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Determining fit: the role of matching procedures in prospective higher education students' enrolment behaviour

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ABSTRACT

In the Netherlands, the implementation of mandatory procedures in which prospective students do a final check on their initial higher education program choice (so-called matching procedures), were introduced to improve student-program fit. We argue that prospective students who lack feelings of fit with the program during these matching procedures are less likely to finalise their enrolment. Using data of 13 programs at four Dutch universities, the association between various matching procedures and finalising enrolment, and finalising enrolment before and after the implementation of matching were examined. Enrolment rates were lower in programs with more intensive matching procedures and higher in pre-matching cohorts than in matching cohorts, indicating the potential value of pre-enrolment fit checks. In conclusion, this study gives indications that it can be worthwhile to invest in guiding prospective students in their program choice by obliging them to test their fit with the program through intensive matching procedures.


KEYWORDS

Transition to higher education; student-program fit; program choice; matching procedures; enrolment rates

Student dropout is often associated with negative consequences for both the student and institutions who share the costs of higher education participation (Vossensteyn, 2002). Therefore, student dropout is a persistent concern for higher education managers and students alike. Since funding of universities is often partially based on graduation rates (Jongbloed et al., 2018; Kirk, 2018), it increases their revenues when they can retain students (Zhang et al., 2010). For students, negative consequences of dropout are untapped human potential, a low return on financial investment (Oreopoulos & Petronijevic, 2013) and reduced social welfare (Hällsten, 2017).

Despite the potentially severe consequences of a wrong program choice, students are often not in a good position to judge how well they will fit with a program (James, 2002). Therefore, it is important to guide students in their program choice. Several European studies have shown the need to improve the process of program choice of prospective students to advance

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the fit between student and program (see for example: Austria (Unger et al., 2009), Flanders (Goovaerts, 2012), Germany (Heublein et al., 2010), the Netherlands (Meeuwisse et al., 2010), and Switzerland (Wolter et al., 2013)). Feelings of misfit become clear when students, once they started studying, realise that their expectations do not correspond with the reality of the program (e.g., Warps et al., 2017, p. 11), which could result in dropout once more realistic beliefs set in (Watson et al., 2004). When students have the chance to form realistic beliefs regarding their program fit prior to enrolment, mismatches between expectations and reality of the program can be prevented.

Person-environment fit

In this study, data on the enrolment behaviour of prospective undergraduate students are analysed within a theoretical framework on person-environment fit. Person-environment fit is the compatibility between individual and environmental characteristics (Kristof-Brown & Guay, 2011). Fit research across a variety of domains shows that an individual's performance improves if there is alignment between a person and the environment (Ward & Brennan, 2020). Drawing on insights from Expectancy Value Theory (EVT, e.g., Eccles & Wigfield, 2002; Wigfield & Eccles, 2000) and Self-Determination Theory (SDT, Deci & Ryan, 2008), we identify three concepts that we assume to be important in the context of a higher education program choice.

First, we consider the concept ability beliefs, which is defined here as 'one's beliefs in their abilities to perform a certain task'. In the literature it is referred to as self-efficacy (Bandura, 1977), beliefs about competence (Eccles-Parsons et al., 1983) or ability beliefs (Eccles et al., 1989). In Expectancy-Value Theory, it is proposed that someone's beliefs about their competence influences their expectancies and values. In return, these expectancies and values directly influence performance and task choice. Thus, in the context of a higher education program choice, prospective students will assess their current capabilities and their estimated probability of success in order to determine fit on this aspect. A closely related concept is competence, one of the three basic psychological needs, identified by Ryan and Deci (2017) in their Basic Psychological Needs Theory, a sub-theory of SDT. Competence concerns experiencing mastery of a specific skill (Vansteenkiste et al., 2020). In the educational context, this basic need becomes satisfied when students successfully engage in a certain task and experience opportunities to extend their skills regarding this task. Based on insights from these three theoretical perspectives, we assume that the concept of ability beliefs is a vital aspect to experience student-program fit.

Second, (vocational) interest plays an important role in adolescents' learning and development (Renninger & Hidi, 2017). Vocational interest is related to program choice (Whitney, 1969), but it might be difficult for students to decide which interests to pursue. Students often have multiple interests, which they can generally not pursue all within one higher education program (Hofer, 2010; Vulperhorst et al., 2018). According to EVT, students will weigh the value of the program (e.g., for example in terms of their different interests), thereby trying to maximise pros and minimise cons (Eccles & Wigfield, 2002) in their program choice. Moreover, Ryan and Deci (2000, p. 57) '*recognize that basic need satisfaction accrues in part from engaging in interesting activities*'. In this study, interests are defined as 'the extent to which a person values certain topics over others'. We assume

that students need to acquire a realistic sense of how their interests align with the program they wish to pursue and vice versa.

Third, we argue that students need to feel a sense of belonging in order to stay motivated. SDT identifies relatedness as another basic psychological need (Ryan & Deci, 2017). Relatedness indicates feelings of warmth and bonding (Vansteenkiste et al., 2020). This basic need becomes satisfied when a person feels connected with and important to others. In his Student Integration Model, Tinto (1993) identifies the need for social integration as an important factor to prevent student dropout and since then countless studies have argued the same (e.g., Tice et al., 2021). Tinto defines social integration as the presence of positive relationships with peers. We use a somewhat wider scope, by defining sense of belonging as ‘a sense of connectedness with fellow students, staff members and one’s physical surroundings’. Sense of belonging is the third aspect that we deem important for students in determining fit with the program of their choice. In conclusion, we define testing student-program fit as students asking themselves whether they match with the program of their choice regarding ability beliefs, interests, and sense of belonging.

A fitting program choice is associated with positive outcomes for the student. For example, experiencing a sense of belonging positively influences students’ engagement in the academic process (McFarlane, 2018; Trowler, 2010) and is associated with a low probability of dropout (Kirk, 2018). Moreover, previous work highlights that experiencing feelings of misfit in general (Feldman et al., 1999; Ulriksen et al., 2010; Warps et al., 2017) or more specifically in sense of belonging (Naylor et al., 2018; Tinto, 1993) are among the most important predictors of dropout. It is thus important that prospective undergraduate students test their fit with the program before actually starting a program in order to reduce non-fitting program choices.

Matching procedures in the Netherlands

In the Netherlands, undergraduate students enrol in focused study programs, such as German language, business economics, applied mathematics, or cultural anthropology, rather than a broad field (e.g., social sciences, or literature). Some of these programs (e.g., veterinary sciences, medicine, or psychology) apply selection procedures, but most programs are non-selective, i.e., these are open for all students who successfully passed the national final pre-university high school exams. The enrolment procedure for prospective undergraduate students wishing to enrol in a non-selective Dutch university program consists of several steps. The main steps are visualised in [Figure 1](#). After filing an initial admission request, prospective students are invited to participate in a matching procedure to check whether they made the right choice (Association of Universities [VSNU], n.d.). Thereafter, students can either finalise their enrolment for the program of their initial choice or opt for another program or institution or decide not to enrol at all. All higher education institutions in the Netherlands are obliged to offer prospective students applying for non-selective programs the possibility of taking part in a matching procedure (Wet Kwaliteit in Verscheidenheid Hoger Onderwijs [Quality in Diversity Law], 2013). These matching procedures differ from selection in that in selection procedures program staff decides about taking students in or not, while after participating in matching procedures it remains the student’s decision whether to enrol or not, also

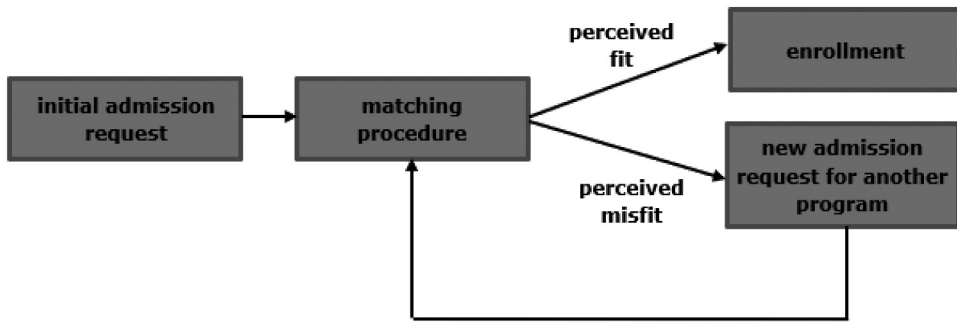


Figure 1. Enrolment procedure for prospective students at Dutch universities for non-selective programs.

when they received a negative advice. Some programs put conditions on the admission of late applicants with a negative advice (e.g., following a summer course to compensate deficiencies) or provide additional (compulsory) student counselling.

We argue, that to be useful as a fit-check, matching procedures should allow for testing fit on at least one of the three components of student-program fit discussed above. Earlier research shows that this is the case to some extent for all types of matching procedures offered at Dutch universities (Soppe et al., 2019). Moreover, Niessen et al. (2016) have shown that these matching procedures can be useful for preventing a wrong choice. Using data from one Dutch university, they showed that the lower students' scores on a curriculum sampling test at the end of the matching procedure, the less likely they were to finalise their enrolment. The implementation of matching procedures is an attempt to let non-fitting students drop out during the enrolment procedures, that is, let them realise that there is a lack of fit before they start studying.

Universities are entitled to develop matching procedures themselves, according to their own needs and insights, and therefore, across and within universities there is a wide variety of procedures. There are, however, several elements that are offered at every university. All matching procedures start with an online questionnaire. Questionnaires are not the same across universities, but generally contain similar sections such as (a selection of): high school grades; attendance at orientation activities to learn about different programs; motivation or reasons for choosing the program; expectations of the program; expected future jobs; ability beliefs; general time use. Most matching procedures end with generic feedback or nonbinding advice on the perceived fit between a prospective student and the program. In between these two elements of the procedure, three main activities can be identified. Some programs offer personal interviews to prospective students who are deemed at risk of dropout based on their answers on the questionnaire. In these interviews, program staff tries to assess whether prospective students have a realistic view of the program. Moreover, they discuss the student's motivation, and try to identify potential problems. Other programs offer short online courses. These online courses can be compared to MOOCs. They typically consist of a set of modules that represent first-year courses. Students must study course materials, watch video lectures, and then test their knowledge with tests. Finally, there are programs that offer trial studying on campus, a so-called matching day. During matching days students

follow lectures, and tutorials/research practicals relating to a first-year subject. Often, students must prepare themselves for the matching day by studying course materials, and sometimes they take a test at the end of the day.

Prospective students experience that certain types of matching allow for more thorough testing of student-program fit than other types (Soppe et al., 2019). Students perceive trial studying on campus as the most thorough check of student-program fit, allowing them to test their interests, ability beliefs, and sense of belonging. A type of matching that was perceived almost equally helpful in testing fit was the online course. However, in online matching procedures testing sense of belonging is not easily possible, given the individual, online set-up. Matching procedures which consist of interviews with students deemed at risk of dropout, are considered least helpful by prospective students in testing fit, since they only allow for testing students' interests. Given these results of previous research, it is important to investigate whether the experiences reported by students on testing student-program fit are also reflected in their enrolment behaviour. We therefore compare enrolment rates (i.e., the ratio between the number of students that files an initial admission request and the number of students that finalises their enrolment) between programs with different kinds of matching procedures and between cohorts before and after the implementation of the matching procedures.

Aim of the study

This study explores the association between types of fit-checks and enrolment rates, using data of various matching procedures in the Netherlands. These matching procedures aim to offer a fit-check prior to enrolment. If these procedures function as envisaged, students who experience a lack of fit, will drop out of the enrolment process rather than later from the program itself. Hence, finding an association between matching procedures and enrolment rates, provides an indication that fit checks prior to enrolment can advance the match between student and program. The lower the enrolment rate, the more prospective students have chosen not to finalise their enrolment for the program after participating in a matching procedure. It must be noted that the students deciding not to enrol are not necessarily nonfitting students, but simply the ones who do not *experience* (enough) fit. In sum, lower enrolment rates are positive for the program, if indeed the matching procedure helped students changing their mind when experiencing feelings of misfit during the matching procedure.

By comparing enrolment rates between different types of matching procedures at four Dutch universities, we identify whether enrolment behaviour differs across these types of matching. Our research question is: *How do enrolment rates vary between university programs with different types of matching procedures? How do these rates differ before and after implementing matching procedures?*

Methods

Sample

The sample includes information on academic records ($N=20,104$) of nine cohorts (2009–2017) of students who applied for programs in four academic disciplines at four

Table 1. Programs in the sample per cohort; pre-matching cohorts in grey.

Cohort	University			
	U1	U2	U3	U4
Type of matching	Mixed	Interview	Online course	Matching day
2009				HUM/STEM/SS
2010				All programs
2011				All programs
2012	All programs			All programs
2013	All programs			All programs
2014	All programs	All programs		All programs
2015	HUM/STEM/SS	All programs		All programs
2016	All programs	All programs		All programs
2017	All programs		STEM	All programs

In University 1, the humanities and social sciences program consisted of a matching day on campus, the business program applied online matching and the STEM program conducted interviews with students at risk.

Dutch universities (13 study programs in total). These programs are representative for humanities, business, science, technology, engineering and mathematics (STEM), and social sciences. We will refer to the programs in our sample as *program* when discussing a specific study program, or comparing the programs within one university (e.g., humanities program vs. business program of University 1). When grouping the programs together, for example when studying the sample as a whole, they will be referred to using the term *discipline* (i.e., all humanities programs collectively).

The records of the students in our sample contain information about finalising enrolment and the type of matching procedure. An overview of the available data per cohort and types of matching procedures is displayed in Table 1. It has to be noted that obtained data for University 3 consists of two programs across five cohorts. Only the registration of admission data for the STEM program in cohort 2017 was suitable for calculating enrolment rates. Because it is a large program that represents the online matching in our sample (together with the business program of U1), it was decided to keep this information in the dataset, despite it being the only usable data of University 3. Detailed information on all the matching procedures in our sample is available as online supplementary material.

Prospective students (55% male) were on average 19 years old ($M=19.0$; $SD=2.0$) during their application. Those who applied to a program in 2014–2017 belong to a matching cohort, as do prospective students who applied to University 4 in 2013. The remaining students applied to a program before the implementation of matching (hereafter: pre-matching cohorts).

Procedure

Admission and matching information was drawn from the registration systems by data managers of each university. All information was anonymised before being transferred to the authors. Permission for this study was obtained by a university Ethical Review Board (FETC17–098).

Analyses

This study combined data from different universities which allowed for a comparison of the three main types of matching procedures. Since these data were acquired from the

different university registration systems, they are different in nature. Since we were interested in exploring the association between matching procedures and enrolment rates, analyses were conducted on the program level, rather than the individual level. Because the nature of this study is exploratory, assumed differences in enrolment rates are first visualised and then tested for significance using chi-square association tests with Bonferroni correction to account for multiple testing.

The analyses were carried out in four steps. First, to establish an overview, differences in enrolment rates across programs with different types of matching were identified (data of matching cohorts; $N = 11,404$). Second, to exclude the potential impact of institutional variation, the comparative analyses were repeated using data of one university with different matching procedures (University 1; $N = 3,517$). Third, the data was presented per academic discipline to identify differences in the enrolment rates of programs within the same discipline across different universities, ($N = 11,404$). In the fourth step, to establish whether differences in enrolment can be attributed to the implementation of matching procedures, enrolment rates of cohorts with matching procedures were compared to cohorts before the implementation of matching. Due to differences in registration of matching data across institutions, this final step is conducted for University 1 ($N = 6,201$) and University 4 ($N = 10,533$).

Results

In the first step, enrolment rates across types of matching were compared for all matching cohorts and disciplines combined. Figure 2 shows that for the total sample, enrolment rates were highest for programs which held interviews with students at risk of dropout and lowest for programs with trial studying on campus. The association between enrolment rates and type of matching was significant, $\chi^2(2, N = 11,404) = 128.56, p < .001$, but weak, $V = .11$ (Cohen, 1988). Post-hoc tests also showed significant results (see Table 2), indicating that enrolment rates were higher in programs which held interviews with students at risk than in programs with online matching procedures and enrolment rates were higher in programs with online matching procedures than in programs with trial studying on campus.

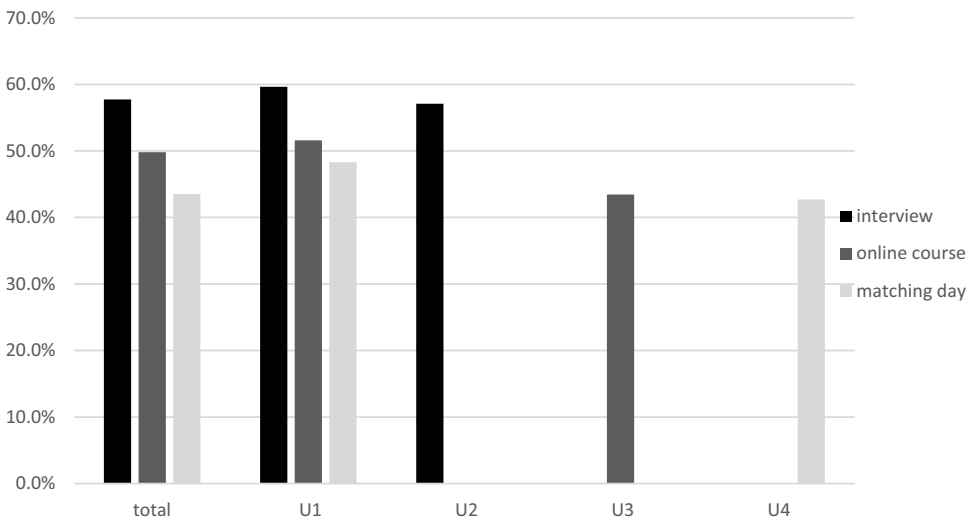


Figure 2. Enrolment rates by type of matching in total and per university; all matching cohorts.

Table 2. Post-hoc tests (with Bonferroni correction) showing the association between enrolment rate and type of matching procedure for the total sample and different sub samples.

	Interviews at risk students vs. online matching	Online matching vs. trial studying on campus	Interviews at risk students vs. trial studying on campus
Total sample	$\chi^2 (1, N = 4,582) = 28.04, p < .001, V = .08$	$\chi^2 (1, N = 9,504) = 30.62, p < .001, V = .06$	$\chi^2 (1, N = 7,822) = 120.43, p < .001, V = .12$
University 1	$\chi^2 (1, N = 2,546) = 9.65, p = .006, V = .06$	$\chi^2 (1, N = 3,066) = 2.89, p = .267, V = .03$	$\chi^2 (1, N = 1,422) = 15.88, p < .001, V = .11$
HUM	$\chi^2 (1, N = 444) = .01, p = 1.00, V = .00$	$\chi^2 (1, N = 1,573) = 6.44, p = .033, V = .06$	$\chi^2 (1, N = 1,785) = 17.00, p < .001, V = .10$
BUS	$\chi^2 (1, N = 2,742) = 5.28, p = .066, V = .04$	$\chi^2 (1, N = 4,812) = 71.49, p < .001, V = .12$	$\chi^2 (1, N = 3,596) = 72.57, p < .001, V = .14$
STEM	$\chi^2 (1, N = 1,233) = 33.41, p < .001, V = .17$	$\chi^2 (1, N = 1,641) = 23.01, p < .001, V = .12$	$\chi^2 (1, N = 1,700) = 2.78, p = .288, V = .04$

Second, [Figure 2](#) shows enrolment rates per university. The different matching procedures within University 1 made it possible to look at variations in enrolment rates between types of matching within one university, therefore cancelling out the influence of specific university characteristics. Results of testing the association between type of matching and enrolment rates on the data of University 1 alone showed a significant, $\chi^2 (2, N = 3,517) = 15.90, p < .001$, but weak association between type of matching and enrolment rates ($V = .07$). Within University 1, enrolment rates were higher in programs which held interviews with students at risk than in programs with both online matching and trial studying. Differences in enrolment rates between trial studying and online matching procedures, however, were not significant. University 2, 3 and 4 do not allow for such difference testing, since each university applied one type of matching procedure. Enrolment rates were highest in University 2 (interviews with students at risk of dropout) and lowest in University 4 (trial studying on campus).

Third, [Figure 3](#) shows the association between type of matching and enrolment rates per academic discipline. The association between type of matching and enrolment rates was significant for the humanities, $\chi^2 (2, N = 1,901) = 21.19, p < .001, V = .11$, business, $\chi^2 (2, N = 5,575) = 110.03, p < .001, V = .14$, and STEM, $\chi^2 (2, N = 2,287) = 36.71, p < .001, V = .13$. Since the omnibus tests were significant, we conducted post-hoc tests to identify which types of matching differed from one another. For both the humanities and business disciplines enrolment rates were higher in programs which held interviews with students at risk and online matching procedures than in programs with trial studying, while there was no difference in enrolment rates between programs which held interviews with students at risk and online matching procedures. Enrolment rates for STEM programs deviated from the overall pattern with online procedures showing lower enrolment rates than programs with trial studying on campus. The difference in enrolment rates for programs which held interviews with students at risk and trial studying was not significant. Finally, none of the social science programs in our sample employed online matching procedures and thus post-hoc tests are not relevant. Enrolment rates for social science programs which held interviews with students at risk were, however, higher than enrolment rates in programs with trial studying, $\chi^2 (1, N = 1,641) = 14.82, p < .001, V = .10$. To sum up, there were generally small but significant differences in enrolment rates across programs with different types of matching procedures. [Table 2](#) summarises the results of all post-hoc tests.

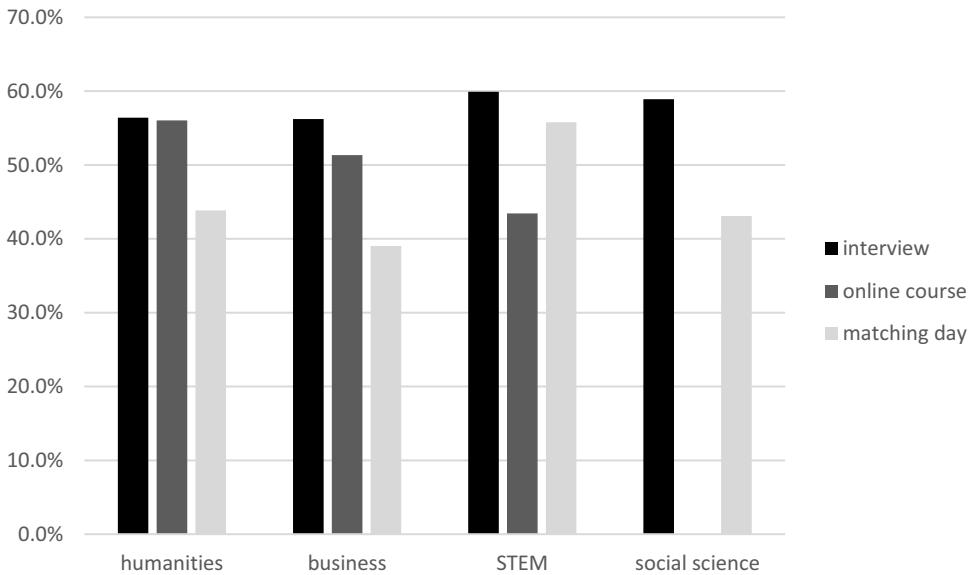


Figure 3. Enrolment rates by type of matching per discipline; all matching cohorts.

In the fourth step, changes in patterns of enrolment rates over time were investigated. Pre-matching data was available for University 1 and University 4. [Figure 4](#) shows the enrolment rates over time per program for University 1. No difference was observed in the average enrolment rate before and after the implementation of matching for programs that offered matching activities only for students that were deemed at risk of dropout (the business program and the STEM program). On the other hand, programs which offered intensive matching procedures for all students allowing to test (almost) all aspects of student-program fit (the humanities and social science programs), showed considerable differences in the average percentage of students that finalised their enrolment before and after matching was implemented. Effect sizes for these associations over time in the humanities and social science programs are medium-small. Significance and effect sizes for both University 1 and University 4 are shown in [Table 3](#) to aid comparability between universities.

The results of the enrolment rates over time for University 4, which employed trial studying on campus for all programs, are displayed in [Figure 5](#). There was a clear drop in enrolment rates after the implementation of the matching procedures for the humanities, STEM, and social science programs. Effect sizes for these associations over time are medium-small to medium. Enrolment rates for the business program were slightly higher after the implementation of the matching procedures, but the effect is small.

Although no causal conclusions can be drawn from this cross-sectional study, we aim to account for as many alternative explanations as possible. In step 2 of the analyses, we have accounted for possible differences between universities. In this last step, we want to exclude another alternative explanation to the observed enrolment patterns; a stark increase in the number of prospective students who filed more than one initial admission request within the same university since the implementation of the matching procedures. Since an increase in the number of prospective students filing multiple initial admission requests would automatically result in lower enrolment rates (because most students only

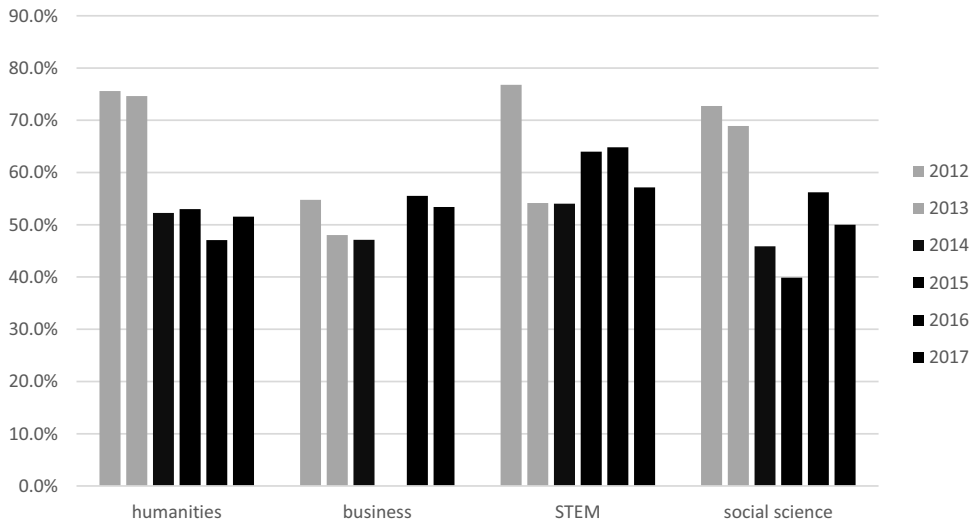


Figure 4. Enrolment rates per program of University 1 before (light grey) and after (black) the implementation of matching. Data for the business program of University 1 is missing since selection procedures were applied for the 2015 cohort.

Table 3. Chi-square tests of the association between belonging to a matching cohort and enrolment rate for the different disciplines in University 1 and University 4.

	Total sample U1 with all admission requests	Total sample U4 with all admission requests	Sub sample U4 with applicants who filed one admission request
HUM	$\chi^2 (1, N = 860) = 51.84, p < .001, V = .25$	$\chi^2 (1, N = 2380) = 173.37, p < .001, V = .27$	$\chi^2 (1, N = 1807) = 88.34, p < .001, V = .22$
BUS	$\chi^2 (1, N = 3741) = 0.03, p = .873, V = .00$	$\chi^2 (1, N = 5178) = 15.58, p < .001, V = .06$	$\chi^2 (1, N = 4445) = 33.33, p < .001, V = .09$
STEM	$\chi^2 (1, N = 627) = 0.15, p = .693, V = .02$	$\chi^2 (1, N = 1450) = 54.58, p < .001, V = .21$	$\chi^2 (1, N = 1003) = 36.08, p < .001, V = .19$
SS	$\chi^2 (1, N = 973) = 48.80, p < .001, V = .22$	$\chi^2 (1, N = 1525) = 84.08, p < .001, V = .24$	$\chi^2 (1, N = 954) = 34.65, p < .001, V = .19$

start with one program), the analyses for University 4 were rerun on a subsample with only the students that filed 1 initial admission request (see column 3 of Table 3). The results are the same for University 4 as a whole and the subsample, indicating that an increase in the number of prospective students filing multiple initial admission requests does not explain the changes in enrolment rates over time.

Discussion

This study investigated the association between matching procedures and enrolment rates. We found that, overall, enrolment rates were lowest in programs that employ trial studying on campus and highest in programs with interviews for students at risk of dropout. Previously, we found that the more matching procedures allow for testing multiple aspects of student-program fit, the more useful prospective students find these for making a final program choice (Soppe et al., 2019). Hence, the types of matching procedures that are

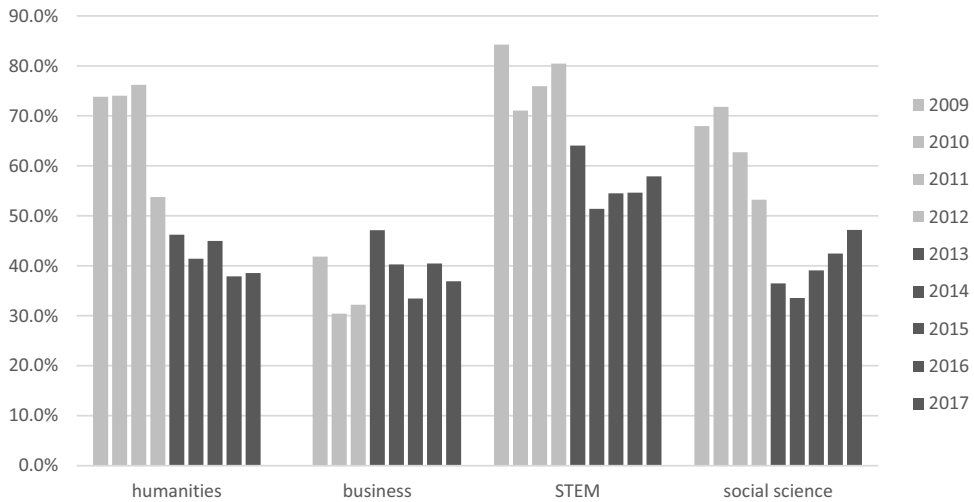


Figure 5. Enrolment rates per program of University 4 before (light grey) and after (black) the implementation of matching. Data for the business program is missing for the 2009 cohort.

deemed useful by prospective students for making a final program choice, are the same types of matching procedures that have lower enrolment rates in matching cohorts.

Even though societal factors (e.g., the implementation of academic dismissal policies) cannot be ruled out as possible confounders, and a causal effect cannot be established, it seems probable that lower enrolment rates in programs with more intensive matching procedures are a result of the implementation of these procedures, given the differences in enrolment rates between pre-matching cohorts and matching cohorts. Although we observed that the number of students applying for more than one program increased with the introduction of the matching procedures, we showed that this cannot explain the lower enrolment rates in matching cohorts as compared to pre-matching cohorts. As a result, it is plausible that online courses and especially trial studying help students to check their program-fit and therefore lead to dropout of non-fitting students before the start of the program.

When studying the data in more detail, two things stood out that are worth mentioning. First, investigating differences in enrolment rates across disciplines showed that the STEM discipline followed a deviating pattern from the other disciplines. In this case, enrolment rates are lowest for the online matching procedures rather than the matching days. We see two plausible explanations for this deviation from the overall pattern. First, the pattern can be caused by an institutional effect. The STEM program is the only program of University 3 in our sample. Because the overall enrolment rates of University 3 are unknown, it is not possible to compare the online course with other matching procedures of this university. Second, online matching might be more suitable for students in STEM than trial studying on campus. The main difference between the online course and trial studying is that trial studying is on campus, together with other students. This makes it possible for prospective students to test whether they feel a sense of belonging. Sense of belonging might play a different role for STEM students than for non-STEM students when testing their student-program fit (Soppe et al., 2019).

Therefore, it would be interesting for future research to explore differences in needs for testing student-program fit between students in STEM and students in non-STEM disciplines.

A second deviation from the overall pattern is the observation that the business programs show no changes over time in their enrolment rates, unlike the other disciplines. One explanation for this observation could be that it concerns a program that is relatively often chosen by students who don't know what to study. It is plausible that students file an initial enrolment request for this program as a back-up plan, and then de-register before the start of the academic year once they find something else. That would explain the low enrolment rates in pre-matching cohorts, as well as the lack of change. Future research could attempt to identify characteristics of programs that already had low enrolment rates before the implementation of matching and investigate the added value of matching procedures for these programs.

A potential weakness of our study lies in the type and quality of the data, which results in several minor problems. Since the universities in our sample use different systems for their student administration, making them comparable was challenging. Retrieving these data through Statistics Netherlands was also not an option, since information on matching procedures is not shared outside the universities. These challenges prevented us from analysing the data at the individual level. However, since matching procedures are the same for all students in the same program, individual data were not necessarily required to answer our research questions. Second, there is overlap between universities and the type of matching procedure they have implemented. However, we addressed this potential problem by running the analysis regarding differences in enrolment rates between programs with different types of matching procedures on the data of University 1 separately. Although the overall pattern of enrolment was the same in University 1 and the total sample, there was a small difference, indicating potential differences between universities in the relation between specific matching procedures and finalising enrolment. An explanation might be that types of matching that are the same on paper (between universities), are different in practice. Especially an online course or trial studying can be much more intensive at one institution than the other.

All things considered, we hold a reasonable level of confidence in stating that the observed differences in enrolment rates between programs and over time are at least partially due to (the intensity of) the matching procedures of those particular programs. Matching procedures that exclusively provide interviews for students at risk of dropout do not appear to sufficiently prompt students to reconsider their program choice. This may be attributed to the fact that these procedures do not afford students the opportunity to adequately assess their student-program fit. Furthermore, it is worth noting that prior research has highlighted the limitations of interviews as reliable predictors of first-year GPA (e.g., Dana et al., 2013; Reumer & Van der Wende, 2010). This underscores the concern regarding the suitability of utilising interviews within the context of matching procedures. In light of these considerations, this study gives indications that it can be worthwhile to invest in guiding prospective students in their program choice by obliging them to test their fit with the program through intensive matching procedures. More intensive matching procedures possibly allow for better testing of ability beliefs, interests, and sense of belonging. Earlier studies have demonstrated the importance of these concepts in ensuring fit and reducing dropout (e.g., Naylor et al., 2018; Whitney,

1969). Moreover, an additional benefit of these matching procedures is that students start their program more motivated, better prepared, and pre-established familiarity with some of their fellow students (Warps et al., 2017). Although matching procedures are associated with costs, in terms of finances and effort, an internal investigation at one of the institutions in our sample showed that the added benefits of increased retention far outweighed the costs associated with the matching procedures (personal communication, 26 February 2020). If the results of this study were to be found in different contexts, higher education institutions wishing to achieve a better fitting student population should focus on designing fit checks in such a way that multiple aspects of student-program fit can be tested.

We suggest that these procedures incorporate a test of course material of any kind to provide insight in a student's abilities and an overview of program content, preferably using a representative sample of teaching course materials in any way. Ideally the procedures are on campus, to allow prospective students to interact with one another and the program staff, as well as experiencing the atmosphere in and around the university buildings. The combination of the three components of student-program fit is especially important, since subject-interest is not a stable trait (Vulperhorst et al., 2021). Subject-interest has been found to decrease in the first year of study due to feelings of a lack of social integration (Van der Veen et al., 2005). Moreover, students who think they have lower chances of graduating are found to be less integrated, which decreases subject interest even further. By creating a sense of belonging prior to the start of the academic year through on-campus matching procedures, while also dedicating time to verifying ability beliefs and interests, these effects of losing interest could be softened.

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