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Heuristic decision-making in foster care matching: Evidence from a think-aloud study

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ABSTRACT

Complex decisions are often based on heuristics, which are shortcuts or simple ‘rules of thumb’. Since the matching decision in family foster care is often made in a less-than-ideal setting and riddled with uncertainty, heuristics are expected to be applied in that field of child and youth care on a daily basis. However, the use of heuristics in the matching decision has not been studied empirically until now. This research explores how decision-making heuristics are used by practitioners to determine which foster family is the best fit for a child. A number of 20 matching practitioners from the Netherlands were interviewed using vignettes and a ‘think-aloud’ methodology to generate an understanding of their reasoning. Two types of vignettes were created: hypothetical children and hypothetical foster families. The interviews were analyzed using a qualitative deductive content analysis focusing on key indicators of three classes of heuristics: recognition heuristics, one-reason heuristics, and trade-off heuristics. The results show that recognition heuristics did not play a decisive role in the matching process; practitioners considered more than one family before making a final decision. The findings for the one-reason heuristics reveal conjunctive decision-making rules; families were rejected based on one negative premise. The analysis of the trade-off heuristics demonstrates that the number of positive premises and the ratio between positive and negative premises predicted the matching decision. However, the total number of premises also predicted the matching decision, which might indicate confirmation bias.

1. Aim and research questions

The goal of matching in foster care is to choose the best fitting foster family for a child (Zeijlmans, López López, Grietens, & Knorth, 2017; Strijker & Zandberg, 2001). Several guidelines and tools have been provided to promote the use of analytical decision-making techniques in the matching decision (Moore, McDonald, & Cronbaugh-Auld, 2016; Strijker & Zandberg, 2001; Van Dam, Nordkamp, & Robbroeckx, 2000). These guidelines consider matching from a normative perspective, assuming a “gold standard” or a correct decision to be made (López, Fluke, Benbenishty, & Knorth, 2015). The focus on rationalizing the matching decision is in line with the increasingly recognized idea that decisions in social work need to be validated with evidence and explicated in a normative reasoning format (Taylor & White, 2001). Because a wrong decision in social work can have profound consequences for the people involved, concerns about the erroneous nature of decision-making are understandable.

Several studies have focused on the reasoning processes in the decision-making of social work practitioners (e.g., Benbenishty,

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Osmo, & Gold, 2003; Munro, 1999; Spratt, Devaney, & Hayes, 2015). In these studies, practitioners appear to process information in a rather deliberate manner, based on rules they think are relevant (Benbenishty et al., 2003; Sheppard & Ryan, 2003). However, biases can also be detected, such as the tendency to focus on a narrow range of evidence or to be reluctant to revise previous judgements (Munro, 1999; Spratt et al., 2015). Thus, decision-makers choose, albeit correct or incorrect, their decision strategies (Dieckmann & Rieskamp, 2007). Furthermore, they use their *psycho-social rationality* to adapt decision strategies to the complex reality of the environment (Taylor, 2017).

The ‘bounded rationality’ model, which originates from the work of Simon (1956), describes how decisions in practice are often based on *heuristics*, which are shortcuts or simple ‘rules of thumb’ for making decisions (Taylor, 2012). The definition of a heuristic used in this paper comes from Gigerenzer and Gaissmaier (2011, p. 254): “A heuristic is a strategy that ignores part of the information, with the goal of making decisions more quickly, frugally, and/or accurately than more complex methods”. These rules are considered simple due to the uncomplicated nature compared to the more analytical rules that require, for instance, comparing all attributes of all the alternatives (Gigerenzer & Gaissmaier, 2011). Heuristics can also be expected to be employed in matching practice, since the matching decision is often made in a less-than ideal or compromised setting in which there is a lack of time to consider all alternatives or with uncertain or missing information (Pösö & Laakso, 2016; Zeijlmans, López López, Grietens, & Knorth, 2018).

The work on heuristics is often associated with the work of Daniel Kahneman and Amos Tversky, who identified heuristics as a source of potential biases (i.e. Kahneman, 2003; Tversky & Kahneman, 1974; Tversky & Kahneman, 1983). However, while analytic decision-making approaches are generally considered to be superior to a heuristic approach, their higher rate of success is not always guaranteed (Gigerenzer & Gaissmaier, 2011). This is explained by the bias-variance dilemma. In statistical theory, three sources of errors are identified: bias, variance and random error. Using analytic decision-making decreases the risk of bias; yet, by using more uncertain parameters, the influence of variance increases. Heuristics use fewer parameters to come to a conclusion, thereby diminishing the influence of variance on errors and limiting the influence of uncertainty (Dieckmann & Rieskamp, 2007; Gigerenzer & Brighton, 2009; Gigerenzer & Gaissmaier, 2011). For example, Wübben and Wangenheim (2008) compared complex models with a simple heuristic to distinguish customers who are likely to purchase again in a given time frame (active customers) from those who will not (inactive customers). The heuristic predicted that customers who had not purchased anything within a certain number of months were inactive. Both decision-making models, complex versus simple, were tested in three industry settings for their ability to predict which customers would be active in the future. Results showed that the efficacy of both models was similar; the complex model did not outperform the simple heuristic. Thus, the efficacy of heuristics or more complex models is determined by the context of the decision (Gigerenzer & Brighton, 2009). Heuristics can be considered rational decision-making tools in environments with a high degree of uncertainty and complexity (Taylor, 2017). Therefore, it is important to understand the decision-making processes used by matching practitioners in their daily practice. Knowing the decision rules applied by practitioners helps to distinguish potentially effective heuristics that can, eventually, be tested against more complex models for matching children with foster carers.

Heuristics are often grouped in four classes: recognition-based decision-making, one-reason decision-making, trade-off heuristics and social heuristics (Gigerenzer & Gaissmaier, 2011). The first three classes of heuristics can be used individually on a task, whereas the social heuristics are more applicable to settings in which multiple people must decide together. The first class, *recognition-based decision-making*, uses the familiarity of alternatives as a predictor for the decision-making outcomes, wherein the highest value is attached to alternatives that are recognized (‘recognition heuristic’) or recognized faster (‘fluency heuristic’). A specific sub-heuristic of fluency is the ‘take-the-first’ heuristic in which the first alternative that comes to mind is chosen. In the case of matching, this could imply that the first foster family that comes to mind, when one is familiarizing with the information of the foster child, is the family in which the child would be placed.

The second class of heuristics, *one-reason decision-making*, is when decisions are made based on one cue (Gigerenzer & Gaissmaier, 2011). Part of this class are the conjunctive rules, the so-called ‘deal breakers’ that need to be met to continue the deliberation, and the disjunctive rules in which an alternative is accepted when one key attribute is acceptable regardless of the other attributes (Bruch & Feinberg, 2017). In the matching decision, these cues are likely to be a combination of an attribute from the child with a foster family attribute.

The third class of heuristics consists of the *trade-off heuristics*, in which multiple cues and alternatives are considered and compensatory strategies can be used (Gigerenzer & Gaissmaier, 2011). Unlike recognition-based and one-reason decisions, this class of heuristics weights more cues. However, contrary to analytic decision-making strategies, the trade-off heuristics consider all cues equally and ignore the potential differences in importance for the decision. Tallying is one example of trade-off heuristics, which implies a simple counting of desirable and undesirable cues after which the alternative with the largest number of desirable cues is chosen. In the matching decision, this would mean that the family with the most favorable, the least unfavorable or the best ratio between favorable and unfavorable cues will be chosen by the practitioner.

Finally, the *social heuristics*, such as imitate the majority or follow the most influential person, are heuristics based on social information (Gigerenzer & Gaissmaier, 2011). In matching, these heuristics are most likely to be used in settings of shared decision-making between colleagues. In those settings, it could be expected that one practitioner appears to know best, changing or forming the judgements of the other practitioners.

The compromised or imperfect nature of most matching decisions (Zeijlmans et al., 2018) might cause practitioners to rely on heuristics instead of more analytical approaches to decision-making (Taylor, 2012). However, the use of heuristics in matching decisions has not been assessed and, therefore, it is unknown which, if any, heuristics are used in daily practice. This study, therefore, answers the following research question: ‘Are decision-making heuristics used, and if so how, to determine which foster family is the best fit for a particular child?’ The resulting heuristics might be valuable in improving the matching decision by increasing awareness

on the current use of heuristics, starting a discussion about matching in practice and beginning a research line into the efficacy of heuristics compared to more complex matching models. Thereby, formalizing and understanding heuristics could result in less practice variation and, in the long run, develop a more efficient and transparent decision-making process.

2. Method

In the Netherlands, the matching decision in family foster care is made by a matching practitioner. These practitioners are charged with the task to choose the best foster family for all children entering their foster care organization. This provides an opportunity to study the decision-making process of practitioners who have expertise in making matching decisions on a regular basis. In this study, matching practitioners were interviewed using vignettes. *Vignettes* are stimuli of hypothetical situations to which participants are asked to respond, which are used to elicit opinions, values and reactions (Hughes & Huby, 2002). The vignette approach was combined with the qualitative approach of the ‘think-aloud’ methodology to generate a sophisticated understanding of the practitioners’ reasoning behind matching decisions, while also enabling a controlled comparison between the reasoning of these decision-makers (Wilks, 2004). The research has been approved by the Ethics Committee of the Department of Pedagogical and Educational Sciences of the University of Groningen in January 2015.

2.1. Participants

For the project, 20 matching practitioners were recruited from 17 of the 28 foster care organizations in the Netherlands. All interviews were conducted individually, except for one interview with two practitioners who were, on their request, interviewed as a pair. However, during the meeting, these two practitioners were asked to make their own individual decision as much as possible. The 20 practitioners, of which three were male, had an average age of 46,4 years ($SD = 9,05$). The work experience with matching ranged from one to 15 years and the average was 9,23 ($SD = 4,25$).

2.2. Instrument

While the use of written vignettes is often considered too abstract and detached from real life processes (Hughes & Huby, 2002), matching practitioners deal with written information on children and foster carers on a daily basis. Therefore, written vignettes were designed to reflect real matching cases that the practitioners could come across in their daily practice. To create the vignettes, the first author observed matching practitioners from two organizations and analyzed case files from a third organization. Furthermore, foster care placement literature was consulted to include often-mentioned variables related to placement outcomes (e.g., Oosterman, Schuengel, Slot, Bullens, & Doreleijers, 2007; Van Dam et al., 2000; Van Oijen, 2010). The directionality of these variables was used to create the vignettes. For example, the consulted literature showed that ethnicity and cultural background is a frequently debated topic in matching research (e.g. Carter-Black, 2002; Folaron & Hess, 1993; Jayaratne, Faller, Ortega, & Vandervort, 2008), causing the ethnicity of children and parents to be included in the vignettes. Furthermore, the dominant discourse is that foster carers should be sensitive to racial issues and be able to help a child with developing a racial identity (Carter-Black, 2002; Folaron & Hess, 1993); therefore, a more open attitude towards ethnicity or a more similar cultural background was considered in this study to be a potentially positive cue for practitioners to take into account.

Two types of vignettes were created: 1. hypothetical child’s cases coming into foster care, and 2. hypothetical foster families ready for fostering. Starting points for constructing the vignettes were: none of the foster families should be the perfect fit as this is often neither the case in real situations (Zeijlmans et al., 2018); the best decision should not be apparent to allow for diversity between practitioners; and vignettes should be real-to-life. This resulted in three vignettes of children and five vignettes of potential foster families. The vignettes were presented as a two-page story and made more realistic by adding examples of children’s behavior and reasons for specific wishes by foster parents.

Table 1 presents an overview of the characteristics of the children vignettes. The first child is Yasemin, a five-year old girl with introvert behavior from a minority culture in the Netherlands, who requires a long-term foster care placement. The second vignette is on Dennis, a two-year old boy, on whom very little information is available due to the emergency nature of the placement. The third vignette is about Jeroen, who is almost ten, shows externalizing behavior problems, and, after a failed placement, requires a new long-term foster family. The chosen names are mostly common Dutch first names, except for the vignettes that are created to have a different cultural background. Geographical location was not included in the cases, even though this might play a role in everyday matching decisions, due to the relative nature of distance and the spread geographical distribution of the participating organizations.

The five foster families (Table 2) differed on most of the characteristics, such as age, family composition, fostering experience, et cetera. We determined that practitioners should at least be able to choose from two or three potential options for each child, which is why two or three foster families were designed to have a similar amount of beneficial or disadvantageous elements for the foster children based on the potentially positive and negative associations derived from literature and observations of matching practice. While creating the vignettes, the families De Boer-Meijer, Kolkman and Malik were considered as options for Yasemine; Malik and Timmerman for Dennis; and Van der Wiel, De Boer-Meijer and Malik for Jeroen.

Vignettes were tested using a step-wise approach: discussing the vignettes with the research group; presenting the vignettes to colleagues not involved in designing the cases; discussing the vignettes to a qualitative think tank in our university; and conducting pilot interviews with two practitioners. These pilot interviews validated the adherence to the starting points for designing the vignettes: the practitioners did not think any family was perfect; they came to different decisions even though they were from the

Table 1
Characteristics of the children vignettes.

	1. Yasemin Arslan	2. Dennis Tromp	3. Jeroen Griffel
Age	Five years	Two years	Nine years, almost ten
Gender	Girl	Boy	Boy
Type of placement	Long-term foster care	Emergency	Long-term foster care
Care history	5 months emergency/short-term foster family placement	NA	5 months emergency/short-term foster family placement 18 months long-term foster family placement (disrupted)
Judicial status	Supervision order	Supervision order	Parental rights terminated
Family composition	Father + Mother	Father + Mother ^a	Father; mother and new partner; half-sister; younger brother
Reason out-of-home	Neglect and suicide attempt of mother	Drug raid	Abuse by father, addiction
Abuse	Neglect; sexual abuse ^a ; physical abuse ^a	–	Physical abuse, witness of parental abuse
Ethnicity	Turkish	Dutch ^a	Dutch
Religion	Islamic	–	Catholic ^a
Attitude parents	Negative	–	Mother accepting; father unknown and no contact
Cognition	Delay on language and social skills	–	Delay on social skills
Behavior	Internalizing (problems making contact); characteristics of PDD-NOS	–	Externalizing (aggressive), hyperactive, mischievous; being tested for ADHD
Hobbies	Crafting, likes cats	–	Football, playing outside
Other	Fear of men	–	Does not go well with other children

^a These characteristics were not explicit, but attentive practitioners could sense the existence by noticing cues and insinuations.

same organization; and they confirmed the resemblance between the vignettes and data they normally had available during the matching process. The pilot interviews followed the same protocol as the other interviews and the practitioners did not receive additional information. The only difference was that they were asked extra information afterwards to validate the resemblance to their work. Due to the successful pilot, these two practitioners were included in the final sample and no changes were made to the vignettes.

The interviews included semi-structured questions in the beginning of each vignette regarding the resonance of the vignettes with their daily practice. At the end of each vignette, additional questions were asked on the practitioners' satisfaction with their decision. Furthermore, the participants were asked to reflect on the easiest and most difficult match of the three vignettes and the differences between matching the vignettes and daily practice. However, for the larger part, the interviews consisted of a concurrent think-aloud technique, which asks people to verbalize their thinking while performing a task (Lundgrén-Laine & Salanterä, 2010).

2.3. Procedure

Participants were approached via email correspondence with foster care organizations and by using the researchers' network, a list of participants of a symposium on matching, an online foster care forum and social media. Participation included two separate meetings with each of the participants. The first meeting was a semi-structured interview on general matching practice and the second meeting was the vignette study. The interviews were deliberately spaced on month apart to diminish a link between the results of the first and the second interview that could prompt them towards specific results. After explaining the research during the first meeting, the practitioners signed an informed consent form for both meetings, although they were asked verbal permission after the explanation and before starting the recording of the second meeting.

One month before the vignette interview, after the first meeting, practitioners received the information on the foster families and were asked to read the information before the next meeting. To make sure that the information was read and fresh in their mind, the first questions of the interview focused solely on the foster families by asking them what they found remarkable, interesting or different in the vignettes. This often resulted in information on the characteristics that they deemed beneficial or disadvantageous in a general sense. This simulated the practice of matching decision-making, in which families are trained and assessed before being matched to a foster child and their points of concern and strength are reported in their foster care case file.

The child vignettes were presented one by one during the second meeting. The order of the vignettes was the same for all practitioners. For each child vignette, participants received time to read through the information and could write on the paper if needed. After some initial questions on the representability of the case, the practitioner was asked to make a matching decision. During this decision-making process, participants could read and re-read the information on the child and the families as much as they wanted. The interviewer only interfered with the practitioners' thinking process when they appeared to decide on families without explicitly mentioning their thinking or overlooked one of the families by accident. Questions of the participants about the vignettes were answered only when deemed necessary to understand the case, but no extra information was added to the already described case. The meeting took place at a location of the practitioner's preference and lasted approximately 90 min (30 min per vignette). Participants gave permission in the beginning of the meeting to record the interviews. Afterwards, the interviews were transcribed verbatim.

Table 2
Characteristics of the foster carer vignettes.

	1. Van der Wiel	2. De Boer – Meijer	3. Kolkman	4. Malik	5. Timmerman
Family composition	Father (69), mother (66), daughter (36), two sons (34 + 31). All children living independent.	Lesbian couple (55y + 54y) without children	Father (29), mother (28), one daughter (8)	Father (39), mother (38), two sons (18 + 16). Oldest son living independent.	Father (46)
Fostering experience	3 years, 3 successful short-term placements	14 years, 7 emergency placements and one long-term successful placement	None	< 1 y, failed placement due to behavior of biological child towards previous foster child	5y, 3 prior emergency placements, has been a foster child with foster siblings himself
Ethnicity	Dutch	Dutch	Moroccan	Dutch	Dutch
Profession	Pastry chef (retired) + ballet dancer (retired)	Artist (at home) + teacher primary school	Teacher at the university (part-time) + manager at railway (part-time)	Shop owner (full-time) + stay-at-home mum	Editor (flexible)
Education	Vocational	Pre-vocational + higher education	University	Vocational + primary school	University of applied science
Religion	Protestant	Agnostic + atheist	Protestant	Muslim	Atheist
Type of placements	Long-term or short-term	Long-term of short-term	Long-term	Long-term, short-term or emergency	Short-term or emergency
Preferred age	11 +	4 +	0 to 6 years	2 to 10 years	0 to 4 years
Contra behaviour	No sexual abuse or PDD-NOS	No ADHD, mental handicaps or sexual abuse	No ADHD, PDD-NOS or mental handicap	No mental handicaps or sexual abuse	No mental handicap
Living situation	Villa	Small farm	Terraced house	Apartment	Villa
Animals	1 large dog	1 horse, chickens, goats and cats	1 dog	None	None
Upbringing	Large family, pleasant + pressure to achieve, but much love and affection	Free-spirited + structured and highly religious	Loving + Solid, close	Loving hardworking + unknown	Parents died when child, grew up in loving foster family
Reason for fostering	Love a challenge, have the time and space	Deliberately no biological children, provides them with gratification	Wanting another child, helping children	Children have grown up, saw ad on the need of Moroccan foster families	Motivated by own experience
Parenting style	Loving with clear routine	Personal space, routine and open communication	Clear rules, communicating	Respect and trust	Spending lot of time and energy for a short time
Hobbies	–	Horse-riding, gardening, crafting and arts	Guitar, DIY, volunteering	Cars, chatting, watching TV	Travelling, cooking, video gaming
Attitude towards parents	Want to build a good relationship	Open, can go too far	Open, see the importance	See the importance, will make an effort	No priority, but positive and willing
Other	Recently had a granddaughter	Have been in contact with other cultures	–	Father lived with his grandma for a while in his youth	Social network want to help if needed

2.4. Data analysis

The interviews were analyzed using a qualitative deductive content analysis with focus on the manifest data (Elo & Kyngäs, 2008). This analysis focused on the development of participants' thinking processes for matching the vignettes by looking at the order of matching conclusions, premises and expressions of uncertainty. In the preparation phase, the interviews were transcribed and each transcript was used as a unit of analysis. The interview conducted with the pair of matchers was cut into two units of analysis; one consisting of all expressions made by one matcher and the other consisting of the expressions made by the other. The document was kept intact to understand reactions, which refuted or agreed with something the other had said, but the analysis was done separately for both practitioners. The researchers were continuously aware that the cooperation of these two practitioners could explain differences between their reasoning and the reasoning of other practitioners.

After reading through the interviews multiple times, the coding units of each interview were determined. These coding units consisted of words, sentences or paragraphs containing the same meaning. To be included in this study, the coding units had to be connected to the matching decision for the vignettes and should not be generalized statements on matching or be unrelated to the topic of the interview. Each coding unit was given a number to indicate the order of the statements in the interview and, subsequently, these units were coded using a descriptive codebook. The statements were first coded on the *type of statement*, which included the codes: matching conclusion, premise, expression of uncertainty or pointer from interviewer, and secondly on the child and foster carer vignettes that were discussed in the statement. When the statement was a conclusion, it was subdivided into four categories: none of the families is a match; this family will not be a match to this child; this family is the first choice for this child; this family is not the first choice but a possibility for this child. When the conclusion stated that none of the families is a match, the interviewer urged the matcher to choose the best family present, allowing for both a matching family and a non-match conclusion in the same case. Premises were defined as statements or arguments that provides reasons or support for their decisions and were additionally coded for the direction of the statement, which could be positive, negative or neutral. This is based on the value added to the premise by the practitioner. A positive premise is when the statements' content was considered by the matching practitioner to have a beneficial influence on the foster care placement, whereas a negative premise conveys a potentially harmful or unfavorable impact of the content according to the practitioner. Neutral was coded when the premise was considered to be not harmful but also not beneficial or the other way around, for example *'Two to ten years, so he would fit in their age range'* or *'I do not read anything about her potentially having ADHD, PDD-NOS or a physical handicap, which are the behaviors that Kolkman would not want to foster'*. There is nothing beneficial in these statements. Instead, they show the potential of something negative, which is not present in this particular combination of family and child.

Two of the authors independently coded the statements of one interview to test the clarity of the codes in the codebook. The first time, this resulted in an updated codebook and a clear description for each code. A Cohen's kappa was calculated over the second interview that was coded independently and interpreted based on the guidelines from McHugh (2012). This resulted in a moderate agreement on the type of statement $K = .73$; an almost perfect agreement on the child discussed $K = .94$; and also an almost perfect agreement on the family discussed $K = .94$. For conclusions, we calculated Cohen's K for those conclusions that were identified by both reviewers, which resulted in a $K = 1$, indicating an almost perfect agreement. We did the same for the directions of the premises, which indicated a moderate agreement, $K = .64$. After this level of agreement was reached, the first author coded the other interviews.

To determine the heuristics used by matching practitioners, we examined key indicators of common heuristics for the three matches made by the practitioners. These indicators were based on existing knowledge on decision-making (Gigerenzer & Gaissmaier, 2011; Gigerenzer, 2002) and determined separately for each practitioner and for each case. The chosen family was determined based on the coded conclusion. After identifying a possible heuristic, a more in-depth analysis of the decision-making rules was conducted. To determine whether practitioners use a recognition heuristic, we looked at the order of the discussed families to see if practitioners ended up choosing the first family that comes to mind ('take-the-first' rule). Furthermore, the first statements were examined in more detail to see whether these families were mentioned first due to a specific reason or whether this seemed rather coincidental. For the second class of heuristics, the one-reason decision-making, we examined the amount of positive, negative and neutral premises for the not-chosen and the chosen foster families. Families that were not-chosen based on only one negative premise could indicate a conjunctive rule (a so-called 'deal breaker'), while families chosen based on one positive element disregarding the negative premises could indicate a disjunctive rule in which an alternative is accepted when one key attribute is acceptable regardless of other attributes (Bruch & Feinberg, 2017). When the results indicated a potential conjunctive or disjunctive rule, the statements were analyzed in more depth to see what they had in common. Finally, possible trade-off heuristics were identified by calculating which families had the most positive premises, the least negative premises and the highest percentage of positives compared to the total number of premises. These findings were compared to the outcome of the matching decision to find the percentage of right predictions based on this heuristic. The total number of premises is used to check whether the chosen family was mentioned as frequent as other families or if there were more premises in total. If so, this might indicate that the heuristic does not necessarily predict the outcome, but the desired outcome might predict the number of positives mentioned for the chosen family.

3. Results

On average, the interviews consisted of 131 statements ($SD = 22.94$). The distribution between children was fairly equal with 30% of the statements for Yasemin, 20% for Dennis and 29% for Jeroen. The other statements were not linked to any specific child. As expected, there were differences in the chosen foster family for each child. Yasemin was placed either with the Malik family ($n = 11$)

Table 3

Cross tabulation of families mentioned first and the outcome of the decision.

First mentioned	Outcome				
	Van der Wiel	De Boer-Meijer	Kolkman	Malik	Timmerman
Van der Wiel	1	2	3	6	5
De Boer-Meijer	0	2	2	2	1
Kolkman	2	2	0	0	1
Malik	0	3	2	10	2
Timmerman	2	6	1	1	1

Note. When the first statement was about multiple families without a clear order, the order of coding the statements is determined by the order in which the interviews were presented to the practitioner.

or the Kolkman family ($n = 8$). Four practitioners concluded that none of the families was a good match to Yasemin and preferred to continue to search for other solutions to find her a foster family. Three of these practitioners eventually did express which of the foster families they considered the best match from the presented vignettes, which was used in further analysis. One practitioner did not find any of the families suitable for Yasemin and did not express a best available option. Dennis was matched to the families Timmerman ($n = 10$), Malik ($n = 8$) or De Boer-Meijer ($n = 2$). Jeroen was matched to the families De Boer-Meijer ($n = 13$) or Van der Wiel ($n = 5$). Six practitioners preferred another solution than the presented families because they thought the behavior of Jeroen was ‘too difficult’ for each of the families. Four of them eventually did make a decision on the best available family, which was counted for further analysis, whereas two practitioners could not make a final choice between the presented families.

3.1. Recognition heuristic

The recognition heuristic that was tested was whether the family mentioned first was reflected in the outcome of the decision-making process. Table 3 provides an overview of the families mentioned first compared to the final family chosen for the same child.

The first mentioned family was a good predictor in 14 of the 57 choices made by matching practitioners (three practitioners did not choose any of the families, see earlier). These first statements on foster families were examined in more detail to determine whether there appeared to be a clear reason for being mentioned first. A distinction could be made between statements that were recognition-based or statements that were more incidentally. For example, the statement: ‘*And that she liked crafting. Then I thought about that one creative, artistic foster mother that eh... I think they also had animals* (matcher 16) clearly reflects a family that pops up in the head of the practitioner, while a statement such as ‘*So which families are willing to foster emergency placements? Ah, this one* (matcher 8) is an example of a statement that does not reflect any recognition. Looking at the statements in this way, Yasemin seemed to trigger the most thoughts to certain families. In twelve cases, there appeared to be some recognition in the statement. The Malik family was mentioned first ten times due to the cultural and religious background and the De Boer-Meijer family popped up two times: once because they liked crafts and once because two women could be less threatening. Dennis did not trigger direct positive associations with any of the foster families. The only two statements that resembled an immediate thought to one of the families related to the families that were open for emergency placements and seemed to disregard the other families, as in the following example: ‘*Ehm, yeah there is actually only one emergency foster family. And that is family Timmerman*’ (matcher 11). The vignette on Jeroen only seemed to trigger an immediate positive association with one of the families in one interview, namely the interview with the two practitioners simultaneously. They linked him to the De Boer-Meijer family due to the outdoor space this family could offer him. Another matcher appeared to have an immediate negative association between Jeroen and the Malik family. She stated: ‘*In any case, he would not go to the Malik family, where that son has already rudely sent away one child from his room. I’m not going to do that to the boy haha, to have to endure this foster child*’ (matcher 17).

To assess whether those practitioners who did seem to have an immediate association between the child and one of the foster families did use the recognition heuristic, their statements were assessed for the link with the matching outcome. Of the 16 statements that could be identified as recognition of one of the families, 11 were predictive of the final choice. However, all but one practitioner also mentioned other families before reaching a final conclusion.

The order of mentioned families is illustrated in Fig. 1. It shows, on the left hand side, the exception of matcher 13 who was the only practitioner to stick to the one family that was recognized in the first sentence. On the right hand side, it shows a representative graph of most decision-making processes in which the first family was recognized (matcher 14). The families are numbered one to five. Zero means that a more general statement about the child was made, which was not related to any of the families. As can be seen, matcher 14 thinks of family four, the Malik family, first. Afterwards, the practitioner continues to deliberate the families in order from one to five. At the final stages of her decision-making, she seems to switch from family three, Kolkman, to family four, Malik. She ends up choosing the Malik family, the family with which she started her decision-making process. On the contrary, matcher 13 only expands on his first thought. Thus, although there might be a link between some initial thoughts and the continuation of the matching decision, this is not the most prominent heuristic in the interviews. Even when practitioners immediately make a positive link between a child and the foster family, still other families are considered.

Fig. 1. Examples of the order in which families are mentioned.

3.2. One-reason decision-making

For the one-reason decision-making, the disjunctive and conjunctive rules were found by analyzing those cases in which a family was either rejected based on one negative aspect without mentioning any other premises (conjunctive) or chosen based on only one positive premise despite the negative premises mentioned (disjunctive). Table 4 shows the combination of premises made for the not-chosen families, whereas Table 5 shows the premises for the chosen families. Notice that the axes are switched and different, since the neutral premises are incorporated with the positive premises for the conjunctive rules and with the negative premises for the disjunctive rules.

As can be seen in Table 4, there is a trend towards disregarding a family based on only one negative premise. The content of these 64 premises was examined and showed two often recurring themes. The first theme was that the age of the child did not fit the age range of the foster family, which was mentioned 25 times and was not limited to a specific child, family or practitioner. An example of a family being disregarded by age is the following statement: ‘Let’s see, Kolkman can be discarded because of the age’ (matcher 17). The second theme was that the type of foster care did not correspond with the foster family profile that was sought for, as can be seen in the following quotation: ‘Well, in any case, mr. Timmermans is discarded because he has emergency or short-term foster care. And this is more short-term/long-term. So he would be discarded for me’ (matcher 16). This theme was mentioned 21 times and also was not limited to a specific child, family or practitioner. The rest of the premises related to the behavior of the child that would not fit with the foster family (5 times), the composition of the foster family (5 times), cultural aspects that did not match (3 times), and the old age of the foster carers (2 times).

Table 5 does not show a clear trend towards a disjunctive rule. Most families are chosen due to a variety of combinations between positive, negative and neutral premises. Only four families were chosen with only one positive premise. These four positive premises did not have anything in common. However, the table also shows that some practitioners chose a family despite not mentioning one single positive premise. This was explained by the neutral premises. When considering the neutral premises as positive premises, these families appear to be chosen due to their lack of negative premises, as can be seen in Table 6. Only one practitioner chose a family while only mentioning one negative premise. However, this was the practitioner who participated together with her colleague in the interview. Her colleague did mention positive premises and, although she did not verbally agree or joined in those positive premises, she might have considered them implicitly.

3.3. Trade-off heuristics

Three key indicators were used to test the trade-off heuristics against the decisions made by the matching practitioners: most positives, least negatives, and the highest percentage of positives compared to the total number of premises. Additionally, the total number of premises mentioned was used to check whether this predicted the matching decision. This might indicate that the chosen

Table 4

Cross tabulation of negative premises and positive/neutral premises for families that were not chosen.

Number of negative premises	Number of positive/neutral premises										
	0	1	2	3	4	5	6	7	8	9	10
0	30	2	5	3					1		1
1	64	20	7	3	4	3					
2	30	14	6	1		2	1		1		
3	8	1	7	2	4			1		1	
4	3	3	2	2		1	1	2			
5		2	2		1			1			
6											
7					1						

Table 5

Cross tabulation of positive premises and negative/neutral premises for families that were chosen.

Number of positive premises	Number of negative/neutral premises									
	0	1	2	3	4	5	6	7	11	
0		1	1	2		2	1			
1			1		3					
2		1	1	2	2	1	2			
3	2	3		3	2	1		1		
4	1	1	2	3	2	1				
5		1	3			1				1
6		1								
7			1	1			1			
9				1						
10							1			
11				1						
12					1					
13					1					

Table 6

Cross tabulation of positive and neutral premises and negative premises for families that were chosen.

Number of positive and neutral premises	Number of negative premises					
	0	1	2	3	4	5
0		1				
2	1	2		1		
3	4	1	1		1	
4	4	3	4	1		
5	3	3		2		1
6	2	4				
7	4	2	1	1		
8	1					
9	1	1				
10				1		
12	1		1		2	
16	1	1				

family receives more attention than the other families. Table 7 shows the percentages of correct estimates for these four key indicators. Looking at the most positives proved to be a good predictor for the chosen families in 81% of the cases, the least negatives in 49% of the cases and the ratio between positives and negatives in 82% of the cases. Since the neutral arguments proved to play a decisive role in some decisions, the heuristics have also been calculated when neutral premises were considered as positives. However, this barely improved the predictability of the trade-off heuristics, which went from 81% to 86% for the most positives mentioned and from 82% to 81% for the ratio between positives and the total number of premises. Therefore, the neutrals were not considered as positive in this analysis.

The ‘least negatives’ heuristic has the lowest predictability, which can be explained by the aforementioned conjunctive decision-making rules. When families are rejected based on one premise, these families will often be the family with the least negative premises and will not be chosen. The most positives and the highest positives compared to the total number of premises score almost similar. These scores seem to be connected with the family that ends up to be chosen. However, in 81% of the cases, the number of premises alone also predicted which family ended up being chosen.

Table 7

Effectiveness of trade-off heuristics in predicting the decision-making outcome.

	Correct estimates using ‘most positives’	Correct estimates using ‘least negatives’	Correct estimates using ‘ratio pos/neg’	Correct estimates using ‘most premises’
Yasemin	74%	42%	74%	68%
Dennis	70%	70%	80%	80%
Jeroen	100%	33%	94%	94%
Total	81%	49%	82%	81%

Note. When multiple families had the same score, the heuristic was considered effective when one of the families matched the outcome of the decision.

4. Discussion

This study aimed to discover the heuristics used by matching practitioners to determine which family is the best fit for a child. Using vignettes and think-aloud procedures, three classes of heuristics have been analyzed: recognition heuristics, one-reason decision-making, and trade-off heuristics (Gigerenzer & Gaissmaier, 2011).

4.1. Main findings

This research shows that, as theorized by Taylor (2012), practitioners seemed to rely more on heuristics instead of more analytical approaches to decision-making. Although several guidelines to matching exist (Moore et al., 2016; Strijker & Zandberg, 2001; Van Dam et al., 2000), none of the matchers used these guidelines completely. Only a few mentioned that they would normally use available tools for analyzing and assessing a potential match between a family and child. Furthermore, not all of the information contained in the vignettes was used by practitioners to make their decision, which indicates that they use heuristics to make their decisions more quickly and frugally.

The first heuristic tested in this study was the recognition heuristic (Gigerenzer & Gaissmaier, 2011), in which recognition was operationalized as the first family mentioned. Results showed that practitioners do, in some cases, appear to have a family that they immediately recognize as being a good fit with some characteristics of the child. However, this recognized family, the first mentioned family, was not automatically chosen as the best family overall. Practitioners always considered more characteristics of that family before making the final decision and all but one practitioner assessed the characteristics of the other families. Therefore, it seems that the recognition heuristic does not play a decisive role in the matching decision process. However, the first family could have a slight benefit over the other families, since eleven of the sixteen statements that could be considered as an immediate recognition of one of the families were predictive of the final choice. This is in line with previous research in social work that finds that practitioners can be biased in the sense that they are reluctant to revise previous judgements (Munro, 1999; Spratt et al., 2015). However, the findings of this study do not prove whether this heuristic decreased the quality of matching decision.

The findings for the one-reason heuristics (Bruch & Feinberg, 2017; Gigerenzer & Gaissmaier, 2011) showed the existence of conjunctive decision-making rules. Families were rejected based on one negative premise, without checking the other aspects. These conjunctive rules argue that there is no match when the age of the foster child does not fit the age range of the foster family or when the child requires a different type of care than the foster family offers. These ‘deal breakers’ were used in the majority of cases, which indicated that practitioners judged this rule to be relevant and effective in their daily decision-making. In some cases, this rule might even be applied implicitly, since a substantial number of families were rejected without mentioning any negative premise. The opposite of the conjunctive rules, the so-called disjunctive rules, were not identified in the interviews. In general, practitioners mentioned at least multiple neutrals or positives before making a final decision.

The trade-off heuristics showed that the outcome of the decision-making process is linked to the number of positive premises mentioned by the practitioner and the ratio of positives compared to negatives. However, the outcome was also linked to the family with the most mentioned premises, which might indicate ‘confirmation bias’. A confirmation bias would mean that practitioners, after deciding implicitly on one of the families, look for characteristics that validate their decision (Munro, 1999; Spratt et al., 2015). Since all the family vignettes essentially had the same amount of elements that could be used as a positive or negative premise, the fact that the number of premises for the chosen family was higher shows that practitioners tend to zoom in on a family that they feel is a good option before making their final decision. However, as with the recognition heuristic, this study does not show whether the quality of the decision-making decreased based on the use of the heuristic or if this might make the decision more effective and accurate, as could happen in some settings (Dieckmann & Rieskamp, 2007; Gigerenzer & Brighton, 2009; Gigerenzer & Gaissmaier, 2011).

4.2. Strengths and limitations

The vignettes in combination with the think-aloud approach proved valuable for gaining insight into the decision-making mechanisms of the matching decision. An additional strength of this study was the comparative nature of the vignette method. All practitioners received the same families. The nature of the vignettes triggered different responses from practitioners without providing a clear correct answer. Since our sample included several foster care organizations in the Netherlands, the results are not limited to a specific matching practice. Furthermore, matchers differed in experience, age and gender, making the sample heterogeneous within this specific field of expertise. The findings are, therefore, likely to be transferable. As practitioners reflected, the vignette resembled their daily work in that not all information was readily available and the perfect family did not exist. However, transferability of our findings from the Dutch context to systems in which the practice of matching is different remains unknown.

Although the vignettes were created to reflect daily practice, practitioners often emphasized additional steps that they would normally take before reaching a decision, such as discussing with colleagues, meeting with stakeholders or asking for more information. These options were not available in the interview in which practitioners could only express their desire to know more on certain elements of the vignettes. This caused practitioners to work with their assumptions instead of offering them the possibility to answer their uncertainties. For example, in real matching decisions, practitioners might know the foster families personally or be able to recall their information quicker than they did with the vignettes presented in our study. Hypothetically, this could trigger the recognition heuristic more frequently than in this study and cause them to stop looking at other families with whom they are also familiar. Furthermore, the order of presenting the vignettes might have influenced the thinking process of practitioners and obstructed the identification of the recognition heuristic. Some practitioners appeared to feel the need to discuss the families in their

presented order. Also, the order determined which family was coded as being mentioned first when the statement could relate the multiple families.

Finally, the think-aloud methodology does not ensure that all thoughts behind a decision are explicit. Some decision-making steps might have been applied implicitly, which might have been the case for the families rejected without mentioning any negative premise. Also, the recognition heuristic might not always be visible in the interviews as practitioners decided to go through the interview one by one.

4.3. Implications and recommendations

The results of this study support the notion that practitioners use heuristic decision-making strategies. However, the heuristics used by practitioners have not been tested for the accuracy and effectiveness in real-life settings. The vignettes used in this study have been created without a best option in mind. Future research should attempt to analyze these heuristics in daily decision-making settings, for instance by using an observational design combined with think-aloud procedures and a follow-up questionnaire to analyze the success of the matching decision. Furthermore, it could be interesting to study how much the judgements of individual practitioners differ from the more standardized matching methodologies and tools (Moore et al., 2016; Strijker & Zandberg, 2001; Van Dam et al., 2000). This study also showed that practitioners differed in the families chosen for the same child. It was beyond the scope of this research to analyze the values behind the statements and chosen families. However, vignettes provide a valuable opportunity to identify values and ethical dilemmas faced by practitioners matching children with foster families (Wilks, 2004); for example, the rationales of the matching practitioners could be analyzed using the framework of Rosen, Proctor, Morrow-Howell, and Staudt, (1995). Approaching these interviews from this perspective would be an interesting follow-up study, which might improve our understanding of social work ethics and the influence of the decision-maker on the matching results.

For practice, this research also provides recommendations. Since the results show that practitioners choose their decision-making heuristics based on psycho-social rationality instead of following standardized guidelines, a quality check to the decisions should be incorporated in daily practice. This could include creating outcome feedback or learning opportunities from decisions made in the past to evolve the matching decision from intuitive decision-making to more validated processes. Also, consultation with colleagues should be a standardized step in every matching decision to ensure that personal bias has less effect on the matching decision. Furthermore, standardized decision-making should not be neglected. The guidelines and tools provided by research do have value for matching practitioners, although they might not be easy to use in the complex and less-than-ideal setting of everyday decision-making. After all, heuristics are always prone to bias and should be used with care (Tversky & Kahneman, 1983). Being aware of the used heuristics and the potential bias in those heuristics will help to improve the overall quality of matching decisions.

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Appendix A. Supplementary data

Supplementary material related to this article can be found, in the online version, at doi:<https://doi.org/10.1016/j.chiabu.2018.12.007>.

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