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Matching Job Ads to Job Seekers' Needs for Flexible Working:

A Machine Learning Algorithm to Predict Perceived Fit

The industry problem

FLEXJOB
TRAVAILLER AUTREMENT

The company
Internet job board providing job ads to job seekers wanting to find '**flexible jobs**'

Flexible working

- **Time** (no fixed schedule, part-time…)
- **Place** (teleworking, co-working…)
- **Content** (communication media, freelancing…)

(ten Brummelhuis et al., 2011; ter Hoeven and van Zoonen, 2015)

The industry problem

P-E fit approved!

The company need:

Develop an algorithm to

Match job ads to their job seekers' needs for flexible working in real time

The research problem

- **Developing such algorithm is challenging**

1. Few research on the antecedents of P-E fit

2. P-E fit traditionally requires direct measurement…
   - … Of fit as perceived by individuals (molar approach)
   - … Of perceptions and needs (atomistic approach)

(Edwards, Cable, Williamson, Lambert, & Shipp, 2006)

The research question

To what **extent** and **parsimony** can job ads be matched to job seekers' needs for flexible working **without direct measures** of perceived fit or advertised perceived flexibility?

The project

The framework 1/2

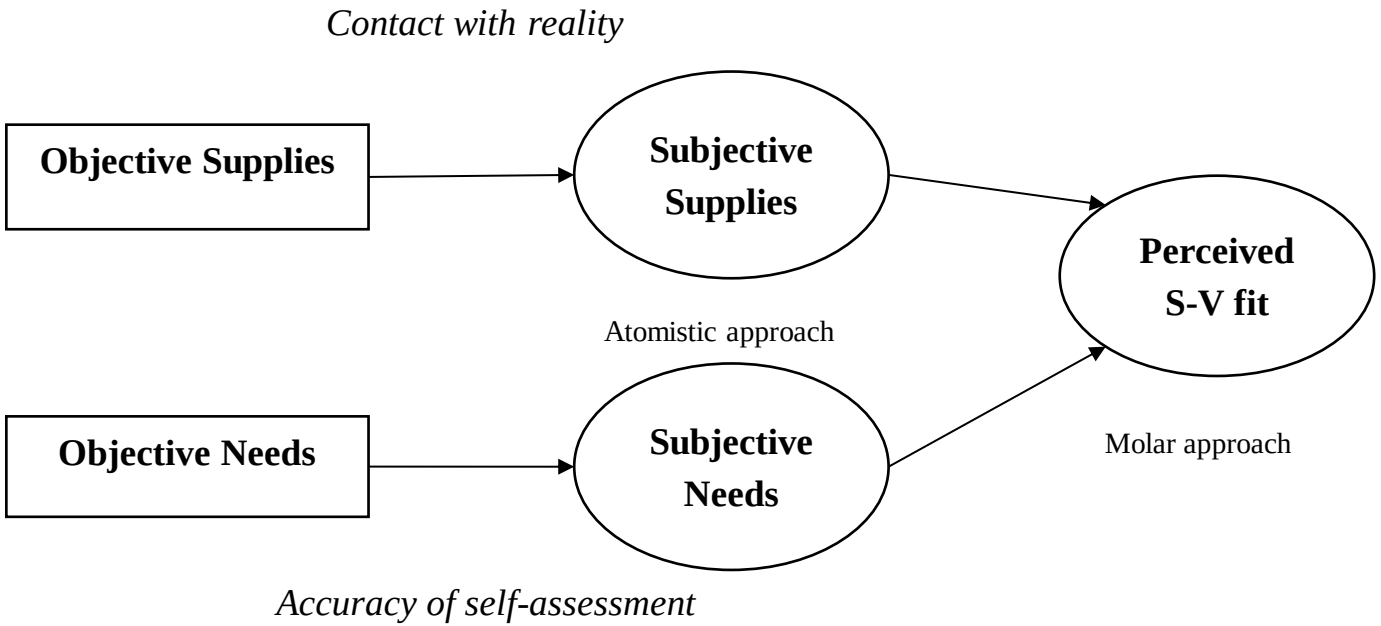


Figure 1. *Objective and Subjective Supplies-Needs Fit (adapted from Edwards et al., 2006; Edwards, Caplan, & Van Harrison, 1998, p. 32).*

The framework 2/2

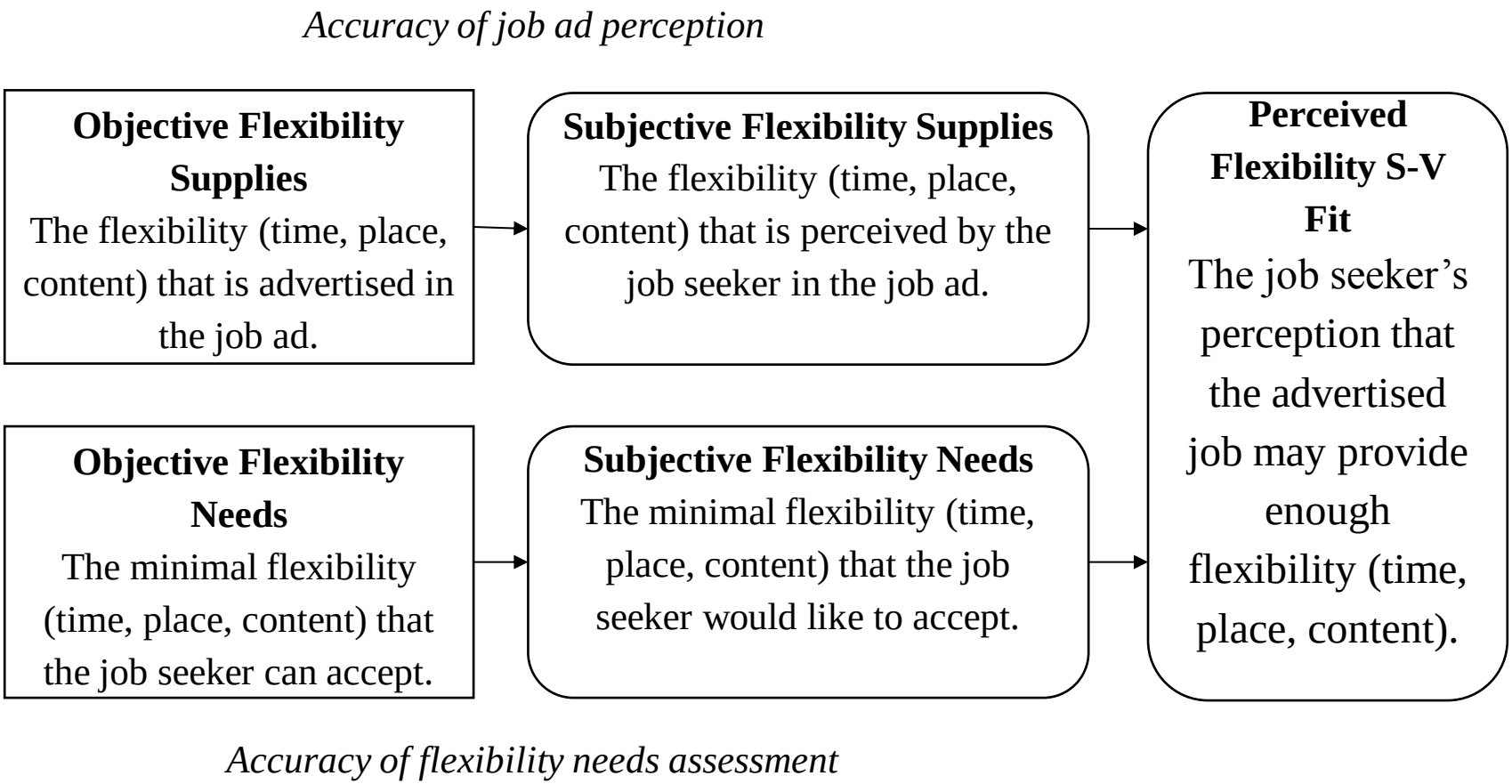
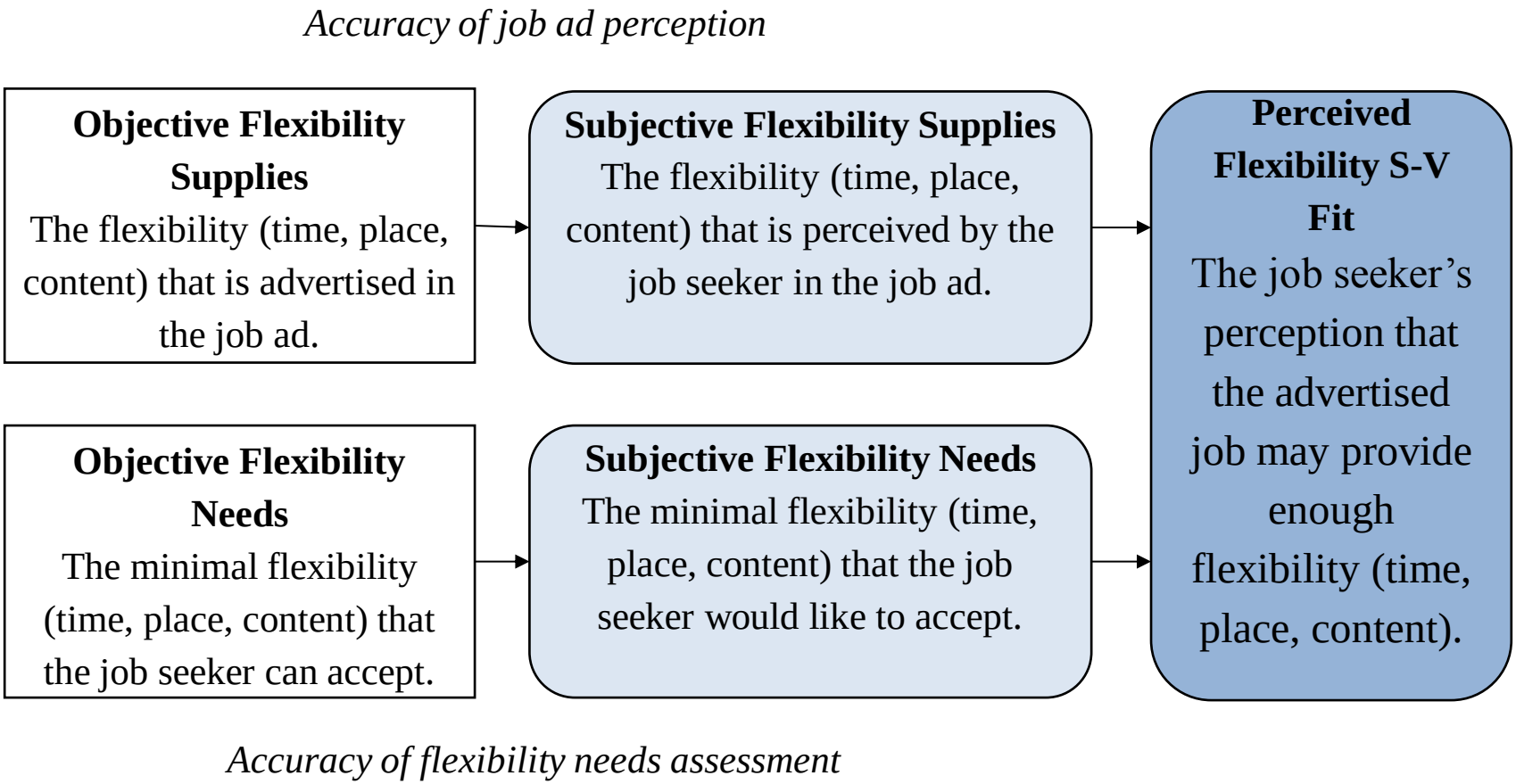


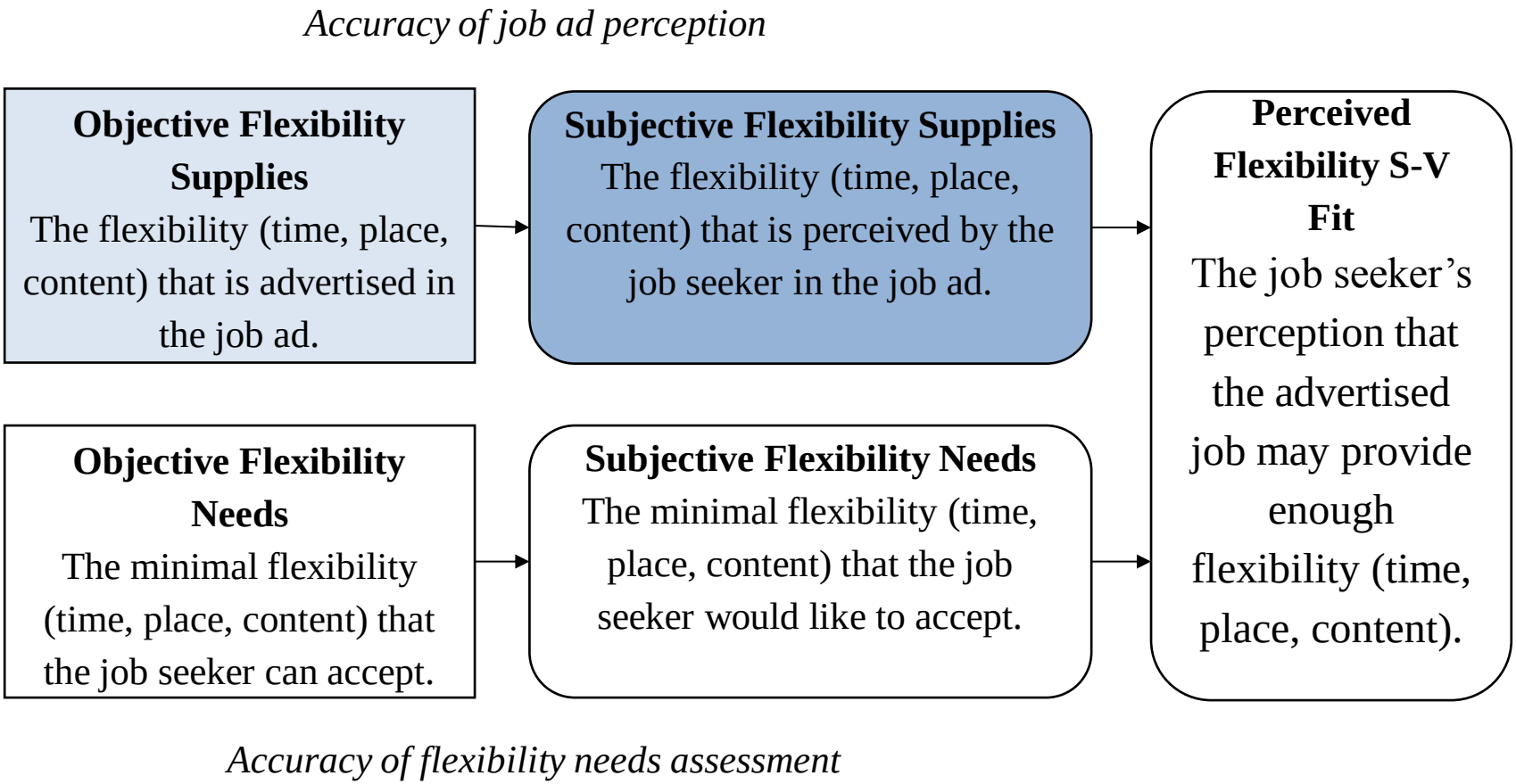
Figure 2. *Objective and Subjective Supplies-Needs Fit for Flexible Working Needs.*

Hypothesis 1



H1. Subjective flexibility supplies and needs will predict perceived flexibility S-V fit

Hypothesis 2



H2. Objective flexibility supplies will predict subjective flexibility supplies

Hypothesis 3

RQ solved!

Accuracy of job ad perception

Objective Flexibility Supplies
The flexibility (time, place, content) that is advertised in the job ad.

Subjective Flexibility Supplies
The flexibility (time, place, content) that is perceived by the job seeker in the job ad.

Objective Flexibility Needs
The minimal flexibility (time, place, content) that the job seeker can accept.

Subjective Flexibility Needs
The minimal flexibility (time, place, content) that the job seeker would like to accept.

Perceived Flexibility S-V Fit
The job seeker's perception that the advertised job may provide enough flexibility (time, place, content).

Accuracy of flexibility needs assessment

H3. Objective flexibility supplies and subjective flexibility needs will predict perceived flexibility S-V fit.

Methodology
and
Preliminary results

Methodology

- **Methodology**
  - **Machine learning** linear regressions
  - **Algorithm 1:** predict supplies from job ads content
  - **Algorithm 2:** predict fit from ads content + needs

- **Sample**
  - Volunteer users of this Internet job board
  - 93 users analyzed 410 job ads (312 distinct)
  - Each job ad analyzed by 1.3 participants on average
  - **Which interrater coefficient to use?**

The algorithms

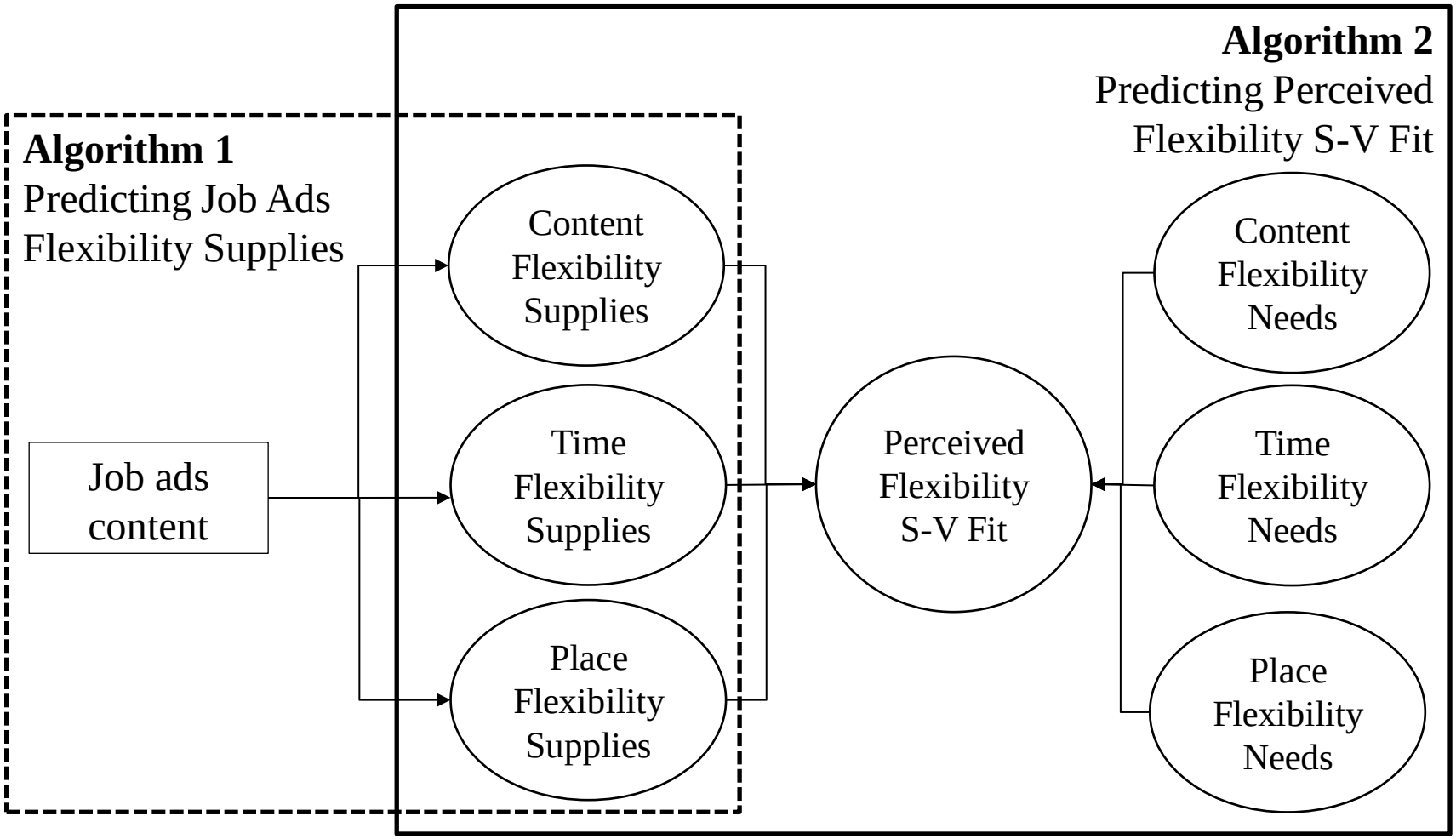


Figure 3. *The two algorithms that will be designed to test the hypotheses.*

The experiment

- Test the predictive power of the algorithms on the website using an experimental design

  1. **Control group:** see random job ads (no algorithm)
  2. **Low match:** see job ads with low computed match
  3. **High match:** see job ads with high computed match

- **Compare Perceived Fit scores with ANOVA…**

Preliminary results for Hypothesis 1

Outcome: Perceived Flexibility S-V Fit	**Variable**	**Unstandardized coefficient**
Step 1 $R^2 = .025^*$	(Constant)	3.540
	Birth year	-.002
	Gender	.130
	Education	.096*
	Job experience	-.018
	Salary expectations	.103*
Step 2 $R^2 = .707^{***}$	Subjective Time Flexibility Supplies	.424***
	Subjective Time Flexibility Needs	-.121**
	Subjective Place Flexibility Supplies	.290***
	Subjective Place Flexibility Needs	-.019
	Subjective Content Flexibility Supplies	.182***
	Subjective Content Flexibility Needs	.025
Step 3 $R^2 = .727^{***}$	Perceived Demands-Abilities Fit	.149***

Notes. R^2 is adjusted and its significance refers to the significance in F change compared to the previous step. * $p < .05$. ** $p < .01$. *** $p < .001$.

Potential implications

- **Practical**
  - Algorithm used by the company
  - Better and easier job seeking experience based on scientific research on fit
  - Can be replicated for other fit algorithms

- **Theoretical**
  - A replicable fit algorithm used in practice
  - Understanding of objective supplies
  - Relationships between atomistic and molar fit