Integrative Analysis of Longitudinal Studies on Aging

www.ialsa.org

Big Data, Big Analysis:

A Collaborative Modeling Framework for Multi-study Replication

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- The IALSA network (NIH/NIA 1P01AG043362) is comprised of over 100 longitudinal studies on aging, health and dementia.
  - Mix of samples aged from birth to 100 years
  - Assessed from 1921 to the present.
  - Monitoring each individual for 4 to 48 years
  - Time between assessments 6 months to 17 years

- Focus on the reproducibility of results (i.e., direction and pattern of effects) across populations, historical periods, measurements, designs, and statistical models.

- Research aim: *To maintain and enhance cognitive and physical health and well-being throughout the lifespan*

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IALSA Approach: Coordinated Analysis with Replication (CAR)

- Finds common measures among studies (maelstrom-research.org)
- Fits same models to many longitudinal studies
- Meta-analyzes model solutions
- Aim: *Maximize value from each study while providing comparable results*
- Expect similar conclusions regardless of the exact variables used.
- Evaluation of sensitivity to statistical model
- Meta-Analysis / Meta-Regression

Hofer, S. M., & **Piccinin**, A. M. (2009). Integrative data analysis through coordination of measurement and analysis protocol across independent longitudinal studies. *Psychological methods, 14(2), 150*.

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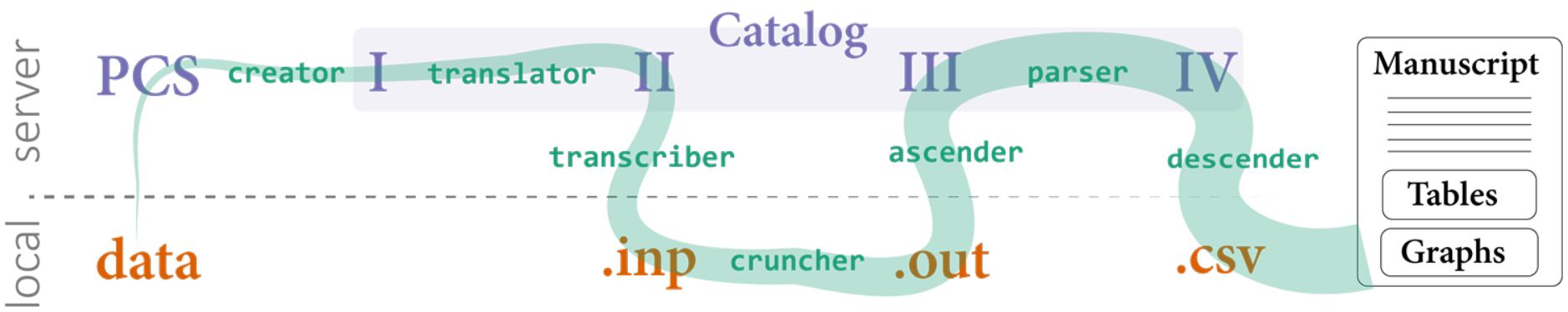
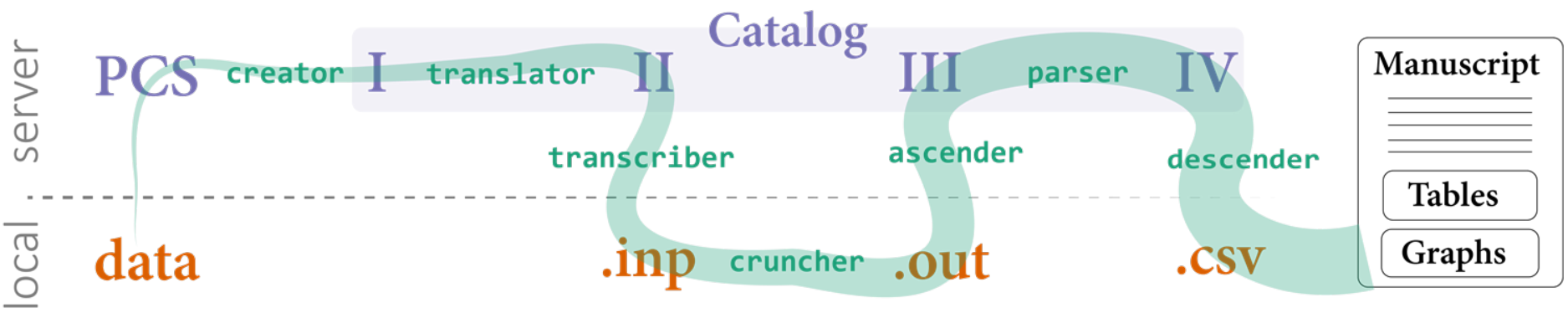
IALSA Portland Workshop *Feb 23-25, 2015* (*github.com/IALSA/IALSA-2015-Portland*)

- Primary aim: To examine the associations between changes in
  - **physical functioning** (i.e., grip strength, pulmonary function) and
  - **cognitive functioning** (i.e., memory, reasoning)
  - in multiple-study comparative framework.
- Research foci: To examine concurrent decline between
  - Pulmonary function – Cognition
  - Grip Strength – Cognition
  - Gait – Cognition
  - Cognition: Within and across cognitive domains
  - Physical functioning: Across pulmonary, grip, gait
- Bivariate linear growth curve models
- Adjustment for age, sex, education, height, health behaviors and outcomes

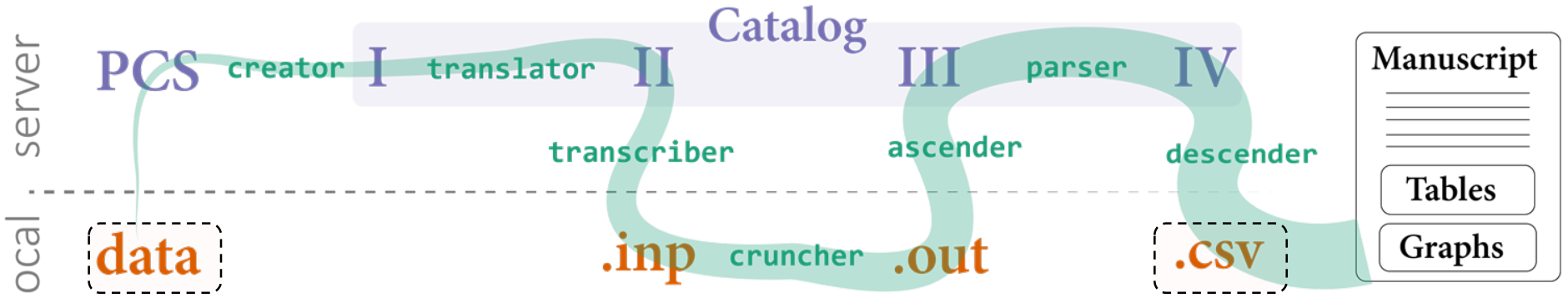

Portland, OR
Feb 23-25, 2015



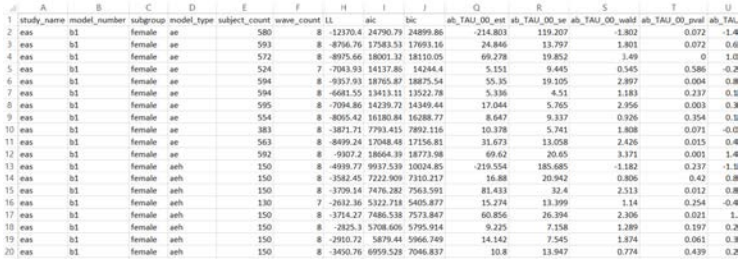
This is the
WORKFLOW MAP
of the coordinated analysis



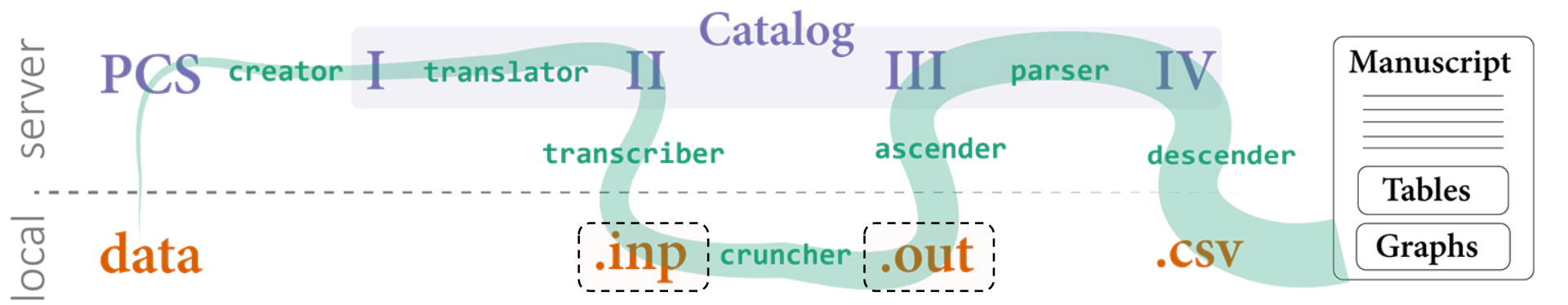
Next
We will show you
What each element and process
IS and DOES



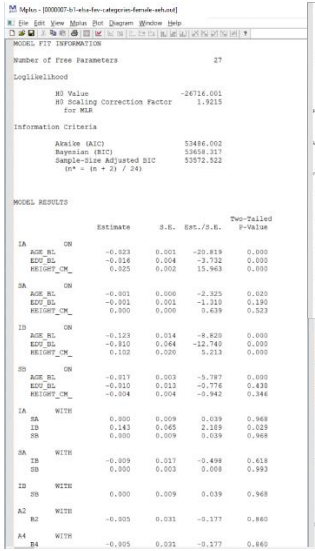
These are
Language-agnostic
Tabulated
DATA FILES

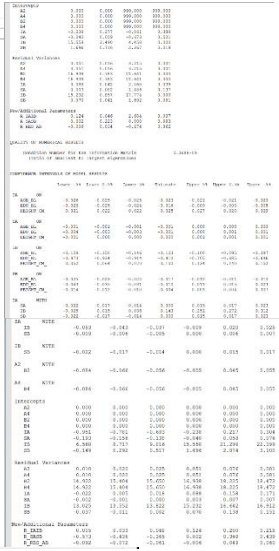


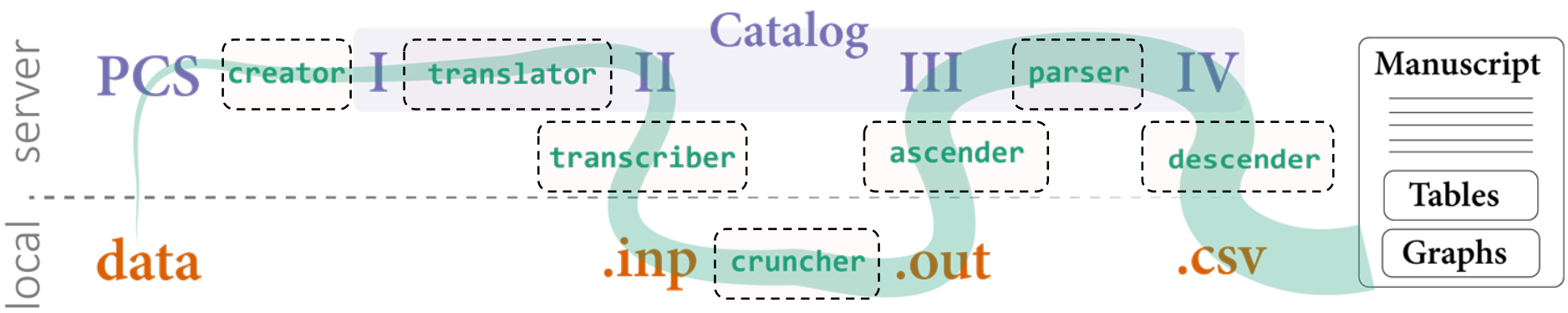
	id	year_bl	age_bl	year_born	male_bl	edu_bl	height_cm_bl	diabetes_bl	cardio_bl	smoke_bl	age_t1	age_t2	age_t3	age_t4	age_t5	age_t6	animals_t1	animals_t2	animals_t3	animals_t4	animals_t5	anima
1	103712	2002	55	1947	0	4	172.20	1	0	0	55	57	59	61	63	65	18	24	15	16	23	NA
2	103713	2002	71	1931	1	3	NA	0	0	0	71	73	75	NA	NA	NA	10	9	8	NA	NA	NA
3	103714	2002	51	1950	0	4	169.50	0	0	0	51	53	55	57	59	61	33	27	19	28	31	NA



These are
Free-form
TEXT FILES/STRINGS
used and produced by Mplus

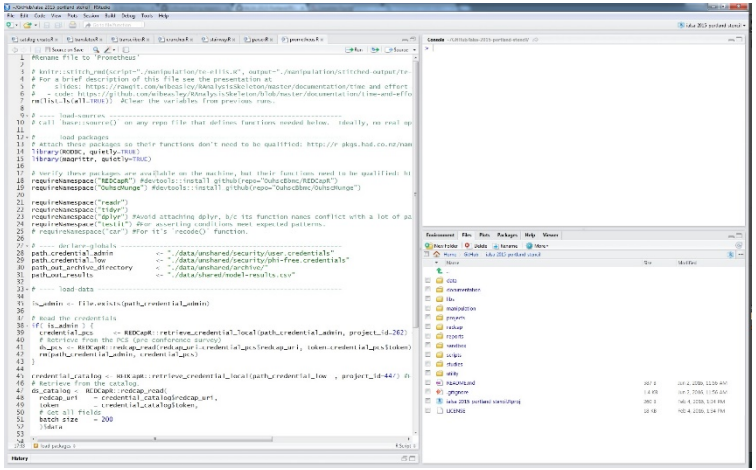


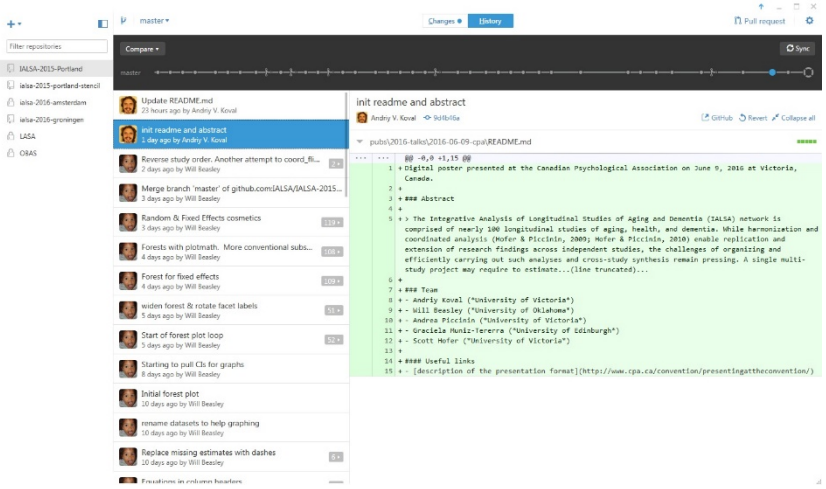


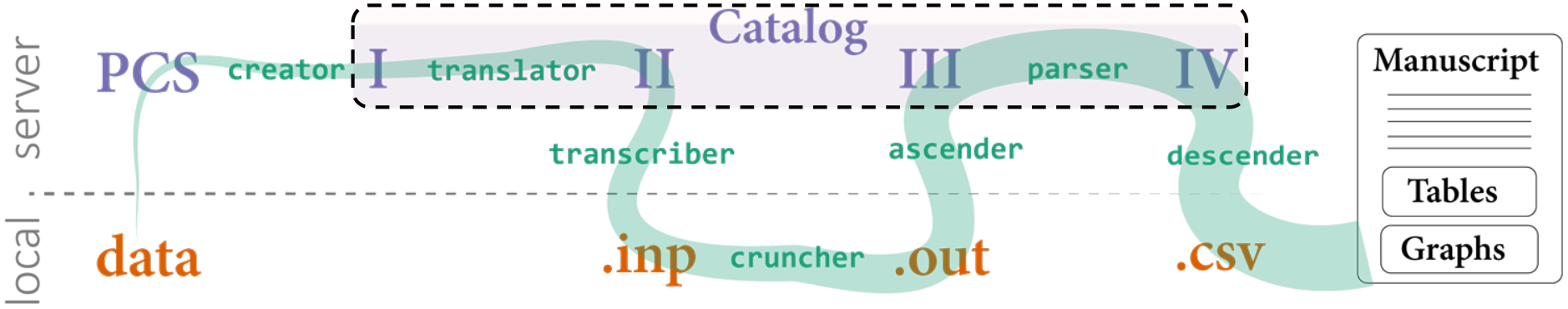


These are R SCRIPTS

Run in RStudio and coordinated in GitHub

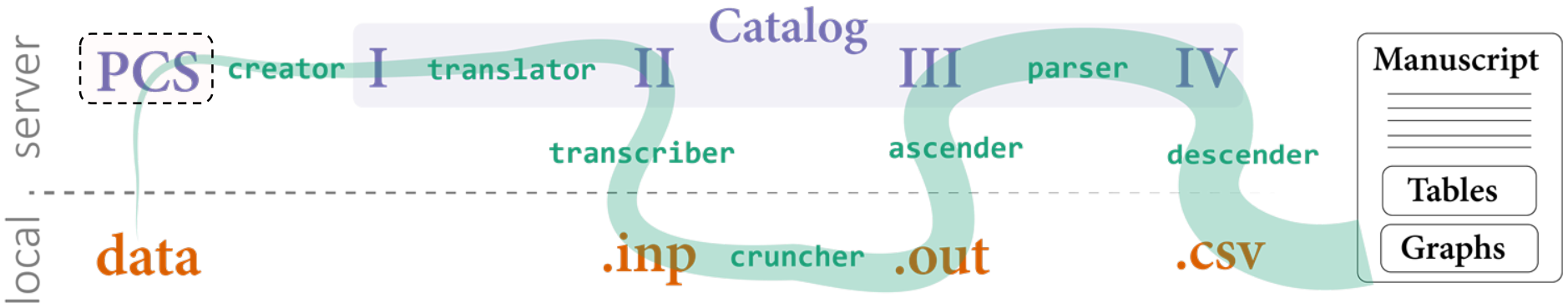




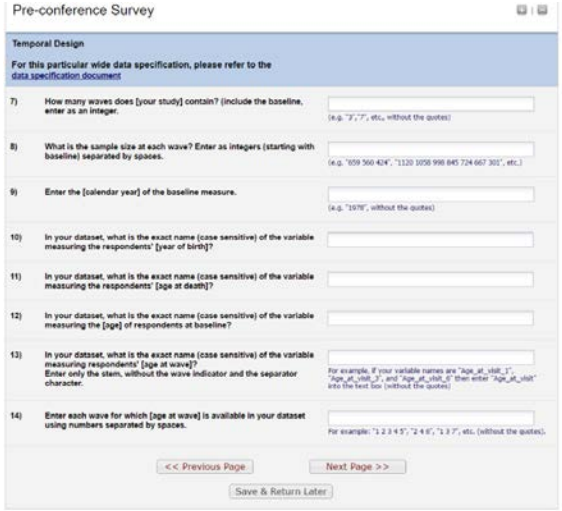


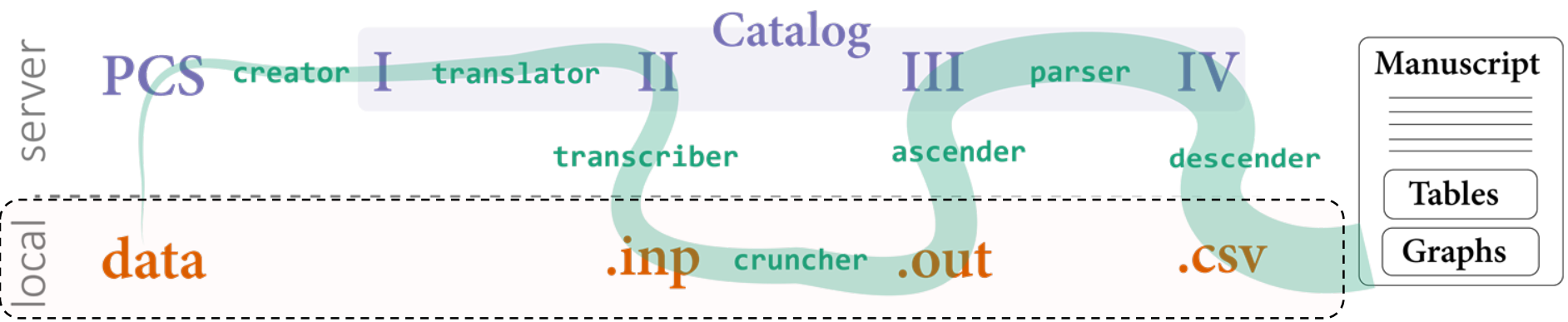
This is a
DATASET
each row = one model per study
It is stored on a REDCap server

REDCap
Research Electronic Data Capture

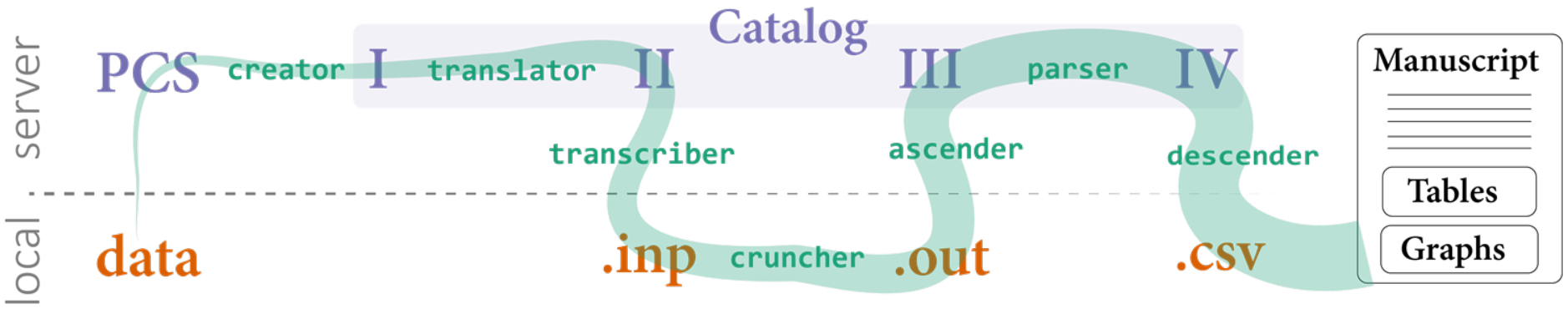


This is a
REDCap survey
Through which participants
Enter information about their studies

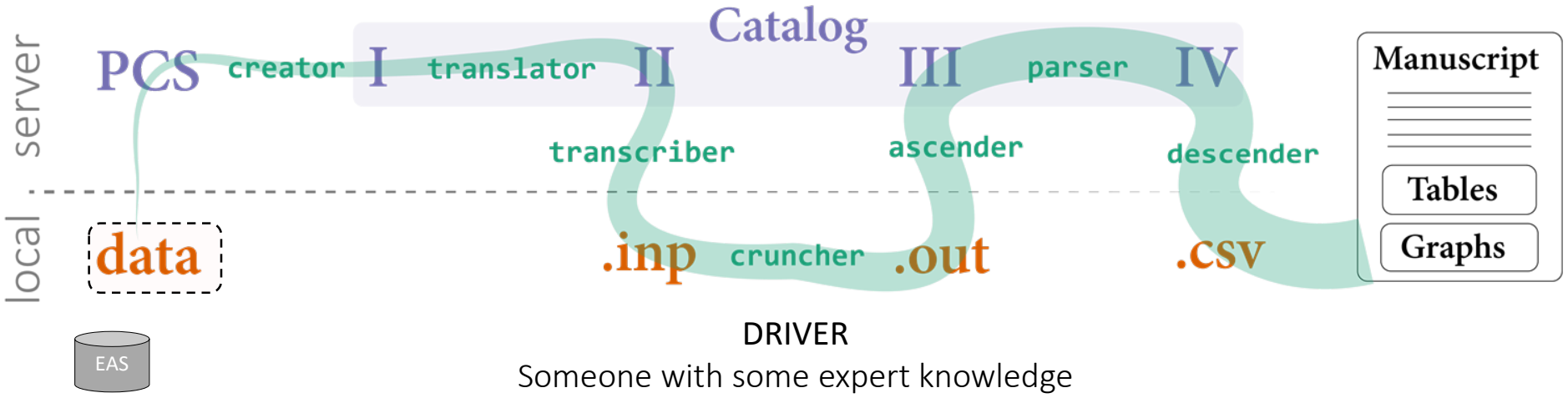




This is PRIVATE space
On local machines of drivers
Raw data never leaves this space



Now we will walk you through
Coordinated Analysis with Replication
from raw data files to tables and graphs in manuscripts



EAS

DRIVER

Someone with some expert knowledge

Of a particular longitudinal study

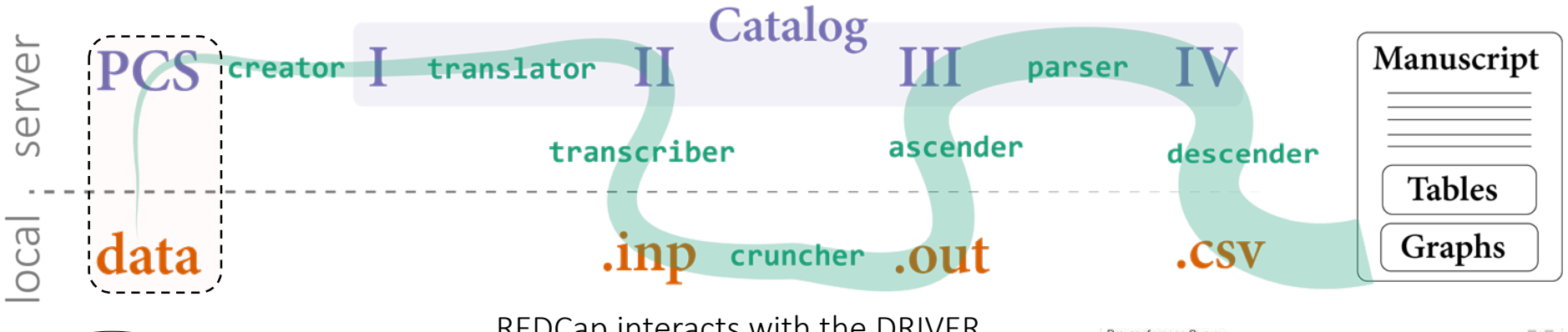
Who brings groomed data to CAR

Wide

	id	year_bl	age_bl	year_born	male_bl	edu_bl	height_cm_bl	diabetes_bl	cardio_bl	smoke_bl	age_t1	age_t2	age_t3	age_t4	age_t5	age_t6	animals_t1	animals_t2	animals_t3	animals_t4	animals_t5	anima
1	103712	2002	55	1947	0	4	172.20	1	0	0	55	57	59	61	63	65	18	24	15	16	23	NA
2	103713	2002	71	1931	1	3	NA	0	0	0	71	73	75	NA	NA	NA	10	9	8	NA	NA	NA
3	103714	2002	51	1950	0	4	169.50	0	0	0	51	53	55	57	59	61	33	27	19	28	31	NA

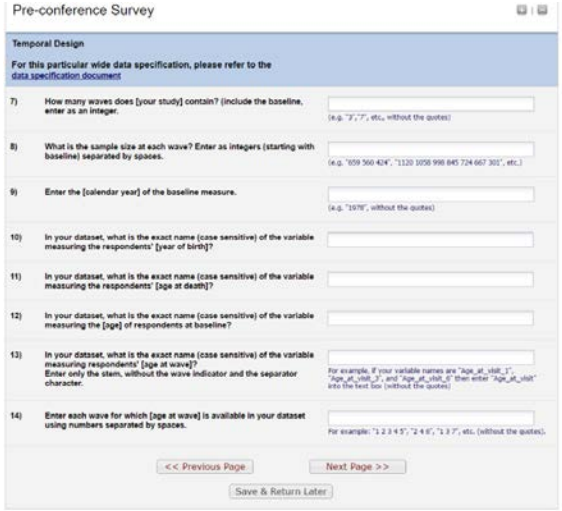
Long

	id	wave	year_born	years_since_bl	year_bl	year	age_bl	age	male_bl	edu_bl	height_cm_bl	diabetes_bl	cardio_bl	smoke_bl	fev	fvc	pef	grip	gait	word_recall_im	word_recall_de	animals
1	103712	1	1947	0	2002	2002	55	55	0	4	172.20	1	0	0	NA	NA	NA	NA	NA	6	6	18
2	103712	2	1947	2	2002	2004	55	57	0	4	172.20	1	0	0	2.99	2.99	4.99	26.833333	NA	6	6	24
3	103712	3	1947	4	2002	2006	55	59	0	4	172.20	1	0	0	NA	NA	NA	NA	NA	10	8	15
4	103712	4	1947	6	2002	2008	55	61	0	4	172.20	1	0	0	2.58	2.58	3.78	21.333333	0.687679112	7	7	16
5	103712	5	1947	8	2002	2010	55	63	0	4	172.20	1	0	0	NA	NA	NA	NA	1.105990767	7	6	23
6	103712	6	1947	10	2002	2012	55	65	0	4	172.20	1	0	0	NA	NA	NA	25.500000	1.019108295	6	6	NA
7	103713	1	1931	0	2002	2002	71	71	1	3	NA	0	0	0	NA	NA	NA	NA	0.108572721	5	1	10
8	103713	2	1931	2	2002	2004	71	73	1	3	NA	0	0	0	NA	NA	3.62	17.166667	0.096793711	3	4	9
9	103713	3	1931	4	2002	2006	71	75	1	3	NA	0	0	0	NA	NA	NA	NA	NA	4	2	8
10	103714	1	1950	0	2002	2002	51	51	0	4	169.50	0	0	0	NA	NA	NA	NA	NA	8	7	33

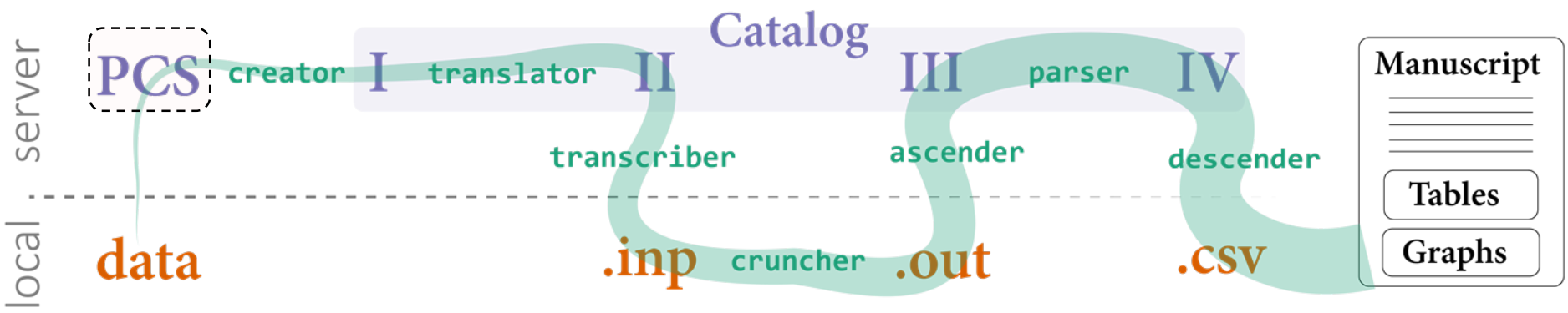


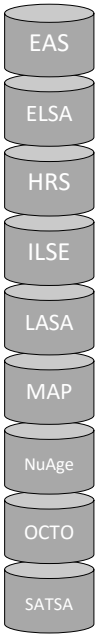
REDCap interacts with the DRIVER
to obtain relevant description
of the study 's DATASET and characteristics.

Image credit: https://support.novell.com/techcenter/articles/ana19920502.html

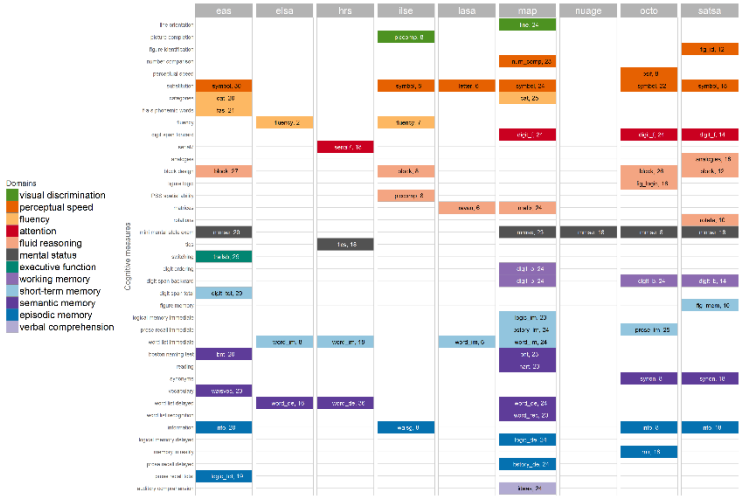


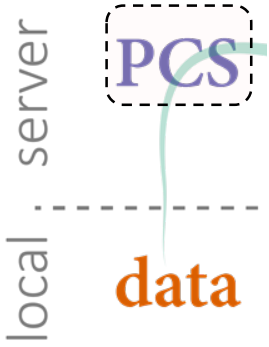
	id	year_bl	age_bl	year_born	male_bl	edu_bl	height_cm_bl	diabetes_bl	cardio_bl	smoke_bl	age_t1	age_t2	age_t3	age_t4	age_t5	age_t6	animals_t1	animals_t2	animals_t3	animals_t4	animals_t5	anima
1	103712	2002	55	1947	0	4	172.20	1	0	0	55	57	59	61	63	65	18	24	15	16	23	NA
2	103713	2002	71	1931	1	3	NA	0	0	0	71	73	75	NA	NA	NA	10	9	8	NA	NA	NA
3	103714	2002	51	1950	0	4	169.50	0	0	0	51	53	55	57	59	61	33	27	19	28	31	NA

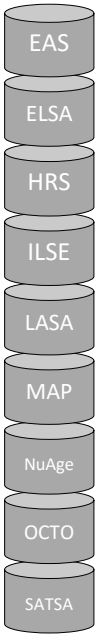




When all drivers Fill in the Pre-Conference Survey
We can see which have similar
COGNITIVE MEASURES



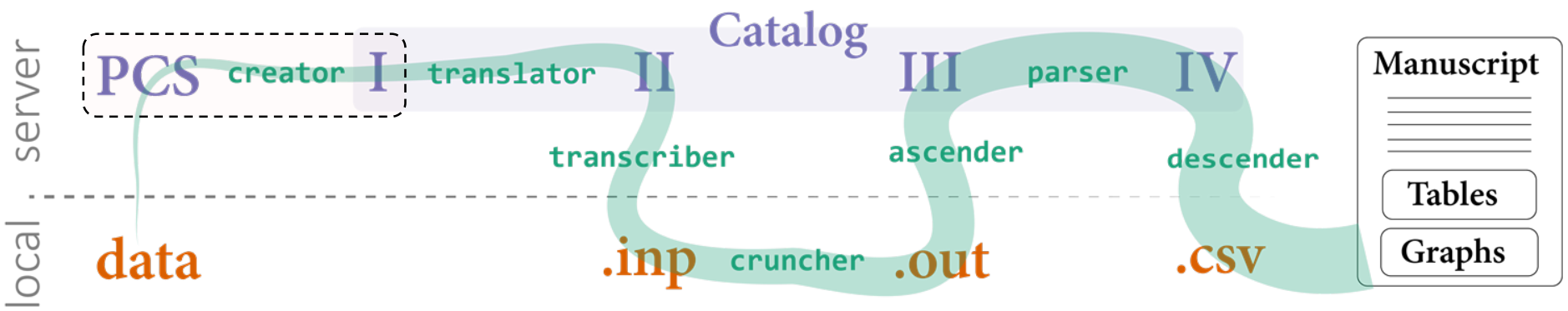




Domains
- visual discrimination
- perceptual speed
- fluency
- attention
- fluid reasoning
- mental status
- executive function
- working memory
- short-term memory
- semantic memory
- episodic memory
- verbal comprehension

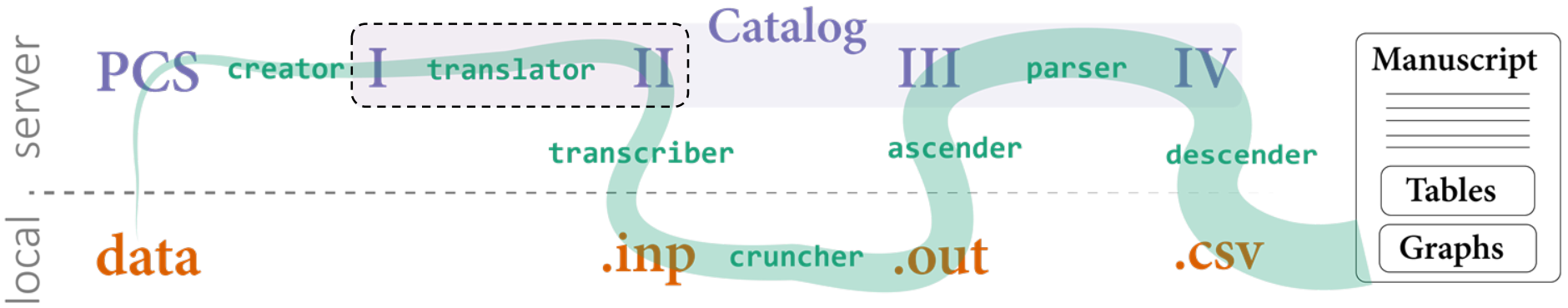
Cognitive measures

	eas	elsa	hrs	ilse	lasa	map	nuage	octo	satsa
line orientation						line, 24			
picture completion				piccomp, 8					
figure identification									fig_id, 12
number comparison						num_comp, 23			
perceptual speed								psif, 8	
substitution	symbol, 30			symbol, 8	letter, 6	symbol, 24		symbol, 22	symbol, 18
categories	cat, 20					cat, 25			
f-a-s phonemic words	fas, 21								
fluency		fluency, 2		fluency, 7					
digit span forward						digit_f, 24		digit_f, 24	digit_f, 14
serial7			serial7, 18						
analogies									analogies, 18
block design	block, 27			block, 8				block, 26	block, 12
figure logic								fig_logic, 18	
IPSS spatial ability				piccomp, 8					
matrices					raven, 6	matix, 24			
rotations									rotate, 10
mini mental state exam	mmse, 20					mmse, 23	mmse, 18	mmse, 8	mmse, 18
tics			tics, 18						
switching	trailsb, 29								
digit ordering						digit_o, 24			
digit span backward						digit_b, 24		digit_b, 24	digit_b, 14
digit span total	digit_tot, 29								
figure memory									fig_mem, 10
logical memory immediate						logic_im, 23			
prose recall immediate						bstory_im, 24		prose_im, 25	
word list immediate		word_im, 8	word_im, 18		word_im, 6	word_im, 24			
boston naming test	bnt, 20					bnt, 23			
reading						nart, 23			
synonyms								synon, 8	synon, 18
vocabulary	waisvoc, 20								
word list delayed		word_de, 16	word_de, 36			word_de, 24			
word list recognition						word_rec, 20			
information	info, 20			waisg, 8				info, 8	info, 18
logical memory delayed						logic_de, 24			
memory in reality								mir, 18	
prose recall delayed						bstory_de, 24			
prose recall total	logic_tot, 19								
auditory comprehension						ideas, 24			



Script run on server.
After drivers enter responses into PCS,
the CREATOR populates/writes
PART I of the Catalog.

1	eas	gait	block	female	a
2	eas	gait	block	female	ae
3	eas	gait	block	female	aeh
4	eas	gait	block	female	aehplus
5	eas	gait	block	female	full
6	eas	gait	block	male	a
7	eas	gait	block	male	ae
8	eas	gait	block	male	aeh
9	eas	gait	block	male	aehplus
10	eas	gait	block	male	full
11	eas	gait	bnt	female	a
12	eas	gait	bnt	female	ae
13	eas	gait	bnt	female	aeh
14	eas	gait	bnt	female	aehplus
15	eas	gait	bnt	female	full



Script run on server.
Using dataset descriptions, the
TRANSLATOR encodes STATISTICAL MODELS
Into M*plus* estimation language

1	eas	gait	block	female	a
2	eas	gait	block	female	ae
3	eas	gait	block	female	aeh
4	eas	gait	block	female	aehplus
5	eas	gait	block	female	full
6	eas	gait	block	male	a
7	eas	gait	block	male	ae
8	eas	gait	block	male	aeh
9	eas	gait	block	male	aehplus
10	eas	gait	block	male	full
11	eas	gait	bnt	female	a
12	eas	gait	bnt	female	ae
13	eas	gait	bnt	female	aeh
14	eas	gait	bnt	female	aehplus
15	eas	gait	bnt	female	full

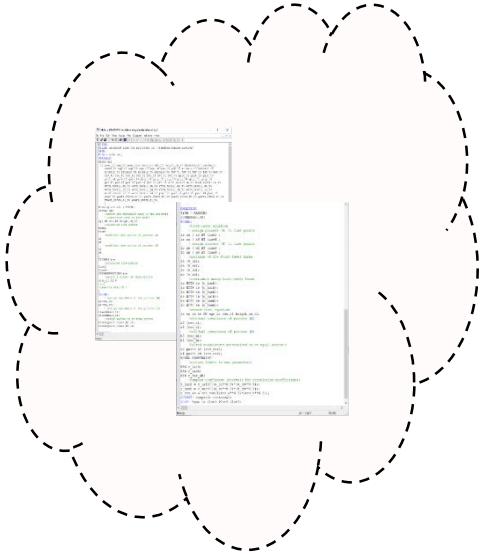
$$_{o=\text{Physical}}\beta_{0i} = {}_{p}\gamma_{00} + {}_{p}\Gamma_{0k}(CovSet) + {}_{p}u_{0i}$$

$$_{o=\text{Physical}}\beta_{1i} = {}_{p}\gamma_{10} + {}_{p}\Gamma_{1k}(CovSet) + {}_{p}u_{1i}$$

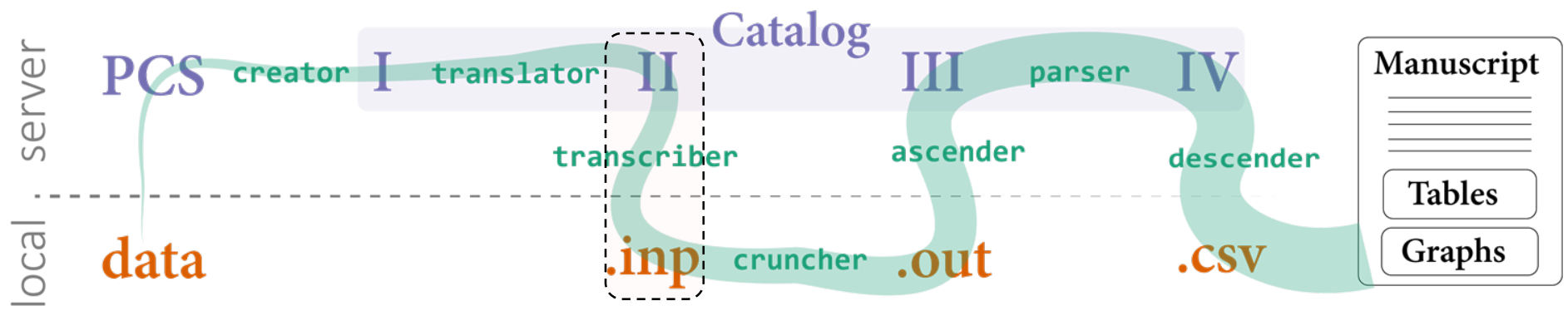
$${}_{o}y_{ti} = {}_{o}\beta_{0i} + {}_{o}\beta_{1i}(Time_{ti}) + {}_{o}\varepsilon_{ti}$$

$$_{o=\text{Cognitive}}\beta_{1i} = {}_{c}\gamma_{10} + {}_{c}\Gamma_{1k}(CovSet) + {}_{c}u_{1i}$$

$$_{o=\text{Cognitive}}\beta_{0i} = {}_{c}\gamma_{00} + {}_{c}\Gamma_{0k}(CovSet) + {}_{c}u_{0i}$$



	Fixed Effects	Random Effects	Residuals
Physical Intercept	${}_{p}\gamma_{00}$ ${}_{p}\gamma_{01}$ ${}_{p}\gamma_{02}$ ⋯ ${}_{p}\gamma_{0k}$	${}_{pp}\tau_{00}$ ${}_{pp}\tau_{01}$ ${}_{pc}\tau_{01}$ ${}_{pc}\tau_{00}$	${}_{p}\sigma^2$ ${}_{pc}\sigma^2$
Physical Slope	${}_{p}\gamma_{10}$ ${}_{p}\gamma_{11}$ ${}_{p}\gamma_{12}$ ⋯ ${}_{p}\gamma_{1k}$	${}_{pp}\tau_{11}$ ${}_{pc}\tau_{11}$ ${}_{pc}\tau_{10}$	
Cognitive Slope	${}_{c}\gamma_{10}$ ${}_{c}\gamma_{11}$ ${}_{c}\gamma_{12}$ ⋯ ${}_{c}\gamma_{1k}$	${}_{cc}\tau_{11}$ ${}_{cc}\tau_{10}$	${}_{c}\sigma^2$
Cognitive Intercept	${}_{c}\gamma_{00}$ ${}_{c}\gamma_{01}$ ${}_{c}\gamma_{02}$ ⋯ ${}_{c}\gamma_{0k}$	${}_{cc}\tau_{00}$	



Script, run on driver's local machine.
TRANSCRIBER takes model syntax from Part II,
and saves it as an `.inp` file on the driver's local machine

ock	female	a
ock	female	ae
ock	female	aeh
ock	female	aehplus
ock	female	full
ock	male	a
ock	male	ae
ock	male	aeh
ock	male	aehplus
ock	male	full
t	female	a
t	female	ae
t	female	aeh
t	female	aehplus
t	female	full

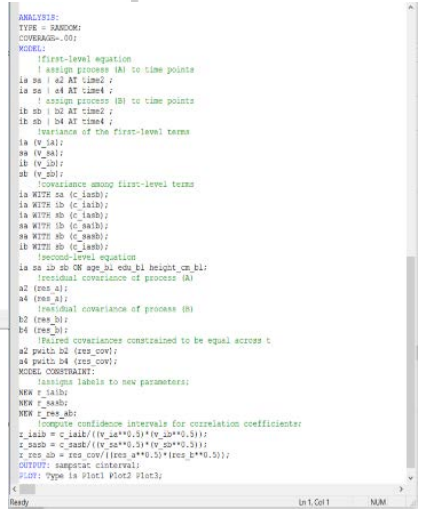
$$_{o=\text{Physical}}\beta_{0i} = {}_{p}\gamma_{00} + {}_{p}\Gamma_{0k}(CovSet) + {}_{p}u_{0i}$$

$$_{o=\text{Physical}}\beta_{1i} = {}_{p}\gamma_{10} + {}_{p}\Gamma_{1k}(CovSet) + {}_{p}u_{1i}$$

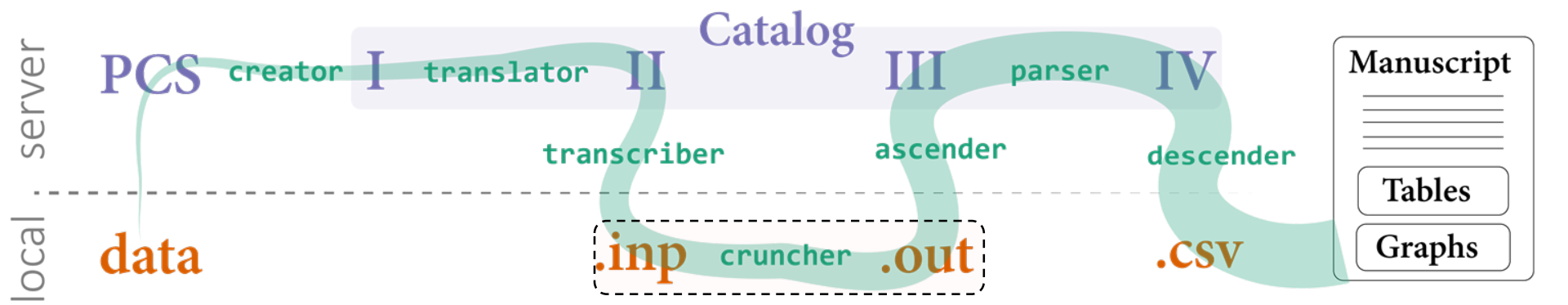
$$_{o}y_{ti} = {}_{o}\beta_{0i} + {}_{o}\beta_{1i}(Time_{ti}) + {}_{o}\varepsilon_{ti}$$

$$_{o=\text{Cognitive}}\beta_{1i} = {}_{c}\gamma_{10} + {}_{c}\Gamma_{1k}(CovSet) + {}_{c}u_{1i}$$

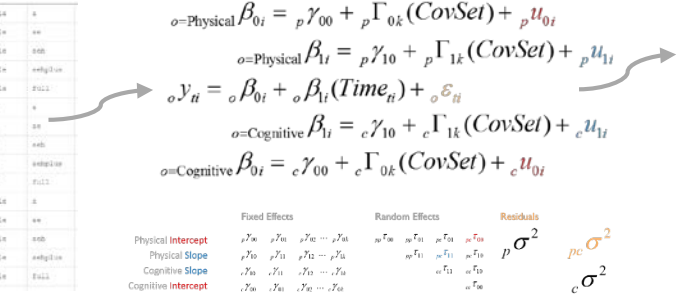
$$_{o=\text{Cognitive}}\beta_{0i} = {}_{c}\gamma_{00} + {}_{c}\Gamma_{0k}(CovSet) + {}_{c}u_{0i}$$

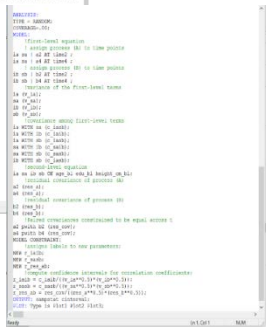


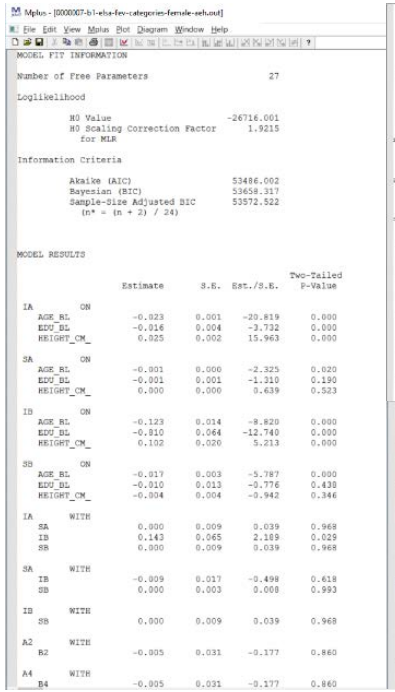
	Fixed Effects				Random Effects				Residuals
Physical Intercept	${}_{p}\gamma_{00}$	${}_{p}\gamma_{01}$	${}_{p}\gamma_{02}$ ⋯	${}_{p}\gamma_{0k}$	${}_{pp}\tau_{00}$	${}_{pp}\tau_{01}$	${}_{pc}\tau_{01}$	${}_{pc}\tau_{00}$	${}_{p}\sigma^2$
Physical Slope	${}_{p}\gamma_{10}$	${}_{p}\gamma_{11}$	${}_{p}\gamma_{12}$ ⋯	${}_{p}\gamma_{1k}$		${}_{pp}\tau_{11}$	${}_{pc}\tau_{11}$	${}_{pc}\tau_{10}$	${}_{pc}\sigma^2$
Cognitive Slope	${}_{c}\gamma_{10}$	${}_{c}\gamma_{11}$	${}_{c}\gamma_{12}$ ⋯	${}_{c}\gamma_{1k}$			${}_{cc}\tau_{11}$	${}_{cc}\tau_{10}$	${}_{c}\sigma^2$
Cognitive Intercept	${}_{c}\gamma_{00}$	${}_{c}\gamma_{01}$	${}_{c}\gamma_{02}$ ⋯	${}_{c}\gamma_{0k}$				${}_{cc}\tau_{00}$	

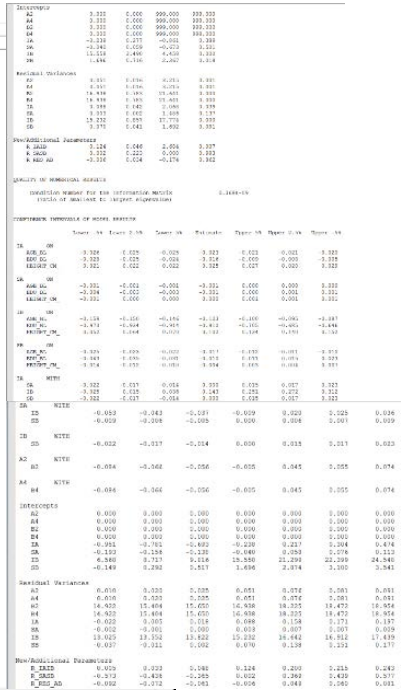


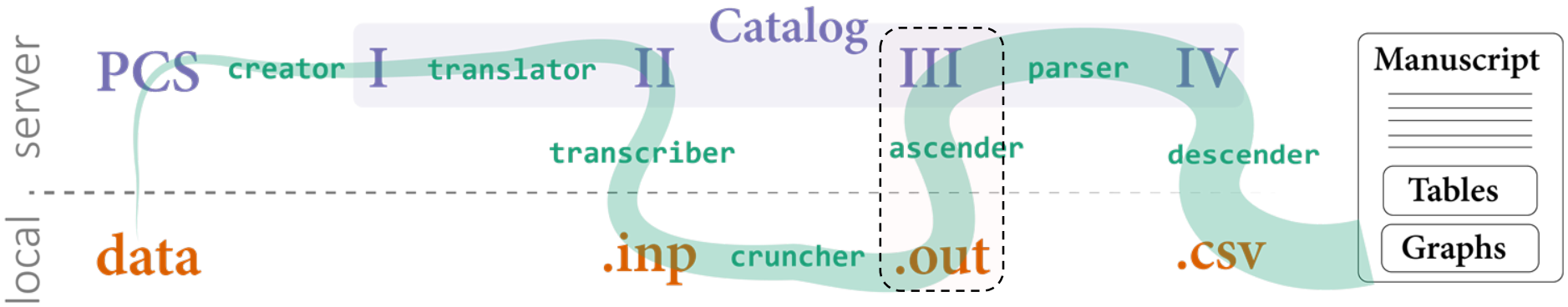
Script, run on driver's local machine.
Calls a local installation of M*plus*,
which uses the local `.dat` and `.inp` files.
Returns an `.out` file containing the MODEL SOLUTION



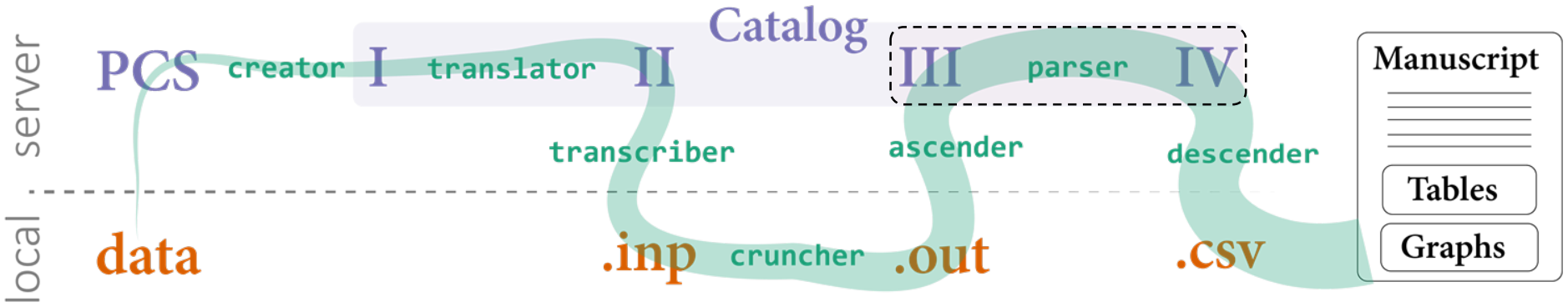








Script, run on driver's local machine.
Uploads the contents of the `.out` files
to Part III of the Catalog.



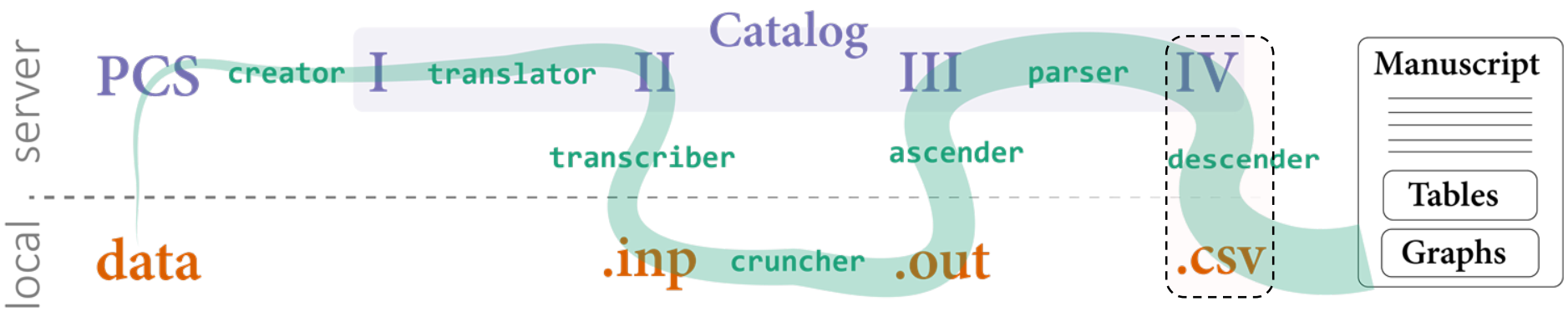
Script run on server.

PARSER extracts model solution from the M*plus* output

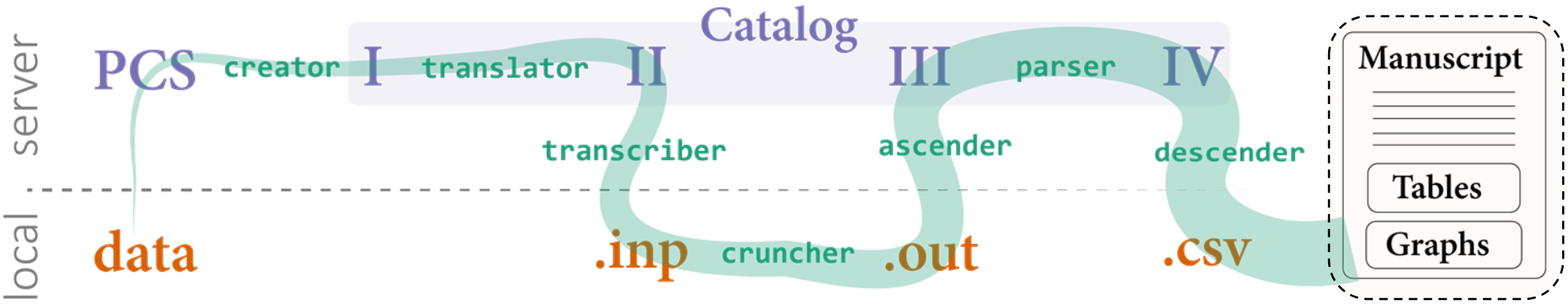
(e.g. parameter estimates, fit indices, and the convergence status).

For each model, these values are saved as separate columns in a single row of Part IV.

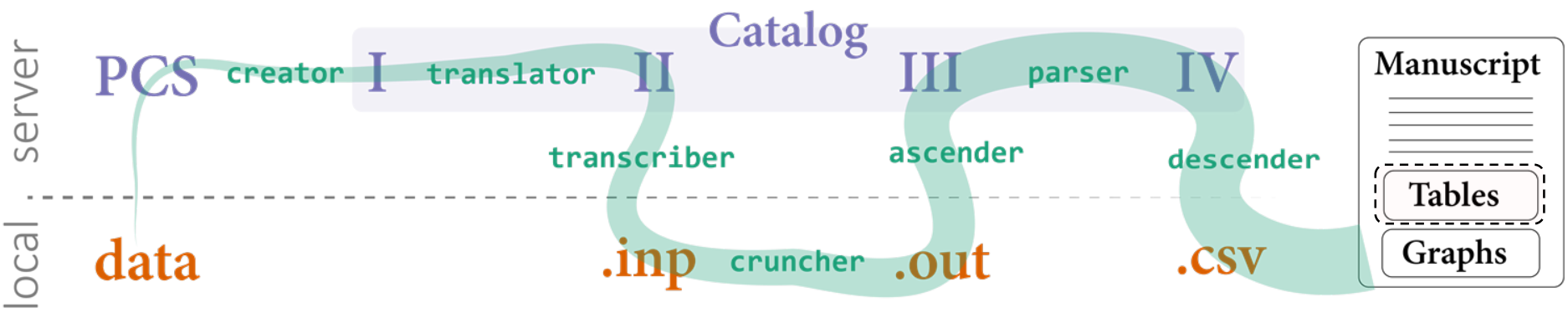
	A	B	C	D	E	F	H	I	J	Q	R	S	T	U	V	W	X	Y	Z	AA
1	study_name	model_number	subgroup	model_type	subject_count	wave_count	LL	aic	bic	ab_TAU_00_est	ab_TAU_00_se	ab_TAU_00_wald	ab_TAU_00_pval	ab_TAU_11_est	ab_TAU_11_se	ab_TAU_11_wald	ab_TAU_11_pval	ab_TAU_01_est	ab_TAU_01_se	ab_TAU_01_wa
2	eas	b1	female	ae	580	8	-12370.4	24790.79	24899.86	-214.803	119.207	-1.802	0.072	-1.426	2.859	-0.499	0.618	-22.556	18.624	-1.2
3	eas	b1	female	ae	593	8	-8766.76	17583.53	17693.16	24.846	13.797	1.801	0.072	0.642	0.347	1.848	0.065	3.495	2.177	1.6
4	eas	b1	female	ae	572	8	-8975.66	18001.32	18110.05	69.278	19.852	3.49	0	1.023	0.37	2.766	0.006	-1.254	2.055	-0.
5	eas	b1	female	ae	524	7	-7043.93	14137.86	14244.4	5.151	9.445	0.545	0.586	-0.282	0.357	-0.79	0.43	2.919	1.916	1.5
6	eas	b1	female	ae	594	8	-9357.93	18765.87	18875.54	55.35	19.105	2.897	0.004	0.815	0.456	1.786	0.074	0.303	2.457	0.1
7	eas	b1	female	ae	594	8	-6681.55	13413.11	13522.78	5.336	4.51	1.183	0.237	0.112	0.109	1.026	0.305	-0.201	0.628	-0.3
8	eas	b1	female	ae	595	8	-7094.86	14239.72	14349.44	17.044	5.765	2.956	0.003	0.322	0.185	1.742	0.081	-1.337	1.027	-1.3
9	eas	b1	female	ae	554	8	-8065.42	16180.84	16288.77	8.647	9.337	0.926	0.354	0.157	0.283	0.553	0.58	2.549	1.865	1.3
10	eas	b1	female	ae	383	8	-3871.71	7793.415	7892.116	10.378	5.741	1.808	0.071	-0.002	0.119	-0.017	0.987	0.215	0.657	0.3
11	eas	b1	female	ae	563	8	-8499.24	17048.48	17156.81	31.673	13.058	2.426	0.015	0.446	0.305	1.462	0.144	-2.218	1.767	-1.2
12	eas	b1	female	ae	592	8	-9307.2	18664.39	18773.98	69.62	20.65	3.371	0.001	1.426	0.639	2.231	0.026	0.118	3.455	0.0
13	eas	b1	female	aeh	150	8	-4939.77	9937.539	10024.85	-219.554	185.685	-1.182	0.237	-1.111	4.85	-0.229	0.819	-10.409	35.697	-0.2
14	eas	b1	female	aeh	150	8	-3582.45	7222.909	7310.217	16.88	20.942	0.806	0.42	0.837	0.945	0.886	0.376	5.52	4.478	1.2
15	eas	b1	female	aeh	150	8	-3709.14	7476.282	7563.591	81.433	32.4	2.513	0.012	0.817	0.561	1.456	0.145	-0.832	3.422	-0.2
16	eas	b1	female	aeh	130	7	-2632.36	5322.718	5405.877	15.274	13.399	1.14	0.254	-0.483	0.706	-0.684	0.494	4.214	3.568	1.1
17	eas	b1	female	aeh	150	8	-3714.27	7486.538	7573.847	60.856	26.394	2.306	0.021	1.19	0.811	1.467	0.142	-3.555	3.466	-1.0
18	eas	b1	female	aeh	150	8	-2825.3	5708.606	5795.914	9.225	7.158	1.289	0.197	0.286	0.231	1.237	0.216	-0.949	1.443	-0.6
19	eas	b1	female	aeh	150	8	-2910.72	5879.44	5966.749	14.142	7.545	1.874	0.061	0.362	0.232	1.56	0.119	-1.206	1.531	-0.7
20	eas	b1	female	aeh	150	8	-3450.76	6959.528	7046.837	10.8	13.947	0.774	0.439	0.247	0.583	0.423	0.672	1.455	3.278	0.4
21	eas	b1	female	aeh	72	8	-1316.58	2691.156	2757.179	2.34	3.898	0.6	0.548	0.012	0.179	0.068	0.946	0.26	0.828	0.3



Script run on server.
Copies the entire catalog as a CSV on the driver's local machine.
This disconnected CSV are drivers' to keep for further analysis.



The Catalog forms the dataset for META-ANALYSIS,
In which models are the new units.
MANUSCRIPTS reports and interprets the results of meta-analysis.



DYNAMIC tables store all possible values.
These are useful to have for EXPLORATION.
You can filter and sort to guide your search for patterns.

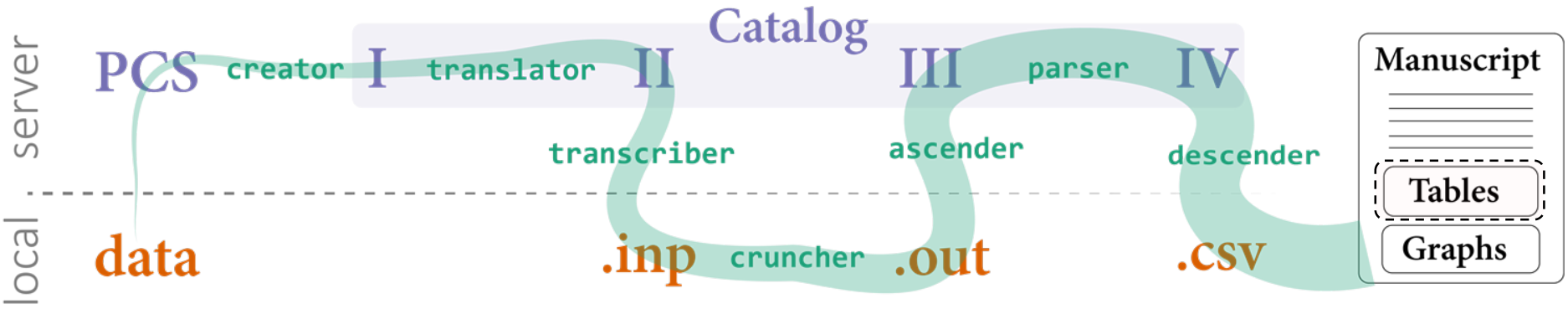
Dynamic Table

Show 10 entries Search:

Random Effects Growth Curve Model Solution

	study name	process a	process b	subgroup	model type	n	r intercept	r slope	r residual
							All	All	All
1	eas	gait	block	female	a	563	0.25(0.08),p<.01	0.30(0.27),p=.26	-0.02(0.05),p=.72
2	eas	gait	block	female	ae	563	0.22(0.08),p=.01	0.46(0.31),p=.14	-0.02(0.05),p=.73
3	eas	gait	block	female	aeh	150	0.26(0.14),p=.06	0.03(0.63),p=.96	-0.06(0.08),p=.41
4	eas	gait	block	female	aehplus	150	0.17(0.16),p=.28	0.02(0.67),p=.98	-0.07(0.08),p=.36
5	eas	gait	block	female	full	150	0.14(0.17),p=.41	0.01(0.69),p=.99	-0.07(0.08),p=.38
6	eas	gait	block	male	a	350	0.40(0.11),p<.01	0.39(0.70),p=.58	-0.05(0.07),p=.50
7	eas	gait	block	male	ae	350	0.40(0.12),p<.01	0.40(0.78),p=.61	-0.05(0.07),p=.50
8	eas	gait	block	male	aeh	72	0.28(0.30),p=.34	0.22(3.38),p=.95	0.01(0.13),p=.91
9	eas	gait	block	male	aehplus	72	0.29(0.37),p=.43	0.15(7.19),p=.98	0.01(0.15),p=.95
10	eas	gait	block	male	full	72	0.25(0.43),p=.56	0.17(4.41),p=.97	0.00(0.16),p=.98

Showing 1 to 10 of 967 entries Previous 1 2 3 4 5 ... 99 Next



STATIC tables print targeted results.
These are useful to have for DEMONSTRATION.

Dynamic Table

Show 10 entries Search:

Random Effects Growth Curve Model Solution

	study name	process a	process b	subgroup	model type	n	r intercept	r slope	r residual
							All	All	All
1	eas	gait	block	female	a	563	0.25(0.08),p<.01	0.30(0.27),p=.26	-0.02(0.05),p=.72
2	eas	gait	block	female	ae	563	0.22(0.08),p=.01	0.46(0.31),p=.14	-0.02(0.05),p=.73
3	eas	gait	block	female	aeh	150	0.26(0.14),p=.06	0.03(0.63),p=.96	-0.06(0.08),p=.41
4	eas	gait	block	female	aehplus	150	0.17(0.16),p=.28	0.02(0.67),p=.98	-0.07(0.08),p=.36
5	eas	gait	block	female	full	150	0.14(0.17),p=.41	0.01(0.69),p=.99	-0.07(0.08),p=.38
6	eas	gait	block	male	a	350	0.40(0.11),p<.01	0.39(0.70),p=.58	-0.05(0.07),p=.50
7	eas	gait	block	male	ae	350	0.40(0.12),p<.01	0.40(0.78),p=.61	-0.05(0.07),p=.50
8	eas	gait	block	male	aeh	72	0.28(0.30),p=.34	0.22(3.38),p=.95	0.01(0.13),p=.91
9	eas	gait	block	male	aehplus	72	0.29(0.37),p=.43	0.15(7.19),p=.98	0.01(0.15),p=.95
10	eas	gait	block	male	full	72	0.25(0.43),p=.56	0.17(4.41),p=.97	0.00(0.16),p=.98

Showing 1 to 10 of 967 entries Previous 1 2 3 4 5 ... 99 Next

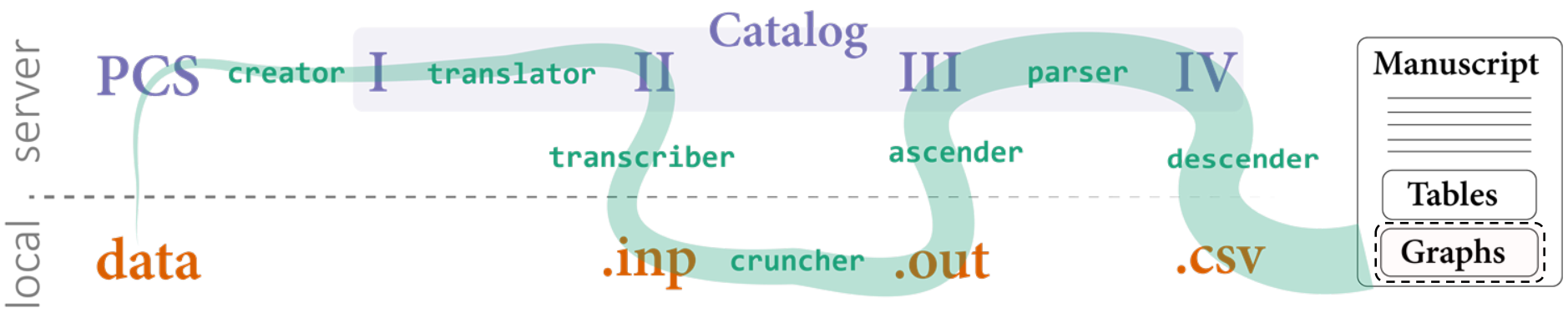
Static Tables

The 'aehplus' model (with covariates age, education, /health, and others) is shown for each combination of

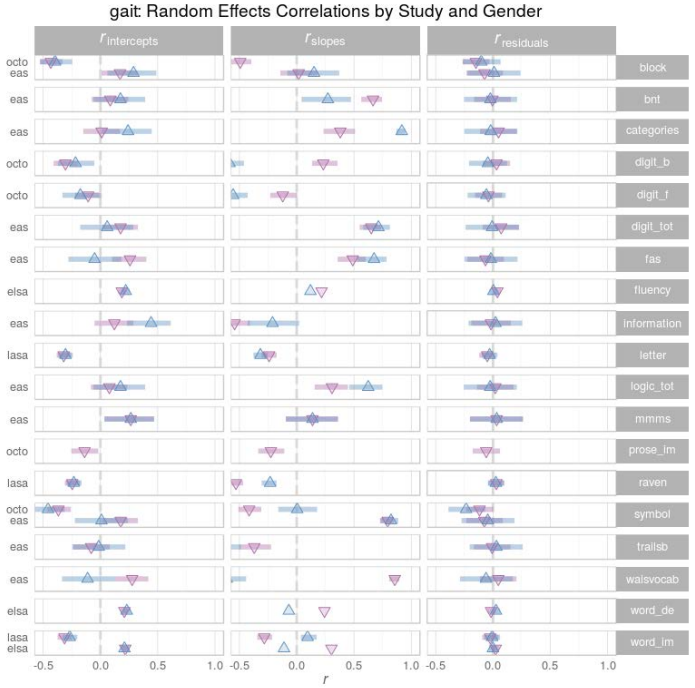
- study,
- process, and
- gender.

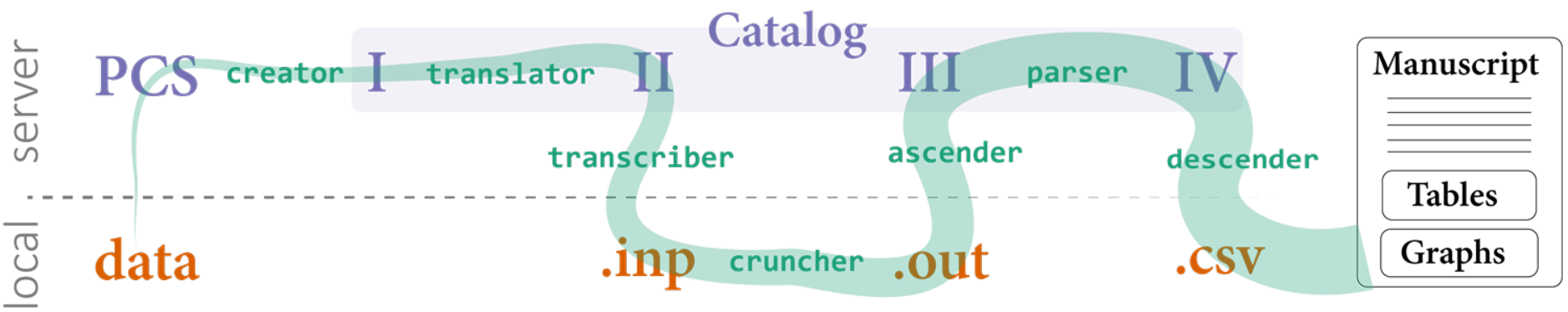
eas

Processes	Gender	n	$r_{intercepts}$	r_{slopes}	$r_{residuals}$
gait vs block	female	150	0.17(0.16),p=.28	0.02(0.67),p=.98	-0.07(0.08),p=.36
gait vs block	male	72	0.29(0.37),p=.43	0.15(7.19),p=.98	0.01(0.15),p=.95
gait vs bnt	female	150	0.09(0.18),p=.63	0.67(0.49),p=.18	-0.01(0.12),p=.97
gait vs bnt	male	72	0.17(0.38),p=.64	0.27(2.80),p=.92	-0.02(0.20),p=.91
gait vs categories	female	150	0.01(0.13),p=.93	0.38(0.44),p=.39	0.05(0.11),p=.67
gait vs categories	male	72	0.24(0.38),p=.52	0.92(1.14),p=.42	-0.02(0.17),p=.90
gait vs digit_tot	female	150	0.18(0.17),p=.29	0.65(0.40),p=.10	0.07(0.08),p=.40
gait vs digit_tot	male	72	0.06(0.37),p=.87	0.71(1.50),p=.63	-0.01(0.18),p=.96
gait vs fas	female	150	0.26(0.14),p=.06	0.49(0.61),p=.42	-0.07(0.08),p=.40
gait vs fas	male	72	-0.05(0.29),p=.86	0.68(2.69),p=.80	-0.02(0.22),p=.93
gait vs information	female	130	0.12(0.22),p=.58	-0.54(1.41),p=.70	-0.02(0.11),p=.87
gait vs information	male	70	0.44(0.44),p=.32	-0.21(8.37),p=.98	0.02(0.19),p=.91
gait vs logic_tot	female	150	0.08(0.15),p=.60	0.31(0.76),p=.69	0.02(0.10),p=.83
gait vs logic_tot	male	72	0.17(0.36),p=.62	0.62(2.40),p=.80	-0.03(0.19),p=.90
gait vs nsms	female	72	0.27(0.63),p=.67	0.14(3.05),p=.96	0.03(0.17),p=.85
gait vs nsms	male	72	0.27(0.63),p=.67	0.14(3.05),p=.96	0.03(0.17),p=.85
gait vs symbol	female	150	0.18(0.15),p=.24	0.79(0.61),p=.19	-0.08(0.10),p=.44
gait vs symbol	male	72	0.01(0.29),p=.97	0.82(1.15),p=.47	-0.05(0.22),p=.83



FOREST plots display the values from the tables
To optimize for useful comparisons.





Big Data, Big Analysis:

A Collaborative Modeling Framework for Multi-study Replication

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Integrative Analysis of Longitudinal Studies on Aging

www.ialsa.org

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University of Victoria

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Study	Driver
Einstein Aging Study	Andrea Zammit
English Longitudinal Study of Aging	Annie Robitaille
HRS	Chenkai Wu
Interdisciplinary Longitudinal Study	Philipp Handschuh
Normative Aging Study	Lewina Lee
NuAge	Valerie Jarry
OCTO-Twin	Marcus Praetorius
Rush Memory and Aging Project	Cassandra Brown
SATSA	Deborah Finkel