"STRATEGIC" BEHAVIOR IN A STRATEGY-PROOF ENVIRONMENT*

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Strategy-proof mechanisms eliminate agents' incentives to misrepresent their preferences. We present direct field evidence of preference misrepresentation under the strategy-proof deferred acceptance. We show that applicants to graduate degrees in psychology in Israel often report that they prefer to avoid receiving funding, even though the mechanism preserves privacy and funding comes with no strings attached and constitutes a positive signal of ability. Surveys indicate that other kinds of preference misrepresentation are also prevalent. Preference misrepresentation in the field is associated with weaker applicants. Our findings have important implications for the study and design of matching marketplaces.

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1. INTRODUCTION

In recent years, a growing number of students are being assigned to schools through centralized clearinghouses. Inspired by market design theory, both existing and new clearinghouses are adopting strategy-proof allocation mechanisms (i.e., where agents have no incentive to misrepresent their true preferences), especially ones based on the deferred acceptance algorithm (DA, Gale & Shapley, 1962).[1] Thaler & Sunstein (2008) summarize the main benefits of strategy-proof allocation mechanisms for school choice in saying that they do *"not penalize parents who are unsophisticated about the choice process,"* and that *"in return administrators do not have to guess about parents' true preferences."* But do agents always truthfully report their preferences to these mechanisms?

We identify a substantial fraction of applicants in a high-stakes environment who misrepresent their preferences even though the mechanism uses the strategy-proof (applicant-proposing) DA (Dubins & Freedman, 1981; Roth, 1982). Misrepresentation is systematic: weaker applicants misrepresent their preferences more often.

Detecting deviations from the truthful reporting assumption in the field is a difficult challenge. We present a novel approach to detecting such deviations in college-admissions environments, where applicants are required to rank admission to the same academic program under different financial terms (e.g., with or without a scholarship). We say that an applicant *obviously misrepresents her preferences* if she submits to the mechanism a rank-order list (ROL) that is inconsistent with the natural ordering (i.e., she reports that she prefers not to receive funding).[2]

We apply our approach to administrative data from the Israeli Psychology Master's Match (IPMM; Hassidim *et al.*, 2017b), a clearinghouse that matches students to graduate programs in psychology (including MA programs in clinical psychology, a requirement for becoming a therapist). Approximately one out of five ROLs that rank programs that offer admission under multiple levels of financial aid is an obvious misrepresentation. Between 2% and 8% of the cases of obvious misrepresentation were costly ex post, with an average monetary loss of more than $5,000.[3]

[1]Examples include school choice in Boston and New York City (Abdulkadiroğlu *et al.*, 2005, 2009), and college admissions in Australia and Hungary (Artemov *et al.*, 2017; Biró, 2007). Many popular mechanisms are approximately strategy-proof in large markets (Azevedo & Budish, 2012).

[2]Following the circulation of an earlier draft of this paper, our method was used by others to detect mistakes in college-admissions markets in Turkey, Australia, and Hungary (Arslan, 2018; Artemov *et al.*, 2017; Shorrer & Sóvágó, 2017). Obvious misrepresentations have also been detected in the American Genetic Counseling Admissions Match (personal communication, Jonah Peranson, 2018).

[3]While mistakes are individually suboptimal, their implications for social welfare can be both positive and negative (Rees-Jones, 2017a).

Notably, the fraction of untruthful agents may be substantially higher as applicants may have misrepresented their preferences in ways that cannot be detected using our approach, such as ranking as first a program other than their favorite. We provide survey evidence supporting this hypothesis. We also provide evidence suggesting that survey-based estimates understate the rate of misrepresentation; comparing reports of obvious misrepresentation with observed behavior, we find that survey-based estimates of obvious misrepresentation are biased downward.

Obvious misrepresentation is more common among academically weaker applicants, as measured by their academic achievements, the prestige of their undergraduate program, and their position in programs' rankings. A potential explanation is that academically weaker applicants are more likely to misunderstand the instructions provided by the clearinghouse.[4] However, the applicants, all of whom are college graduates with a competitive major (psychology), receive very simple instructions about the optimal strategy on multiple occasions. An alternative explanation is that applicants tend to misrepresent their preferences more when they expect that the likelihood of admission to their preferred choices is low.

We propose two explanations for the body of evidence that we document. The first is that applicants, who typically have no experience with DA, misperceive the rules of the mechanism (Cason & Plott, 2014), leading them to use the heuristic that a higher ranking is rewarded with a higher probability of assignment. This heuristic is consistent with the optimal behavior in many common economic environments, including many popular assignment mechanisms. The second explanation is that applicants who assign zero (or negligible) probability to admission with funding use a weakly dominated strategy that is still (approximately) optimal under their beliefs (Artemov *et al.*, 2017; Chen & Pereyra, 2015). In Section 6, we elaborate on these and other potential explanations, such as social preferences (Charness & Rabin, 2002) and self-image concerns (Bénabou & Tirole, 2011; Kőszegi, 2006).

Our findings have important implications for the study and design of matching marketplaces. First, they highlight the critical importance of the way that advice is communicated to applicants. In particular, the way the mechanism is described and the availability of decision support are crucial elements of inducing truthful reports. For example, comparing our findings to those of Shorrer & Sóvágó (2017), who use our approach, suggests that mistakes due to lack of understanding of the rules can be minimized by describing the mechanism in terms of admission cut-offs.

A second issue is whether preference reports to DA can be assumed truthful. This assumption is used by many studies to evaluate the consequences of alternative strategy-proof mechanisms. For example, it is used to evaluate different randomization methods (Abdulkadiroğlu *et al.*,

[4]See Benjamin *et al.* (2013); Basteck & Mantovani (2018); Guillen & Hakimov (2017).

2009), different seat reservation schemes (Dur *et al.*, 2013), and different matching algorithms (Abdulkadiroğlu *et al.*, 2017; Che & Tercieux, Forthcoming). The underlying rationale is that when one strategy-proof mechanism is replaced with another, only the matching algorithm is changed, and there should be no behavioral response.[5] Some readers of the working paper version of this article have suggested that in light of evidence on preference misrepresentations, this methodology may be problematic. Fack *et al.* (2015) find that *"incorrectly imposing truth-telling leads to a serious under-estimation of preferences for popular or small schools,"* and propose replacing the assumption of truthful reporting with the weaker assumption of "stability," when applicants are not facing substantial uncertainty about the set of feasible alternatives (see Artemov *et al.*, 2017). Arslan's (2018) findings in Turkish college admissions are similar.

1.1. *Related Literature*

There is a large literature documenting suboptimal behavior in education markets. Informational frictions and the complexity of the application process are often blamed (e.g., Bettinger *et al.*, 2012; Hastings & Weinstein, 2008; Pallais, 2015). Suboptimal behavior has also been documented in centralized school-choice environments where a strategically demanding mechanism, such as the Boston mechanism, is in place (e.g., He, 2015; Kapor *et al.*, 2016). By contrast, we detect mistakes in an environment that was designed to eliminate strategic considerations, where informational frictions and the complexity of the application process are not likely explanations.[6]

Numerous recent studies suggest that a substantial fraction of agents may misrepresent their preferences under DA. In the lab, Chen & Sönmez (2006) find that about 30% of the "proposers" failed to report their true preferences under DA, and the number was even higher for the strategy-proof top trading cycles mechanism (Shapley & Scarf, 1974). This finding is robust: similar results were found under a variety of treatments and variations of these environments.[7] In the field, where the stakes are high and individuals are free to seek advice, Rees-Jones (2017b) provides survey-based evidence of preference misrepresentation, and Chen

[5]The assumption of truthful reporting is also used to evaluate the consequence of changing a manipulable mechanism to a strategy-proof alternative and vice versa (Budish & Cantillon, 2012; He & Magnac, 2017), and to estimate applicants' preferences (e.g., Hällsten, 2010).

[6]Budish & Kessler (2017) address the related question of students' ability to express their preferences using a reporting language in a more complex course-scheduling environment.

[7]Examples include Braun *et al.* (2014), Calsamiglia *et al.* (2010), Chen & Kesten (2013), Ding & Schotter (2016, 2015), Echenique *et al.* (2015), Featherstone & Niederle (2016), Guillen & Hing (2014), Pais & Pintér (2008), Pais *et al.* (2011), and Zhu (2015).

& Pereyra (2015) provide suggestive evidence. Rees-Jones & Skowronek (2018) detect misrepresentation in an online experiment whose participants were medical doctors who submitted their preferences to the National Resident Matching Program (NRMP) days before. Our approach provides direct evidence of extensive misrepresentation in the field, relying exclusively on observational data.

Several recent studies find that weaker applicants misrepresent their preferences more under DA (see Hassidim *et al.*, 2017a). Artemov *et al.* (2017) and Shorrer & Sóvágó (2017) use the approach we present here for detecting misrepresentation and find a negative correlation between obvious misrepresentation and academic ability in Australia and Hungary, respectively. Rees-Jones (2017b) finds a similar pattern in a survey of participants in the NRMP. In all of the above-mentioned settings, academic ability and admission priority (i.e., the strength of the applicant) are positively correlated, making it difficult to separate the effects of the two. In the working paper version of this article (Hassidim *et al.*, 2016) we use data from the experimental treatments of Li (2017), and establish a strong negative causal relationship between the strength of an applicant and the rates of misrepresentation. This result is corroborated by Rees-Jones & Skowronek (2018) and Shorrer & Sóvágó (2017).

Preference misrepresentation in strategy-proof environments is not a phenomenon limited to matching markets. Laboratory experiments have found a similar phenomenon in a variety of strategy-proof environments (e.g., Attiyeh *et al.*, 2000; Kagel *et al.*, 1987). In light of such findings, there is increasing interest in mechanisms that are robust to behavioral faults (McFadden, 2009) and in criteria stronger than strategy-proofness such as secure implementation (Cason *et al.*, 2006; Saijo *et al.*, 2007) and obvious strategy-proofness (Li, 2017). Our findings underscore the practical importance of such notions.[8]

2. BACKGROUND: THE ISRAELI PSYCHOLOGY MASTER'S MATCH

Applicants to Master's and PhD programs in psychology (including MA in clinical psychology, which is a requirement for becoming a therapist) are required to send to programs materials such as undergraduate transcripts, MITAM scores,[9] and recommendation letters. Each institution charges a flat application fee of 460NIS (about $120), independently of the number of programs or tracks the student applies to. Programs then selectively invite applicants to interviews.

In 2014, we proposed to replace the existing strategically demanding decentralized protocol

[8] Ashlagi & Gonczarowski (2018) show that stable outcomes cannot be implemented in a manner that is obviously strategy-proof for applicants.

[9] The MITAM is an exam that was designed to facilitate the screening of applicants for advanced degrees in psychology.

with a centralized clearinghouse that uses DA (see Hassidim *et al.*, 2017b).[10] Our proposal was accepted unanimously by all institutions. Other than the market-clearing stage, the admissions process remains unchanged.

Participants. There are nine universities (PhD-granting institutions) and about twenty colleges in Israel. Universities are publicly funded and have identical tuition costs. College tuition varies, but it is always greater than or equal to university tuition. In general, graduating from a university is more prestigious than graduating from a college.

Thirteen departments offered admissions to their PhD and Master's programs in psychology exclusively through the centralized clearinghouse. More than 90% of the applicants completed their Bachelor's studies in one of the participating departments. Only one college that offers graduate degrees in psychology did not participate. This college was not part of the pre-existing decentralized protocol, and was not considered a competitor by the participating institutions.

Funding and dual listing. Some departments offer positions in the same program, but under different terms. In particular, several programs endow a small subset of admitted students with prestigious no-strings-attached scholarships (e.g., "Presidential Scholarships"). Such scholarships may be a key determinant of applicants' preferences. For example, an applicant's most preferred options could be: 1) program A with funding, 2) program B, and 3) program A without funding. The mechanism is expressive enough to accommodate such preferences. Applicants are asked to rank each alternative (e.g., A with funding) separately, as in Sönmez (2013).

The ability to attract high-quality applicants using a small number of exclusive scholarships was demanded by some departments, which felt that historically this strategy allowed them to improve the quality of their incoming class. In 2014, a total of 10 programs in 3 universities allowed applicants to rank their programs with and without funding. In 2015, one more university allowed applicants to rank its five programs with and without funding. Three universities offered two-year MA scholarships that ranged from 8,000NIS ($2,070) a year up to 90,000NIS ($23,323) a year. Another university offered PhD scholarships that ranged from 16,182NIS ($4,218) for three years up to 213,879NIS ($55,760) for a five-year program. The lowest level of funding covers roughly a year's tuition, whereas the highest pays slightly more than the median salary in Israel.

Releasing information. Departments and applicants were informed that their reported preferences and placement would not be revealed to anyone (other than in the form of aggregate statistics), including other applicants and programs. The only exception was that contact

[10]Departments can use affirmative action, submit different rankings of applicants for different programs and terms, and use quotas as in Kamada & Kojima (2015). Starting in 2015, couples can apply together, using Ashlagi *et al.*'s (2014) approximately strategy-proof extension of DA. Only one couple used this option in 2015.

information of unmatched applicants would be transferred to programs that either failed to fill their capacity or had open positions due to "no-shows." As a result of this policy, programs could only learn that an applicant had expressed a preference for receiving funding, if she was admitted with funding.

Educating participants. Faculty and staff in participating departments attended presentations in which both DA and the fact that it was strategy-proof for applicants were covered in great detail. It was also explained that untruthful reporting could, in theory, be beneficial for the programs, but that gaining something from such misrepresentation usually requires extensive knowledge of both applicants' and other programs' behavior.

Applicants participating in the match were advised on multiple occasions to submit their true preferences, and were told that misrepresenting their preferences could only hurt them as compared to telling the truth. This advice was communicated in all emails and letters received from the automated matching system and from the departments themselves. Furthermore, this issue was addressed in multiple forms on the Frequently Asked Questions (FAQ) section of the matching system's website (see Appendix B).

The system's support team replied to hundreds of inquiries, and strategy-proofness was the subject of dozens. The details of DA and its strategy-proofness were carefully explained to all applicants who inquired about the mechanism. These applicants also received a link to a video of a general-audience lecture on DA in Hebrew.

User interface. Applicants were asked to submit their ROLs online. There was no limit on ROLs' length. The drag-and-drop interface was simple and friendly (see Appendix C), as reflected in responses to user surveys. If an applicant submitted an ROL that included only a subset of the alternatives offered by a particular program (e.g., only the funded position), a pop-up alert appeared. This feature was meant to mitigate the risk of applicants accidentally ranking only some of the positions offered by a program.

Obvious misrepresentation. Under the assumption that, holding their placement fixed, applicants prefer to receive a prestigious no-strings-attached scholarship, an ROL ranking a non-funded position in some program higher than a funded position in the same program (henceforth *obvious flipping*), or ranking only a non-funded position in a program that offers funded positions (henceforth *obvious dropping*), is a misrepresentation of the applicant's true preferences. When an ROL is an obvious flipping or an obvious dropping, we say that the ROL is an *obvious misrepresentation (of true preferences)*. Under standard assumptions on preferences, obvious misrepresentation is a weakly dominated strategy.

3. DATA

3.1. *Administrative Match Data*

Our sample consists of all preference reports submitted to the 2014 and 2015 matches and personal information reported to the matching system (including Bachelor's degree institutions and gender). In 2014, there were 13 departments that offered a total of 52 different programs. Of the 970 applicants who participated in the match, 75.6% were female, 69.6% received their Bachelor's degree from a university, and 89.4% received their Bachelor's degree from a department with a Master's program. A total of 540 positions were filled through the system, including 25 funded positions.

We call an ROL *relevant* if it includes a non-funded position in a program that also offers a funded position (the ROL need not include the funded position to be considered relevant). Obvious misrepresentation can be detected only in relevant ROLs. In 2014, 260 applicants submitted a relevant ROL. Of these, 73% were female, 68.5% received their Bachelor's degree from a university, and 87.7% received their Bachelor's degree from a department with a Master's program. Only 11 ROLs included a funded position but not the non-funded position in the same program.

In 2015, there were 13 departments that offered 50 different programs. Of the 964 applicants,[11] 74.7% were female, 73.4% received their Bachelor's degree from a university, and 91.6% received their Bachelor's degree from a department with a Master's program. A total of 197 of the applicants had already applied in 2014. Due to the increase in the number of dually listed programs, the number of relevant ROLs grew to 444 (72.3% of which were female, 80.6% with a Bachelor's degree from a university, and 92.8% with a Bachelor's degree from a department with a Master's program). A total of 588 positions were filled through the match, including 35 funded positions. Only 14 ROLs included a funded position but not the non-funded position in the same program.

The level of observation we chose was a particular applicant ROL. This choice left us with 704 (= 260+444) relevant observations. We further eliminated from our sample 32 observations that corresponded to the first ROL submitted by individuals who applied in both years. We did this to allow for learning when possible (none of our results change if we consider either the complete sample or only the first ROLs). Of the 672 remaining relevant ROLs, 72.7% were submitted by females, 76% by university graduates, and 90.8% by graduates of institutions with a Master's program.

[11] In 2015 couples were allowed to submit a joint preference list. Only one couple used this option, and was excluded from the analysis.

TABLE I

DESCRIPTIVE STATISTICS: IPMM 2014–2015[a]

	2014	2015
Departments	13	13
Programs	52	50
Dually listed	10	15
Applicants (with repetitions)		
Female	733	720
Male	237	244
Placed	540	588
Placed with funding	25	35
Total	970	964
Relevant ROLs (with repetitions)		
Female	190	321
Male	70	123
BA from university	178	358
BA from MA-granting department	228	412
Placed	193	341
Placed with funding	23	35
Total	260	444

[a] Repetitions refer to the 197 applicants who applied in both years. Source: IPMM 2014–2015 administrative data.

3.2. *Survey Data*

In addition to the administrative match data, we also use data from two post-match surveys. The first survey was commissioned by the participating departments and was administered online following the 2014 match in order to assess the reaction to the new system. It was voluntary and anonymous. A total of 367 applicants responded. Since this survey was completely anonymous, results cannot be linked to the administrative match data.

Following the 2015 match, we conducted a telephone survey that was designed to assess user satisfaction with the system, and to assess user perception of the system's incentive properties. We focused on the population of applicants who submitted relevant ROLs. Shortly after the match results were published, we contacted these applicants by phone, and asked them if they would be willing to participate in a voluntary survey about the admission process. They were told that the survey was being conducted on behalf of the administrators of the matching system and that their answers would be kept private and secure, would be used only for research purposes and for improving the system, and that in any case their responses would not be transferred to any department of psychology (except as aggregate results). Applicants who agreed were asked several types of questions. First, their identity was ascertained and they were asked if this was the first year they were applying. Second, they were asked about their experience using the automated system. Third, they were asked about the degree to

which they were informed about the mechanism. Fourth, they were asked about the degree to which they misrepresented their preferences. Fifth, they were asked about their degree of satisfaction with the admission process in general and the automated matching system in particular. Sixth, they were asked for some demographic information, including their MITAM score and their assessment of their family's socioeconomic status. Finally, they were asked to provide any additional feedback they had, and were offered the opportunity to receive the results of the survey. Appendix D lists all survey questions in the order they were asked, and Table V describes the variables that we used and provides summary statistics.

The response rate was high, 292/444, over 65%. Many non-respondents were abroad or otherwise unavailable to take the call. This high response rate is consistent both with the high level of satisfaction with the matching system among respondents (an average score of 8.1/10 relative to 4.7/10 for satisfaction with the admission process in general) and with the fact that many of the respondents expressed interest in receiving the survey results or volunteered advice on how to improve the system. Respondents and non-respondents were not statistically different in terms of any of the following characteristics: gender, Bachelor's degree institution, whether the applicant was ranked by some program, whether the applicant submitted an obvious misrepresentation, and type of obvious misrepresentation (obvious flipping or obvious dropping).

4. THE PREVALENCE OF PREFERENCE MISREPRESENTATION

4.1. *Direct Evidence*

TABLE II

THE PREVALENCE OF OBVIOUS MISTAKES: IPMM 2014–2015[a]

	2014	2015	Full sample
Relevant ROLs	260	444	672
Obvious misrepresentation	47	90	130
Obvious dropping	25	43	64
Obvious flipping	25	48	70
Costly mistake (lower bound)	3	0	3
Costly mistake (upper bound)	6	4	10

[a] The full sample does not include the first ROL of applicants who applied in both years. The lower (upper) bound corresponds to the result from ranking the funded contract directly above the unfunded contract (at the top of the ROL). Source: IPMM 2014–2015 administrative data.

Of the 672 ROLs in our sample, 130 (19.3%) obviously misrepresented the applicant's true preferences, with almost equal shares of obvious flipping and obvious dropping. The fractions

are stable across years. Preferences over all dually listed programs were obviously misrepresented by some ROLs, with the percentage of ROLs misrepresenting preferences for funding in a certain program ranging from 9% to 29% (mean=16.7%, std. dev.=5.35%) across dually listed programs.

Of the 289 ROLs that include multiple dually listed programs, 55 ROLs (19.0%) were an obvious misrepresentation. Of these, 24 ROLs (8.3%) ranked the funded position higher for one program but not for another program, 13 (4.5%) of which reversed the order of one pair but not that of another. These findings refute the assumption of truthfulness under the weaker assumption that the direction of each applicant's preference for (or aversion to) funding is not program-specific.

4.2. *Survey-based Evidence*

Of the 292 participants in the 2015 survey, 38 (13%) reported submitting an ROL that ranked some program higher relative to their true preferences, and 49 (16.8%) reported submitting an ROL that ranked some program lower relative to their true preferences. A total of 59 participants (20.2%) reported at least one of these forms of misrepresentation. When respondents gave a verbal justification for their behavior, it often involved (strategically irrelevant) considerations of chances of admission. Three applicants reported lack of trust in the system as the reason. Only 18 of the 59 participants who reported increasing or decreasing the rank of some program submitted an obvious misrepresentation.

Of the 54 respondents who actually submitted an obvious misrepresentation, only 29 (53.7%) reported this behavior (17 denied and 8 refused to answer this question).[12] By contrast, only 12 of the other 238 respondents (5.0%) falsely reported that they submitted an obvious misrepresentation, and only 8 (3.4%) refused to answer (the differences are statistically significant at $p < 0.01$ using Fisher's exact test). The most common justifications given by respondents for obvious misrepresentation were thinking that chances were slim and improving admission probability. Only three respondents attributed obvious misrepresentation to misunderstanding or mistrusting the system.

The above figures, combined with the lack of evidence of selection in responding to the survey, suggest a downward bias in survey-based estimates of preference misrepresentation, potentially due to individuals' reluctance to report socially undesirable behavior. Of the 367 participants in the 2014 survey, 18% reported submitting an ROL that was only "*partially truthful*," with 1% reporting not submitting their true preferences. Of the 13% of the respondents who reported

[12]Of the 28 respondents who submitted an obvious flipping, 16 (57%) reported such behavior. Similarly, only 14 of the 27 (52%) respondents who submitted an obvious dropping reported such behavior.

giving a higher ranking to a study track "*that ranked you high (even though you may have preferred other study tracks)*," more than a third (5%) also reported that they were truthful.

The 2014 survey was quite direct in its attempt to understand agents' behavior. For example, 18% responded positively to the question: "*In your opinion, was there a strategic advantage in ranking programs to which you think you have a better chance of being admitted (even though it was made clear that there was no such advantage)?*" Most of these respondents could not explain why. An additional 21% reported that they thought that the answer was negative, but they could not explain why.

5. THE COST AND CORRELATES OF PREFERENCE MISREPRESENTATION

Is obvious misrepresentation costly? We address this question in two ways to get a lower and an upper bound for the cost of obvious misrepresentation. First, we change ROLs that obviously misrepresented true preferences, by ranking funded positions just above the corresponding non-funded positions while leaving the rest of the ROLs unchanged. This gives us a lower bound of 3 affected individuals. That is, 3 out of 130 individuals would have received a scholarship (of more than $6,000 on average) in the program they were assigned to had they asked for one. For an upper bound, we repeat the same exercise, this time ranking the funded position as the first choice. We get an upper bound of 10 affected individuals. The additional 7 individuals were placed in a program they ranked higher than the unfunded position in the program where they could have received a scholarship (of more than $5,000, on average). Since, in ROLs that were not an obvious misrepresentation, the funded and unfunded contracts in the same program were typically ranked consecutively, it is natural to assume that the true value is closer to the lower bound (with the caveat that this paper establishes that ROLs often do not reflect true preferences, especially with respect to funding). It is important to stress, however, that the above bounds account for the cost of *obvious* misrepresentation only. Our approach cannot detect other kinds of preference misrepresentation, and thus we are unable to measure their costs. Furthermore, the potential cost of obvious misrepresentation is bounded by the limited availability of scholarships in the IPMM (cf. Shorrer & Sóvágó, 2017).

To put the numbers from the above paragraph into perspective, note that 60 out of 567 (10.5%) relevant ROLs with no obvious misrepresentation resulted in placement in a funded position. The smaller proportion of applicants who had the potential to be placed in a funded position suggests that it is not the strongest applicants who submit obvious misrepresentations. Another indication that obvious misrepresentation is more common among weaker applicants is that the number of misrepresenters who hold a (more prestigious) university Bachelor's degree is 85 (65.4%), significantly lower than their share in the population of applicants who submitted relevant ROLs (76.1%, $p = 0.016$). By contrast, the gender ratio of the misrepresenters is similar

TABLE III

CORRELATES OF OBVIOUS MISREPRESENTATION: ADMINISTRATIVE DATA[a]

	(1) OMR	(2) Flipped	(3) Dropped
Female	−0.0290	−0.0300	−0.00656
	(0.0356)	(0.0280)	(0.0266)
NotRanked	0.202***	0.0905*	0.101**
	(0.0635)	(0.0499)	(0.0510)
DesirabilityQuintile(1)	0.0352	0.0273	0.0152
	(0.0533)	(0.0416)	(0.0413)
DesirabilityQuintile(2)	−0.0437	−0.0278	−0.0165
	(0.0506)	(0.0375)	(0.0392)
DesirabilityQuintile(3)	0.0315	0.0240	−0.00268
	(0.0531)	(0.0412)	(0.0400)
DesirabilityQuintile(4)	−0.0706	−0.0152	−0.0662**
	(0.0479)	(0.0387)	(0.0325)
Year and BA institution fixed effects	YES	YES	YES
Observations	672	672	672
R-squared	0.071	0.038	0.039

$^{***}p < 0.01$, $^{**}p < 0.05$, $^{*}p < 0.1$

[a] The table presents the results of a linear regression of a dummy variable for obvious misrepresentation (OMR) on variables that are available from the administrative match data. The analysis is repeated breaking down obvious misrepresentation by type. In all specifications, the year dummy and all institution dummies have coefficients that are not statistically distinguishable from 0. Robust standard errors are in parentheses.

to that of the general population (92 women and 38 men).

Next, we perform linear regressions with the dependent variable being an indicator that equals one if the ROL is an obvious misrepresentation. The right-hand side variables include year, gender, and Bachelor's degree institution fixed effects, a dummy for being the ROL of one of the 15% of the applicants who were not ranked by any program in the year the ROL was submitted, and dummies for the quintile of the eigenvector centrality measure of the desirability of an applicant.[13] We repeat this analysis further refining the dependent variable by the type of misrepresentation: flipping or dropping. Table III and Table VI summarize our findings.

[13]The eigenvector centrality measure of the desirability of applicants is based on the eigenvector associated with the largest eigenvalue of the matrix A that summarizes pairwise comparisons of applicants' rankings by the programs. Specifically, $A_{ij} = (n_{ij} + 1)/(n_{ji} + 1)$, where n_{ij} denotes the number of programs that ranked both i and j and ranked i above j. Both the eigenvector centrality measure of the desirability of applicants and the quintiles are calculated separately for each year. Table VIII provides evidence of a positive correlation between this ad-hoc measure of desirability and our measure of ability, applicants' (self-reported) MITAM scores.

The estimated coefficients indicate that being "unpopular" with departments correlates with submitting an obvious misrepresentation. For example, column (1) illustrates that unranked applicants were more than twice as likely to submit an obvious misrepresentation relative to applicants who were ranked by some program. While the regressions in this section are used only as a convenient means to summarize the data and should not be given a causal interpretation, this could suggest that more desirable applicants are more likely to be truthful, or at least less likely to submit an obvious misrepresentation.

The 2015 post-match survey allows us a more refined look into the correlates of misrepresentation. In particular, we have a better measure of academic ability in the form of the (self-reported) MITAM score. We regress a dummy for obvious misrepresentation on administrative and survey-based controls. The results are summarized in Table IV. All specifications suggest a negative relation between MITAM and obvious misrepresentation above the median MITAM score in the sample.

In Table VII we further break down the obvious misrepresentation variable to obvious dropping and obvious flipping. In both cases the relationship with the MITAM score persists. Additionally, we find that obvious dropping is correlated with high socioeconomic status, and that obvious flipping is positively correlated with not reading the FAQ. Such correlations can be explained by wealthier individuals putting less weight on funding in their (mistaken) trade-off, and by less attentive individuals being less aware of the way the mechanism works.

Finally, we repeat the analysis of Table IV with reported misrepresentation as the left-hand side variable. The results are summarized in columns (1) and (2) of Table IX. Unranked applicants are significantly more likely to report misrepresentation. Additionally, a higher level of self-confidence about the ability to explain the way the system works is associated with lower rates of (reported) misrepresentation.[14]

6. DISCUSSION

How should one interpret the body of evidence on (obvious) misrepresentation? Hassidim *et al.* (2017a) provide an elaborate discussion of possible explanations, which roughly fall into two broad categories. According to explanations of the first category, it is impossible or suboptimal for some of the applicants to report their preferences to the mechanism truthfully. According to explanations of the second category, in spite of the good incentive properties of the mechanism, many applicants still make dominated choices. We believe that explanations from the second category are behind most of the misrepresentation we observe in the IPMM.

[14]In this context, it is important to reiterate the fact that the survey was conducted after the match results were published; thus, the reports may have been affected by the match outcomes.

TABLE IV

CORRELATES OF OBVIOUS MISREPRESENTATION: SURVEY DATA[a]

	(1) OMR	(2) OMR	(3) OMR	(4) OMR
Female	−0.0481	−0.0530	−0.0649	−0.0717
	(0.0573)	(0.0569)	(0.0576)	(0.0566)
FaqHelpful	−0.0117	−0.00645	−0.0212	−0.0166
	(0.0896)	(0.0897)	(0.0837)	(0.0859)
FaqNotRead	0.0709	0.0758	0.0655	0.0705
	(0.103)	(0.103)	(0.0965)	(0.0985)
ExplanationConfidence	$6.73e{-}05$	−0.00391	$8.70e{-}05$	−0.00377
	(0.0267)	(0.0257)	(0.0272)	(0.0261)
Age	0.0216	0.0180	0.00586	0.000448
	(0.0264)	(0.0259)	(0.0258)	(0.0254)
SocioeconomicStatus	0.0290	0.0327	0.0307	0.0349
	(0.0209)	(0.0206)	(0.0205)	(0.0202)
MITAM	−0.0702***	−0.0922***	−0.0824***	−0.106***
	(0.0242)	(0.0240)	(0.0259)	(0.0260)
MITAM^2		−0.0608***		−0.0609***
		(0.0145)		(0.0146)
NotRanked	0.138	0.118	0.0534	0.0194
	(0.0846)	(0.0853)	(0.107)	(0.108)
DesirabilityQuintile(1)			−0.00500	−0.0348
			(0.0955)	(0.0945)
DesirabilityQuintile(2)			−0.246***	−0.261***
			(0.0898)	(0.0878)
DesirabilityQuintile(3)			−0.0416	−0.0569
			(0.0938)	(0.0921)
DesirabilityQuintile(4)			−0.151*	−0.163**
			(0.0787)	(0.0763)
BA institution fixed effects	YES	YES	YES	YES
Observations	240	240	240	240
R-squared	0.104	0.141	0.149	0.187

$^{***}p < 0.01$, $^{**}p < 0.05$, $^{*}p < 0.1$

[a] The table presents the results of a linear regression of a dummy variable for obvious misrepresentation (OMR) on variables that are available from the 2015 post-match survey in addition to administrative match data. Columns (2) and (4) include a quadratic term in the MITAM score. Columns (3) and (4) include controls for desirability quintiles. Explanation confidence, age, socioeconomic status, and MITAM were normalized to have a mean of zero and standard deviation of one. Robust standard errors are in parentheses.

In the first category we list technical issues such as inputting mistakes, being unaware of the availability of funded positions, or costs associated with ROLs' length, as well as privacy

concerns, self-image concerns (Bénabou & Tirole, 2011; Kőszegi, 2006),[15] altruism (Rabin, 1993), peer effects, or avoiding disappointment (Kőszegi & Rabin, 2009). None of the above, save possibly the last, can explain the experimental evidence (e.g., Hassidim *et al.*, 2016), nor are any of them supported by our surveys (except for the altruistic motives reported by three respondents).

Some of these explanations are also unlikely for other reasons. Inputting mistakes are nearly ruled out in light of the simple user interface and survey responses of applicants who deliberately misrepresented preferences. Lack of information about funded positions is also deemed unlikely, especially given the explicit warning about not ranking funded opportunities (when ranking their non-funded counterparts), and since it cannot explain obvious flipping. The interface did not limit ROLs' length, and there was no monetary cost for submitting a long list (participation was completely free). Furthermore, the mental cost of considering funded positions is likely negligible compared to the more "complex" task of ranking programs. At any rate, costs cannot explain obvious flipping. Finally, the instructions and emails that applicants received were very clear about preserving applicants' privacy.

Explanations of the first category, like those reviewed above, imply that the workhorse model used by economists to design and analyze school-choice systems abstracts away an important feature of the economic environment. The nontechnical explanations in this category all imply that the message space may not be expressive enough for applicants to report their preferences truthfully. However, we believe that explanations of the second category are behind most of the misrepresentation we observe. In particular, we find two explanations most compelling.

The first is that applicants fail to identify the optimal strategy. In the IPMM, the optimal strategy was communicated to applicants on many occasions, and in multiple forms. For this reason, we do not believe that lack of information about the optimal strategy, or its complexity, plays an important role. Cognitive limitations may, however, hinder applicants' ability to process this advice. Moreover, applicants may mistrust the advice provided to them.[16]

When individuals do not fully understand the mechanism or do not trust the information they are given, a natural idea is that the mechanism rewards a higher ranking with an increased probability of matching.[17] The optimal behavior in such matching environments is

[15] We note that self-image concerns of the kind described in Kőszegi (2006) are less plausible in environments where applicants learn whether they would have been allocated other options had they asked for them (Artemov *et al.*, 2017; Chen & Pereyra, 2015; Shorrer & Sóvágó, 2017).

[16] After all, individuals are often told that "honesty is the best policy," even when being honest is not optimal. And verifying the incentive properties of DA is not straightforward (see Roth, 1982).

[17] Applicants may also believe that their actions influence the likelihood of certain probability events that, in fact, do not depend on their actions. Arad (2014) finds that "magical thinking" leads subjects to avoid "greedy" choices out of fear of "punishment by the universe."

consistent with the correlation between the strength of an applicant and truthful reporting. Survey responses that indicated misrepresentation with an intention to increase the likelihood of admission are further evidence in support of this theory.

The second explanation is that applicants use a *weakly* dominated strategy because they believe that, in practice, the chances that the dominant strategy will do better are zero or close to zero. This explanation is consistent with the correlation between applicants' strength and truthful behavior, and with survey responses indicating misrepresentation due to low chances of admission.

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APPENDIX A: ADDITIONAL TABLES AND FIGURES – FOR ONLINE PUBLICATION

TABLE V

VARIABLE LIST

Variable	Mean (SD)	Number of observations	Definition
A. Administrative data			
OMR	.194 (.395)	672	1 if ROL is an obvious misrepresentation
Flipped	.104 (.306)	672	1 if ROL is obvious flipping
Dropped	.095 (.294)	672	1 if ROL is obvious dropping
Female	.728 (.446)	672	1 if applicant is female, 0 if male
NotRanked	.149 (.356)	672	1 if applicant was not ranked by any program in the year the ROL was submitted
DesirabilityRank	344.46 (187.0)	672	Eigenvector centrality desirability rank of the applicant in the year the ROL was submitted
DesirabilityQuintile(i)		672	1 if applicant was in quintile (i) of DesirabilityRank among applicants who were ranked in the year the ROL was submitted
Year	.661 (.474)	672	0 if ROL was submitted in 2014, 1 if ROL was submitted in 2015
BA*		672	Dummy variables for Bachelor's degree from each of the participating institutions
B. 2015 post-match survey data			
DecreasedPosition	.17 (.376)	289	1 if reported ranking some position lower than actual preferences
IncreasedPosition	.132 (.339)	288	1 if reported ranking some position higher than actual preferences
ReportedMisrepresentation	.204 (.404)	288	1 if IncreasedPosition=1 or DecreasedPosition=1
AwareOfScholarship	.965 (.185)	283	1 if reported being aware of the option to rank some programs with and without a scholarship
ReportedOMR	.149 (.356)	276	1 if reported submitting an obvious misrepresentation
Age	27.63 (4.126)	289	Self-reported age
SocioeconomicStatus	2.793 (1.008)	285	Answer to socioeconomic status question (see Appendix D), 0 (lowest) to 5 (highest)
MitamScore	118.82 (14.93)	248	Self-reported MITAM score
MatchingSatisfaction	8.08 (2.07)	291	Reported satisfaction from matching process, 1 (lowest) to 10 (highest)
ApplicationSatisfaction	4.68 (2.58)	290	Reported satisfaction from application process, 1 (lowest) to 10 (highest)
FaqNotRead	.762 (.426)	290	1 if reported not reading the FAQ
FaqHelpful	.682 (.467)	290	1 if reported reading the FAQ and that it was helpful
ExplanationThiConfidence	8.34 (1.63)	291	Self-confidence in ability to explain how the matching process works, 1 (lowest) to 10 (highest)

TABLE VI

Correlates of obvious misrepresentation: Administrative data[a]

	(1) OMR	(2) OMR	(3) OMR	(4) Flipped	(5) Flipped	(6) Flipped	(7) Dropped	(8) Dropped	(9) Dropped
Female		−0.0269	−0.0290		−0.0298	−0.0300		−0.00415	−0.00656
		(0.0354)	(0.0356)		(0.0276)	(0.0280)		(0.0266)	(0.0266)
NotRanked	0.207***	0.212***	0.202***	0.0891**	0.0891**	0.0905*	0.111***	0.116***	0.101**
	(0.0508)	(0.0521)	(0.0635)	(0.0403)	(0.0418)	(0.0499)	(0.0409)	(0.0418)	(0.0510)
Desirability Quintile(1)			0.0352			0.0273			0.0152
			(0.0533)			(0.0416)			(0.0413)
Desirability Quintile(2)			−0.0437			−0.0278			−0.0165
			(0.0506)			(0.0375)			(0.0392)
Desirability Quintile(3)			0.0315			0.0240			−0.00268
			(0.0531)			(0.0412)			(0.0400)
Desirability Quintile(4)			−0.0706			−0.0152			−0.0662**
			(0.0479)			(0.0387)			(0.0325)
Year and BA institution fixed effects	NO	YES	YES	NO	YES	YES	NO	YES	YES
Observations	672	672	672	672	672	672	672	672	672
R-squared	0.035	0.062	0.071	0.011	0.034	0.038	0.018	0.031	0.039

$^{***}p < 0.01$, $^{**}p < 0.05$, $^{*}p < 0.1$

[a] The table presents the results of a linear regression of a dummy variable for obvious misrepresentation (OMR) on variables that are available from the administrative match data. The analysis is repeated breaking down obvious misrepresentation by type. Robust standard errors are in parentheses.

TABLE VII

Correlates of dropping and flipping[a]

	Flipped	Flipped	Flipped	Flipped	Dropped	Dropped	Dropped	Dropped
Female	−0.0199	−0.0230	−0.0272	−0.0316	−0.0242	−0.0262	−0.0327	−0.0355
	(0.0427)	(0.0428)	(0.0445)	(0.0443)	(0.0434)	(0.0435)	(0.0426)	(0.0427)
FaqHelpful	0.0554	0.0588	0.0523	0.0553	−0.0682	−0.0660	−0.0741	−0.0723
	(0.0459)	(0.0462)	(0.0453)	(0.0462)	(0.0794)	(0.0796)	(0.0758)	(0.0768)
FaqNotRead	0.150**	0.154**	0.147**	0.150**	−0.0619	−0.0599	−0.0636	−0.0616
	(0.0667)	(0.0669)	(0.0638)	(0.0647)	(0.0863)	(0.0864)	(0.0836)	(0.0844)
Explanation-Confidence	−0.0169	−0.0195	−0.0163	−0.0188	0.0212	0.0196	0.0204	0.0188
	(0.0197)	(0.0192)	(0.0196)	(0.0191)	(0.0239)	(0.0238)	(0.0243)	(0.0241)
Age	0.00311	0.000763	−0.00450	−0.00799	0.0171	0.0156	0.00951	0.00733
	(0.0171)	(0.0169)	(0.0171)	(0.0170)	(0.0199)	(0.0198)	(0.0195)	(0.0194)
Socioeconomic Status	0.00497	0.00737	0.00847	0.0112	0.0332**	0.0348**	0.0310**	0.0326**
	(0.0176)	(0.0174)	(0.0171)	(0.0169)	(0.0156)	(0.0157)	(0.0154)	(0.0154)
MITAM	−0.0279	−0.0422**	−0.0352*	−0.0506**	−0.0447**	−0.0537***	−0.0490**	−0.0586***
	(0.0174)	(0.0177)	(0.0191)	(0.0198)	(0.0180)	(0.0195)	(0.0199)	(0.0220)
MITAM^2		−0.0394***		−0.0392***		−0.0248**		−0.0245**
		(0.0124)		(0.0124)		(0.00987)		(0.0101)
NotRanked	−0.00271	−0.0153	−0.0272	−0.0491	0.138*	0.130*	0.0841	0.0705
	(0.0647)	(0.0637)	(0.0791)	(0.0785)	(0.0711)	(0.0724)	(0.0892)	(0.0918)
Desirability Quintile(1)			0.0152	−0.00394			0.00735	−0.00461
			(0.0742)	(0.0740)			(0.0752)	(0.0759)
Desirability Quintile(2)			−0.143**	−0.153**			−0.102	−0.109
			(0.0627)	(0.0629)			(0.0726)	(0.0727)
Desirability Quintile(3)			0.0200	0.0101			−0.0596	−0.0657
			(0.0745)	(0.0734)			(0.0676)	(0.0686)
Desirability Quintile(4)			−0.0399	−0.0474			−0.109**	−0.114**
			(0.0641)	(0.0627)			(0.0513)	(0.0520)
BA institution fixed effects	YES	YES	YES	YES	YES	YES	YES	YES
Observations	240	240	240	240	240	240	240	240
R-squared	0.076	0.102	0.104	0.130	0.122	0.134	0.150	0.162

$^{***}p < 0.01$, $^{**}p < 0.05$, $^{*}p < 0.1$.

[a] The table presents the results of a linear regression of a dummy variable for obvious flipping (dropping) on variables that are available from the 2015 post-match survey in addition to administrative match data. The specifications follow those in Table IV. Explanation confidence, age, socioeconomic status, and MITAM were normalized to have a mean of zero and a standard deviation of one. Robust standard errors are in parentheses.

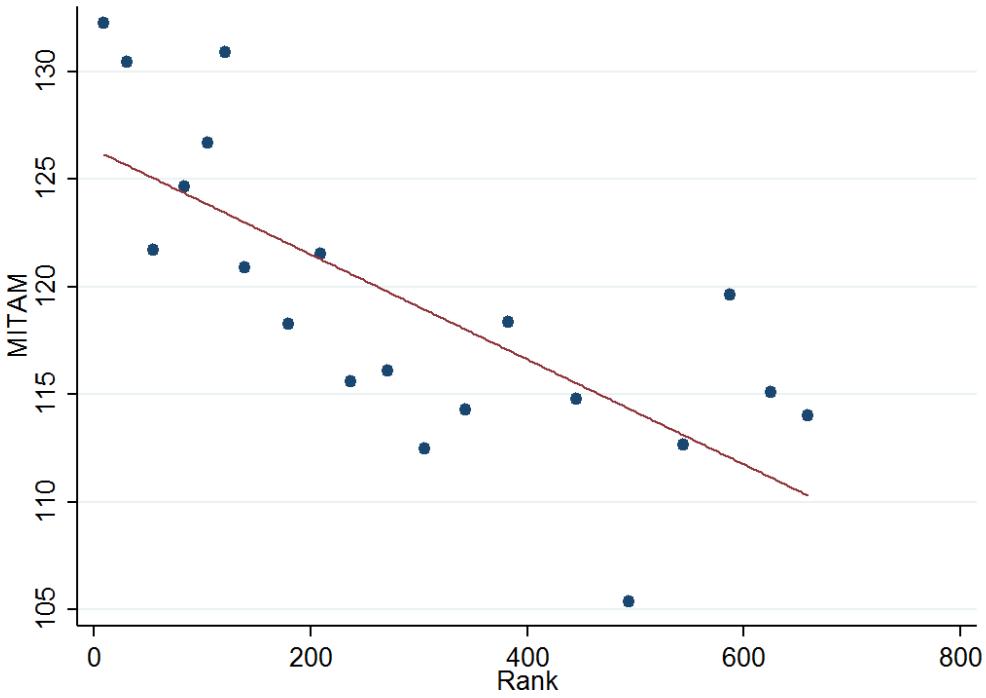

FIGURE 1.— MITAM vs. desirability. Observations (216, corresponding to respondents to the 2015 post-match survey who were ranked by some program and reported their MITAM score) are partitioned into 20 equal bins by their eigenvector centrality rank. Lower rank corresponds to higher desirability.

TABLE VIII

MITAM VS. DESIRABILITY[a]

	(1) MITAM	(2) MITAM
DesirabilityQuintile(1)		0.0498
		(0.209)
DesirabilityQuintile(2)		−0.207
		(0.236)
DesirabilityQuintile(3)		−0.0725
		(0.221)
DesirabilityQuintile(4)		0.510***
		(0.195)
DesirabilityQuintile(5)		0.788***
		(0.197)
DesirabilityRank	−0.00164***	
	(0.000311)	
Constant	0.507***	−0.223
	(0.106)	(0.150)
Observations	216	248
R-squared	0.108	0.125

$^{***}p < 0.01$, $^{**}p < 0.05$, $^{*}p < 0.1$

[a] The table presents the results of a linear regression of the self-reported MITAM score from the 2015 post-match survey on our measures of desirability. Column 1 uses the desirability rank, which can only be calculated for individuals who were ranked by some program. Column 2 uses desirability-quintile dummies and includes unranked applicants (omitted dummy). Robust standard errors are in parentheses.

TABLE IX

CORRELATES OF REPORTED MISREPRESENTATION[a]

	(1) Reported Misrepresentation	(2) Reported Misrepresentation	(3) Reported OMR	(4) Reported OMR
OMR		0.00266		0.502***
		(0.0735)		(0.0812)
Female	−0.0394	−0.0392	−0.0271	0.00179
	(0.0573)	(0.0580)	(0.0506)	(0.0428)
FaqHelpful	−0.169	−0.169	−0.0626	−0.0554
	(0.107)	(0.108)	(0.0793)	(0.0728)
FaqNotRead	0.0185	0.0183	0.0271	0.00394
	(0.122)	(0.122)	(0.0932)	(0.0788)
Explanation Confidence	−0.0538*	−0.0538*	−0.0346	−0.0332
	(0.0273)	(0.0274)	(0.0273)	(0.0204)
Age	−0.0257	−0.0257	0.0610*	0.0607*
	(0.0271)	(0.0272)	(0.0318)	(0.0328)
SocioeconomicStatus	0.0463	0.0462	0.0271	0.00995
	(0.0288)	(0.0288)	(0.0206)	(0.0170)
MITAM	−0.00650	−0.00621	−0.0336	0.0165
	(0.0290)	(0.0306)	(0.0234)	(0.0207)
$MITAM^2$	−0.00359	−0.00343	−0.0187	0.0123
	(0.0211)	(0.0222)	(0.0138)	(0.0116)
NotRanked	0.230**	0.230**	0.269**	0.235***
	(0.113)	(0.113)	(0.105)	(0.0825)
DesirabilityQuintile(1)	0.0126	0.0127	0.182**	0.188***
	(0.0877)	(0.0884)	(0.0705)	(0.0685)
DesirabilityQuintile(2)	−0.160*	−0.159*	−0.0292	0.0882*
	(0.0867)	(0.0904)	(0.0579)	(0.0531)
DesirabilityQuintile(3)	0.0458	0.0459	0.0616	0.0893
	(0.0973)	(0.0976)	(0.0620)	(0.0589)
DesirabilityQuintile(4)	−0.0711	−0.0707	0.00437	0.0767
	(0.0767)	(0.0783)	(0.0474)	(0.0501)
BA institution fixed effects	YES	YES	YES	YES
Observations	239	239	230	230
R-squared	0.211	0.212	0.195	0.449

$^{***}p < 0.01$, $^{**}p < 0.05$, $^{*}p < 0.1$

[a] The table presents the results of a linear regression of a dummy variable for reported (obvious) misrepresentation on variables that are available from the 2015 post-match survey in addition to administrative match data. OMR is a dummy variable for submitting an ROL that obviously misrepresented the applicant's preferences. Explanation confidence, age, socioeconomic status, and MITAM were normalized to have 0 mean and standard deviation of 1. The difference in the number of observations stems from survey responders who chose not to respond to the OMR question. Robust standard errors in parentheses.

APPENDIX B: SELECTED FREQUENTLY ASKED QUESTIONS – FOR ONLINE PUBLICATION

This appendix includes a translation of the relevant part of the FAQ page of the matching system website. Any non-person-specific question that was received was paraphrased and posted publicly on this page.[18]

Q: Will anyone else see my ROL?
A: Your ROL is secret and no track will ever have access to it. You are the only person permitted to access your ROL, unless you give out your user name and password.

Q: How does the computerized placement process work?
A: The algorithm tries to place each candidate in her most preferred track. If the track prefers other candidates, the algorithm tries to place the candidate in her second favorite track, and so on, until the candidate is temporarily placed, or until she has been rejected by all tracks. After all candidates go through this process the temporary assignment becomes permanent.

Q: Is there room for strategizing? Should I rank a track that I am interested in but feel like I have no chance of being admitted to?
A: The system was designed so that there is no need for being strategic while ranking the tracks. The only thing that should influence the ranking is the degree of desirability of the track for you. Strategic thinking can only hurt your probability of admission, and cannot improve it. To be specific, it is advisable to rank all of the tracks you interviewed with, even if you think your chances of admission are slim. This will not hurt your chances of being admitted to another track.

Q: I want to study clinical psychology, and I am willing to study [anywhere], even on the moon. I had a good interview with program A and a bad one with program B. On the other hand, I prefer B [to A]. How should I rank them?
A: When you determine your ranking, think only of where you want to study, assuming that you will be admitted. Do not worry about odds! In this case, rank B first and A second. If you rank A first you will not increase your chances of being accepted to a psychology program, and you are only hurting yourself.

Q: I had an interview with program A and they told me that if I ranked them first I would be admitted. I prefer B, but they made no promises. What should I do?
A: Great! You are surely going to be admitted to a psychology program. Rank B first and A second. If B wants you (even though you were not promised admission) you will go there; otherwise you will go to A. It is important to underscore that no one will ever see your ranking!

Q: Does the algorithm take into account the fit between my ranking of the track and the track's ranking of me? That is, if another candidate and I are ranked by one of the tracks so that I am ranked 12th and she is 13th, but she gave the track a higher priority than I did, is it possible that she will be admitted and I will not (assuming that I am not admitted to another track)?
A: This is impossible. The matching algorithm (intentionally) does not take into account your ranking of the track, but only the track's ranking of you. The reason why the algorithm works this way is to circumvent contrivances.

[18]The complete list of questions and answers (in Hebrew) is available at http://psychologymatch.org/info/FAQ.aspx (accessed 7/29/2015).

Q: Will I know after the fact which tracks admitted me (even if I was not placed there)?
A: Not exactly. Tracks do not submit acceptance/rejection lists to the system, but submit a ranking over candidates and the planned size of the track. Applicants are placed in the best track they can get. That is, if you do not get into a track that you ranked higher, you can deduce that this program has filled its capacity. As for programs you ranked lower than the one you were placed in, you can only tell by contacting the track after the fact. Even if you had been admitted to this track, it would have been impossible to move there after the placement was set.

APPENDIX C: USER INTERFACE SCREENSHOTS – FOR ONLINE PUBLICATION

FIGURE 2.— Ranking screen. Programs (with terms, when applicable) appear on the right-hand side of the screen, and are classified by institution. Applicants can drag and drop any number of alternatives (programs with terms) from the right-hand side of the screen to their ROL on the left-hand side of the screen. They can also drag ranked programs to change their order, or remove them from the ROL.

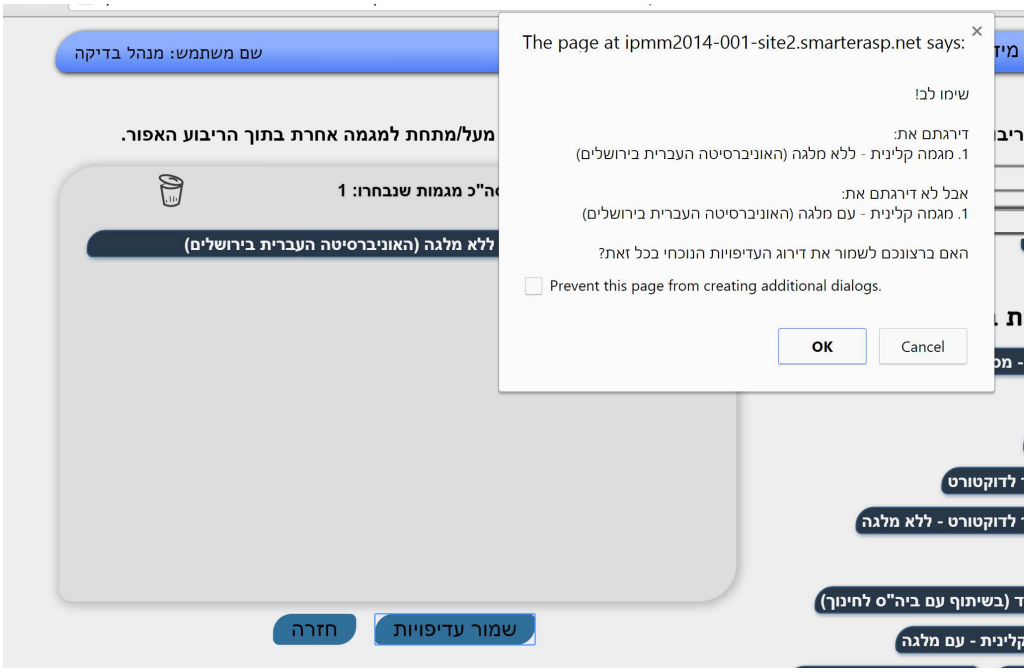

FIGURE 3.— Missing terms warning. This pop-up alert appears since the applicant chose to rank a program without funding, but did not rank it with a scholarship even though such an option existed. The message reads: "Attention! You ranked: (1) Clinical psychology without scholarship (The Hebrew University of Jerusalem), but you did not rank (1) Clinical psychology with scholarship (The Hebrew University of Jerusalem). Do you want to save the current ranking anyway?"

APPENDIX D: 2015 POST-MATCH SURVEY QUESTIONS – FOR ONLINE PUBLICATION

- Was 2015 the first year you applied for a graduate degree?
- If not, in what year did you first apply? Did you use the automated matching system last year?
- Did you encounter any technical difficulties in registering or ranking?
- If so, did you reach out to technical support? Was the response helpful?
- On the matching system website there is a FAQ page. Did you see this page and read the answers that appear there?
- Were the answers helpful?
- On a scale of 1 to 10, if you had to explain to next year's applicants how the matching process works, how well could you explain it?

- What were the factors that were important in ranking programs?
- Is there a program you ranked lower than what you really wanted because you thought your chance of being admitted was relatively low?
- If so, please elaborate.
- Is there a program you ranked higher than what you really wanted because you thought your chance of being admitted was relatively high?
- If so, please elaborate
- Did you apply to A, B, C, or D (names of institutions offering dually listed programs)?
- If so, you could have ranked some of the programs in those institutions with and without a scholarship. Were you aware of that? Which did you rank higher? Why?
- There was an option to register as a couple. Were you aware of this option? Was it relevant to you?
- If so, did you register as a couple? If you didn't, why not?
- On a scale of 1 to 10, how satisfied are you with the automated matching system?
- On a scale of 1 to 10, how satisfied are you with the admission process generally?
- Would you agree to share some demographic information?
- How old are you?
- Where did you go to high school?
- Where are you from (prior to undergraduate studies)?
- How would you describe the economic status of your family (very high, high, medium-high, medium, medium-low, low)?
- What was your MITAM score?
- Would you like to add any more comments?
- Would you like to receive the results of this survey?