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# A Comparative Long-Term Study of Fallback Authentication Schemes

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# Fallback Authentication



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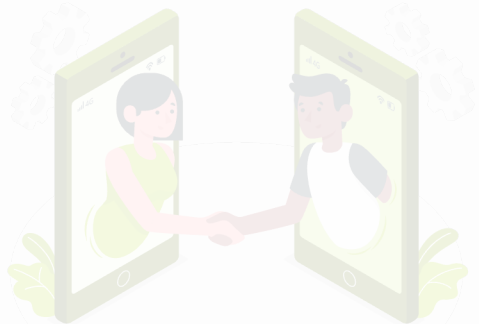


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# Fallback Authentication



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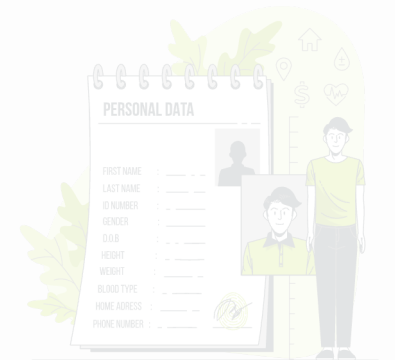


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- Long-term Memorability
- Reliability
- Authentication Time



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## What we did



Long-term study  
over 1.5 years



Reliability



Usability



## What we did not



Security



Accessibility

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# Research Questions



RQ1

How do the fallback schemes perform in terms of **successful** resets?



RQ2

How **long** do resets take for each scheme?



RQ3

How do users assess the schemes' **usability**?

# Study Protocol



# Registration & Fallback Setup



Email

Email

participant-1@gmail.com

Password

\*\*\*\*\*

Confirm Password

\*\*\*\*\*

Next Step

# Registration & Fallback Setup



Email



SMS

Phone Number

 (012) 345-6789

Next Step



# Registration & Fallback Setup



Email



SMS



Personal Knowledge  
Questions (PKQ)

## Security Question 1

What is the first name of your best friend? ▾

Jo

## Security Question 2

What is the last name of your favorite elementary school teacher?

What is the name of the street where you grew up?

What is the name of your high school?

What is your city of birth?

What is your favorite sports team?

What is your mother's maiden name?

Who was your favorite film star or character in school?

Next Step

# Registration & Fallback Setup



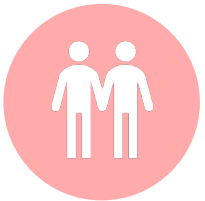
Email



SMS



Personal Knowledge  
Questions (PKQ)



Designated  
Trustees

Trusted Contact 1

Trusted Contact 2

Trusted Contact 3

Next Step

# Results

- Final n = 97
- Convenience Sample
- University Students

# Results



Successful Resets






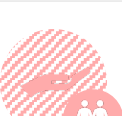


Reset Times



Usability Rating

# RQ1: Successful Resets | Results

		6	12	18	
Email		100%	100%	100%	100%
SMS		82%	71%	100%	92%
PKQ		57%	67%	63%	57%
Trustees		82%	78%	89%	83%
Trustees <i>Others</i>		67%	60%	63%	64%
Trustees <i>Self</i>		88%	100%	100%	94%

# Results



Successful Resets

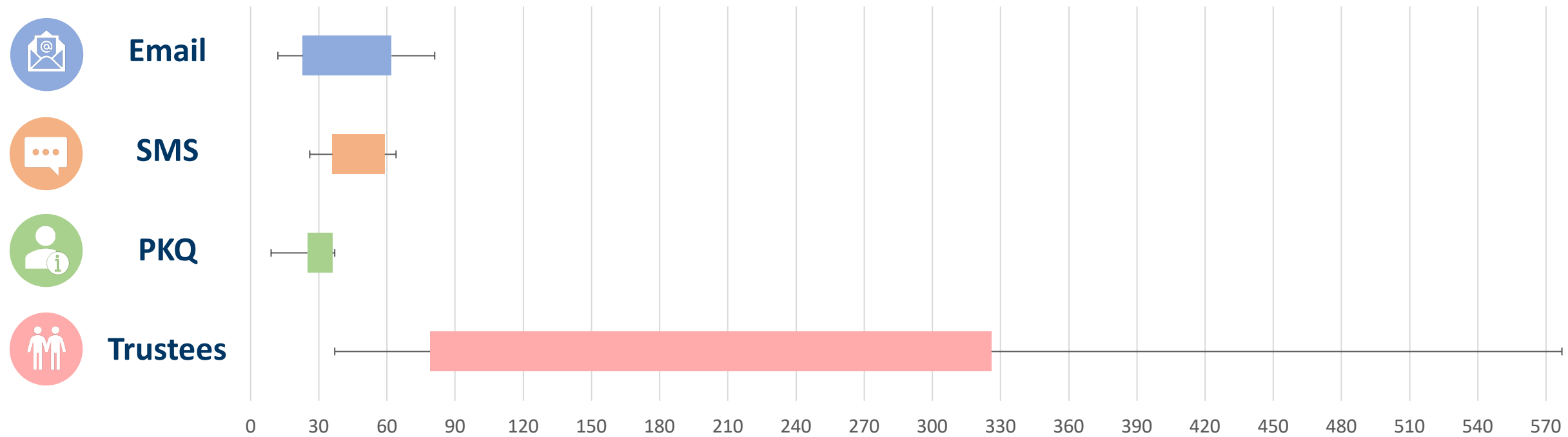


Reset Times

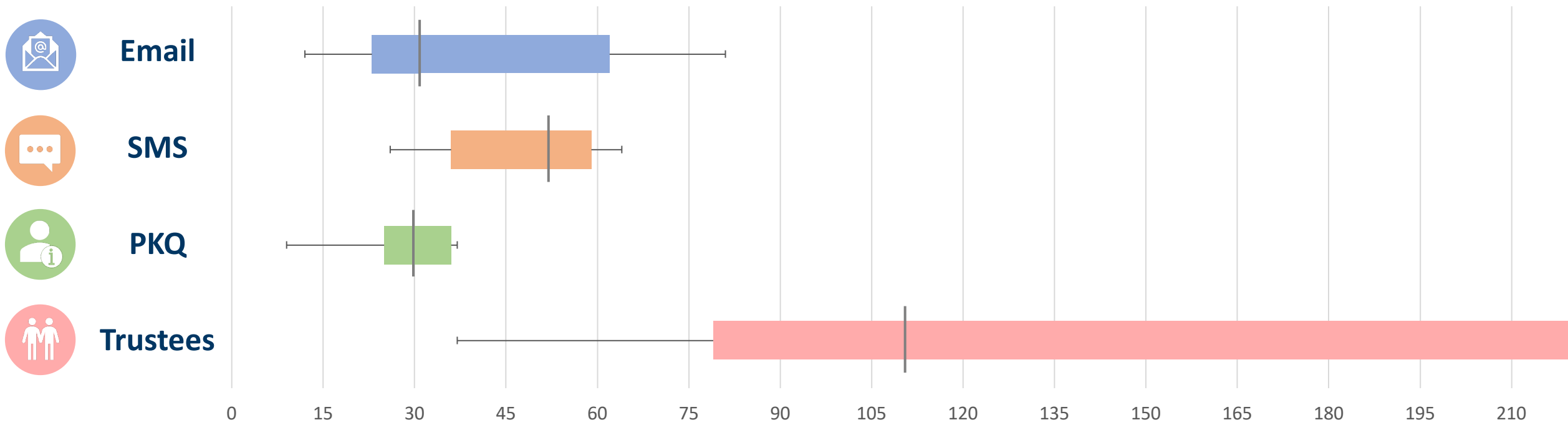


Usability Rating

# Reset Times | Results



# Reset Times | Results





~ 30 sec.



30 sec. - 1 min.



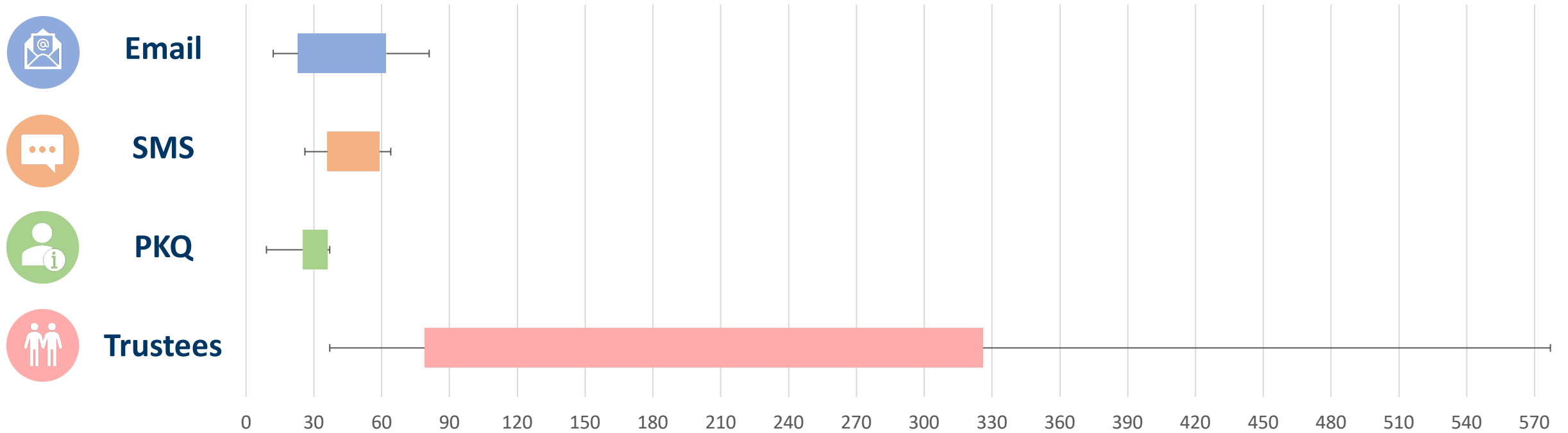
30 sec. - 1 min.



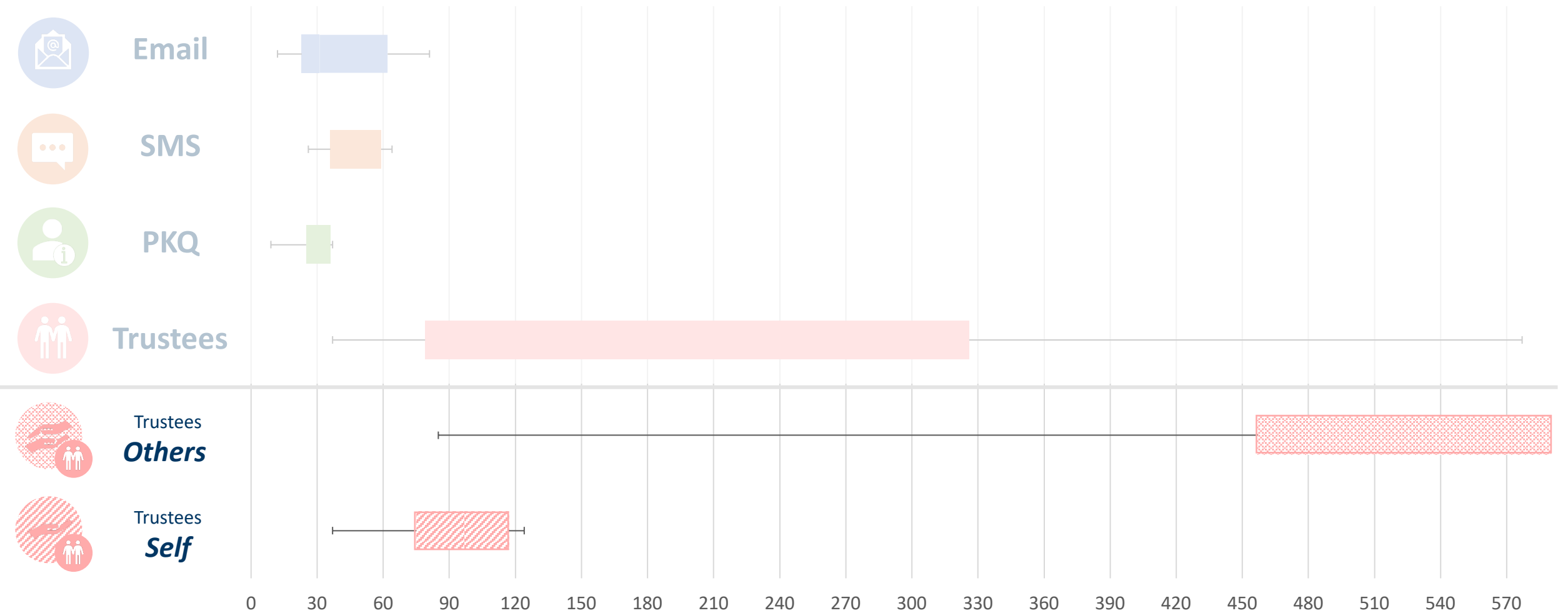
1.5 min. - 5 min.



# Reset Times | Results



# Reset Times | Results



# Results



Successful Resets

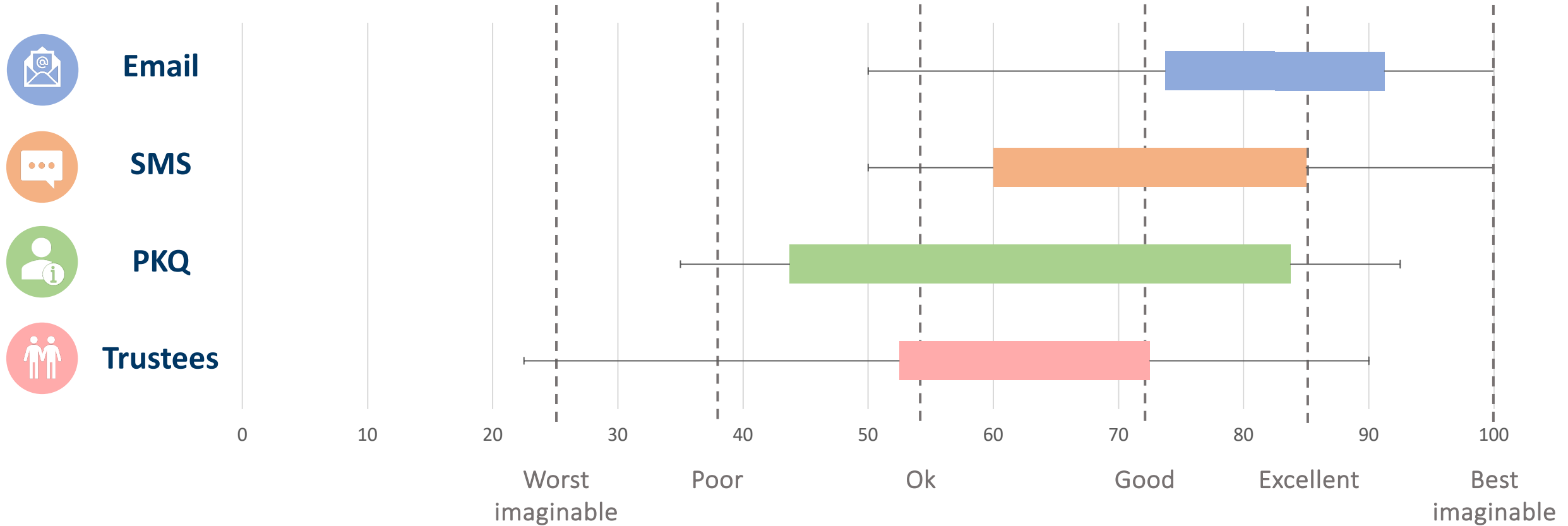


Reset Times

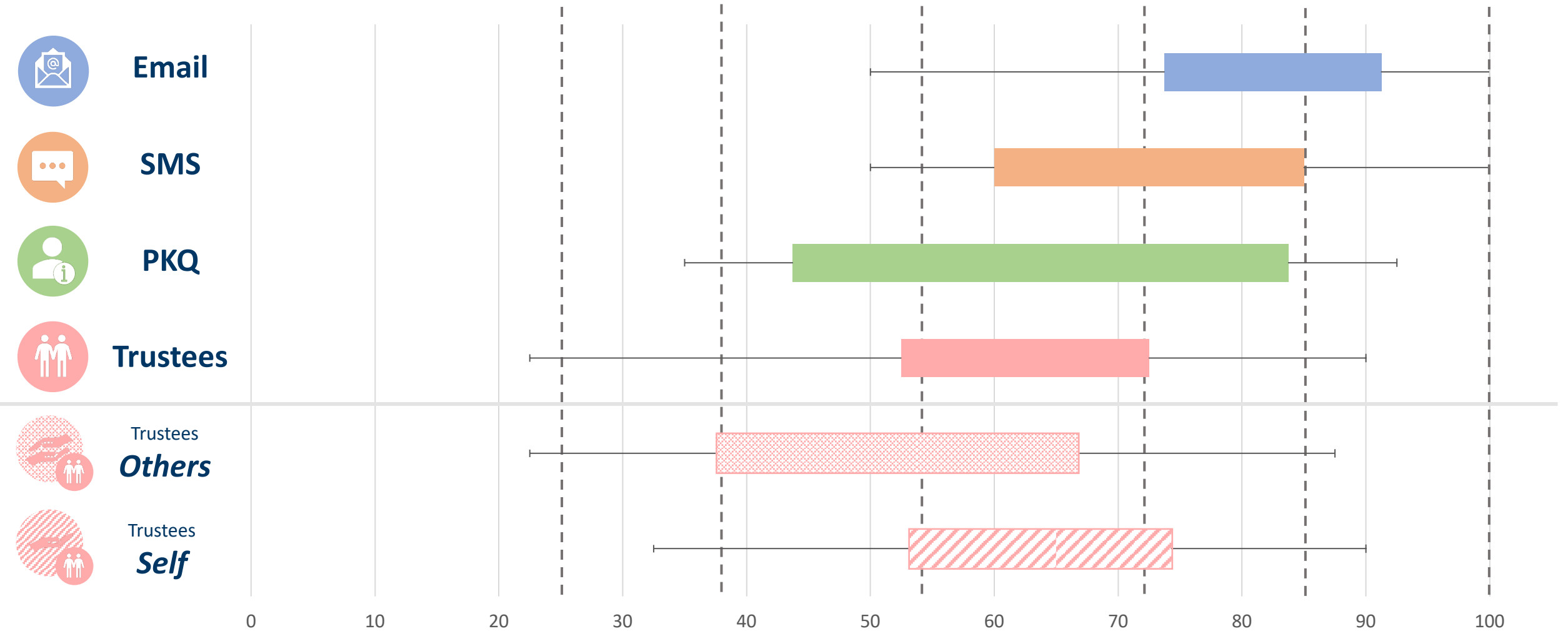


Usability Rating








# Usability Rating | Results





# Usability Rating | Results




# Takeaways

	 RQ1	 RQ2	 RQ3	
	Successrate	Speed	Usability	
 <b>Email</b>	Reliable	Fast	Very Usable	✓
 <b>SMS</b>	Mostly Reliable	Fast	Mostly Usable	✓
 <b>Personal Knowledge Questions (PKQ)</b>	Not Reliable At All	Very Fast	Depends	✗
 <b>Designated Trustees</b>	Depends	Depends	Depends	(✗)


 Longer fallback times have **limited influence**


 Explore hybrid fallback-options


 Do **NOT** use **PKQs!**



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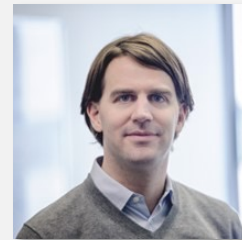
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