0.86  0.88  0.89   0.73  5.7 4.0
```

4.2 Creation of relative attitude scale

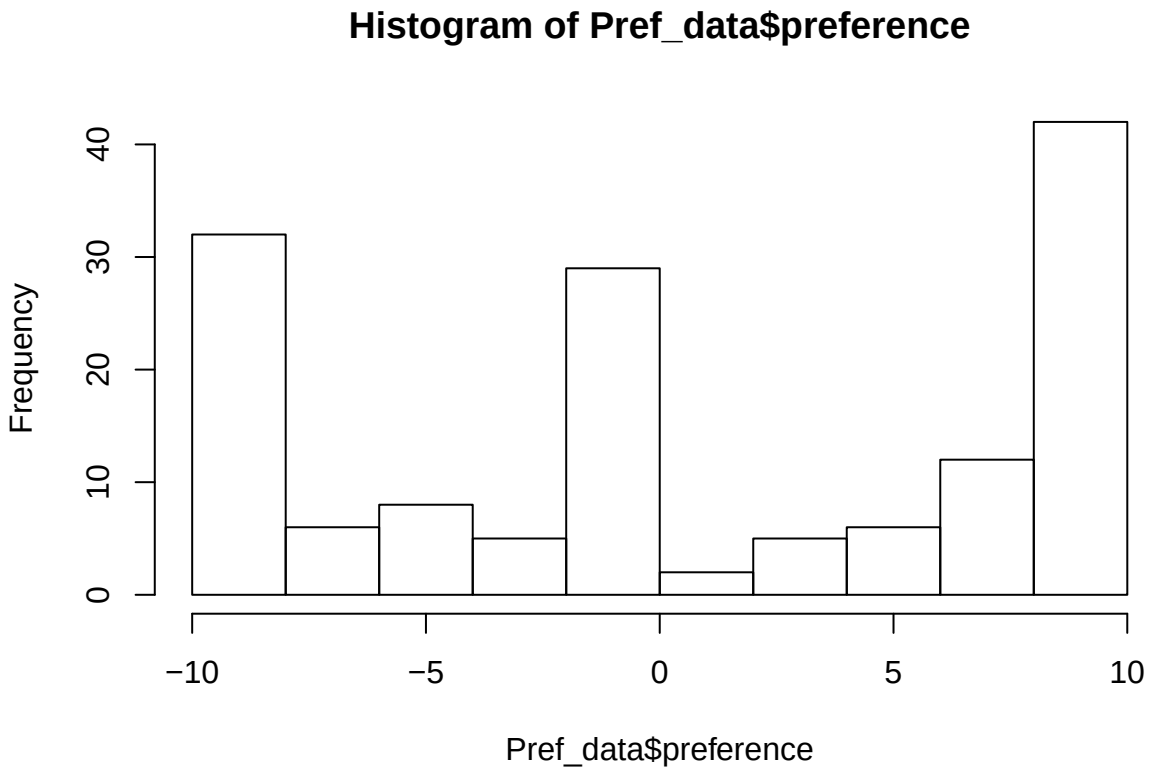
Calculating relative attitude scale by subtracting attitude score for guided style from attitude score for factual style. Direction of scale is consistented with preference scale. In 4 cases, data for the questions 4-7 was missing for one or more of the medical health situation(s). Futher analyses is conducted on data file where missing data has been replaced with data from SPSS imputation algorithm.

Table 7: Missing attitude data, replaced by data imputation procedure SPSS

	id	group	renal
31	19	experienced	green
100	40	less experienced	green
101	40	less experienced	orange
104	41	less experienced	orange

4.3 Recoding preference data

The histrogram of preference data shows W distribution. In total there are 147 preference ratings, with 28 (19%) extremely preference for guided style, with 25 (17%) with neutral preference, and 40 (27%) with a extreme preference for factual style.



With clear deviation from normal distribution preference data was transformed into dichotomous variable thereby removing (17%) the neutral preference rating.

4.4 Confounding variables examination

Potential confounding variables were examined by testing difference in age, education level, and gender between patient groups. No significant difference were found.

statistic	parameter	p.value	method

Table 8: Difference between patient groups on age, education level, and gender (continued below)

statistic	parameter	p.value	method
32.36203	33	0.4986961	Kruskal-Wallis rank sum test
0.01192775	2	0.9940539	Kruskal-Wallis rank sum test
1.049153	1	0.3057023	Kruskal-Wallis rank sum test

data.name
group by age
group by edu_int
group by gender

4.5 Covariate examination

Age, gender, education, work hours and internet use are examined as potential covariate for the analysis for preference, relative attitude, understanding, and adherence by testing effects on these dependent variable. Except for internet use, no significant effect were found.

Table 10: Effect potential co-variate on Preference

	Chisq	Df	Pr(>Chisq)
age	0.5539	1	0.4567
gender	0.1485	1	0.7
edu_int	2.477	2	0.2899
work_hour	0.9962	1	0.3182
internet_use	2.29	2	0.3183

Table 11: Effect potential co-variate on Relative Attitude

	Chisq	Df	Pr(>Chisq)
age	0.9982	1	0.3178
gender	2.278	1	0.1312
edu_int	2.329	2	0.3121
work_hour	0.7911	1	0.3738
internet_use	0.07917	2	0.9612

iteration 1

Table 12: Fixed effects: dv ~ age

	Value	Std.Error	DF	t-value	p-value
(Intercept)	5.428	1.689	245	3.214	0.001485
age	-0.04039	0.02735	47	-1.477	0.1464

Table 13: Standardized Within-Group Residuals

Min	Q1	Med	Q3	Max
-8.845	0.1564	0.1934	0.239	0.3107

Table 14: Effect of age on Understanding

	Observations	Groups	Log-restricted-likelihood
id	294	49	NA

iteration 1

Table 15: Fixed effects: dv ~ gender

	Value	Std.Error	DF	t-value	p-value
(Intercept)	3.761	0.586	245	6.418	7.076e-10
gendermale	-1.04	0.6714	47	-1.549	0.1281

Table 16: Standardized Within-Group Residuals

Min	Q1	Med	Q3	Max
-6.558	0.1525	0.2565	0.2565	0.2565

Table 17: Effect of gender on Understanding

	Observations	Groups	Log-restricted-likelihood
id	294	49	NA

iteration 1

Table 18: Fixed effects: dv ~ edu_int

	Value	Std.Error	DF	t-value	p-value
(Intercept)	1.609	0.7786	245	2.067	0.03977
edu_intsecondary	1.493	0.8592	46	1.738	0.08897
edu_inthigh	1.825	0.9766	46	1.868	0.06811

Table 19: Standardized Within-Group Residuals

Min	Q1	Med	Q3	Max
-5.568	0.1796	0.212	0.212	0.4472

Table 20: Effect of education on Understanding

	Observations	Groups	Log-restricted-likelihood
id	294	49	NA

iteration 1

Table 21: Fixed effects: dv ~ work_hour

	Value	Std.Error	DF	t-value	p-value
(Intercept)	3.414	0.7048	195	4.844	2.585e-06
work_hour	-0.01257	0.01547	37	-0.8128	0.4215

Table 22: Standardized Within-Group Residuals

Min	Q1	Med	Q3	Max
-4.88	0.2117	0.2283	0.2341	0.3413

Table 23: Effect of work hours on Understanding

	Observations	Groups	Log-restricted-likelihood
id	234	39	NA

iteration 1 iteration 2 iteration 3 iteration 4 iteration 5 iteration 6 iteration 7 iteration 8 iteration 9 iteration 10

Table 24: Fixed effects: dv ~ internet_use

	Value	Std.Error	DF	t-value	p-value
(Intercept)	3.135	0.3	245	10.45	2.176e-21
internet_useweekly	25.43	222214	46	0.0001144	0.9999
internet_usemonthly	-1.526	0.8118	46	-1.88	0.06648

Table 25: Standardized Within-Group Residuals

Min	Q1	Med	Q3	Max
-4.95	0.2152	0.2152	0.2152	0.4616

Table 26: Effect of internet use on Understanding

	Observations	Groups	Log-restricted-likelihood
id	294	49	NA

iteration 1 iteration 2 iteration 3 iteration 4 iteration 5 iteration 6 iteration 7

Table 27: Fixed effects: dv ~ age

	Value	Std.Error	DF	t-value	p-value
(Intercept)	2.967	0.8994	245	3.299	0.001114
age	-0.01684	0.01543	47	-1.091	0.2808

Table 28: Standardized Within-Group Residuals

Min	Q1	Med	Q3	Max
-3.451	0.3188	0.3523	0.4528	0.7478

Table 29: Effect of age on Adherence

	Observations	Groups	Log-restricted-likelihood
id	294	49	NA

iteration 1 iteration 2 iteration 3 iteration 4 iteration 5 iteration 6 iteration 7

Table 30: Fixed effects: dv ~ gender

	Value	Std.Error	DF	t-value	p-value
(Intercept)	2.424	0.3187	245	7.605	6.089e-13
gendermale	-0.7202	0.3956	47	-1.821	0.07505

Table 31: Standardized Within-Group Residuals

Min	Q1	Med	Q3	Max
-3.355	0.2972	0.3686	0.3959	0.6814

Table 32: Effect of gender on Adherence

	Observations	Groups	Log-restricted-likelihood
id	294	49	NA

iteration 1 iteration 2 iteration 3 iteration 4 iteration 5 iteration 6 iteration 7

Table 33: Fixed effects: dv ~ edu_int

	Value	Std.Error	DF	t-value	p-value
(Intercept)	1.196	0.8189	245	1.46	0.1454
edu_intsecondary	0.8819	0.855	46	1.031	0.3077
edu_inthigh	0.8114	0.8853	46	0.9165	0.3642

Table 34: Standardized Within-Group Residuals

Min	Q1	Med	Q3	Max
-2.971	0.338	0.347	0.4478	0.8581

Table 35: Effect of education on Adherence

	Observations	Groups	Log-restricted-likelihood
id	294	49	NA

iteration 1 iteration 2 iteration 3 iteration 4 iteration 5 iteration 6

Table 36: Fixed effects: dv ~ work_hour

	Value	Std.Error	DF	t-value	p-value
(Intercept)	2.229	0.5033	195	4.428	1.581e-05
work_hour	-0.009639	0.01174	37	-0.821	0.4169

Table 37: Standardized Within-Group Residuals

Min	Q1	Med	Q3	Max
-2.977	0.3514	0.3729	0.4565	0.6824

Table 38: Effect of work hours on Adherence

	Observations	Groups	Log-restricted-likelihood
id	234	39	NA

iteration 1 iteration 2 iteration 3 iteration 4 iteration 5 iteration 6 iteration 7 iteration 8 iteration 9

Table 39: Fixed effects: dv ~ internet_use

	Value	Std.Error	DF	t-value	p-value
(Intercept)	2.122	0.2015	245	10.53	1.237e-21
internet_useweekly	-0.4913	0.7026	46	-0.6994	0.4878
internet_usemonthly	-1.784	0.7071	46	-2.523	0.01514

Table 40: Standardized Within-Group Residuals

Min	Q1	Med	Q3	Max
-3.004	0.3419	0.3419	0.4057	0.995

Table 41: Effect of internet use on Adherence

	Observations	Groups	Log-restricted-likelihood
id	294	49	NA

Although internet use seems to correlation with adherence, variation of internet use is very limmited, and therefore not considered as potential covaritate in subsequent analyses.

	daily	weekly	monthly
less experienced	13	1	2
experienced with no system experience	14	1	0
experienced	17	1	0

5 Results reported in section understanding and adherence

5.1 Understanding and adherence profile

The two tables below show participants' understanding and adherence to system instruction. Overall understanding is 96%, and overall adherence to system instructions is 87%.

Table 43: Number (%) of patients in 3 experience groups that understood system instruction.

Condition	Less (n= 16)	Intermediate (n= 15)	Full (n= 18)
Alright	.	.	.
–guided	15 (94)	14 (93)	17 (94)
–factual	16 (100)	15 (100)	17 (94)
Mild concern	.	.	.
–guided	16 (100)	15 (100)	15 (83)
–factual	15 (94)	14 (93)	17 (94)
Concern	.	.	.
–guided	16 (100)	15 (100)	17 (94)
–factual	16 (100)	14 (93)	17 (94)

Table 44: Number (%) of patients in 3 experience groups that adhere to system instructions.

Condition	Less (n= 16)	Intermediate (n= 15)	Full (n= 18)
Alright	.	.	.
–guided	11 (69)	12 (80)	17 (94)
–factual	14 (88)	13 (87)	15 (83)
Mild concern	.	.	.
–guided	16 (100)	14 (93)	15 (83)
–factual	13 (81)	14 (93)	16 (89)
Concern	.	.	.
–guided	15 (94)	15 (100)	14 (78)
–factual	15 (94)	14 (93)	14 (78)

In the cell with lowest percentage of understanding (Mild concern, using guided communication style) 3 full experienced participants thought that the system instructed them to do nothing extra.

Table 45: Participants' answer what they thought the system instucted them to do in mild concern health situation when using system with guided communication style.

	other	nothing extra	re-measure	hospital
less experienced	0	0	15	0
experienced with no system experience	0	0	15	0
experienced	0	3	15	0

In the cell with the lowest adherence (Alright, using guided commuication style), **four** less experienced patients would do more (re-measure, contact hospital) than system instructed them to do.

Table 46: Participants' answer that they would do in alright health situation when using system with guided communication style.

	other	nothing extra	re-measure	hospital
less experienced	0	11	1	3
experienced with no system experience	0	12	3	0
experienced	0	17	1	0

5.2 Effect of group, health situation and communication style on understanding

Multilevel analysis on whether on not participants correctly understood the system's instruction, shows no significant effect for group, health situation, communication style, or interaction effects.

Table 47: Multilevel analysis of effect of group, health, and communication style on understand

	Chisq	Df	Pr(>Chisq)
group	7.873	7	0.3439
renal	1.264	7	0.9894
mode	0.6218	5	0.987
group:renal	0.1013	4	0.9988
group:mode	5.083e-07	2	1
renal:mode	0.3996	2	0.8189
group:renal:mode	0.101	4	0.9988

5.3 Effect of group, health situation and communication style on adherence

Multilevel analysis on adherence data reveals significant two-way interaction effect between group and health situation.

Table 48: Multilevel analysis of effect of group, health, and communication style on adherence

	Chisq	Df	Pr(>Chisq)
group	1.02	3	0.7964
renal	2.444	4	0.6547
mode	0.9558	3	0.812
group:renal	13.49	5	0.01917
group:mode	3.189	3	0.3635
renal:mode	1.42	3	0.7009
group:renal:mode	3.532	4	0.473

Examing the frequency, shows that in less experience group showed more deviation in situation with alright health situation,whereas full experienced group shows this in the situation that causes concern.

Table 49: Frequency of adherence for group and health situation

		no	yes
less experienced	green	7	25
	orange	3	29
	red	2	30
experienced with no system experience	green	5	25
	orange	2	28
	red	1	29
experienced	green	4	32
	orange	5	31
	red	8	28

Examing what patients indicated to do when they deviated from the system instructions, shows that while the less experience group would do more (e.g. re-measurement, contact hospital) than the instruction that no action were needed in a situation with no cause of concern, the experience group would do less (e.g. something else, re-measure) than when instructed to contact the hospital.

```
##                                        other nothing extra re-measure hospital
##
## less experienced                     green     0      25     3       3
##                                      orange    0       0    28       2
##                                      red       0       0     2      30
## experienced with no system experience green     0      25     4       1
##                                      orange    2       0    28       0
##                                      red       0       0     1      29
## experienced                          green     0      31     4       0
##                                      orange    1       3    31       1
##                                      red       3       1     4      28
```

Of the 290 cases, 35 were non-adherent cases, made by 21 different participants.

6 Results reported in section Preference and attitude

6.1 Analyses Preference data

Multilevel generalized linear model was fitted on dichotomous preference variable with as dependent variable patient group and medical health situation, include two-way factor interaction. Participant is taken als fixed random factor, and bionomial distribution is assumpted.

Table 50: Multilevel analsysis on Preference analysis

	Chisq	Df	Pr(>Chisq)
group	0.8164	2	0.6648
renal	5.343	2	0.06916
group:renal	21.91	4	0.0002088

A frequence table of the dichotomous variable preference group by participant group and by medical health sitation, shows that for *less experienced* group equally divided preference (52-48) for two communication style througout 3 medical health situation. For the other two participants group, there is a 50-50 preference in the concern situation, while in the other two conditions, relative more preference is given to factual communication style (37-63).

Table 51: Frequency table with 0 for Guided, and 1 for Factual communication style

		0	1
less experienced	green	7	7
	orange	8	6
	red	7	7
experienced with no system experience	green	3	8
	orange	4	8
	red	6	6
experienced	green	7	8
	orange	6	10
	red	7	7

6.1.1 Simple effect analysis on preference

This observation, is confirmed by Simple Effect analysis of two-way interaction found. When multilevel analysis is repeated for only less experienced group, medical health situation is nolonger significant.

Table 52: Multilevel analysis on Preferences for only the less experienced group

	Chisq	Df	Pr(>Chisq)
renal	2.032	2	0.362

When multilevel analysis is repeated only on the other two mature groups and is group no longer included as fixed factor, medical health situation is still significant.

Table 53: Multilevel analysis on Preferences for only the mature group

	Chisq	Df	Pr(>Chisq)
renal	12.06	2	0.002402

6.2 Analysis of Attitude data

6.2.1 Attitude profile

In the experiment, participants could freely switch between communication styles in the last two conditions. In analysis of effect communication style on attitude, these last two were therefore, ignored for the atittude analysis.

Analyse of the attitude data, starts with testing whether participants had postive or negative attitude towards User Interface. This will be done by examine if the score deviate significantly from zero, ie. neutral attitude, neither negative nor positive.

The analyses show that in all groups in all the 3 medical health conditions had postive attitude towards the user interface. Futhermore, for relative attitude alright (green) situation, full experience group show significant attitude more positive towards the facutal then towards guided communication style.

Table 54: Mean (SD) preference and attitude of 3 patient groups for guided and factual communication style

Condition	Less experience	Intermediate	Full experience
green			.
–absolute attitude			.
— guided	6.5 ** (3.3)	5.2 ** (3.8)	5.4 ** (3.3)
— factual	5.7 ** (3.9)	6.3 ** (3)	6.4 ** (3)
–relative attitude	-0.7 (2)	1.1 (2.2)	1 * (1.8)
–preference	0.5 (8.5)	2.5 (6.7)	1.4 (7.8)
orange			.
–absolute attitude			.
— guided	5.4 ** (3.3)	4.7 ** (3.6)	4.9 ** (2.5)
— factual	5 ** (3.4)	5.3 ** (2.7)	4.5 ** (2.7)
–relative attitude	-0.4 (3.2)	0.6 (1.6)	-0.3 (1.7)
–preference	-0.9 (8.3)	1.5 (7.2)	2.7 (7.4)
red			.
–absolute attitude			.
— guided	4.7 ** (3.4)	4.7 ** (2.7)	3.7 ** (1.9)
— factual	5 ** (3.8)	4.3 ** (2.7)	3.8 ** (2.6)
–relative attitude	0.3 (1.4)	-0.4 (1.4)	0.1 (1.5)
–preference	0.3 (8.5)	-0.1 (8)	0.9 (7.7)

When two experience groups are combined, again a signification more positive attitude is found towards the factual then towards the guided communication style in the alright (green) situation.

```
t.test(AttPEA$AttP, mu=0)
```

```
##
##  One Sample t-test
##
```

```
## data:  AttPEA$AttP
## t = 3.0072, df = 32, p-value = 0.0051
## alternative hypothesis: true mean is not equal to 0
## 95 percent confidence interval:
##  0.3328324 1.7302990
## sample estimates:
## mean of x
##  1.031566
```

In the mild concern (orange) no such difference is found.

Table 55: One sample t-test for relative attitude in the heath situation with mild concern.

Test statistic	df	P value	Alternative hypothesis	mean of x
0.3213	32	0.75	two.sided	0.09596

Likewise for concern (red) mental health situation, no significant difference deviation from zero (neutral position on the relative scale) is found.

Table 56: One-sample t-test for relative attitude in healht situation with concern.

Test statistic	df	P value	Alternative hypothesis	mean of x
-0.4709	32	0.6409	two.sided	-0.1187

Significant relative attitude towards the factual style was also found for full experienced group in alright health situation.

Table 57: One-sample t-test for relative attitude in alright health situation for full experienced patient group.

Test statistic	df	P value	Alternative hypothesis	mean of x
2.245	17	0.03835 *	two.sided	0.9653

6.2.2 Multilevel analysis for effect of group and health situation on patient preference

Multilevel analysis on relative attitude with as random intercept participant id, and as fix factors group, medical health, two-way interaction effect as fixed factors shows as no significant fixed main effects, but two-way interaction effect approaching significant level of .05.

Table 58: Multilevel analysis on relative attitude for patient group, and health situation

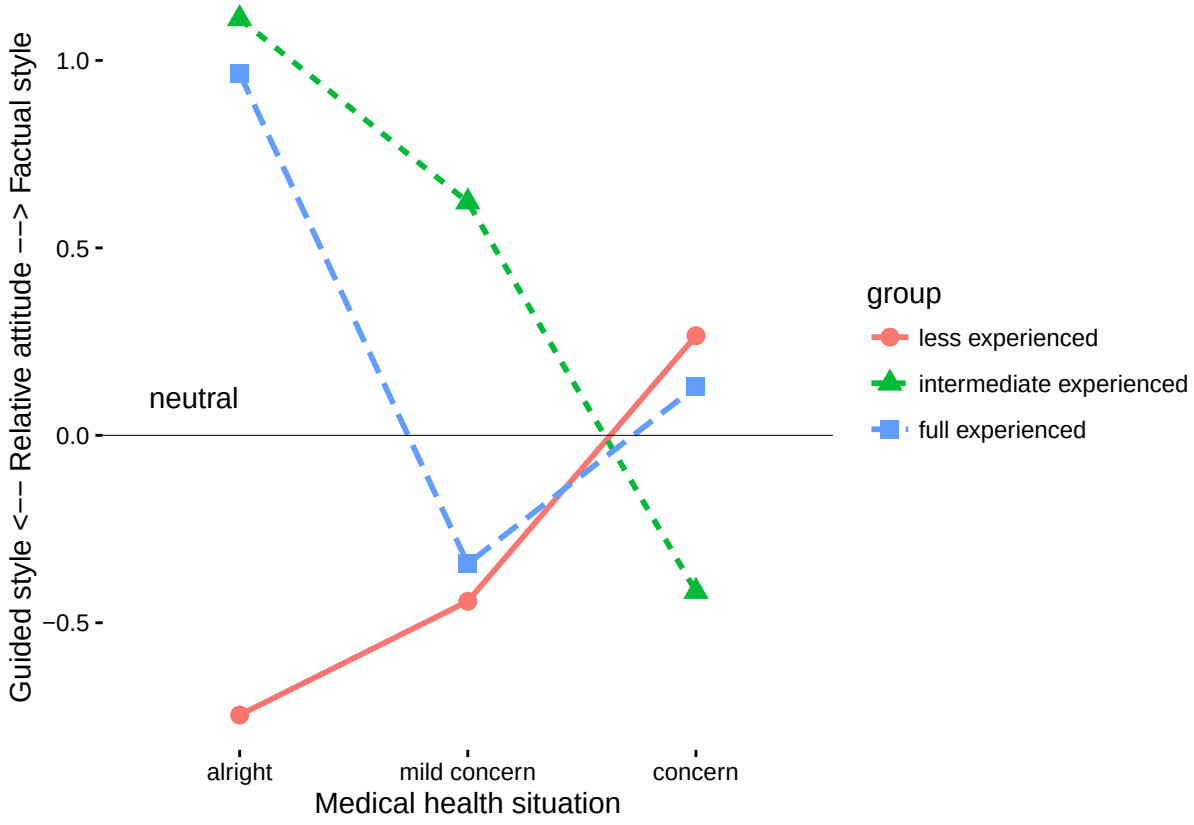
	Chisq	Df	Pr(>Chisq)
group	3.837	2	0.1468
renal	2.138	2	0.3434
group:renal	9.334	4	0.05327

Repeating the multilevel analysis but combining experience group, reveals significant two-way interaction effect.

Table 59: Multilevel analysis on relative attitude for 2 patient group (less experience, and mature patients) and health situation

	Chisq	Df	Pr(>Chisq)
group	3.61	1	0.05743
renal	2.142	2	0.3427
group:renal	6.829	2	0.03289

As figure with relative attitude shows, the attitude in the alright situation for mature groups seems relative more leaning towards factual comminication style compared to less experience group, but also for other health situations attitude seems less leaning towards the factual communication style.



6.2.3 Simple effect analysis of patient preference

This observation from the figure is support by two type of Simple effect analysis First the Simple effect analysis for 3 different health situations, only shows a significant effect for group in alright situation (green), and no significant difference between groups in the other situations.

Table 60: Simple effect analysis for medical health situation = green

	Sum Sq	Df	F value	Pr(>F)
group	34.05	1	8.68	0.004993

	Sum Sq	Df	F value	Pr(>F)
Residuals	184.4	47	NA	NA

Table 61: Simple effect analysis for medical health situation = orange

	Sum Sq	Df	F value	Pr(>F)
group	3.127	1	0.6044	0.4408
Residuals	243.1	47	NA	NA

Table 62: Simple effect analysis for medical health situation = red

	Sum Sq	Df	F value	Pr(>F)
group	1.591	1	0.7781	0.3822
Residuals	96.13	47	NA	NA

A Simple effect analysis for 2 groups (less experience and mature group), only found a significant effect for health situation in mature group, and not for less experience group.

Table 63: Simple effect analysis for group = less experienced

	Chisq	Df	Pr(>Chisq)
renal	1.63	2	0.4427

Table 64: Simple effect analysis for group = mature

	Chisq	Df	Pr(>Chisq)
renal	8.302	2	0.01575

7 Results reported in section Behavior

7.1 Clicking behavior

Overall six conditions, in 21% of time they clicked at least once on learn more link. In the two alright conditions, where people could click on link 'did you know', at least 27% of participants did this. Multilevel analysis on whether people clicked on did you know link revealed no significant effect for group or communication style or two-way interaction effect between these two fixed factors.

Table 65: Multilevel analysis on 'did you know' link click behavior

	Chisq	Df	Pr(>Chisq)
group	1.185	2	0.5529
mode	2.129	1	0.1446
group:mode	1.651	2	0.438

Multilevel analysis on whether or not people clicked on the 'learn more'did reveal significant effect for health situation (renal), communication style (mode), and interaction effect between these two factors.

Table 66: Multilevel analysis on 'learn more' behavior

	Chisq	Df	Pr(>Chisq)
group	17.46	6	0.007739
renal	38.95	5	2.429e-07
mode	18.29	3	0.0003839
group:renal	22.62	5	0.0003994
group:mode	23.04	3	3.962e-05
renal:mode	15.8	3	0.001244
group:renal:mode	2.522	4	0.6407

Examing the percentage of participants that clicked on the 'learn more' shows clear variations between patient group, health sitations, communication styles.

Table 67: Percentage of participant that clicked on 'learnmore' link in 6 conditions

		less experienced	experienced with no system experience	experienced
green	factual	27	7	0
	guided	14	20	6
orange	factual	21	13	19
	guided	43	53	50
red	factual	33	13	6
	guided	27	27	6

The participants especially clicked for more information in the situation that cause mild concern.

green	orange	red
12	33	18

The participants especially clicked for more information with guided commication style.

factual	guided
15	27

The experienced patient less often clicked for more information

less experienced	experienced with no system experience	experienced
28	22	15

Experienced patients tended to click for more information especially in situation that caused mild concern

Table 71: Percentage of participant that clicked on average on the 'learn more' link by patient group and health situation

	green	orange	red
less experienced	21	32	30
experienced with no system experience	13	33	20
experienced	3	34	6

Experienced patient clicked of more information especially less often with the factual communication style

Table 72: Percentage of participant that clicked on average on the 'learn more' link by patient group and communication style

	factual	guided
less experienced	27	28
experienced with no system experience	11	33
experienced	8	21

More participants clicked for additional information especially with guided communication style when dealing with situation that causes mild concern.

Table 73: Percentage of participant that clicked on average on the 'learn more' link by health situation and communication style

	factual	guided
green	11	13
orange	18	49
red	17	20

7.2 Switching behavior

Analysis of switching behavior in the last two condition where people could change the communication style show that only 36% of the participant, changed the communication style to the one they preferred. Which was significantly below the less and 50% of the participants.

Table 74: Number of patient that switched to their prefered communication style in the additional mild concerned health situation conditions

Test statistic	df	P value	Alternative hypothesis	mean of x
-1.909	41	0.03164 *	less	0.3571

For comparison, 31% of the participants changed the communication style we the system was already in their perferred communication style. No significant correlation was found between whether people switch to their perferred style and the stenght of their preference.

Table 75: Correlation between preference strength and whether or not a person switch to their perfer communication style

Test statistic	df	P value	Alternative hypothesis	cor
0.1158	40	0.9084	two.sided	0.01831

8 R version information

This analysis has been runned with following R version.

R version 3.3.0 (2016-05-03)

Platform: x86_64-apple-darwin13.4.0 (64-bit)

locale: en_US.UTF-8||en_US.UTF-8||en_US.UTF-8||C||en_US.UTF-8||en_US.UTF-8

attached base packages: *stats*, *graphics*, *grDevices*, *utils*, *datasets*, *methods* and *base*

other attached packages: *pander(v.0.6.1)*, *reshape(v.0.8.5)*, *psych(v.1.8.4)*, *ggplot2(v.2.1.0)*, *lme4(v.1.1-12)*, *Matrix(v.1.2-8)*, *plyr(v.1.8.4)*, *car(v.2.1-4)*, *MASS(v.7.3-45)* and *foreign(v.0.8-67)*

loaded via a namespace (and not attached): *Rcpp(v.0.12.14)*, *nloptr(v.1.0.4)*, *tools(v.3.3.0)*, *digest(v.0.6.9)*, *evaluate(v.0.12)*, *nlme(v.3.1-127)*, *gtable(v.0.2.0)*, *lattice(v.0.20-33)*, *mgcv(v.1.8-12)*, *yaml(v.2.1.13)*, *parallel(v.3.3.0)*, *SparseM(v.1.7)*, *stringr(v.1.2.0)*, *knitr(v.1.20)*, *MatrixModels(v.0.4-1)*, *rprojroot(v.1.3-2)*, *grid(v.3.3.0)*, *nnet(v.7.3-12)*, *rmarkdown(v.1.10)*, *minqa(v.1.2.4)*, *magrittr(v.1.5)*, *backports(v.1.1.2)*, *scales(v.0.4.0)*, *htmltools(v.0.3.5)*, *splines(v.3.3.0)*, *pbkrtest(v.0.4-6)*, *mnormt(v.1.5-5)*, *colorspace(v.1.2-6)*, *labeling(v.0.3)*, *quantreg(v.5.24)*, *stringi(v.1.0-1)* and *munsell(v.0.4.3)*