Academic specialization choices and academic achievement
prediction and incomplete data
Smits, N.

Citation for published version (APA):

General rights
It is not permitted to download or to forward/distribute the text or part of it without the consent of the author(s) and/or copyright holder(s), other than for strictly personal, individual use, unless the work is under an open content license (like Creative Commons).

Disclaimer/Complaints regulations
If you believe that digital publication of certain material infringes any of your rights or (privacy) interests, please let the Library know, stating your reasons. In case of a legitimate complaint, the Library will make the material inaccessible and/or remove it from the website. Please Ask the Library: https://uba.uva.nl/en/contact, or a letter to: Library of the University of Amsterdam, Secretariat, Singel 425, 1012 WP Amsterdam, The Netherlands. You will be contacted as soon as possible.
Contents

1 Introduction
   1.1 University students’ specialization choice .................. 1
   1.2 University students’ academic achievement .................. 2
   1.3 Missing data ................................................. 3
   1.4 Overview of the chapters .................................... 5

2 Alternative missing data techniques to grade point average: Im-
putting unavailable grades .................................................. 7
   2.1 Introduction ..................................................... 7
   2.2 Brief outline of the Dutch educational system ................ 9
   2.3 Study 1: Similarities and differences between missing grade techniques 9
      2.3.1 Introduction ................................................ 9
      2.3.2 Method ..................................................... 10
      2.3.3 Results .................................................... 17
      2.3.4 Comments ................................................. 20
   2.4 Study 2: Prediction with the completed grades file ............ 20
      2.4.1 Method ..................................................... 20
      2.4.2 Results .................................................... 21
      2.4.3 Comments ................................................. 22
   2.5 Discussion ...................................................... 24

3 The measurement versus prediction paradox in the application of
planned missingness to psychological and educational tests .......... 27
   3.1 Introduction ..................................................... 28
   3.2 Method ......................................................... 30
      3.2.1 Generating data ........................................... 30
      3.2.2 Generating missing item responses ...................... 32
      3.2.3 Incomplete item response techniques ................... 33
      3.2.4 Goodness of imputation ................................ 35
      3.2.5 Data analysis ............................................. 36
   3.3 Results ......................................................... 36
      3.3.1 Data recovery ............................................. 37
      3.3.2 Test quality measure recovery ......................... 41
3.4 Discussion ................................................. 42

4 Predicting academic achievement using background, economic, time budget, and psychological variables: Comparing the utility of four predictive blocks 45
4.1 Introduction ............................................ 46
4.2 Method .................................................. 48
  4.2.1 Sample .............................................. 49
  4.2.2 Survey .............................................. 49
  4.2.3 Background variables ............................... 50
  4.2.4 Economic variables ................................. 50
  4.2.5 Time budgets ....................................... 51
  4.2.6 Psychological variables ............................. 51
  4.2.7 Academic achievement .............................. 52
  4.2.8 Analysis ............................................ 53
4.3 Results .................................................. 54
  4.3.1 Convergence of estimation in NORM ............... 54
  4.3.2 Background predictive block ....................... 55
  4.3.3 Economic predictive block ......................... 56
  4.3.4 Time budgets predictive block ..................... 58
  4.3.5 Psychological predictive block ..................... 59
  4.3.6 Relative importance of variable blocks ............ 61
  4.3.7 Leave-one-out cross validity and Burket’s formula .. 66
4.4 Discussion .............................................. 66
Appendix A: Imputation with NORM .......................... 71
Appendix B: Multiple imputation inference ..................... 71

5 Predicting academic discipline choice using students’ subjective benefits 73
5.1 Introduction ............................................ 73
5.2 Method .................................................. 75
  5.2.1 Analyses ............................................. 77
5.3 Results .................................................. 78
5.4 Discussion .............................................. 83

6 Benefits of academic education: Using student desires, and student perceptions of specializations to predict the choice of a university specialization 87
6.1 Introduction ............................................ 88
6.2 Method .................................................. 90
  6.2.1 Participants ........................................ 90
  6.2.2 Survey .............................................. 90
  6.2.3 Analyses ............................................. 91
6.3 Results .................................................. 96
  6.3.1 Desires associated with academic specializations .... 96