



Uio • University of Oslo

Your Thesis Title May Span for a Maximum of Three Lines on the Cover Page

Firstname Lastname

Master of Science in Assessment, Measurement and Evaluation

30 credits

Centre for Educational Measurement
Faculty of Educational Sciences

Spring 2021

Popular Abstract

Maximum half a page. One single paragraph. No indentation. Nunc sed risus diam. Nam vel neque mi. Fusce pretium a erat nec placerat. Proin faucibus finibus aliquet. Phasellus ut felis feugiat, tempus enim eget, ornare neque. Ut magna ante, faucibus eget pellentesque dictum, dapibus sed libero. Integer hendrerit lacus id lacus sodales vehicula. Curabitur orci tortor, condimentum quis velit in, tincidunt convallis turpis. Sed eget auctor est, et aliquet ipsum. Pellentesque habitant morbi tristique senectus et netus et malesuada fames ac turpis egestas. Etiam vel risus eget velit consectetur blandit. Fusce vitae nulla sapien. Vestibulum luctus neque quis risus laoreet, ac faucibus turpis tristique. Nunc a nunc eget odio fringilla tempus.

Acknowledgements

Maecenas vel maximus erat. Vestibulum ac ornare neque. Integer vestibulum elit sem, ac varius turpis dapibus sed. Nulla erat neque, consecetur nec urna pretium, finibus elementum urna. Donec id hendrerit sem. Cras et arcu nunc. Nam dictum lacus vitae lorem luctus ultricies. Suspendisse varius velit quis imperdiet rhoncus. Quisque ut placerat nulla. Cras ut tortor mattis, finibus nisi non, sollicitudin purus. Vestibulum dolor elit, accumsan id ligula eget, lobortis malesuada lorem. Aenean vel maximus justo.

Proin pretium venenatis tortor, id varius turpis semper non. Sed non elit eget purus cursus ultrices et sit amet diam. Morbi vestibulum tortor magna, sed placerat justo condimentum ac. Morbi leo magna, pharetra in neque eget, fringilla aliquam elit. Duis at ultrices ligula. Suspendisse ac ligula in tortor condimentum feugiat. Etiam ut ligula id sapien efficitur malesuada. Sed nec sagittis nisi, nec auctor dolor. Proin viverra feugiat gravida. Quisque venenatis a risus non venenatis.

In hac habitasse platea dictumst. Sed finibus laoreet quam a mollis. Phasellus turpis est, convallis ut enim ut, aliquet sodales metus. Mauris porta lectus et dolor vehicula semper. Proin volutpat feugiat nibh ut blandit. Morbi mollis nunc et leo ultrices, id posuere ipsum semper. Quisque auctor egestas dignissim. Nunc molestie nulla ac enim tincidunt, non scelerisque enim hendrerit. Nulla bibendum dolor eget tellus porttitor, at auctor velit accumsan. Donec at volutpat eros, eu varius turpis. Phasellus a pellentesque enim.

Aenean id tellus eu ex tempor finibus. Vestibulum ante ipsum primis in faucibus orci luctus et ultrices posuere cubilia curae; Suspendisse gravida volutpat lacinia. Integer imperdiet sagittis suscipit. Aliquam vitae tristique ante. Morbi diam lorem, efficitur sit amet luctus eu, placerat eget neque. Sed quis pretium metus, in bibendum dui. Duis feugiat, justo ut convallis gravida, diam ipsum mattis massa, vitae mollis risus ligula ut quam. Ut feugiat dignissim quam in auctor. Nunc rutrum nec est at iaculis.

Your Thesis Title May Span for a Maximum of Three Lines on the Cover Page

Single paragraph. No indentation. Maximum 250 words. Phasellus egestas purus et sem porta venenatis. Vestibulum ante ipsum primis in faucibus orci luctus et ultrices posuere cubilia curae; Sed pulvinar leo ut posuere sollicitudin. Integer sem tortor, tristique id nisl sed, aliquam pharetra tortor. Integer tortor purus, facilisis mollis tortor nec, sodales bibendum urna. Nulla quam enim, feugiat semper neque ut, sagittis ullamcorper urna. Donec et iaculis mi. Etiam congue tellus ut felis viverra, ac mollis eros venenatis. Vivamus eget ante at eros pulvinar tempor nec at arcu. Donec et vestibulum nunc. Fusce sed metus nisi. In leo turpis, mattis a tincidunt luctus, pellentesque et velit. Ut tortor mi, rutrum nec fringilla vitae, maximus et ligula. Vestibulum finibus semper ornare.

Keywords: keyword 1, keyword 2, keyword 3

Maecenas nec ultricies tellus. Suspendisse tristique a ante non fringilla. Morbi et sem dignissim, aliquet leo vel, scelerisque purus. Sed iaculis, est vel molestie consequat, erat elit venenatis arcu, a tempor libero diam sit amet velit. Sed lectus nunc, viverra a molestie nec, lacinia nec purus. Cras vitae efficitur metus. Nullam ac auctor dolor. Proin quis lacinia urna. Maecenas feugiat congue justo eget iaculis. Pellentesque vehicula nunc sit amet viverra feugiat. Aenean tristique luctus sapien sed feugiat. Donec ut vestibulum lectus, ut fermentum turpis. Etiam rutrum eros a sem commodo consequat (Lüdtke et al., 2008).

First Level 2 Heading

Suspendisse varius iaculis sem, vel congue augue vulputate in. Vestibulum ante ipsum primis in faucibus orci luctus et ultrices posuere cubilia curae; Nullam vitae purus eget purus eleifend gravida finibus eget erat. Quisque eget tincidunt dolor. In ac lectus at lectus cursus scelerisque non a libero. Donec posuere neque vitae sapien aliquet maximus. Phasellus malesuada, lectus eget molestie facilisis, mauris nunc congue risus, in hendrerit magna dolor sit amet eros. Phasellus nec elit nibh. Sed lacinia, augue ac pretium blandit, quam tortor aliquet massa, aliquet eleifend lectus turpis id sapien. Praesent eget leo id enim blandit elementum (Marsh et al., 2009).

One Level 3 Heading

Marsh et al. and colleagues 2009 nulla finibus dignissim ex vitae mattis. Phasellus ligula sapien, auctor vel finibus non, fermentum a diam. Ut commodo leo porttitor libero porta, ac accumsan ante egestas. Vivamus in sem eu felis interdum vulputate. Vivamus ut orci libero. Curabitur nisi odio, pulvinar sed ornare vitae, pellentesque dapibus ligula. Fusce et faucibus dolor. Aliquam erat volutpat. Quisque sagittis justo vitae dui posuere, a aliquet nunc ornare. Praesent tempor a est ac mattis. Interdum et malesuada fames ac ante ipsum primis in faucibus. Proin elementum luctus placerat. Sed rhoncus leo in magna cursus egestas. Aliquam a arcu a urna sodales convallis. Duis a convallis quam, hendrerit commodo tortor.

Another Level 3 Heading

Nullam id commodo turpis. Pellentesque sed fermentum quam. Aenean ut massa id quam pretium blandit ac in ex. Morbi ultricies tellus magna. Quisque ornare, ligula at tincidunt finibus, justo mauris tristique lectus, at bibendum odio sapien sed ante. Curabitur ultrices pulvinar magna quis feugiat. Suspendisse vehicula ex a sem vehicula convallis. Aliquam ut lacus porttitor, bibendum ex eu, varius lorem. Vestibulum ultricies elementum neque, ac pharetra libero mollis in. Etiam eu mollis nulla, eget blandit elit.

Second Level 2 Heading

Aenean nec ultrices turpis, vitae vehicula felis. Praesent nec nisl ultrices, facilisis arcu ac, ultrices tellus. Sed eget urna dolor. Proin tortor nibh, consequat ac metus ut, molestie mattis nibh. Nullam sit amet felis vel risus sagittis eleifend ut vel enim. Morbi suscipit vestibulum neque sed porta. Morbi eu sodales elit, sed laoreet justo. Ut in tellus egestas, consequat purus et, mattis urna. Proin pretium, eros et consectetur dapibus, arcu mauris sagittis elit, sit amet volutpat urna leo sollicitudin quam. Aenean nec porttitor ante, sit amet bibendum est. Nulla sagittis mattis gravida. Etiam elementum, augue et volutpat placerat, nibh lectus pretium tortor, vitae posuere dui elit eget libero. This thesis therefore aims to answer the following research questions:

RQ1. To what extent the variation in Y can be accounted for by the variation in X .

RQ2. How does M influence the relationship between X and Y as a mediator?

Method

Aenean egestas, magna vitae venenatis tincidunt, lacus nunc suscipit mauris, eu tincidunt enim nulla et leo. Ut tincidunt ante at mauris semper hendrerit. Nam consectetur aliquet est sit amet accumsan. Pellentesque porta nisl sapien. Ut vel vulputate est. Ut scelerisque nibh eu augue hendrerit condimentum. Nullam vel dolor consectetur, bibendum ligula nec, faucibus nisi. Sed imperdiet eros ante. Morbi tempor sollicitudin commodo.

Sample

Mauris eu efficitur lectus, id suscipit enim. Phasellus justo nunc, gravida sed pulvinar nec, hendrerit quis orci. Nulla quis interdum augue. Vestibulum augue orci, porta nec erat vitae, bibendum ullamcorper massa. Mauris nec orci eros. Proin neque risus, pellentesque vehicula massa vel, pellentesque iaculis odio. Phasellus ullamcorper, elit vitae convallis eleifend, enim diam euismod ligula, vel fringilla risus tortor pulvinar neque. Sed vel faucibus nibh.

Measures

Suspendisse potenti. Quisque nec interdum nunc. Curabitur tempus nibh non magna porttitor sodales. Donec nec lacus nibh. Phasellus pretium vehicula pretium. In vitae libero tempor, ullamcorper massa nec, ultrices nunc. Etiam aliquet, ante sed ultricies viverra, nunc orci volutpat diam, in vulputate ligula tellus at magna. Quisque dignissim sit amet turpis sit amet fermentum.

Statistical Analysis

Phasellus eget lorem vitae ligula ultrices scelerisque. Curabitur lacinia, magna in interdum faucibus, nibh magna vestibulum risus, eget ornare justo ante in ex. Vivamus ullamcorper commodo erat, a iaculis tortor congue scelerisque. Proin posuere, elit nec ultricies mattis, felis tellus scelerisque dui, sed commodo ex urna eget metus. Integer non dolor vel lacus mollis pharetra. Sed viverra mi in ipsum condimentum fringilla. Suspendisse nec eros vitae ligula faucibus posuere. Pellentesque dolor arcu, vestibulum in purus ut, tincidunt iaculis sapien.

$$E = mc^2 \tag{1}$$

Curabitur viverra velit lacus, sed hendrerit augue dictum egestas. Suspendisse ipsum sem, molestie tempus nulla vitae, faucibus rhoncus massa. Aliquam nisl metus, condimentum

sit amet rhoncus quis, vulputate imperdiet metus. Nulla sit amet venenatis augue. Aenean vehicula placerat quam, at vestibulum arcu condimentum nec. Donec rutrum, sem in pulvinar condimentum, ligula orci pulvinar dui, eu interdum quam tellus in orci. Nunc ullamcorper nulla condimentum odio sollicitudin ornare. Phasellus ut congue libero. Suspendisse potenti. Nam sollicitudin tempus sapien vitae facilisis. Nullam pharetra sem eget ullamcorper venenatis. Maecenas tempus, eros vel tempus laoreet, risus tortor ultrices diam, a blandit nisl velit non purus. Etiam id rutrum mi (see Equation (1)).

Results

Donec vitae efficitur sapien. Sed nisl ante, rutrum ac risus nec, mattis facilisis mauris. Quisque eu faucibus nisi, at viverra tortor. Quisque dignissim bibendum venenatis. Aenean in magna in nisi sagittis congue. In iaculis vulputate iaculis. Proin vel vehicula est. Mauris justo eros, tempor at arcu ac, venenatis semper purus. Cras neque diam, rhoncus sit amet diam vitae, ultricies vulputate mauris. Suspendisse nec tincidunt nibh. Nullam nunc lorem, mollis non augue quis, luctus varius nisl. Vestibulum ac nisl ut enim commodo suscipit non a erat. Nunc hendrerit consectetur odio. Proin semper velit eu mauris vestibulum faucibus. Ut venenatis augue et massa viverra tincidunt. Sed venenatis risus id est pretium pretium (see Table 1).

A Generic Level 2 Heading

Suspendisse laoreet, tortor nec interdum malesuada, risus tortor malesuada leo, sit amet blandit ligula turpis vitae lectus. Morbi ut mauris dapibus, placerat orci in, ullamcorper erat. Pellentesque lacinia a odio tristique imperdiet. Nullam pulvinar sollicitudin arcu ut sagittis. Vestibulum mattis justo vel nibh ultricies dictum. Ut rhoncus tortor vitae quam viverra congue. Morbi lobortis tortor et lacinia vestibulum (see Figure 1).

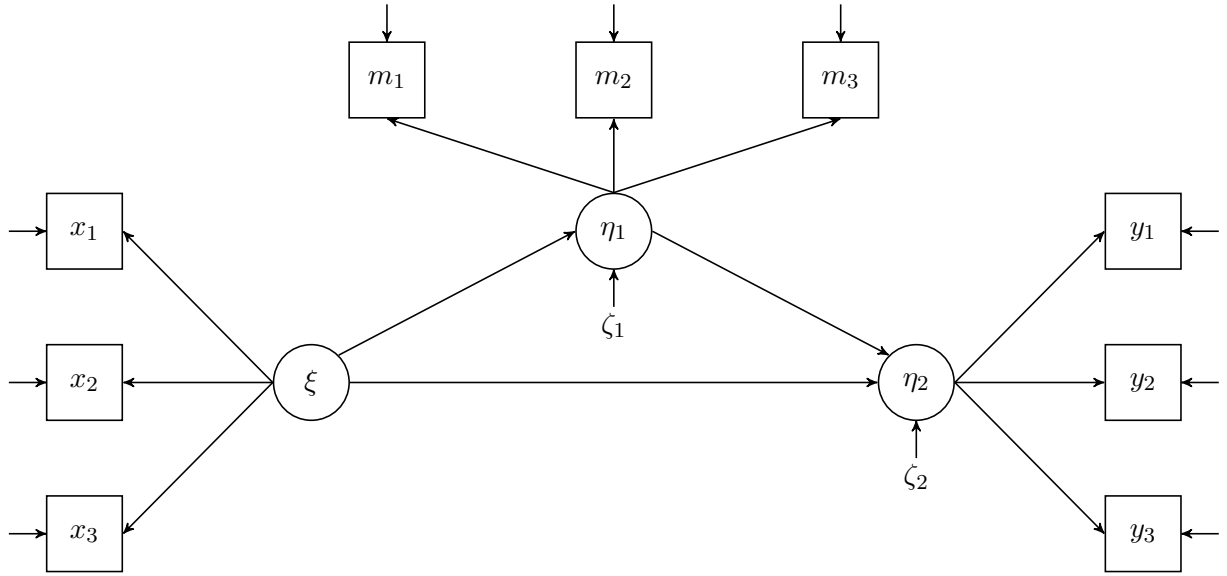
Aenean cursus fringilla maximus. Lorem ipsum dolor sit amet, consectetur adipiscing elit. Integer semper est velit, nec hendrerit nisl convallis ut. Donec ornare leo quis egestas elementum. Curabitur vulputate accumsan odio, et lacinia erat porttitor sit amet. Duis orci sapien, tincidunt sodales malesuada vitae, tempor sed nibh. Praesent sed aliquam libero.

Another Generic Level 2 Heading

Fusce quis erat nec magna porta ornare. Praesent efficitur sapien hendrerit, lobortis nisi et, convallis tellus. Aenean convallis rutrum pretium. Fusce malesuada sapien quis magna dictum, et placerat tellus placerat. Lorem ipsum dolor sit amet, consectetur adipiscing elit.

Figure 1

Model Diagram



Note. A sample diagram.

Suspendisse consectetur non diam non posuere. Aenean erat risus, vestibulum vel eleifend a, vehicula et justo. Cras magna tellus, consequat eu tortor at, euismod maximus dolor.

Table 1*Descriptive Statistics*

Analysis level	Variable label	Non-missing sample size	Missing rate (%) ^a	Median	M	SD	Skewness	Kurtosis	Excess Minimum	Maximum
Student (within, $L1$)	FLSCHOOL	96435	10.01	0.126	0.018	1.020	0.189	-0.343	-1.564	2.317
	FLFAMILY	95133	11.23	0.011	0.064	1.044	0.121	0.030	-2.042	2.452
	NOBULLY	83499	22.08	0.782	-0.059	1.054	-1.078	0.664	-3.859	0.782
	ESCS	104784	2.22	-0.158	-0.241	1.088	-0.533	0.184	-7.711	4.234
	FCFMLRTY	99969	6.71	7.000	7.049	5.455	0.223	-1.039	0.000	18.000
	FLCONFIN	90130	15.89	-0.027	-0.072	1.017	-0.084	0.355	-2.210	2.322
	FLIT ^b	107162	0.00	481.970	478.291	97.074	-0.089	-0.340	114.256	827.977
School (between, $L2$)	EDUSHORT	6346	4.30	0.100	0.131	1.036	0.341	-0.188	-1.421	2.959
	STRATIO	5626	15.16	11.886	13.873	10.171	4.021	25.425	1.000	100.000

Note. ^a Missing rates were computed based on $n_{L1} = 107,162$ students and $n_{L2} = 6,631$ schools. ^b FLIT was obtained by averaging ten plausible values PV1FLIT to PV10FLIT.

Discussion

Donec sapien tellus, dignissim sit amet dolor et, interdum vulputate justo. Mauris eget pellentesque felis. Suspendisse sollicitudin et augue vel molestie. Praesent pharetra pellentesque urna non ultrices. Etiam diam nulla, efficitur rutrum finibus ut, dapibus ut tellus. Vivamus eget est sit amet risus molestie gravida ut ut odio. In id libero semper, dapibus sem nec, vehicula ante. Morbi hendrerit augue egestas congue vulputate. In non maximus justo. Donec at tortor a dui ultricies convallis condimentum quis tellus. In auctor aliquam rutrum. Quisque vehicula justo sit amet arcu lobortis, consectetur condimentum velit tempor. Aliquam ullamcorper est id eleifend maximus. Curabitur vulputate diam in velit tempus commodo.

Conclusion

Donec venenatis ipsum quis consectetur pellentesque. Lorem ipsum dolor sit amet, consectetur adipiscing elit. Mauris luctus, lacus quis rutrum malesuada, sapien mi semper sem, mattis blandit purus dolor efficitur metus. Aenean scelerisque ipsum sit amet urna volutpat lacinia. Vestibulum sagittis rutrum mattis. Aliquam tortor odio, finibus eget erat ut, vehicula hendrerit est. Cras pharetra volutpat est, maximus viverra elit accumsan sit amet. Donec quis dui id augue dapibus tincidunt ac vitae eros. Sed gravida condimentum ligula, vel semper libero sollicitudin id. Donec ac ipsum vulputate, consectetur massa nec, vehicula risus. Pellentesque vitae ullamcorper nunc, vel elementum tellus. Donec aliquam, turpis nec congue luctus, magna tellus dictum sem, non tempor ipsum felis eu lectus. Curabitur id commodo est, sit amet tempor odio. Vivamus fermentum scelerisque vehicula. Ut viverra gravida nulla, a tempor nunc varius tempor.

References

- Lüdtke, O., Marsh, H. W., Robitzsch, A., Trautwein, U., Asparouhov, T., & Muthén, B. (2008). The multilevel latent covariate model: A new, more reliable approach to group-level effects in contextual studies. *Psychological Methods*, 13(3), 203–229. <https://doi.org/10.1037/a0012869>
- Marsh, H. W., Lüdtke, O., Robitzsch, A., Trautwein, U., Asparouhov, T., Muthén, B., & Nagengast, B. (2009). Doubly-latent models of school contextual effects: Integrating multilevel and structural equation approaches to control measurement and sampling error. *Multivariate Behavioral Research*, 44(6), 764–802. <https://doi.org/10.1080/00273170903333665>

Appendix I

GDPR Documentation & Ethical Approval

Fusce interdum iaculis metus eu varius. Fusce nec nunc commodo massa pharetra imperdiet eget quis ipsum. Aliquam hendrerit porttitor congue. Quisque et malesuada nulla. Sed feugiat vel lectus sed hendrerit. Duis et eros eleifend, tempus mauris sed, euismod eros. Donec congue, dolor a finibus sodales, lectus nunc suscipit massa, at mollis massa libero non erat. Donec vel finibus est. Nunc sodales enim eget nunc posuere egestas. Nulla rhoncus commodo leo et dapibus.

Integer malesuada, enim vitae mollis finibus, ligula urna placerat erat, porttitor elementum ipsum est quis mauris. Curabitur consequat felis sit amet diam elementum mollis. Curabitur accumsan congue ornare. Cras tellus ex, tempus pulvinar nulla eu, consequat maximus tellus. Aliquam id magna et leo aliquam vehicula. Praesent mauris est, pretium vitae porta sit amet, venenatis sit amet arcu. Nam interdum tellus ipsum, non viverra leo tristique in. Ut gravida pellentesque tempus. Vivamus ac iaculis nunc, eget auctor enim. Duis placerat faucibus orci, vitae volutpat velit dapibus vel. Nullam mattis enim felis, quis ultricies elit feugiat non. Fusce sit amet orci quis turpis rutrum pretium a eu tellus. Praesent placerat convallis turpis, eget pulvinar neque venenatis feugiat. Cras porta eleifend odio et maximus. Ut mauris lectus, mattis sit amet accumsan vitae, eleifend in eros. Cras et sem at dolor rhoncus pellentesque.

About us (/personvernombud/en/about_us.html)

Norwegian (/personvernombud/meld_prosjekt/meldeplikttest.html)

NSD (</>) > Personvern tjenester (</personvernombud/>) > Data Protection Services (</personvernombud/en/>) > Notify project (</personvernombud/en/notify/>) > Notification Test

Denne siden på norsk (/personvernombud/meld_prosjekt/meldeplikttest.html)

Will you be processing personal data?

Are you unsure whether your project is subject to notification? Feel free to try our informal Notification test. Note that the test is intended as a guidance and is not a formal assessment.

Will you be collecting/processing directly identifiable personal data? ☐ Yes ☒ No

A person will be directly identifiable through name, social security number, or other uniquely personal characteristics.

Read more about personal data (</personvernombud/en/help/vocabulary.html?id=8>) and notification (</personvernombud/en/notify/index.html>).

NB! Even though information is to be anonymized in the final thesis/report, check the box if identifying personal data is to be collected/processed in connection with the project.

Will directly identifiable personal information be linked to the data (e.g. through a reference number which refers to a separate list of names/scrambling key)? ☐ Yes ☒ No

Note that the project will be subject to notification even if you cannot access the scrambling key (</personvernombud/en/help/vocabulary.html?id=11>), as the procedure often is when using a data processor (</personvernombud/en/help/vocabulary.html?id=3>), or in register-based studies (/personvernombud/en/help/research_methods/register_studies.html).

Will you be collecting/processing background information that may identify individuals (indirectly identifiable personal data)? ☐ Yes ☒ No

A person will be indirectly identifiable if it is possible to identify him/her through a combination of background information (such as place of residence or workplace/school, combined with information such as age, gender, occupation, etc.).

Will there be registered personal data (directly/indirectly/via IP or email address, etc.) using online surveys? ☐ Yes ☒ No

Please note that the project will be subject to notification even if you as a student/researcher cannot access the link to the IP or email address, as the procedure often is when using a data processor.

Read more about online surveys (/personvernombud/en/help/research_methods/online_surveys.html).

Will there be registered personal data using digital photo or video files?

☐ Yes☒ No

Photo/video recordings of faces will be regarded as identifiable personal data. In order for a voice to be considered as identifiable, it must be registered in combination with other background information, in such a way that people can be recognized.

Show results

Notify project

Do I have to notify my project? (</personvernombud/en/notify/index.html>)

Notification Form (/personvernombud/en/notify/meldeskjema_link)

Notifying changes (/personvernombud/en/notify/notifying_changes.html)

Get help notifying your project

Processing the notification (</personvernombud/en/help/index.html>)

Frequently asked questions (</personvernombud/en/help/faq.html>)

Vocabulary (</personvernombud/en/help/vocabulary.html>)

Research topics (/personvernombud/en/help/research_topics/)

Research methods (/personvernombud/en/help/research_methods/)

Information and consent (/personvernombud/en/help/information_consent/)

Other approvals (/personvernombud/en/help/other_approvals/)

Result of Notification Test: Not Subject to Notification

You have indicated that neither directly or indirectly identifiable personal data will be registered in the project.

If no personal data is to be registered, the project will not be subject to notification, and you will not have to submit a notification form.

Please note that this is a guidance based on information that you have given in the notification test and not a formal confirmation.

For your information: *In order for a project not to be subject to notification, we presuppose that all information processed using electronic equipment in the project remains anonymous.*

Anonymous information is defined as information that cannot identify individuals in the data set in any of the following ways:

- directly, through uniquely identifiable characteristic (such as name, social security number, email address, etc.)*
- indirectly, through a combination of background variables (such as residence/institution, gender, age, etc.)*
- through a list of names referring to an encryption formula or code, or*
- through recognizable faces on photographs or video recordings.*

Furthermore, we presuppose that names/consent forms are not linked to sensitive personal data.

Kind regards,
NSD Data Protection

Appendix II

Data Management and Analysis Code

All computer files related to this thesis can be found in the author's GitHub page:

<https://github.com/author/MAE>.

- Data sets and codebook can be downloaded from
<https://github.com/author/MAE/Data>
- R syntax for data merging can be found in
<https://github.com/author/MAE/R/merge.R>
- Mplus code for SEM analysis is stored in
<https://github.com/author/MAE/Mplus/SEM.inp>
- Model diagram (Figure 1) was generated using L^AT_EX's tikz package:
<https://github.com/author/MAE/Figures/tikz/Model.tex>

Appendix III

Supplemental Materials

Extra figures or tables, survey questions, test items, stimuli, etc.