



# ***Adaptive User Modeling***

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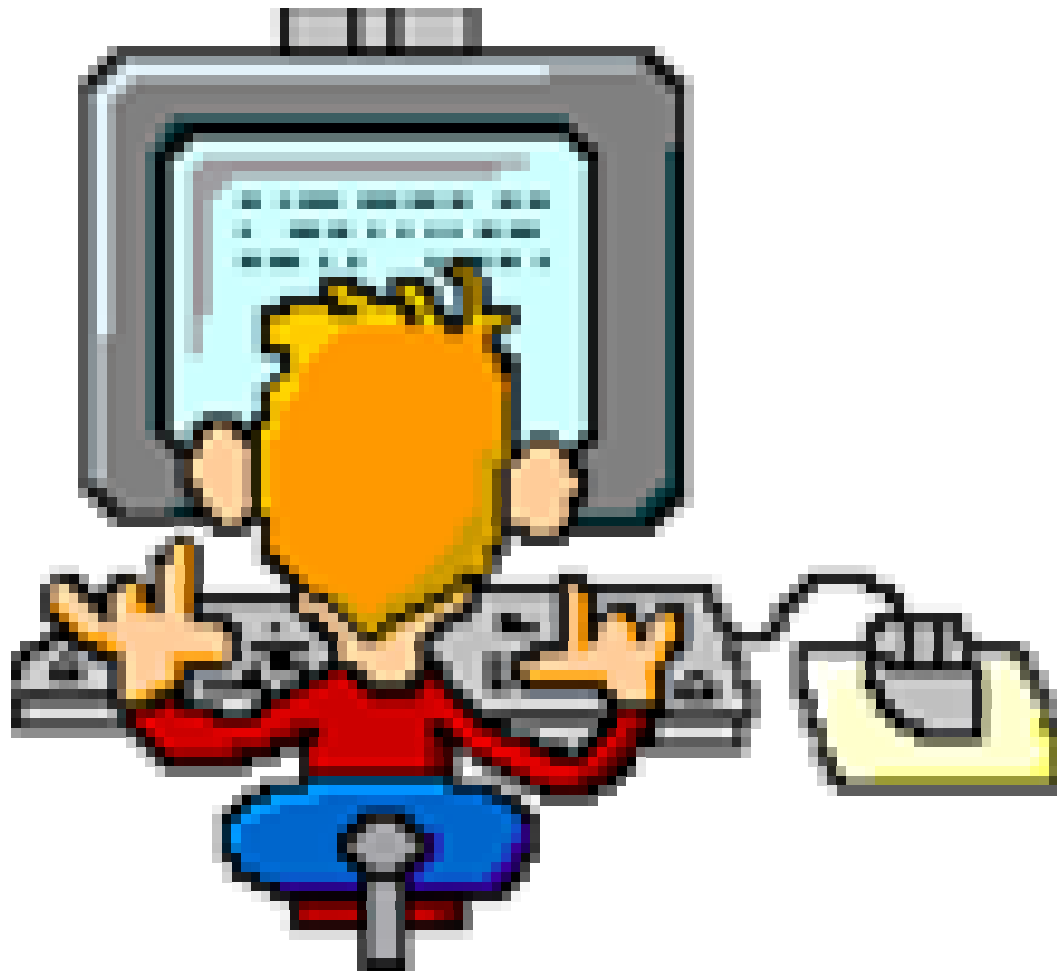
# What's user modeling about?

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- doing what *user* wants = intelligent
- learn about user
  - habits
  - patterns
  - preferences
- put information into a model
- system acts w.r.t. this model

# Typical scenario

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# Perhaps more common scenario

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## **How can you tell?**

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- non-touch type interaction
- changing rate in typing
- verbal exasperation
- slam onto desk

## Have you ever ...

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- felt frustrated with pop-up ads?
- excessive spam?
- chain letters (that don't work)?
- delays in the internet connection?
- phone rings? other interruptions?
- new software?
- what do *you* do?

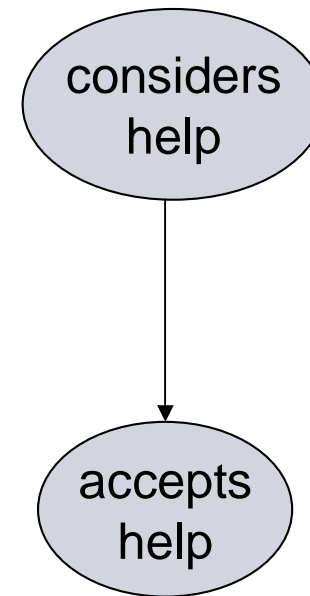
# Passive Learning

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- sit back and watch
- identify relevant **units**
- make associations to co-occurring units
- generalize common patterns
- update frequencies

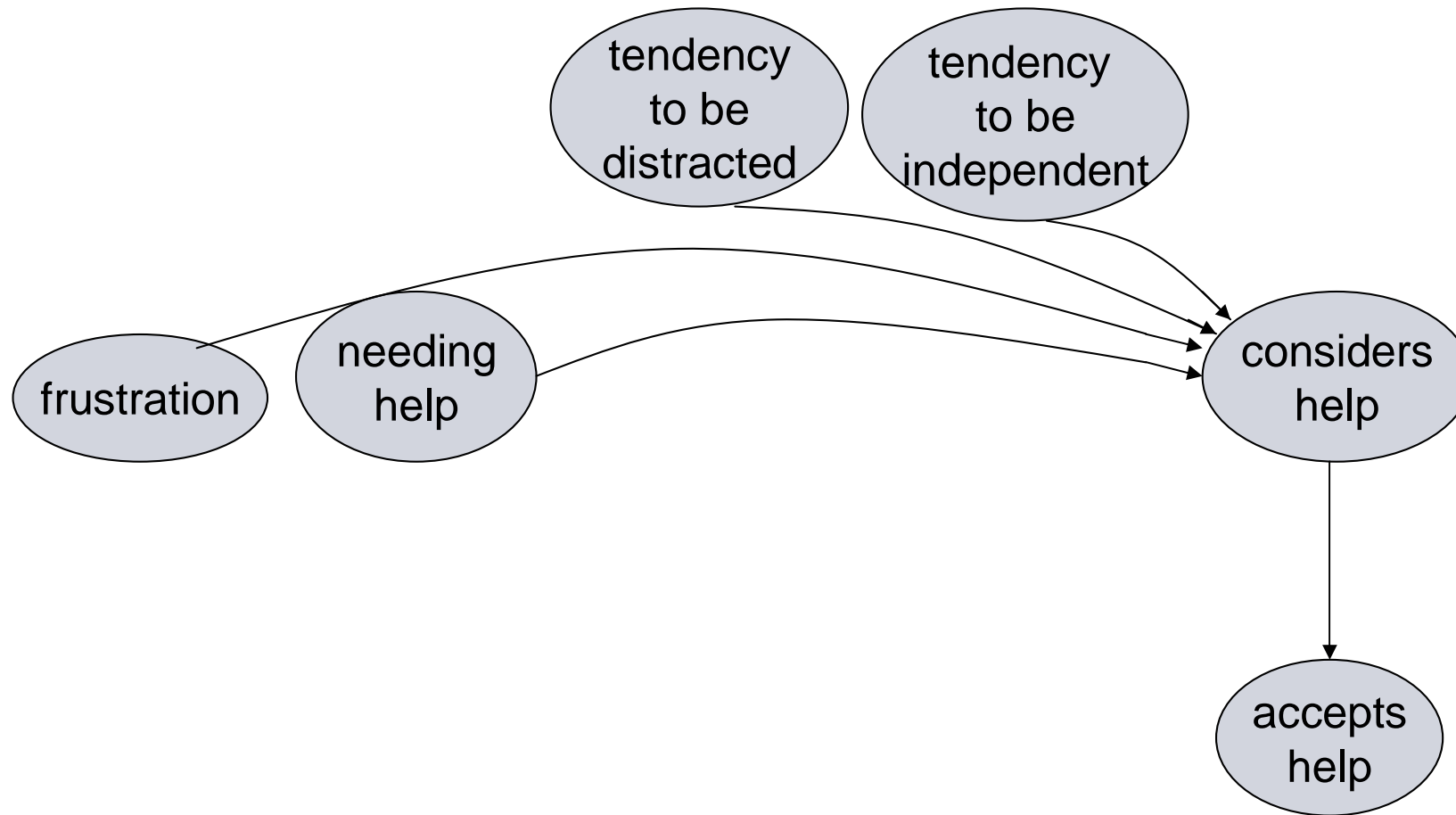
# Our Typing Assistant Model

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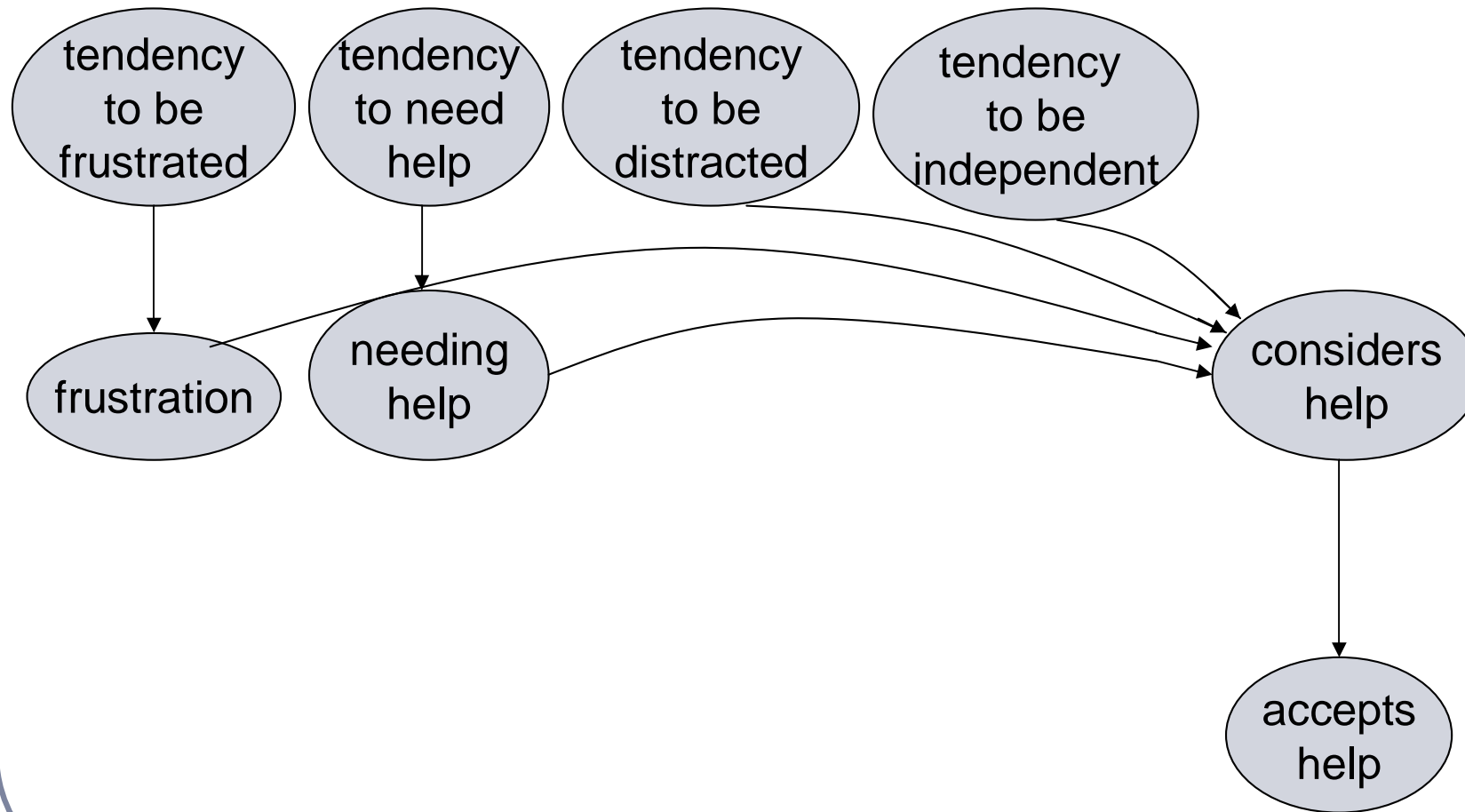


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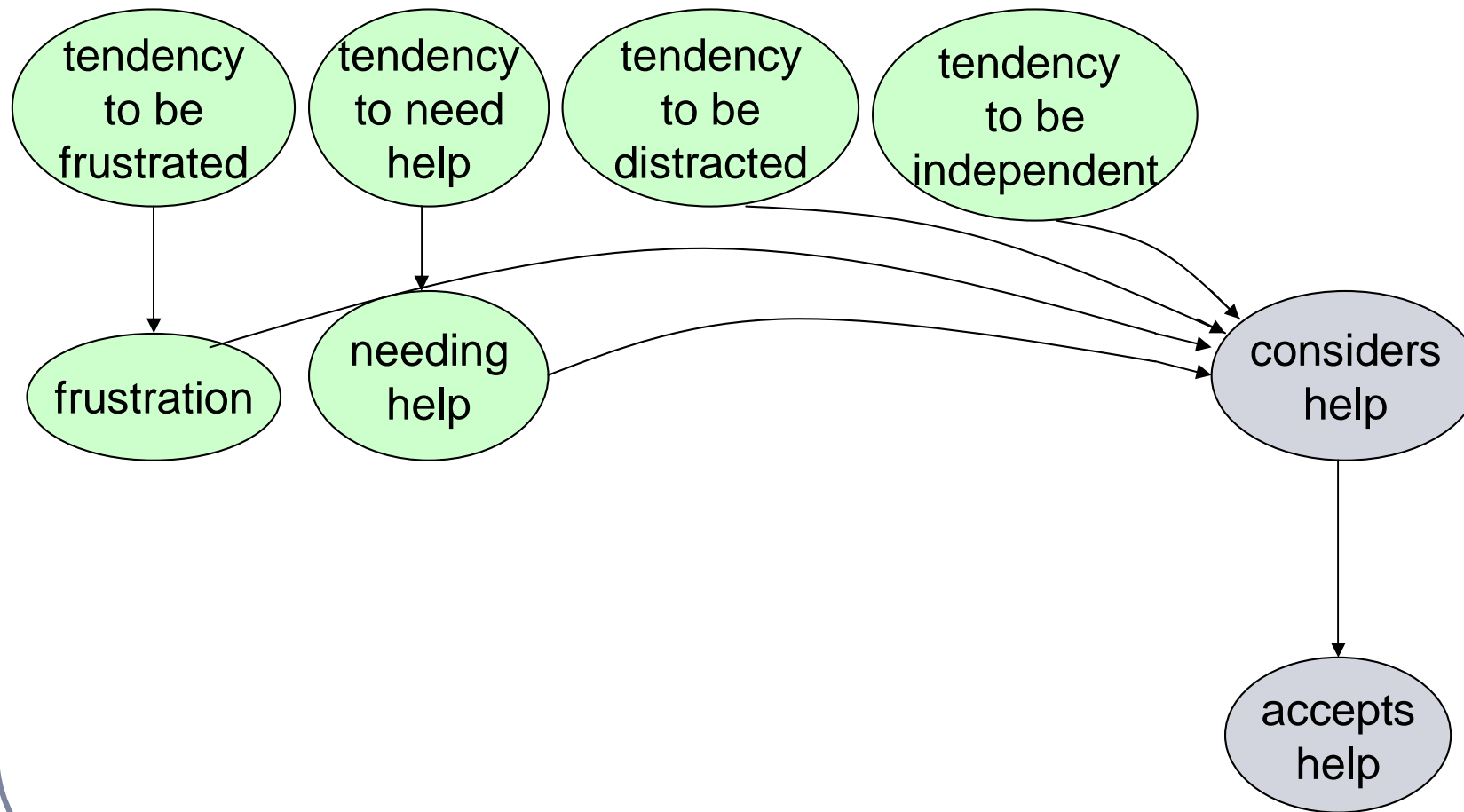
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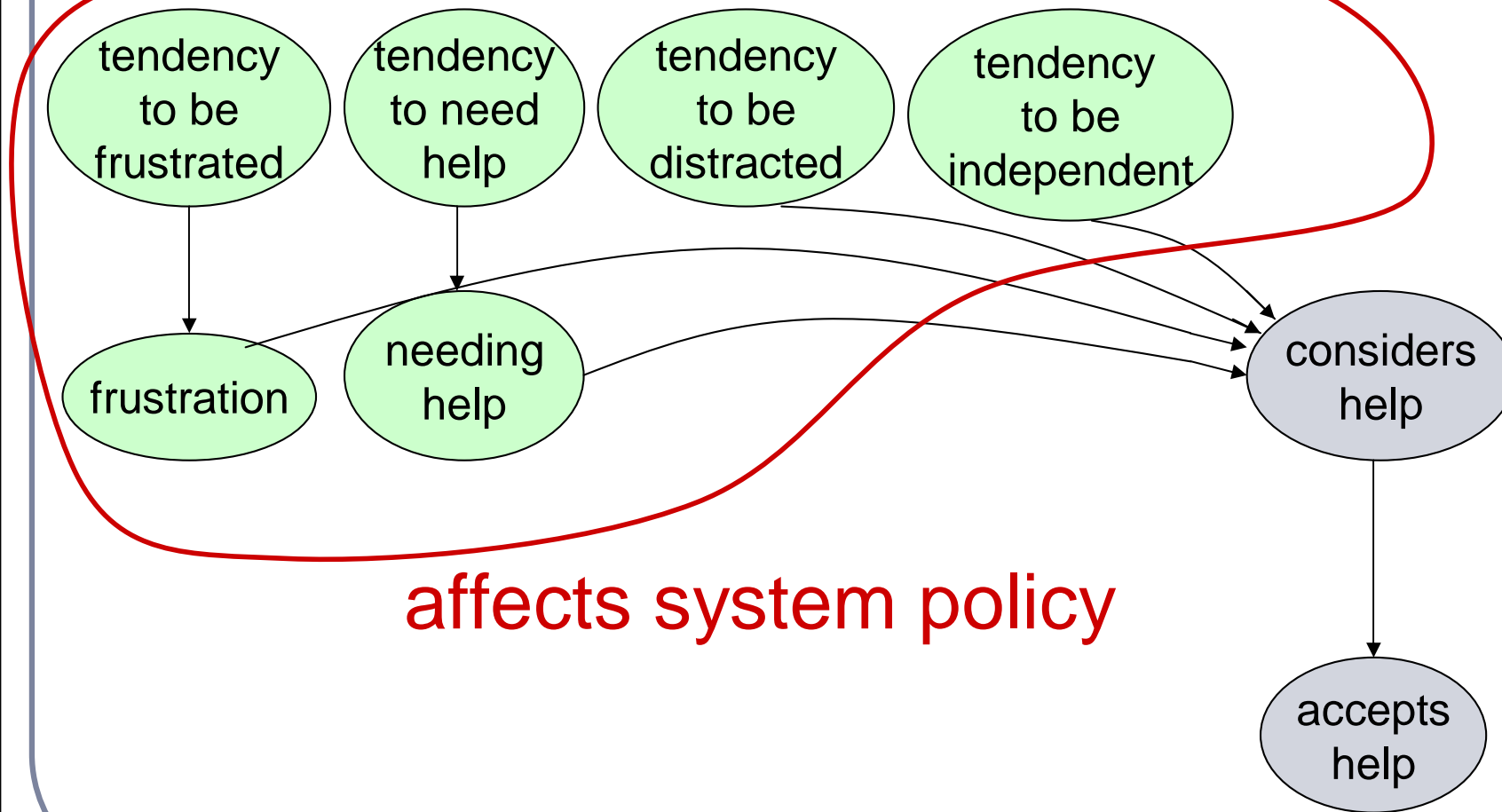
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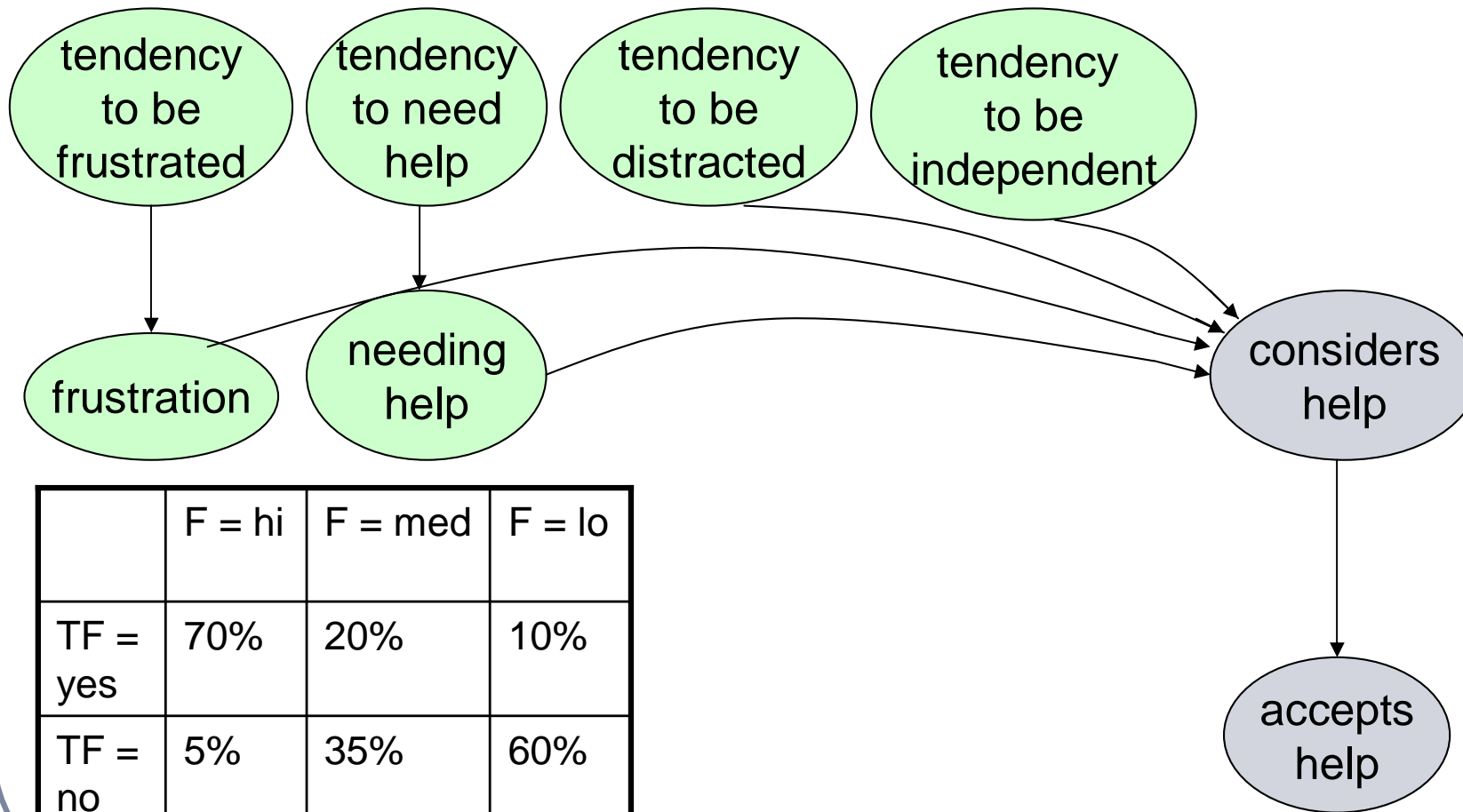
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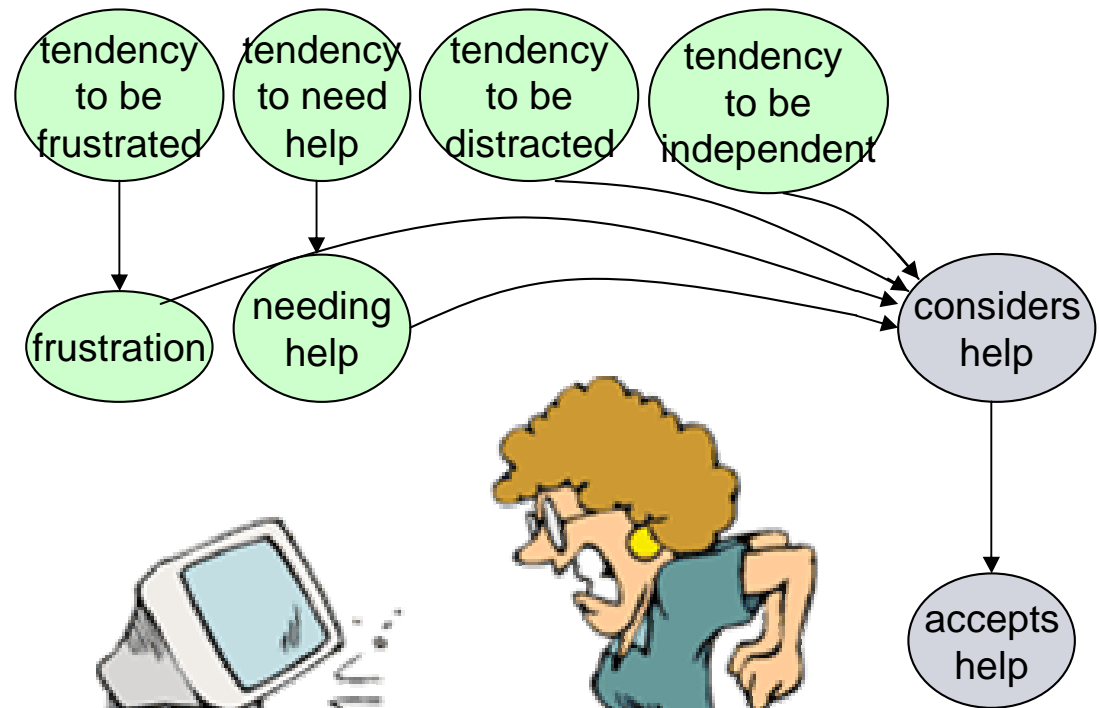
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	F = hi	F = med	F = lo
TF = yes	70%	20%	10%
TF = no	5%	35%	60%

$$\Pr( F=hi \mid TF=yes ) = 70\%$$

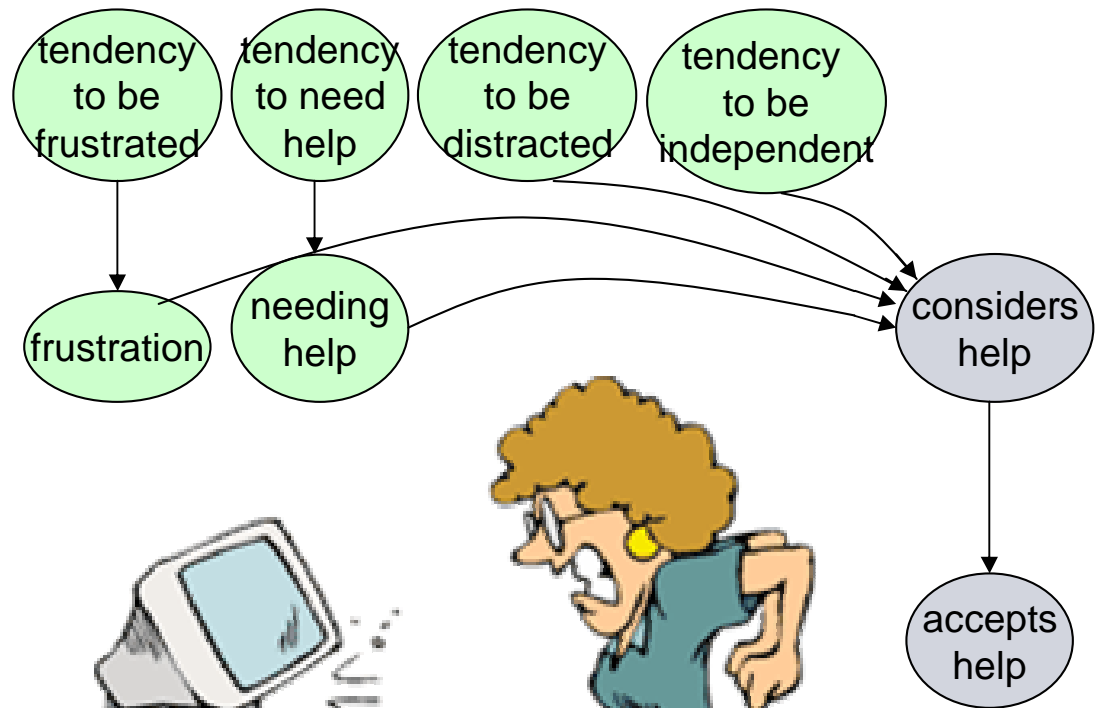


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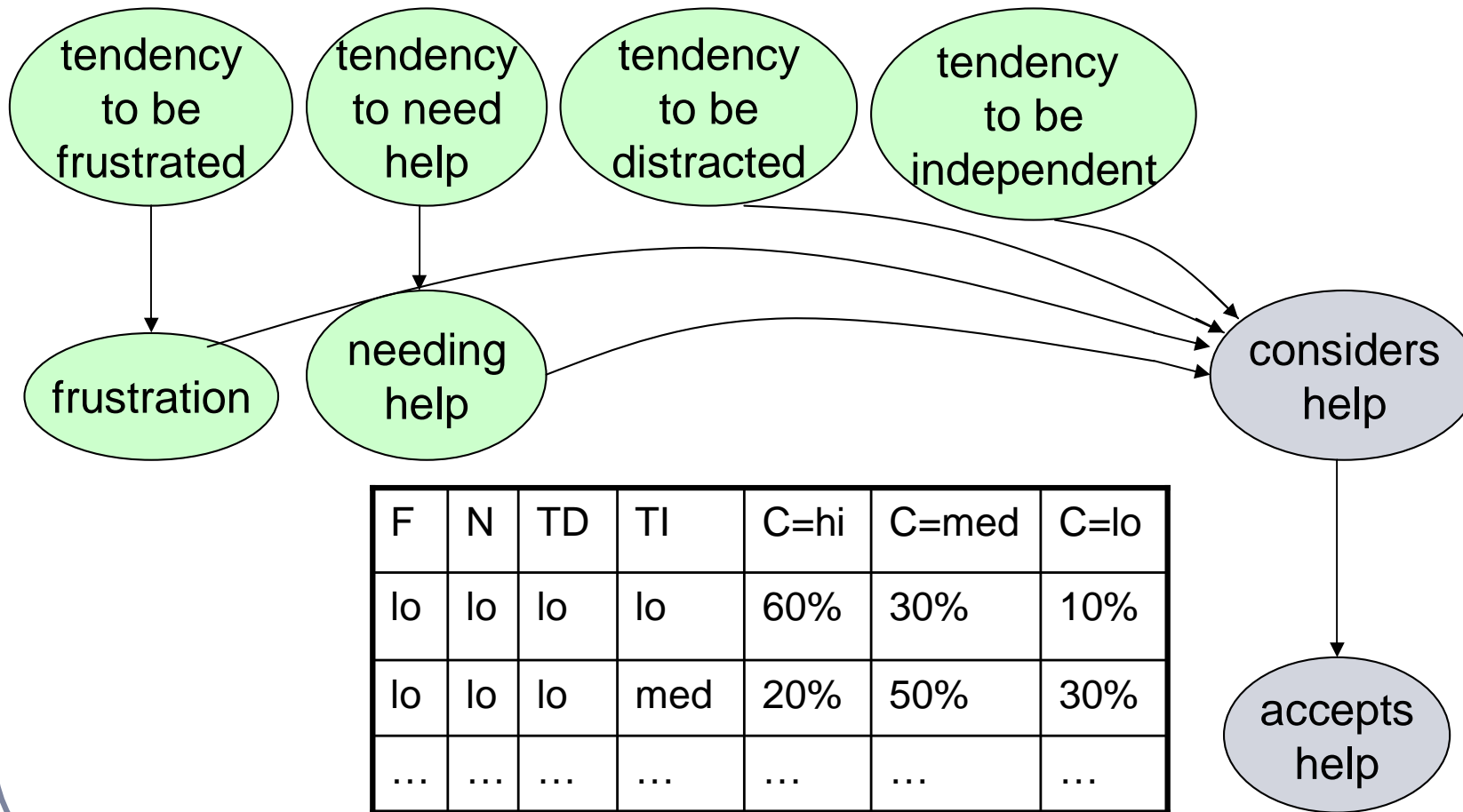
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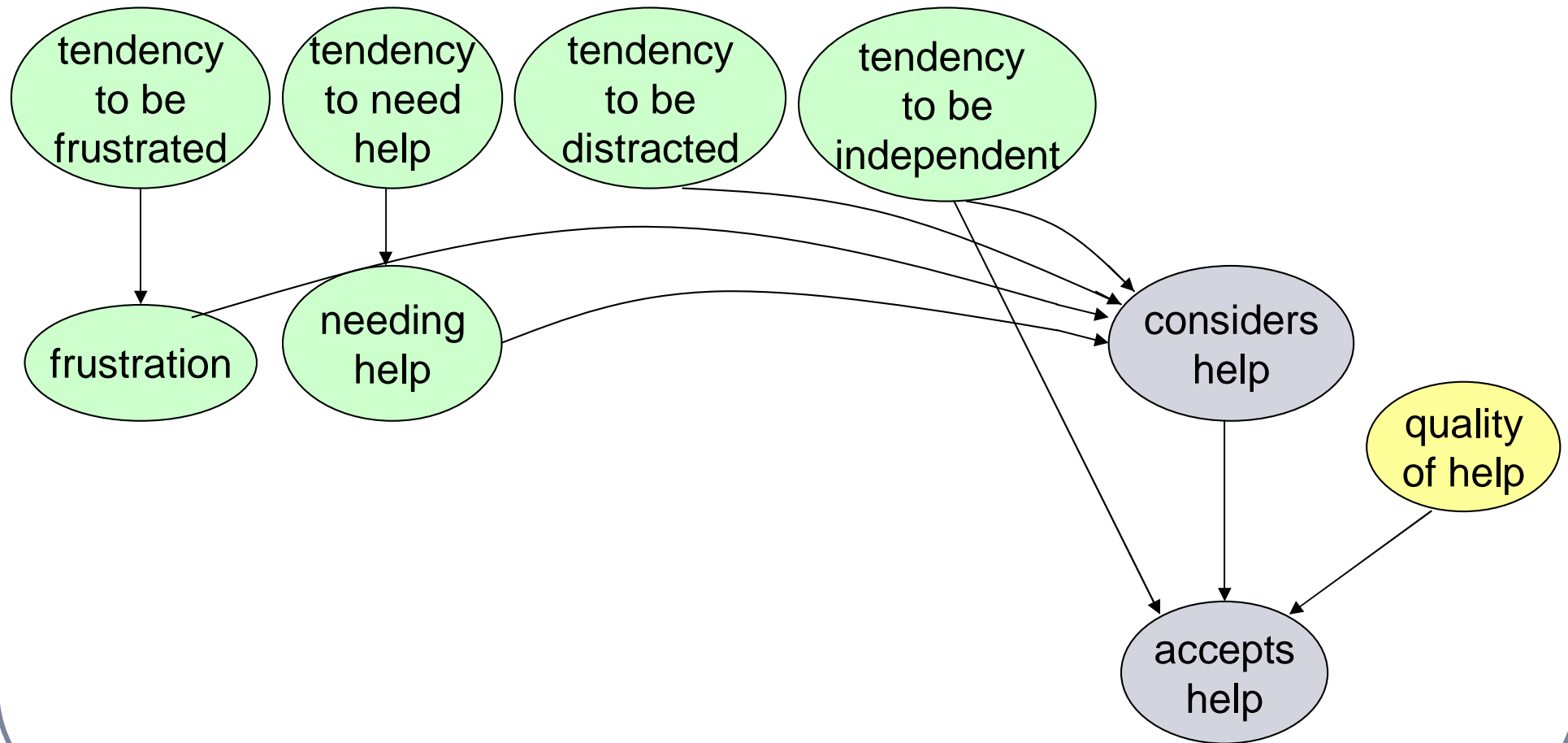
$$\Pr( F=hi \mid TF=yes, TN=no ) = 70\%$$



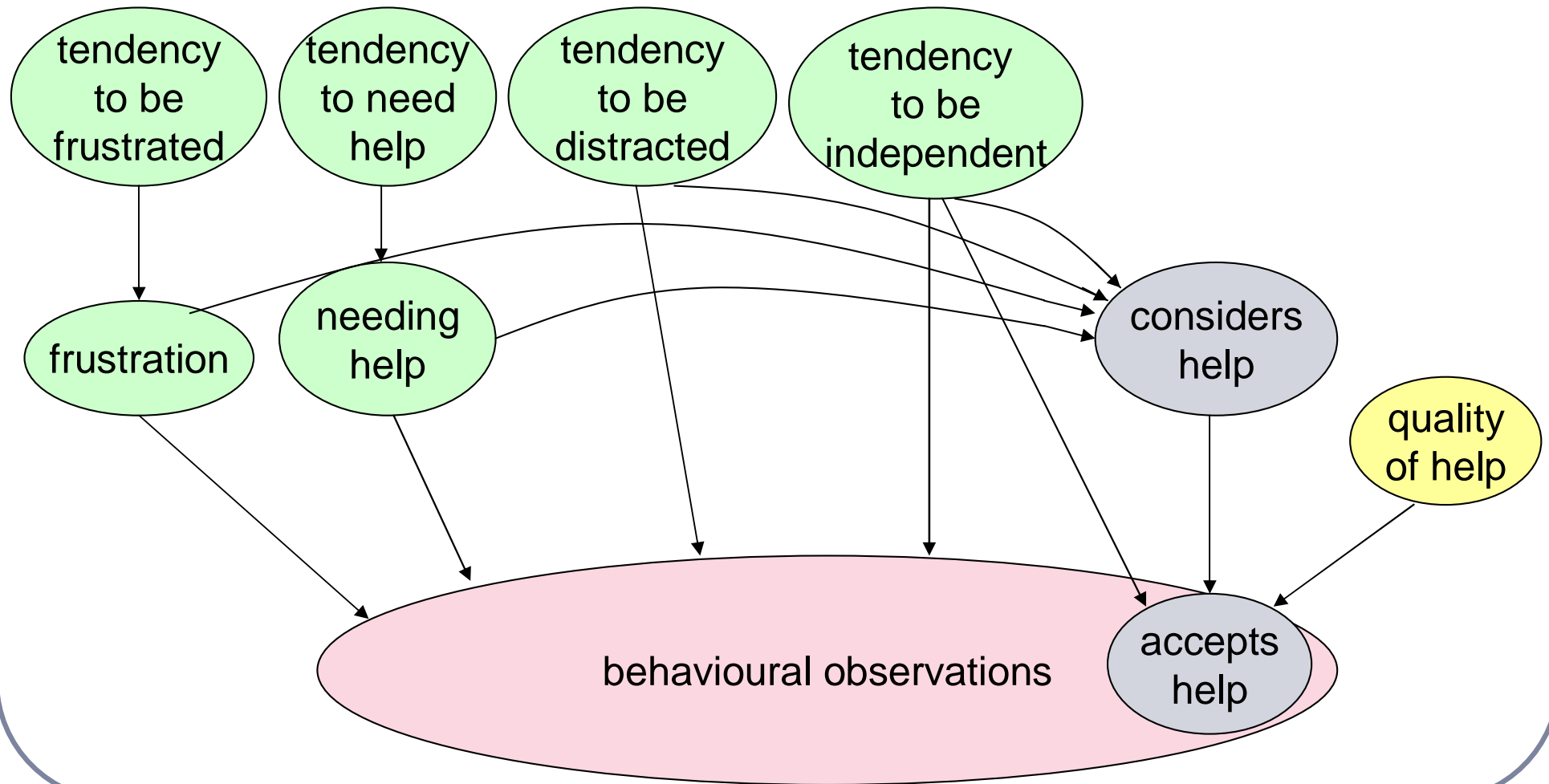
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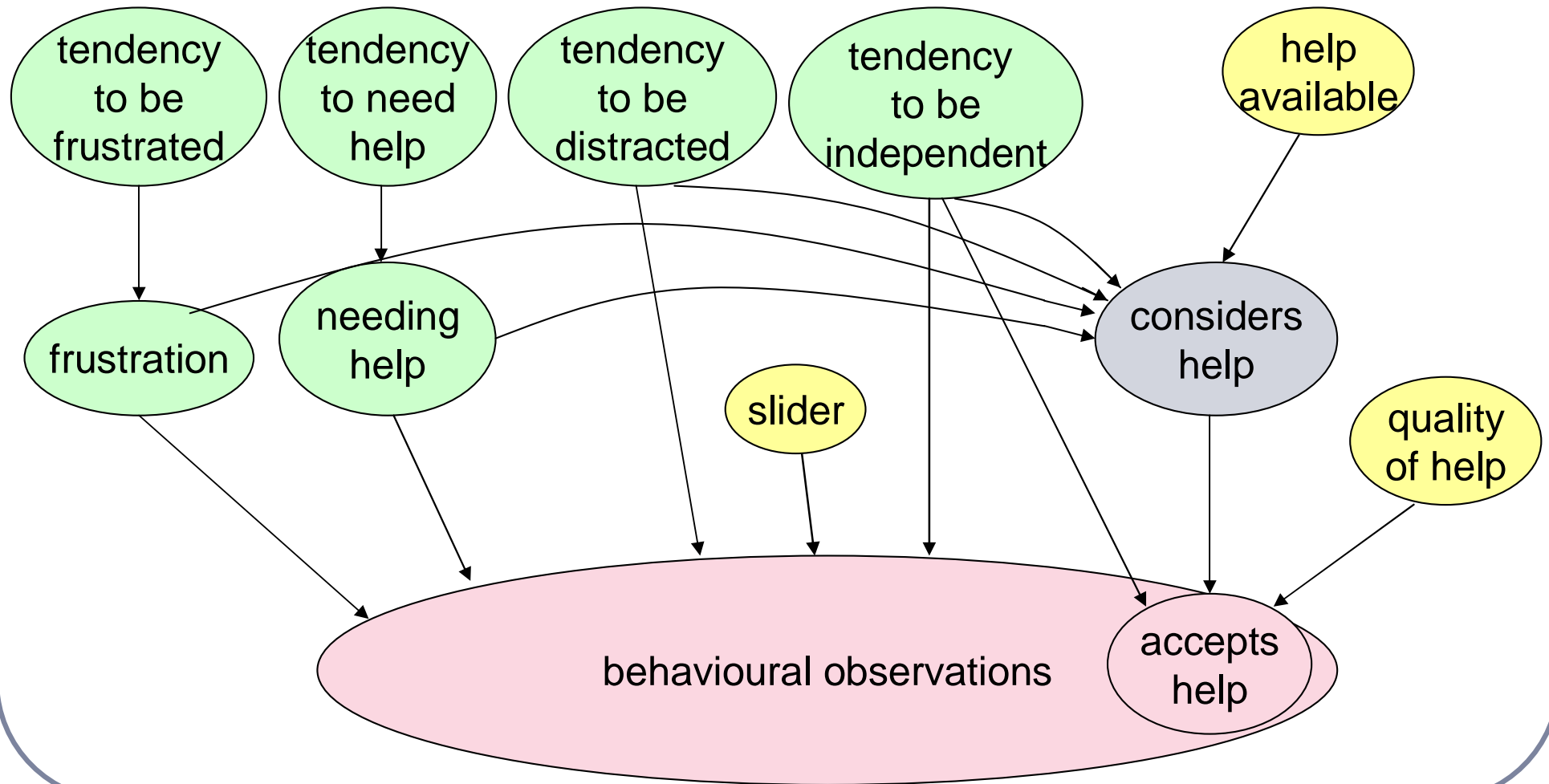
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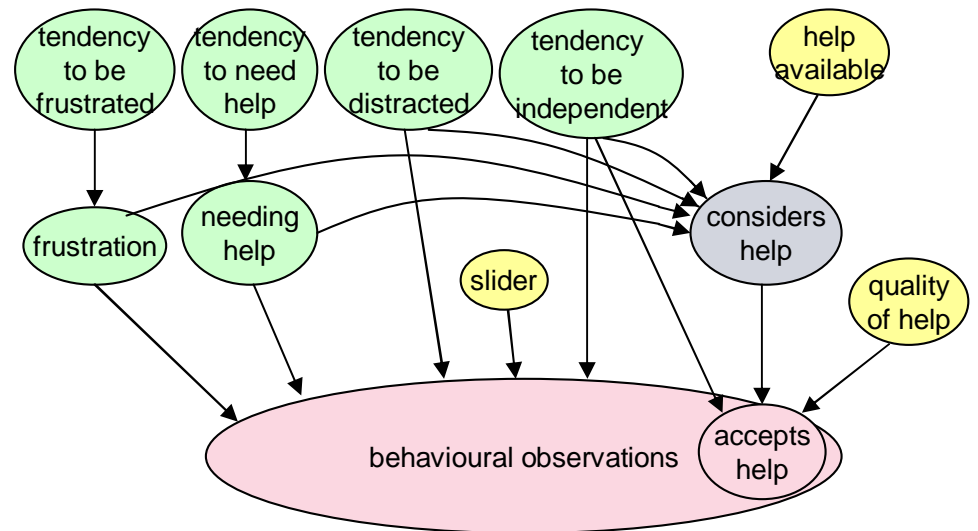


# Our Typing Assistant Model



# Our Typing Assistant Model

learn frequencies



TF	TN	TD	TI	F	N	C	B	Q	S	Obs = type	accept	slam	scream
lo	lo	lo	lo	lo	lo	lo	lo	lo	lo				
lo	lo	lo	lo	lo	lo	lo	lo	lo	med				
...	...	...	...	...	...	...	...	...	...	...	...	...	...

# **It's a hard problem!**

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- inadequate information
- wrong or outdated
- capturing larger context
- user specific
- domain specific

# Active Learning

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- computer knowledge is very fine-grained
- not all useful
- finds **most important** gaps
- asks **most informative** questions
- takes **most rewarding** actions
- evaluate trade-offs *in advance*

# Why Adaptive?

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- dealing with **new** ...
  - preferences
  - situations
  - software
  - people

