

## Block 1, Information sheet

Version Number 31/08/2023

Ethical Clearance Reference Number: LRS-23/24-38543

# Visualization Evaluation Survey

## INFORMATION SHEET FOR PARTICIPANTS

Use a desktop or laptop computer in full-screen mode to participate in this study.

### Title of the study:

Visualization Evaluation Survey.

### Invitation Paragraph

I would like to invite you to participate in this research project which forms part of my PhD research. Before you decide whether you want to take part, it is important for you to understand why the research is being done and what your participation will involve. Please take time to read the following information carefully and discuss it with others if you wish. Ask me if there is anything that is not clear or if you would like more information.

### What is the purpose of the study?

The primary objective of this survey is to collect insights, through a survey, from individuals aged 18 and above who can use a computer to take part in this study. The survey aims to evaluate and compare the effectiveness of three different visualizations in conveying the impact of social media usage on mental health and family functioning.

### What are the inclusion criteria?

Due to the nature of the study in this instance, we require all participants to have normal/corrected-to-normal vision and no colour-vision deficiencies.

### Why have I been invited to take part?

This is an anonymous survey. You can choose to participate voluntarily if you are over 18 years old and can use a computer. We invite you to take part in this research study because you have shown an interest in taking part in our study.

### What will happen if I take part?

If you agree to participate, you will complete a survey anonymously. Initially, you will be asked to complete a straightforward questionnaire that includes some demographic questions (e.g. age, gender, employment status). Afterwards, we will inquire about your social media usage habits. Subsequently, each participant will be shown the same visualizations, and we will request you extract values from these visualizations. The survey will also explore your perceptions regarding the three distinct visualizations presented as part of this study. We will ask questions about your opinions and preferences concerning these visualizations. The survey is expected to take approximately 20 minutes to complete.

### Do I have to take part?

Participation is completely voluntary. You should only take part if you want to and choosing not to take part will not disadvantage you in any way. You are free to withdraw

at any point during the completion of the survey, without having to give a reason by simply not submitting the study. We believe this study presents no risks to you. Once you submit the survey, it will no longer be possible to withdraw from the study because the data will be anonymous.

#### Data handling and confidentiality

This research is anonymous. This means that nobody, including the researchers, will be aware of your identity, and that nobody will be able to connect you to the answers you provide, even indirectly. Your answers will nevertheless be treated confidentially and the information you provide will not allow you to be identified in any research outputs/publications. Any data that we collect will be stored securely on the [REDACTED] servers. We take your privacy very seriously.

#### What will happen to the results of the study?

Research results can be published in the researcher's PhD thesis, in a journal, at conferences, and at outreach events.

#### Who should I contact for further information?

If you have any questions, require more information about this study, or think you have been harmed by participating please contact the primary researcher using the following contact details:

Email: [REDACTED]

#### What if I have further questions, or if something goes wrong?

If this study has harmed, you in any way or if you wish to make a complaint about the conduct of the study you can contact [REDACTED] using the details below for further advice and information:

Email: [REDACTED]

Or

The Chair,

Email: [REDACTED]

Thank you for reading this information sheet and for considering taking part in this research.

## **Consent:**

I confirm that I am 18 years old or older and I have read and understood the above information sheet for this survey. I have had the opportunity to consider the information and ask questions which have been answered to my satisfaction, and I consent voluntarily to be a participant in this survey and understand that I can refuse to take part and withdraw from the study at any time, without having to give a reason. By not answering the questions of this survey.

- I confirm my participation in this survey, as all its inclusion criteria apply to me AND I do not fall into any exclusion groups.
- I decline to participate in this survey

## **What is your Prolific ID?**

***Please note that this response should auto-fill with the correct ID***

```
$ {e://Field/PROLIFIC_PID}
```

## Block 2, Demographics

### Demographics Section:

We will ask you a few demographic questions in this section.

1- What is your gender?

- Male
- Female
- Other
- Prefer not to say

2- What is your age?

- 18 - 24
- 25 - 34
- 35 - 44
- 45 - 54
- 55 - 64

- 65 - 74
- 75 or older

### 3- How would you describe yourself?

- Arab
- Asian (Indian, Pakistani, Bangladeshi, Chinese, any other Asian background)
- Black (African, Caribbean, any other Black background)
- Mixed / Multiple ethnic groups (White and Black Caribbean, White and Black African, White and Asian, any other Mixed Multiple ethnic backgrounds)
- White (English, Welsh, Scottish, Northern Irish, British, Irish, Gypsy or Irish Traveller, Any other White background)
- Any other ethnic group

### 4- What is the highest degree or level of school you have completed?

- Less than a high school diploma
- High school degree or equivalent (e.g. GED)
- Some college, no degree
- Associate degree (e.g. AA, AS)
- Bachelor's degree (e.g. BA, BS)
- Master's degree (e.g. MA, MS, MEd)
- Doctorate or professional degree (e.g. MD, DDS, PhD)

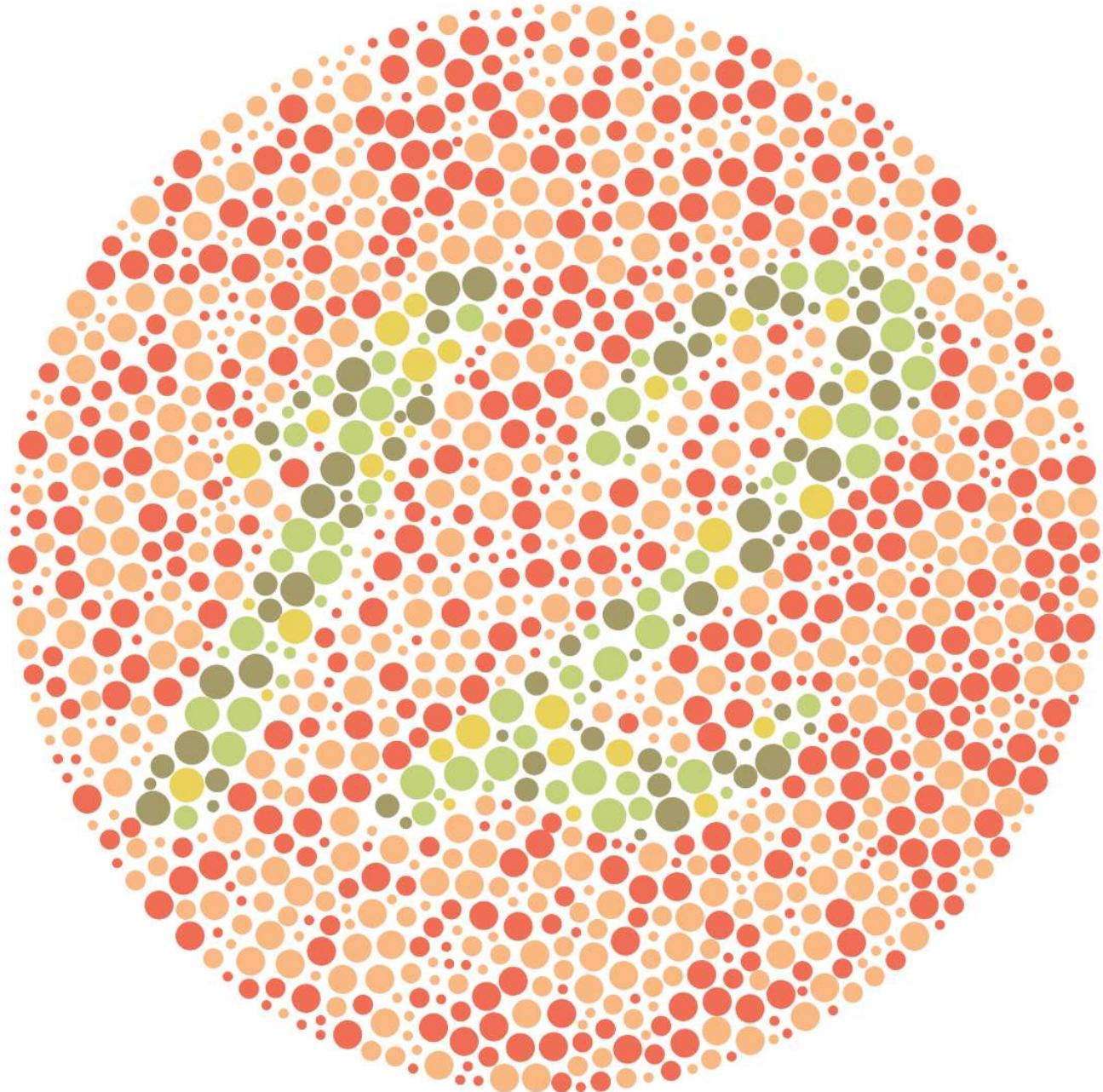
## 5- What is your current employment status?

- Employed full time
- Employed part time
- Unemployed and currently looking for work
- Unemployed not currently looking for work
- Student
- Retired
- Homemaker
- Self-employed
- Unable to work

## 6- Which of these fields' best describes your major or your field of work?

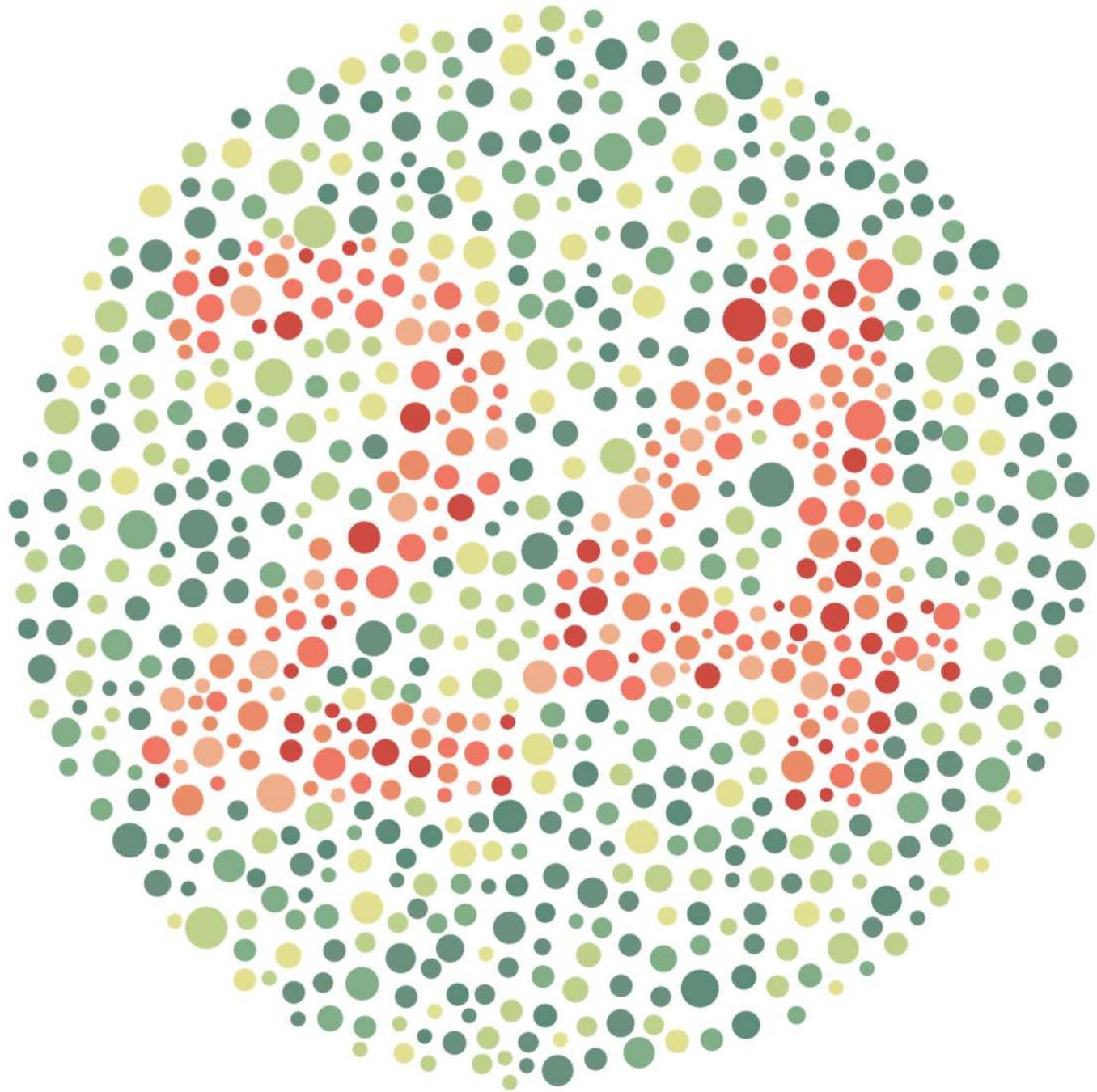
## 7- Do you possess expertise or experience in any form of visualization, including but not limited to data visualization, scientific visualization, or information visualization, either through research, work, or personal exploration?

- Yes

No

8- Choose the number you can see in the image above

 17 12

18

9- Choose the number you can see in the image above

 24

38 28

## Block 3, Qualitative pre-VIS questions

### Social Media Section:

In this section, we will ask you a few questions regarding your use of social media.

1- In average how much time do you think you spend on social media per day?

 Less than 1 hour 1-2 hours 2-3 hours 3-5 hours 5-7 hours More than 7 hours

2- Do you think you have a healthy relationship with social media?

 Yes

No Not sure

3- Do you primarily use text-based social media platforms (where you read and write text in social media platforms that are mostly based on text or it is mostly used for text content by you) or image-based social media platforms (where you view and share images and videos in social platform that are mostly based on images or videos or it is mostly used for images or videos by you)?

- I primarily use text-based social media platforms
- I primarily use image-based social media platforms
- I primarily use both text-based and image-based social media platforms
- I do not use any social media platforms

## Block 4, Training

### Training Section:

In this section, we'll provide you with short training to ensure that you understand the tasks ahead. This training is designed to familiarize you with the concepts and guidelines for accurate responses.

## Why Training Matters:

Taking a few minutes to complete this training will greatly enhance your understanding of the tasks in the following section. It will help you provide more accurate and valuable responses, leading to better results.

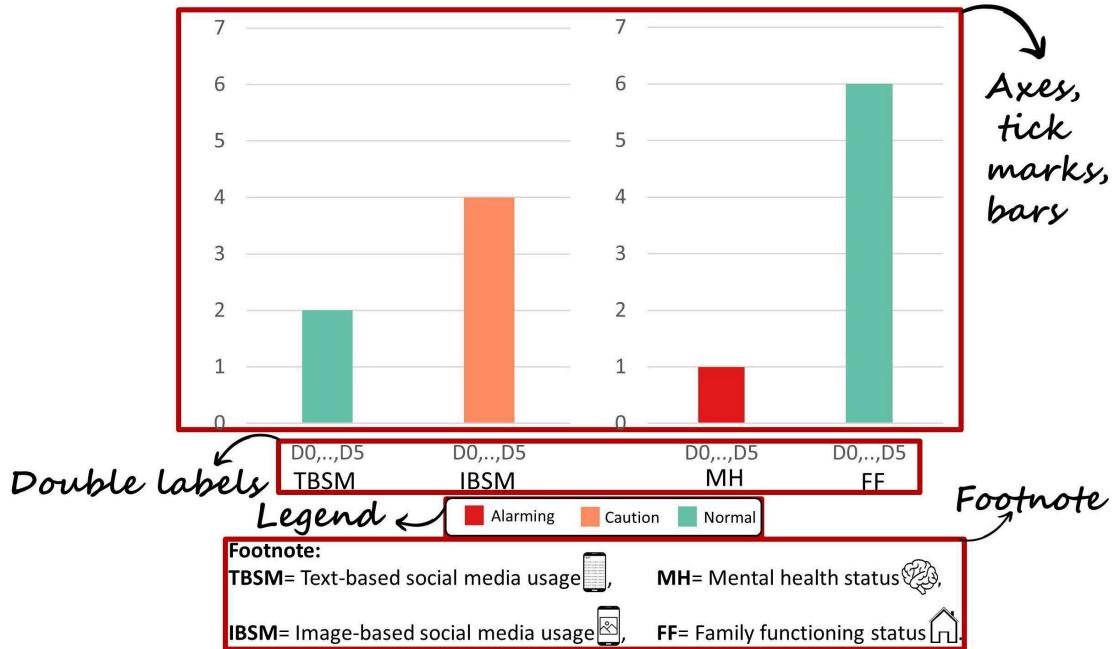
## Concepts Definition:

Mental health status: is a numerical measure of an individual's psychological well-being.

Family functioning status: is a numerical measure of an individual's overall health and dynamics within a family unit.

## Training Instructions:

1. Have a look at the chart interface below and familiarize yourself with each section of the chart which is highlighted in red rectangle.
2. Understand what each section represents.

*Title***Relationship Between Levels of Social Media Use, Mental Health, and Family Functioning**

### 3. Understand how to read the charts.

### Relationship Between Levels of Social Media Use, Mental Health, and Family Functioning

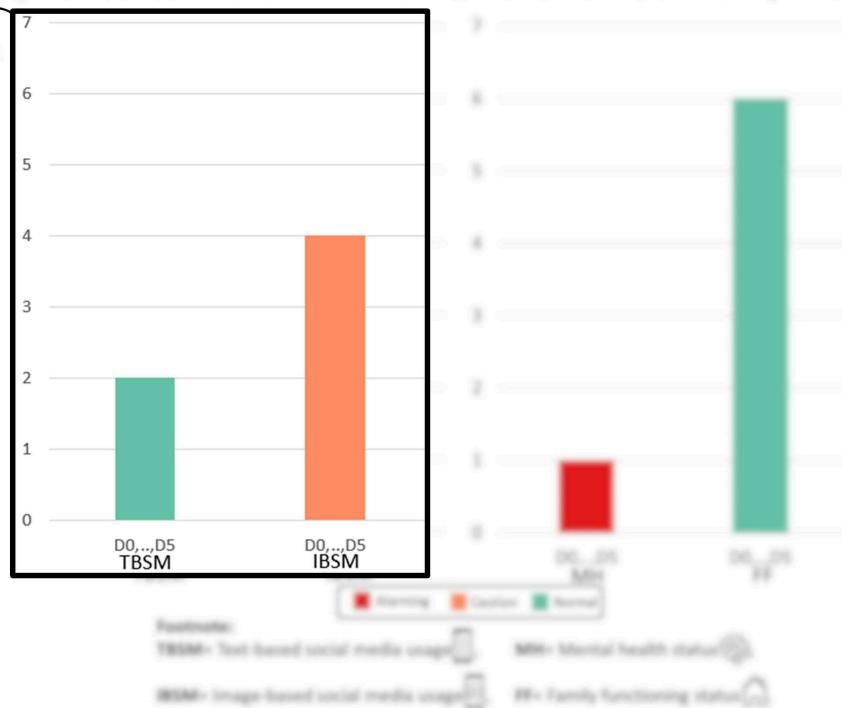
In the left chart, you can see the amount of

**Text-based social media usage  
TBSM  
(first column)**

and

**Image-based social media usage  
IBSM  
(second column)**

For 6 days (D0,..,D5)



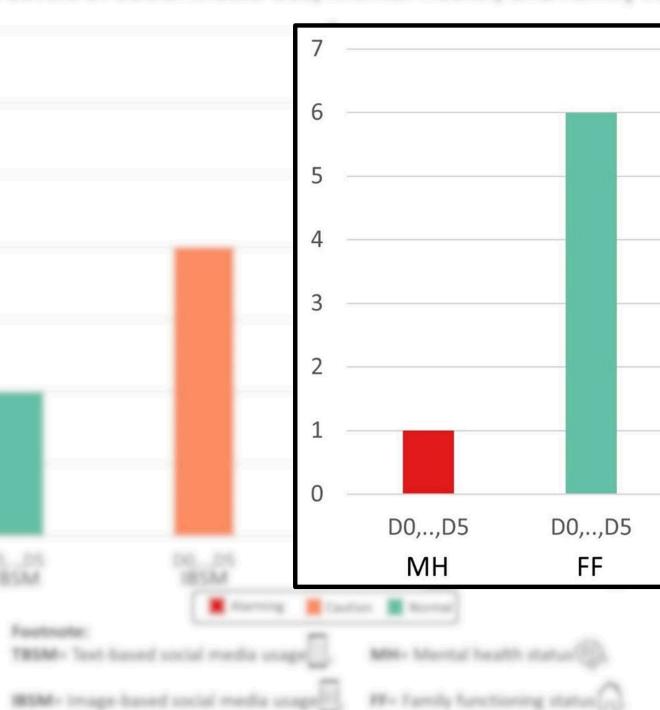
### Relationship Between Levels of Social Media Use, Mental Health, and Family Functioning

In the right chart, you can see the amount of

**Mental health status  
MH  
(first column)**

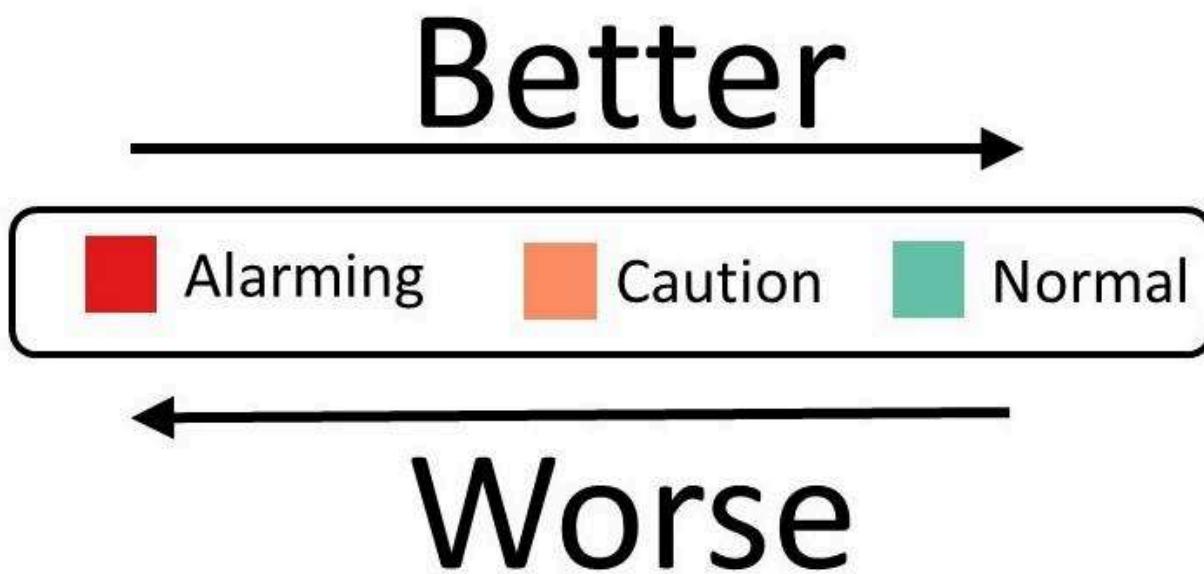
and  
**Family functioning status  
FF  
(second column)**

For 6 days (D0,..,D5)



4. Ensure that you understand how to interpret the distinct scales presented in each chart.

-The assessment of 'Better' and 'Worse', from a health perspective, relies on the categorization into Normal, Caution, and Alarming states. Refer to the image below with the arrows to understand the meaning of 'Better' and 'Worse'.



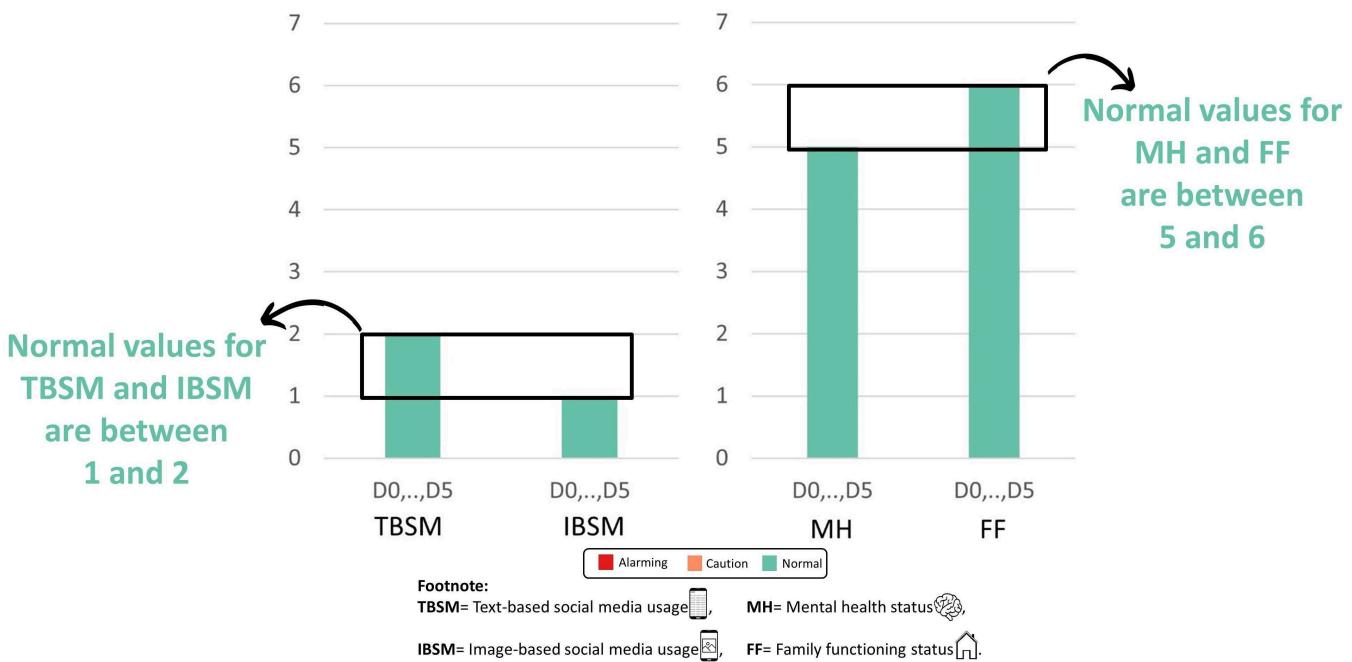
-It's crucial to note that Normal and Alarming states are represented differently in the right chart as compared to the left chart, while Caution has similar representations

on both charts.

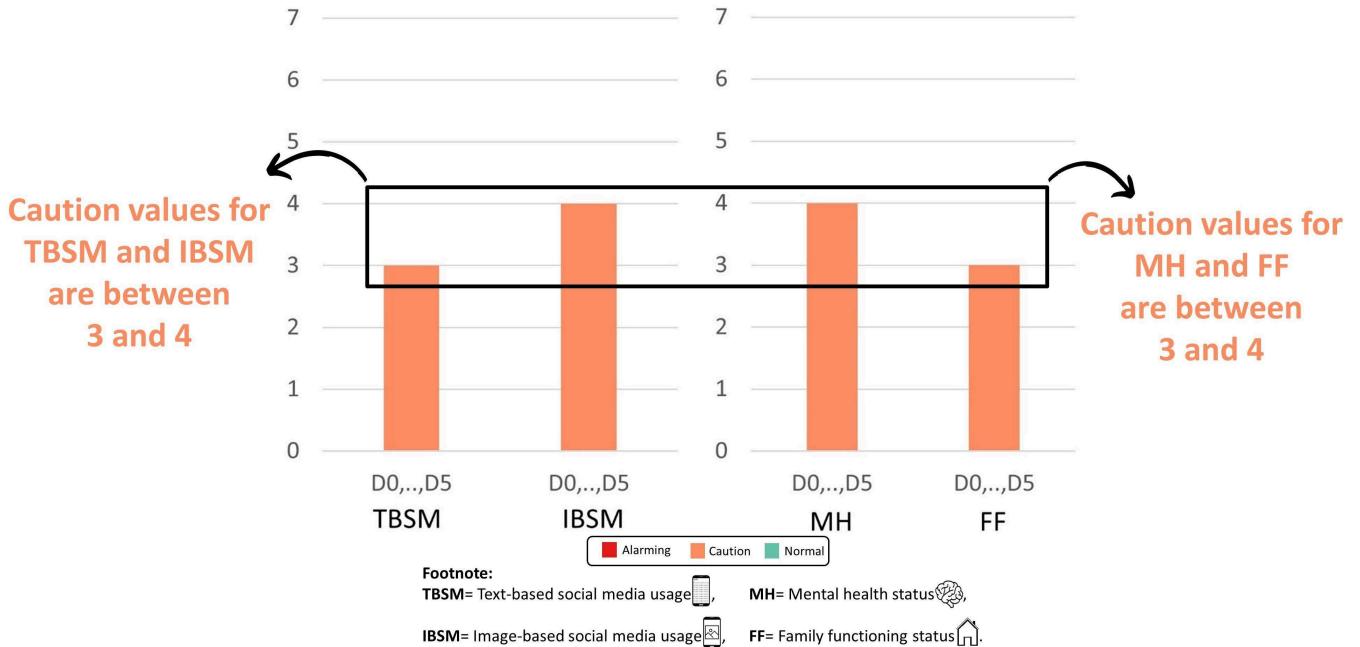
-To gain a clearer understanding of how 'Better' and 'Worse' scales are represented, refer to the chart examples below.

-Observe the variations in the non-continuous scales between the right and left charts, in the different ranges for Normal, Caution, and Alarming states.

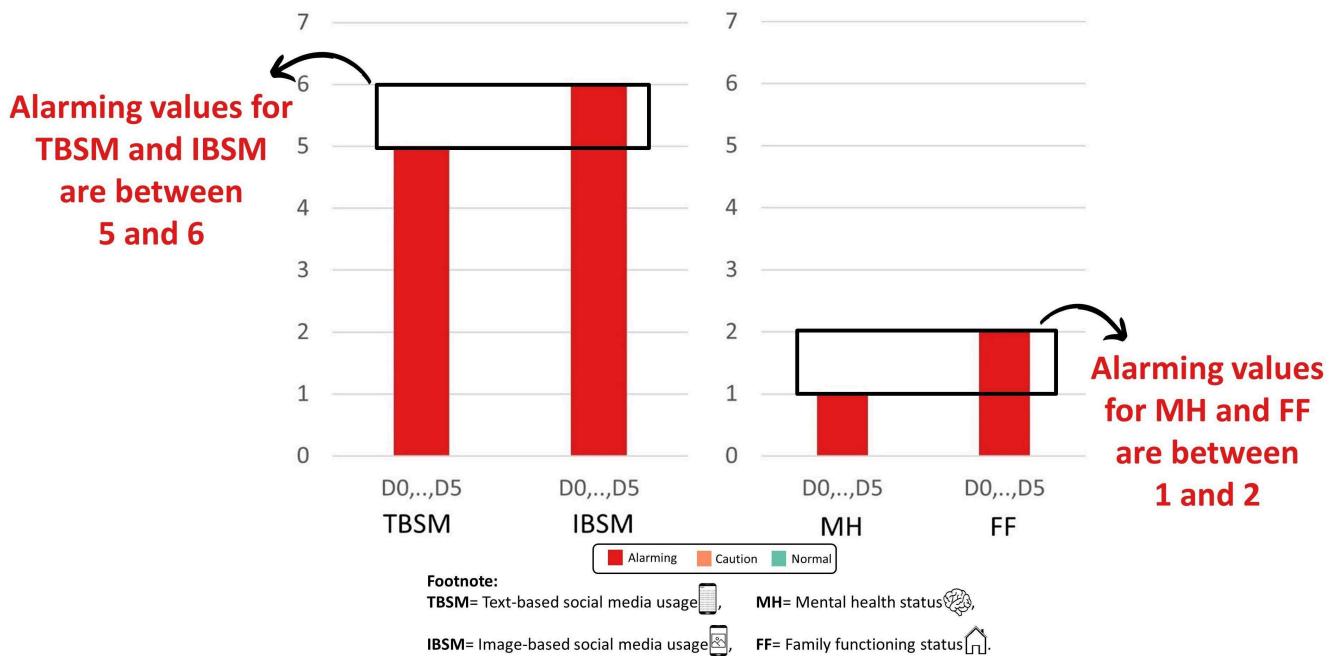
Relationship Between Levels of Social Media Use, Mental Health, and Family Functioning



## Relationship Between Levels of Social Media Use, Mental Health, and Family Functioning



## Relationship Between Levels of Social Media Use, Mental Health, and Family Functioning

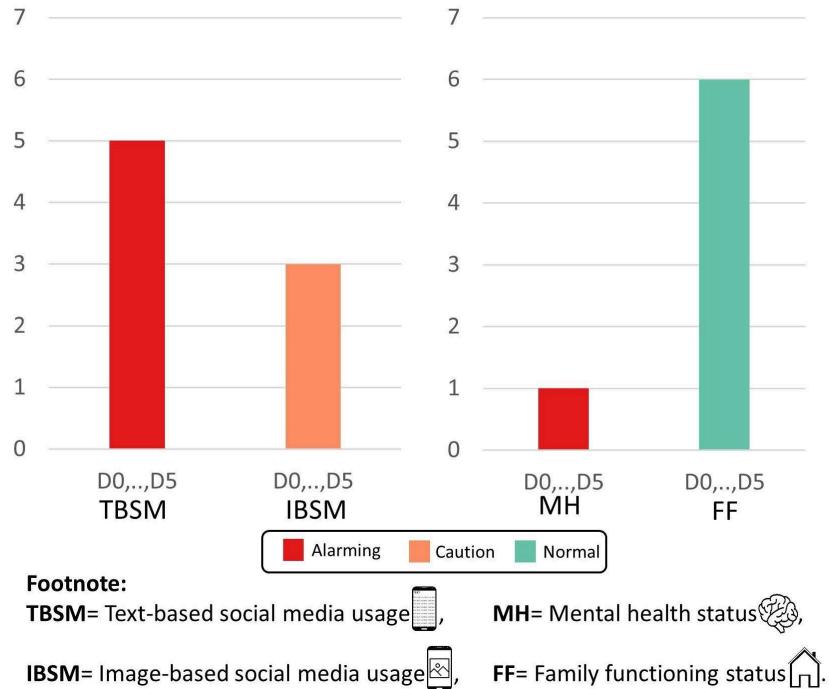


5. Understand the different encodings represented in the following 3 designs.

## In Design 1:

The data is represented by coloured columns and double labels.

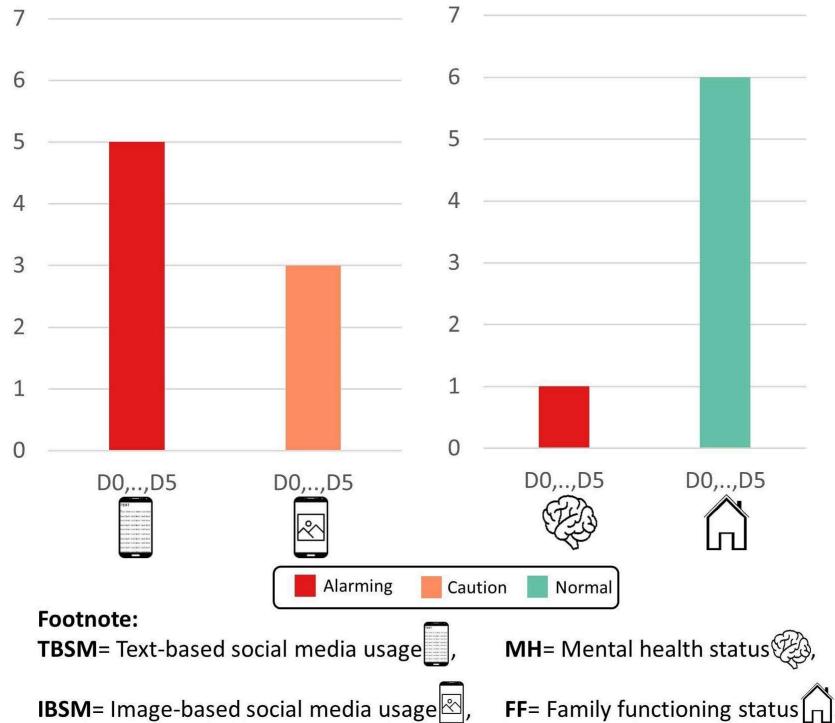
Relationship Between Levels of Social Media Use, Mental Health, and Family Functioning



## In Design 2:

The data is represented by coloured columns and double labels including coloured icons.

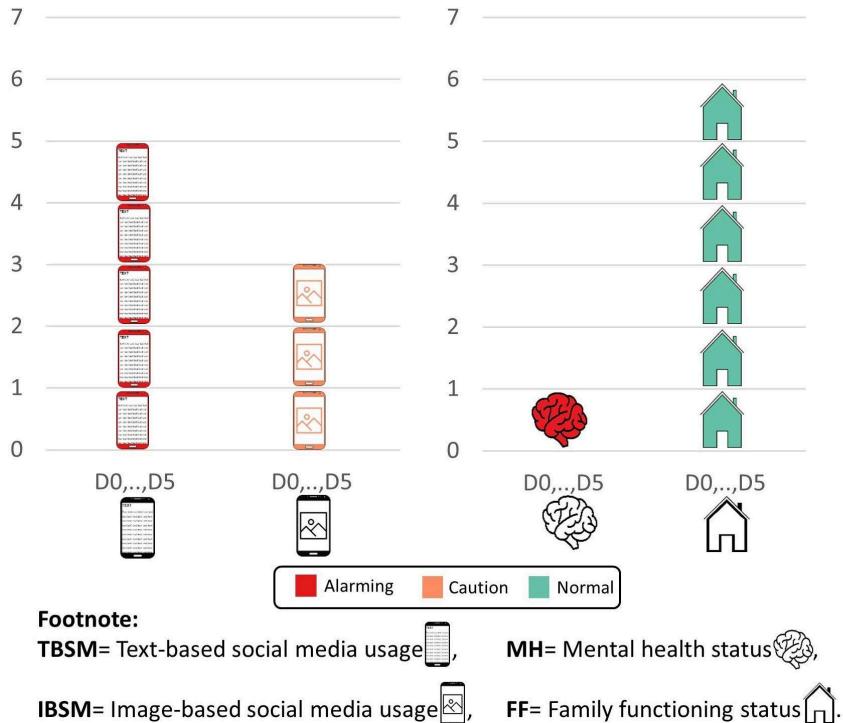
### Relationship Between Levels of Social Media Use, Mental Health, and Family Functioning



### In Design 3:

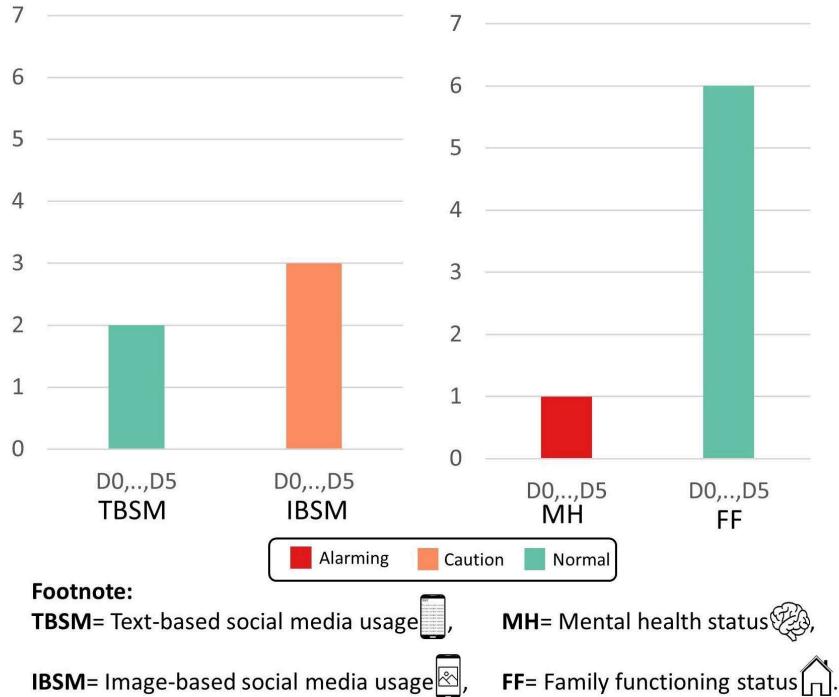
**The data is represented by coloured icons instead of the columns, and double labels including coloured icons.**

## Relationship Between Levels of Social Media Use, Mental Health, and Family Functioning



6. The chart will be followed by a question that you must answer based on the chart.
7. Complete the training questions.

## Relationship Between Levels of Social Media Use, Mental Health, and Family Functioning

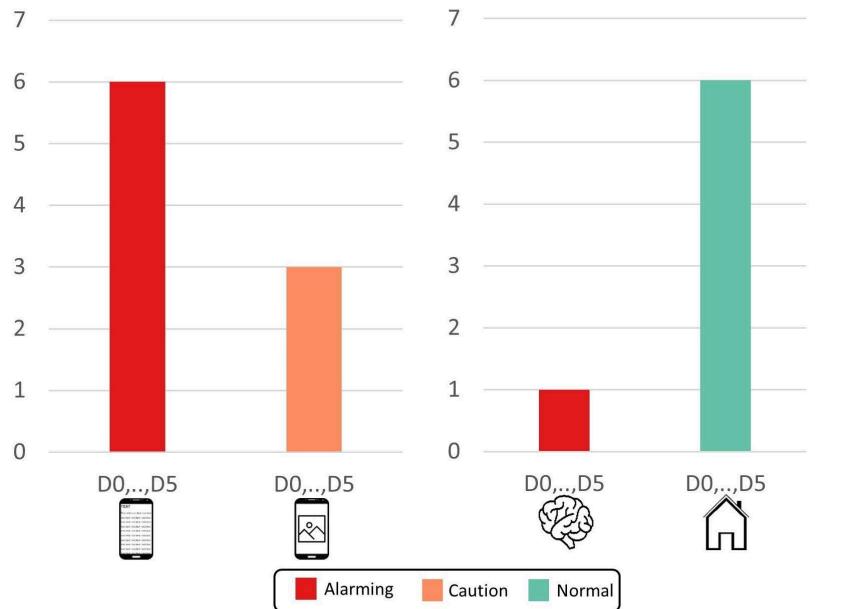


1- According to the above chart, is this statement true or false—"MH value is less than 2" ?

- False
- Neither true nor false
- True

Note: The training question must be answered correctly to proceed next.

## Relationship Between Levels of Social Media Use, Mental Health, and Family Functioning

**Footnote:**

TBSM= Text-based social media usage

MH= Mental health status

IBSM= Image-based social media usage

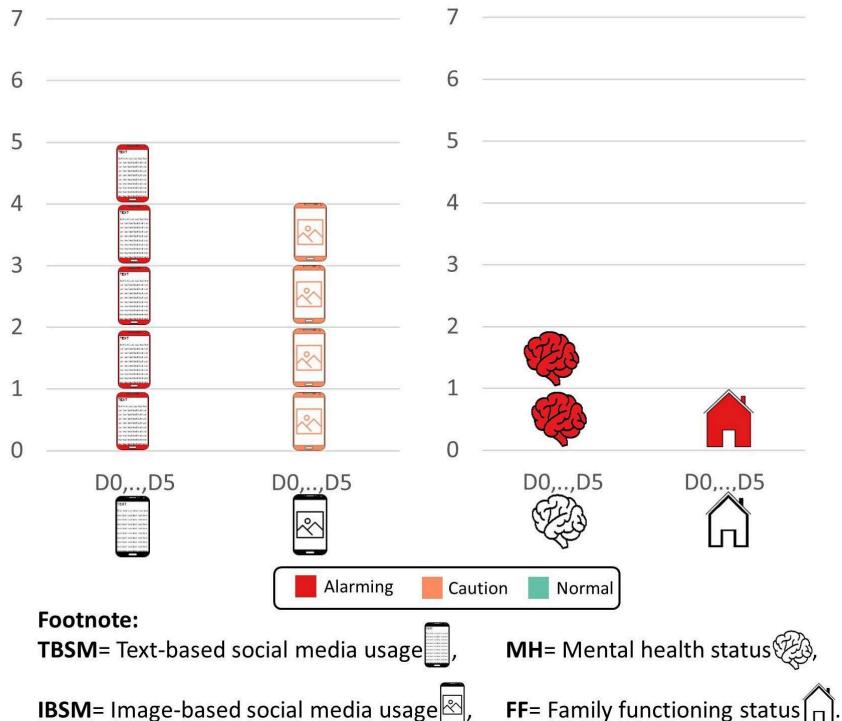
FF= Family functioning status

2- Based on the above chart label, text-based social media is represented as?

- Phone icon with an image
- House icon
- Phone icon with text

Note: The training question must be answered correctly to proceed next.

## Relationship Between Levels of Social Media Use, Mental Health, and Family Functioning



3- In the chart above, what are the numerical *Alarming* values for each individual column in different categories, where '&' represents the logical 'and' operation?

- TBSM & IBSM >4 and MH& FF <3
- TBSM & IBSM <3 while MH& FF >4
- TBSM & IBSM >3 and MH& FF >2

Note: The training question must be answered correctly to proceed next.

## Transition to Task Section:

Congratulations! You have completed the training. You are now equipped with the knowledge to confidently tackle the tasks in the next section.

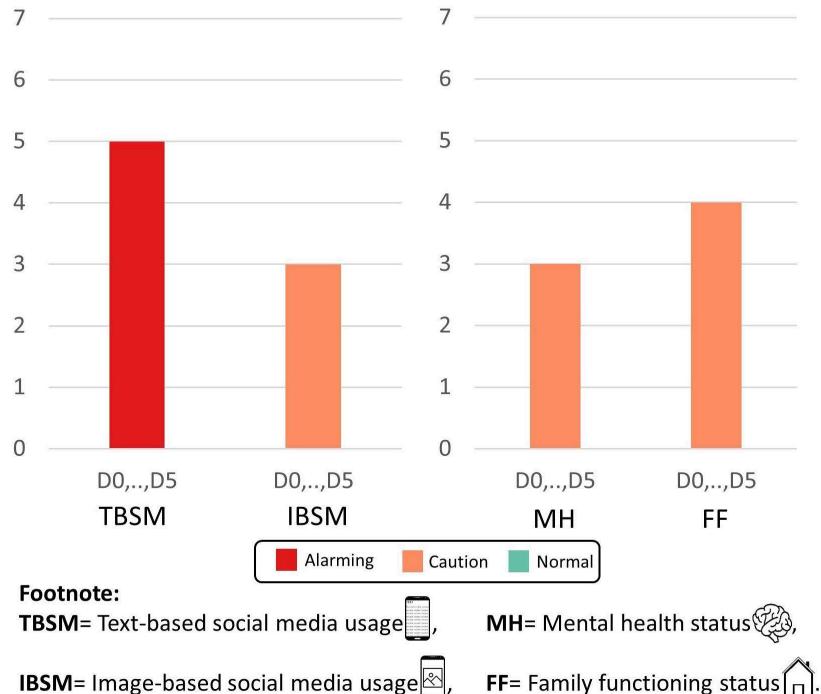
## Task Section:

Welcome to the task section. Your training has equipped you for the following tasks.

The following tasks require you to apply what you have learned.

### **Block 5, Quantitative VIS questions, Level 1 of complexity, Design 1**

## Relationship Between Levels of Social Media Use, Mental Health, and Family Functioning

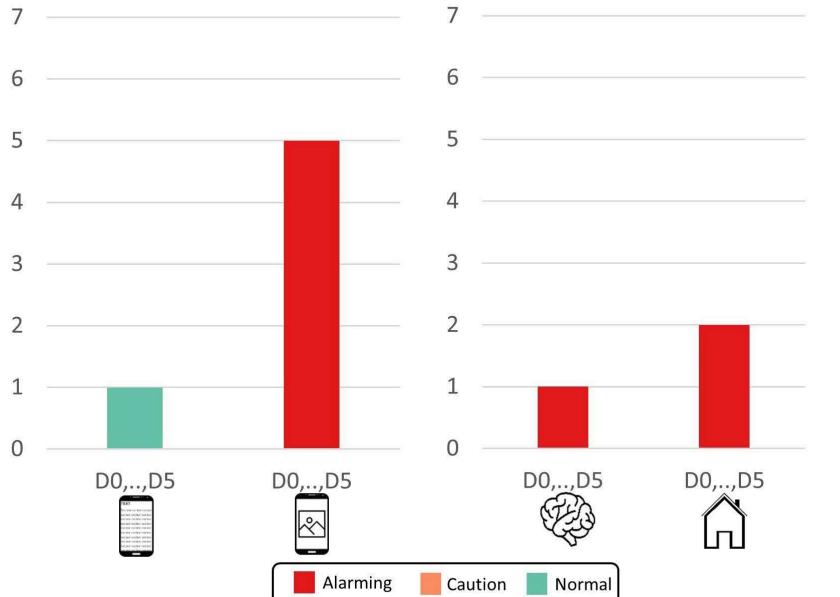


According to the above chart, is IBSM Worse, The Same, or Better than TBSM?

- IBSM is Worse than TBSM
- IBSM is The Same as TBSM
- IBSM is Better than TBSM

## Block 6, Quantitative VIS questions, Level 1 of complexity, Design 2

## Relationship Between Levels of Social Media Use, Mental Health, and Family Functioning



**Footnote:**

TBSM= Text-based social media usage ,

MH= Mental health status .

IBSM= Image-based social media usage ,

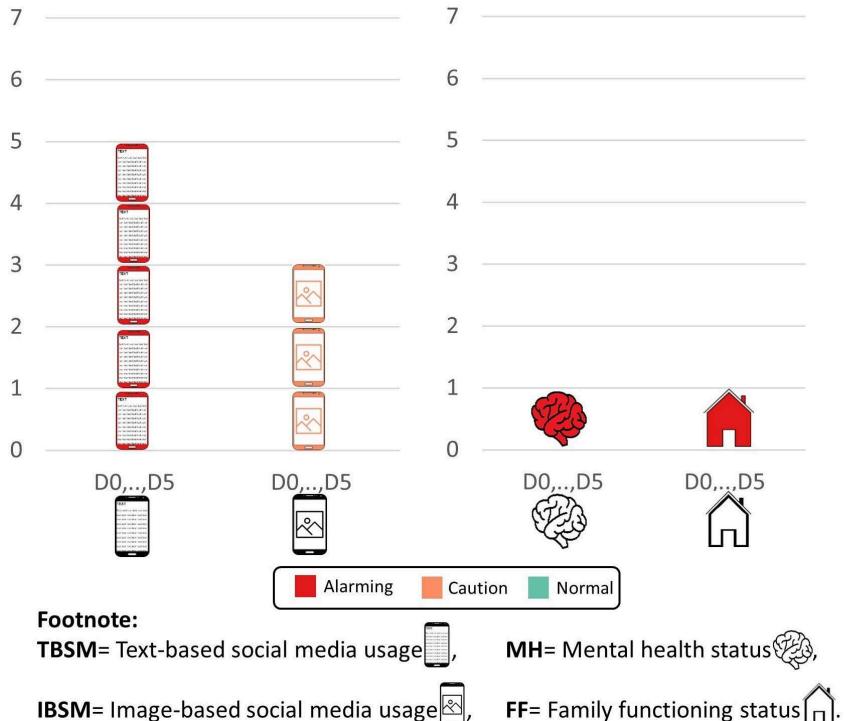
FF= Family functioning status .

According to the above chart, is IBSM Worse, The Same, or Better than TBSM?

- IBSM is Worse than TBSM
- IBSM is The Same as TBSM
- IBSM is Better than TBSM

## Block 7, Quantitative VIS questions, Level 1 of complexity, Design 3

## Relationship Between Levels of Social Media Use, Mental Health, and Family Functioning

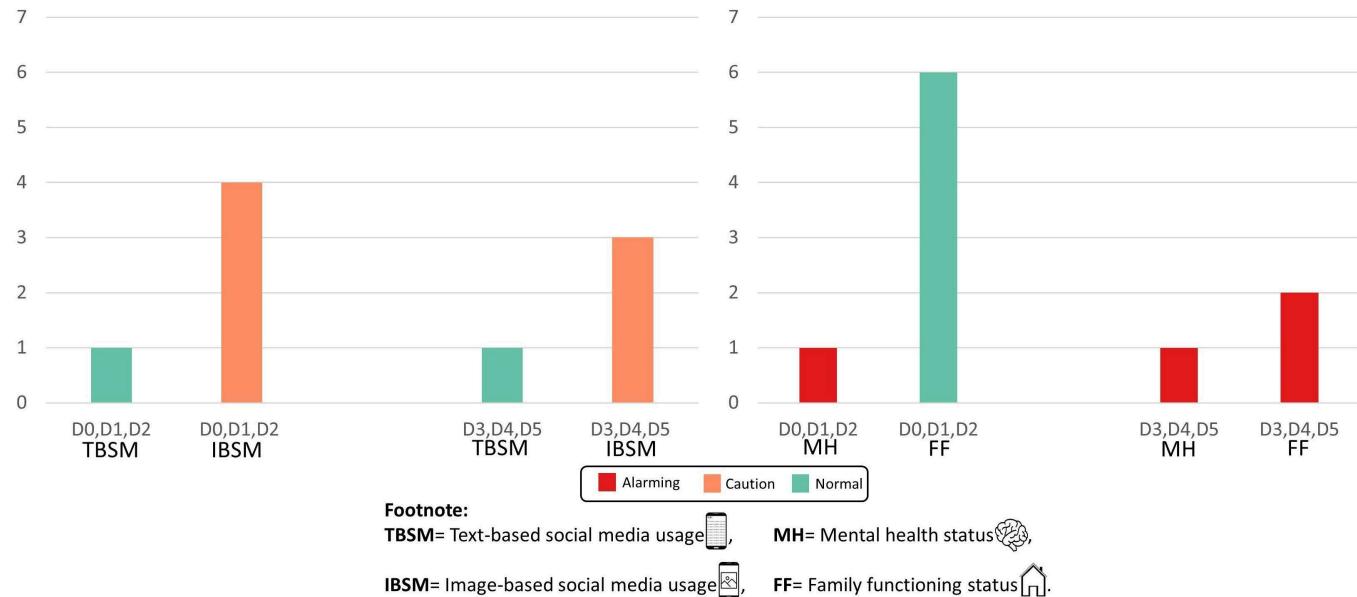


According to the above chart, is IBSM Worse, The Same, or Better than TBSM?

- IBSM is Worse than TBSM
- IBSM is The Same as TBSM
- IBSM is Better than TBSM

## Block 8, Quantitative VIS questions, Level 2 of complexity, Design 1

### Relationship Between Levels of Social Media Use, Mental Health, and Family Functioning

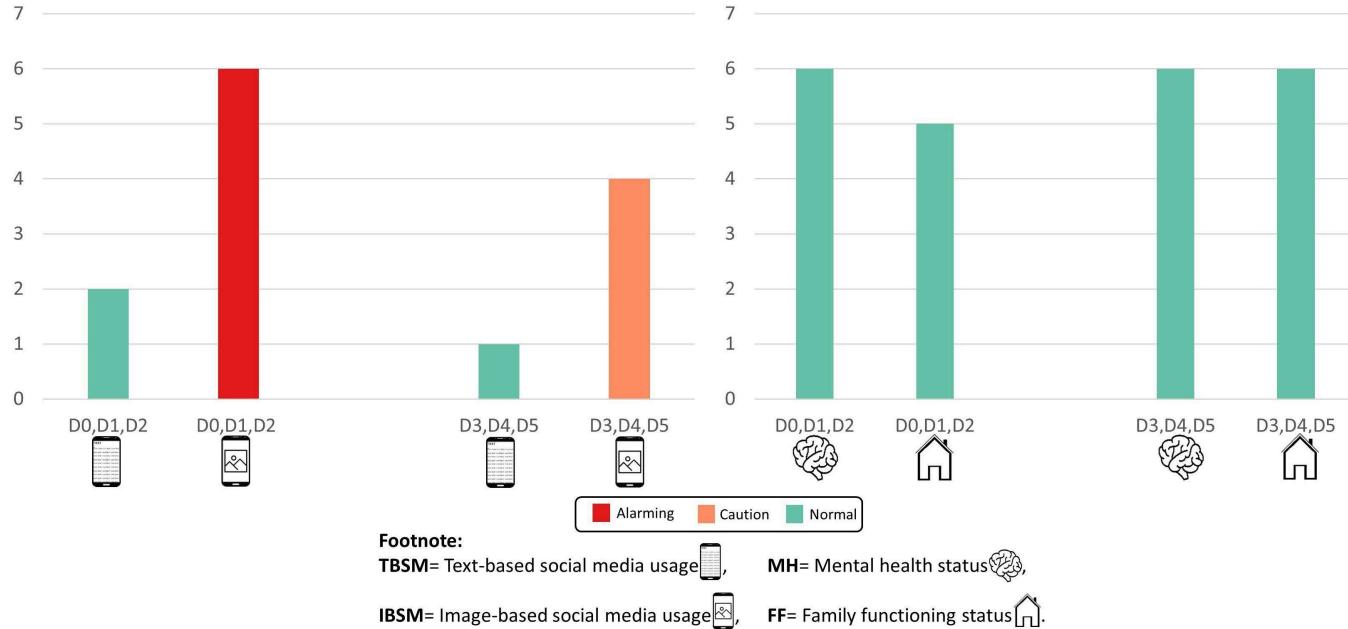


Based on the above chart, which category and what days have the Better values? The options provided to you in the format of (Category-days)

- (IBSM - D0,D1,D2) and (MH - D3,D4,D5)
- (TBSM - D3,D4,D5) and (FF - D0,D1,D2)
- (IBSM - D3,D4,D5) and (FF - D3,D4,D5)

## **Block 9, Quantitative VIS questions, Level 2 of complexity, Design 2**

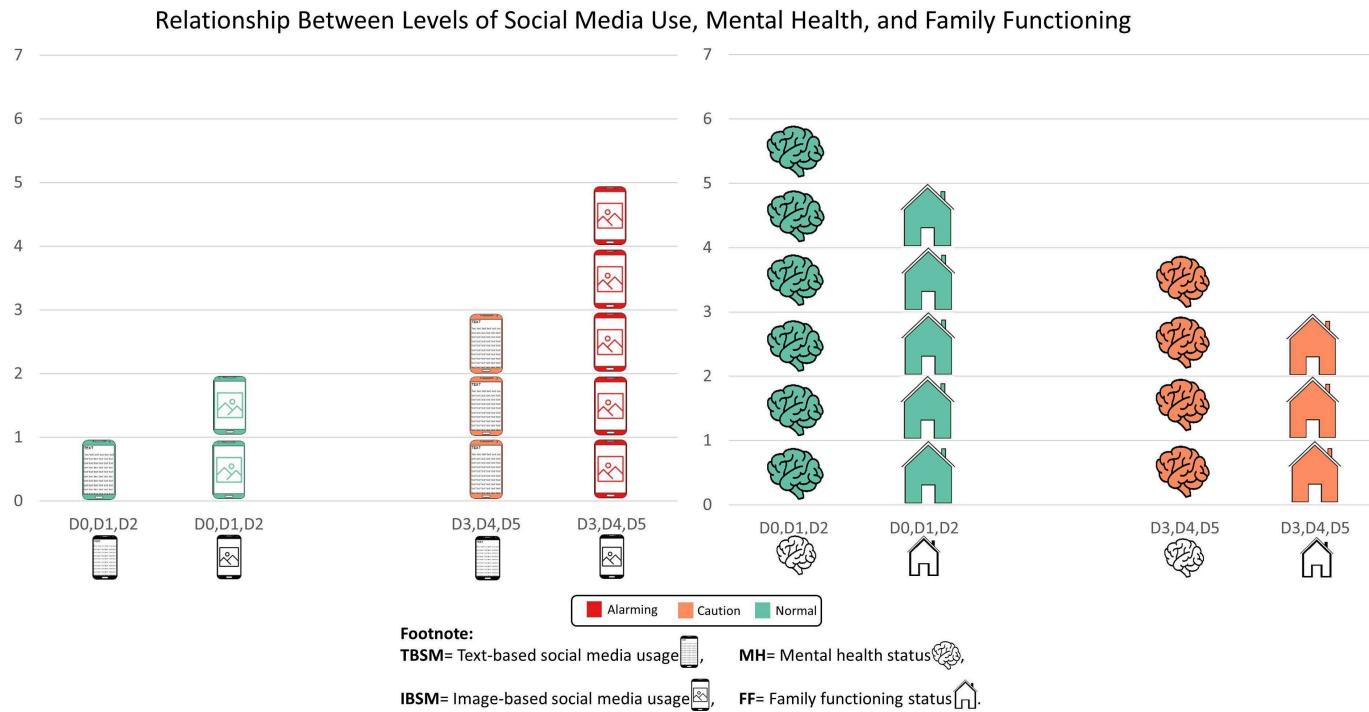
### Relationship Between Levels of Social Media Use, Mental Health, and Family Functioning



Based on the above chart, which category and what days have the Worse values? The options provided to you in the format of (Category-days)

- (IBSM - D3,D4,D5) and (FF - D0,D1,D2)
- (IBSM - D0,D1,D2) and (MH - D3,D4,D5)
- (TBSM - D0,D1,D2) and (FF - D3,D4,D5)

## **Block 10, Quantitative VIS questions, Level 2 of complexity, Design 3**

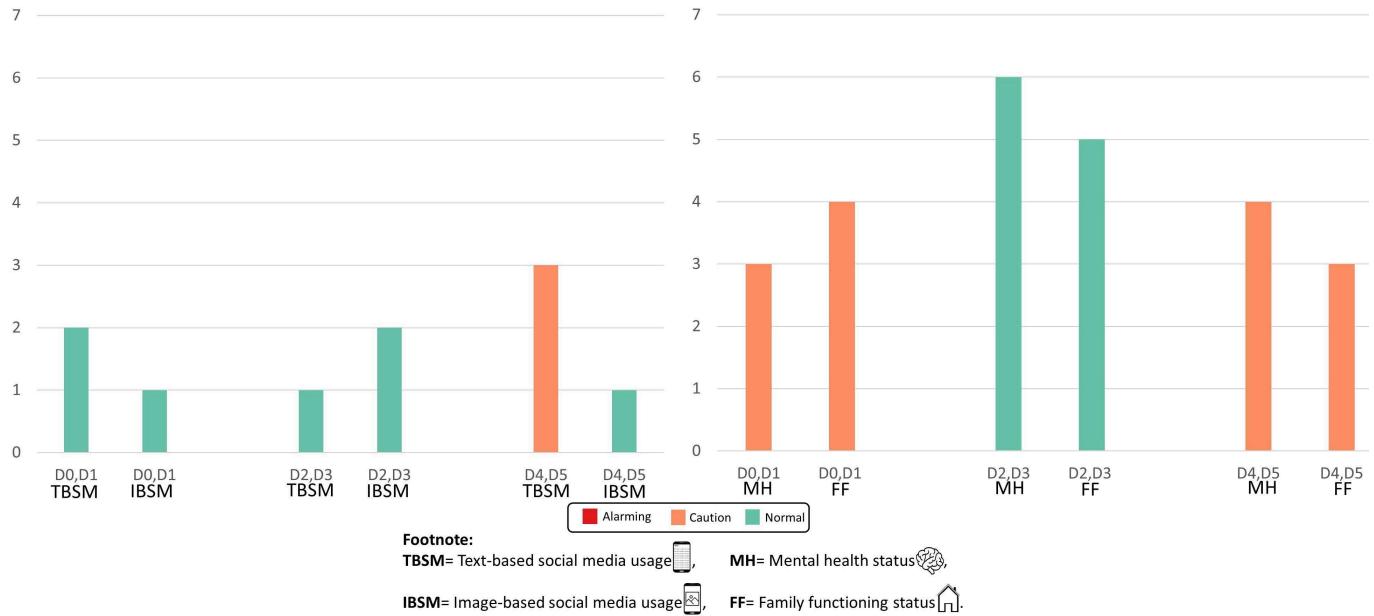


Based on the above chart, which category and what days have the Worse values? The options provided to you in the format of (Category-days)

- (TBSM - D3,D4,D5) and (FF - D0,D1,D2)
- (IBSM - D0,D1,D2) and (MH - D3,D4,D5)
- (IBSM - D3,D4,D5) and (FF - D3,D4,D5)

## Block 11, Quantitative VIS questions, Level 3 of complexity, Design 1

## Relationship Between Levels of Social Media Use, Mental Health, and Family Functioning

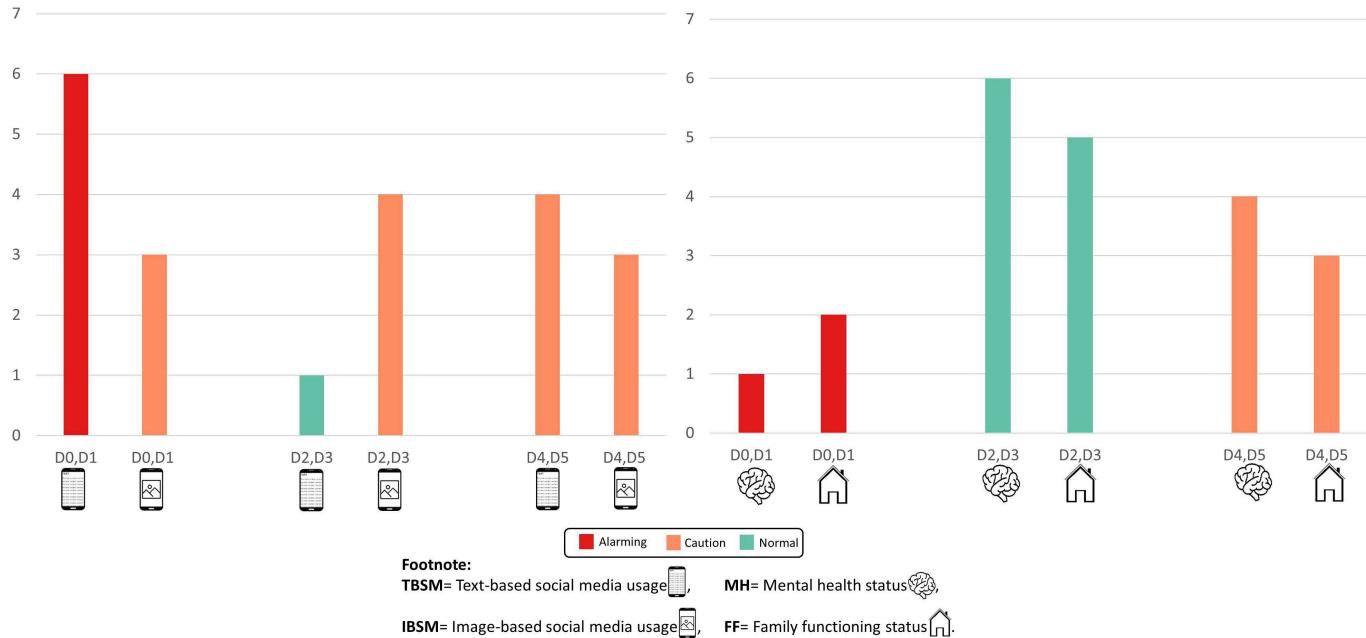


In the chart above, what are the numerical *Normal* values for each individual column in different categories, where '&' represents the logical 'and' operation?

- TBSM & IBSM >6 and MH& FF >4
- TBSM & IBSM <3 and MH& FF >4
- TBSM & IBSM <3 and MH& FF >2

## Block 12, Quantitative VIS questions, Level 3 of complexity, Design 2

## Relationship Between Levels of Social Media Use, Mental Health, and Family Functioning

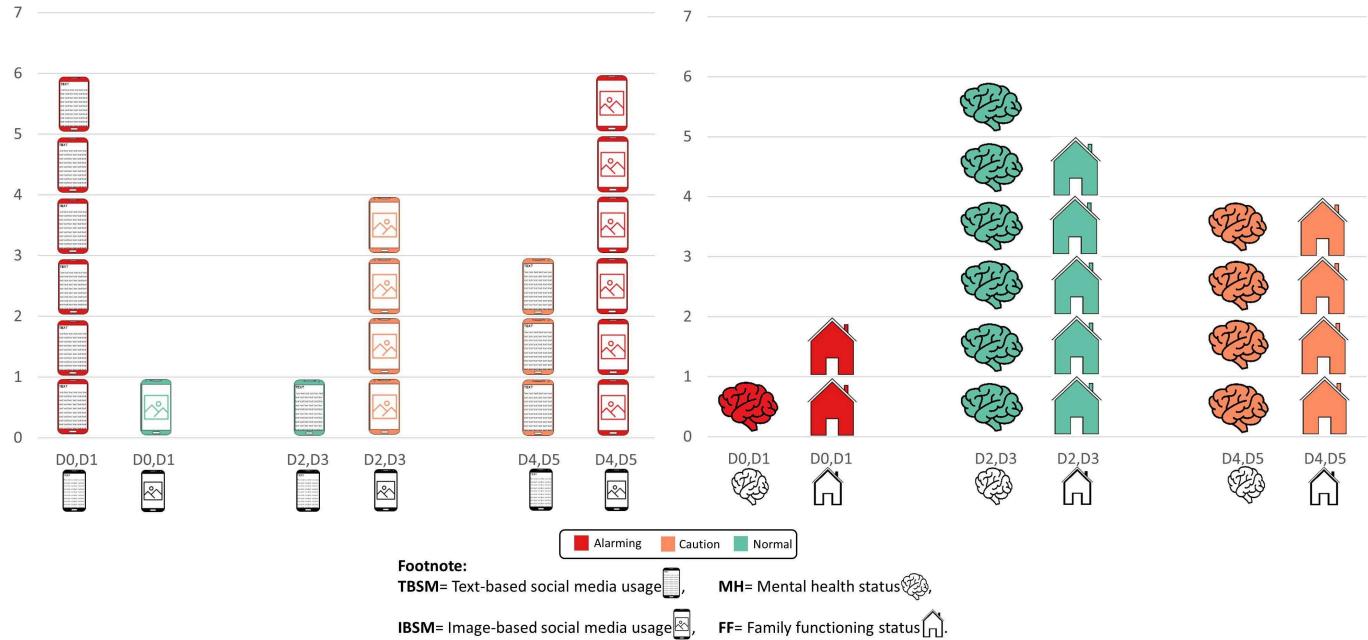


In the chart above, what are the numerical *Caution* values for each individual column in different categories, where '&' represents the logical 'and' operation?

- TBSM & IBSM >2 and MH& FF <5
- TBSM & IBSM <1 and MH& FF <5
- TBSM & IBSM >2 and MH& FF <1

## Block 13, Quantitative VIS questions, Level 3 of complexity, Design 3

## Relationship Between Levels of Social Media Use, Mental Health, and Family Functioning

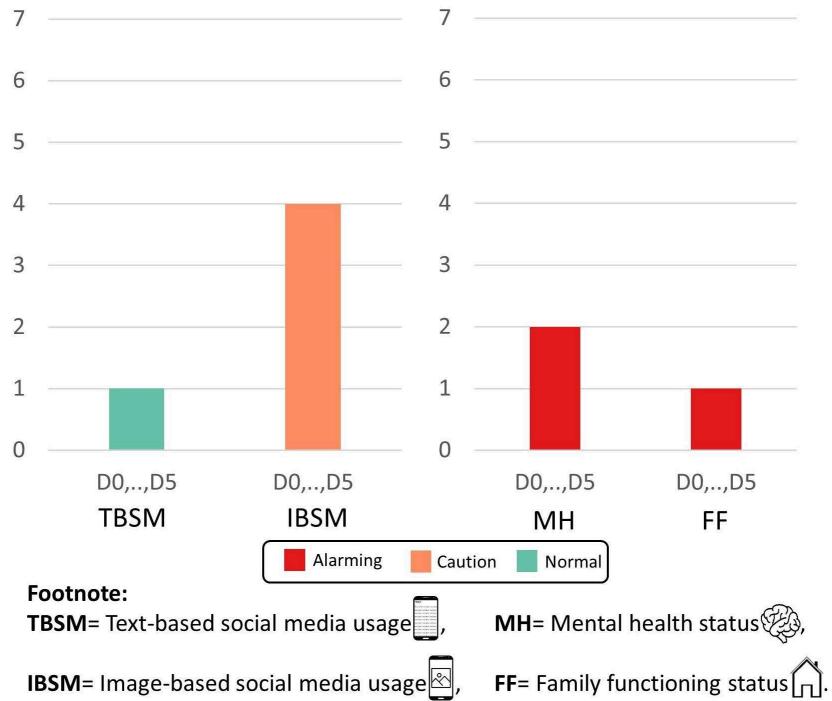


In the chart above, what are the numerical *Alarming* values for each individual column in different categories, where '&' represents the logical 'and' operation?

- TBSM & IBSM >4 and MH& FF < 6
- TBSM & IBSM < 3 and MH& FF < 3
- TBSM & IBSM >4 and MH& FF < 3

## Block 14, Repetition 1, Level 1 of complexity, Design 1

## Relationship Between Levels of Social Media Use, Mental Health, and Family Functioning

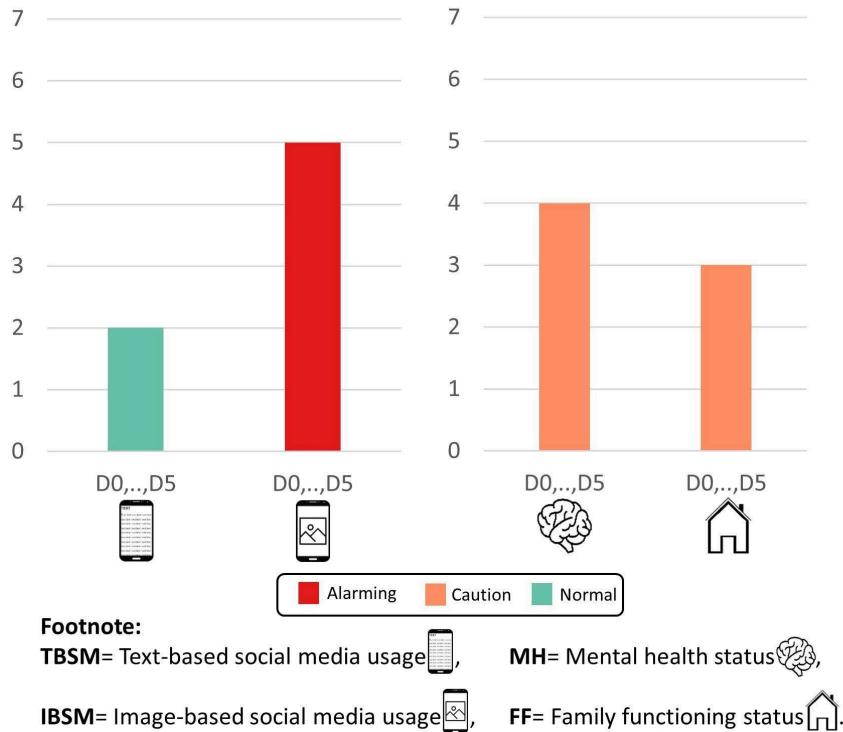


According to the above chart, is IBSM Worse, The Same, or Better than TBSM?

- IBSM is Worse than TBSM
- IBSM is The Same as TBSM
- IBSM is Better than TBSM

## Block 15, Repetition 1, Level 1 of complexity, Design 2

## Relationship Between Levels of Social Media Use, Mental Health, and Family Functioning

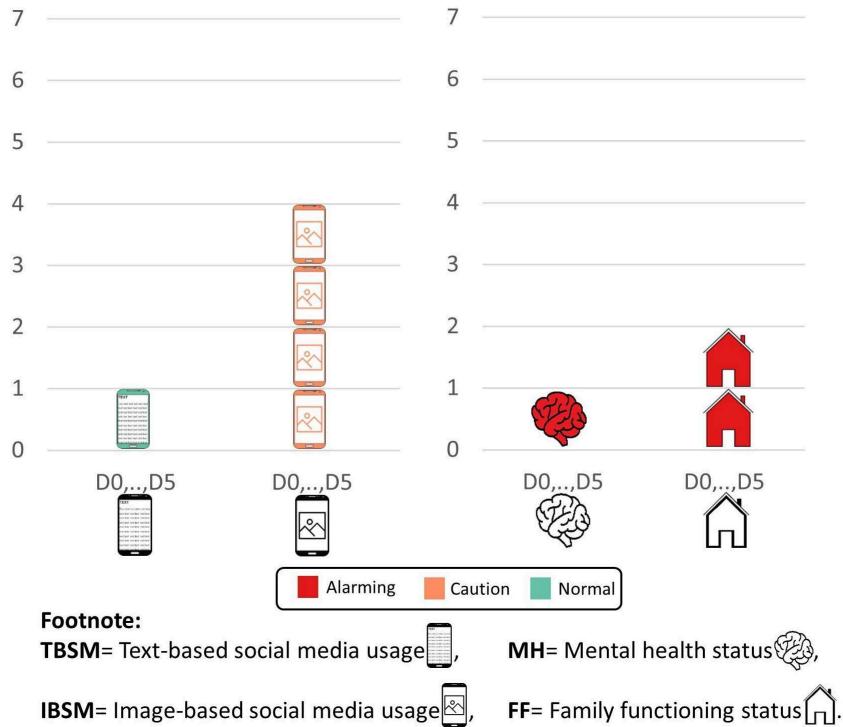


According to the above chart, is IBSM Worse, The Same, or Better than TBSM?

- IBSM is Worse than TBSM
- IBSM is The Same as TBSM
- IBSM is Better than TBSM

## Block 16, Repetition 1, Level 1 of complexity, Design 3

## Relationship Between Levels of Social Media Use, Mental Health, and Family Functioning

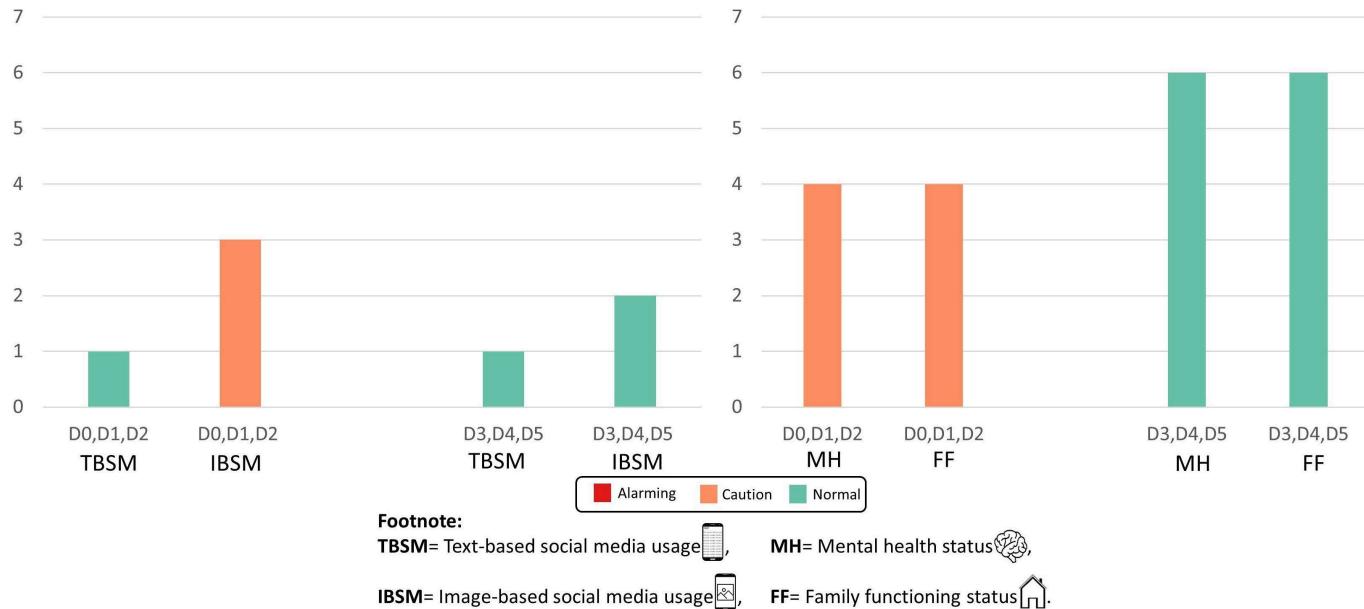


According to the above chart, is IBSM Worse, The Same, or Better than TBSM?

- IBSM is Worse than TBSM
- IBSM is The Same as TBSM
- IBSM is Better than TBSM

## Block 17, Repetition 1, Level 2 of complexity, Design 1

### Relationship Between Levels of Social Media Use, Mental Health, and Family Functioning

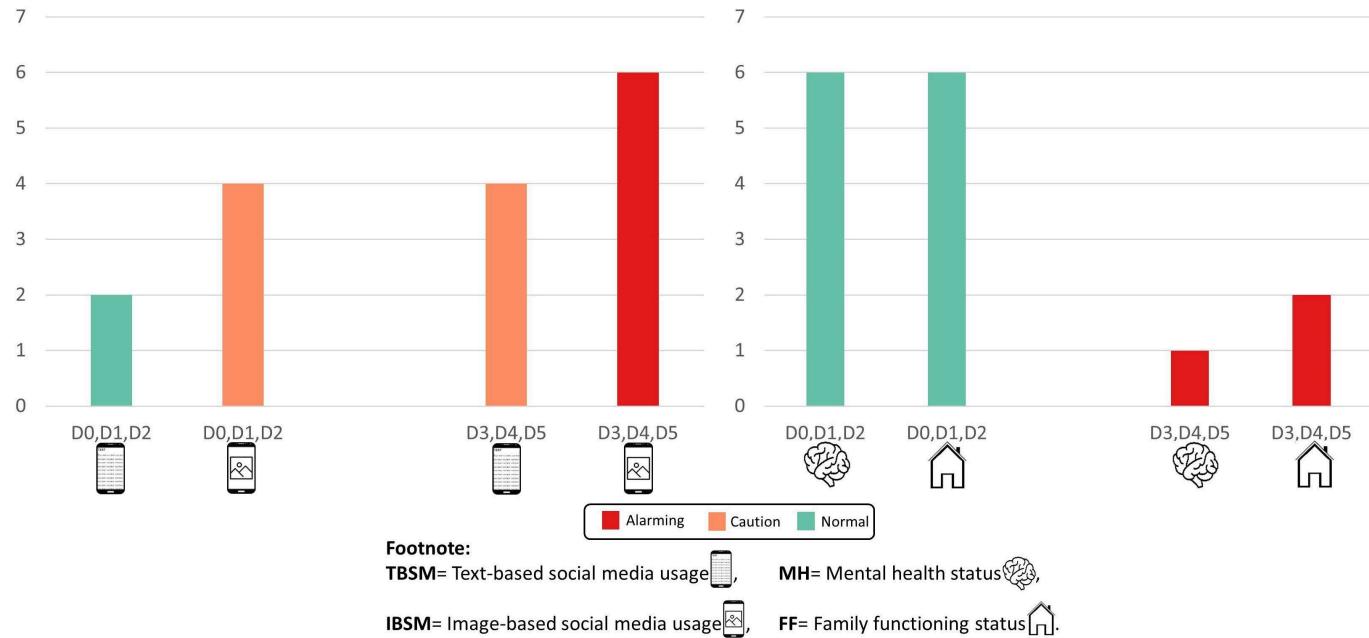


Based on the above chart, which category and what days have the Worse values? The options provided to you in the format of (Category-days)

- (TBSM - D3,D4,D5) and (FF - D3,D4,D5)
- (IBSM - D0,D1,D2) and (MH - D0,D1,D2)
- (TBSM - D3,D4,D5) and (MH - D3,D4,D5)

## Block 18, Repetition 1, Level 2 of complexity, Design 2

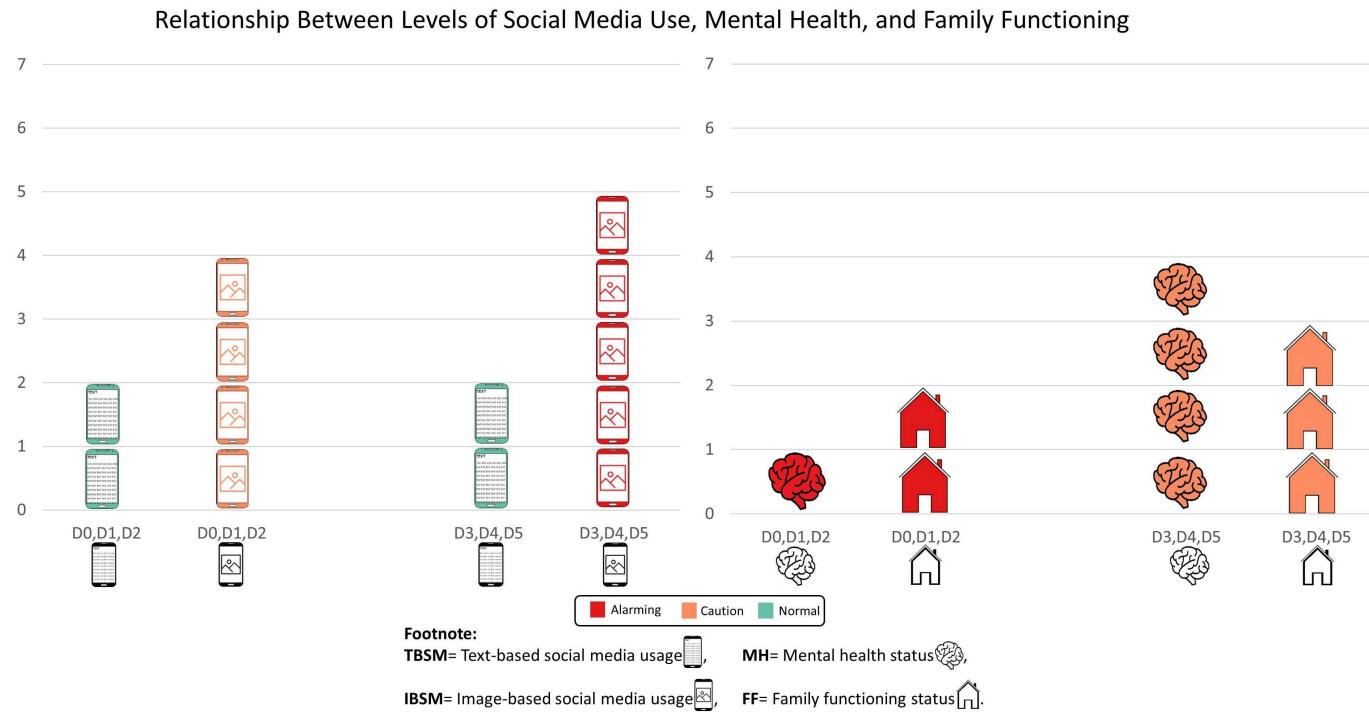
### Relationship Between Levels of Social Media Use, Mental Health, and Family Functioning



Based on the above chart, which category and what days have the Better values? The options provided to you in the format of (Category-days)

- (TBSM - D3,D4,D5) and (MH - D3,D4,D5)
- (IBSM - D3,D4,D5) and (MH - D3,D4,D5)
- (TBSM - D0,D1,D2) and (FF - D0,D1,D2)

## **Block 19, Repetition 1, Level 2 of complexity, Design 3**

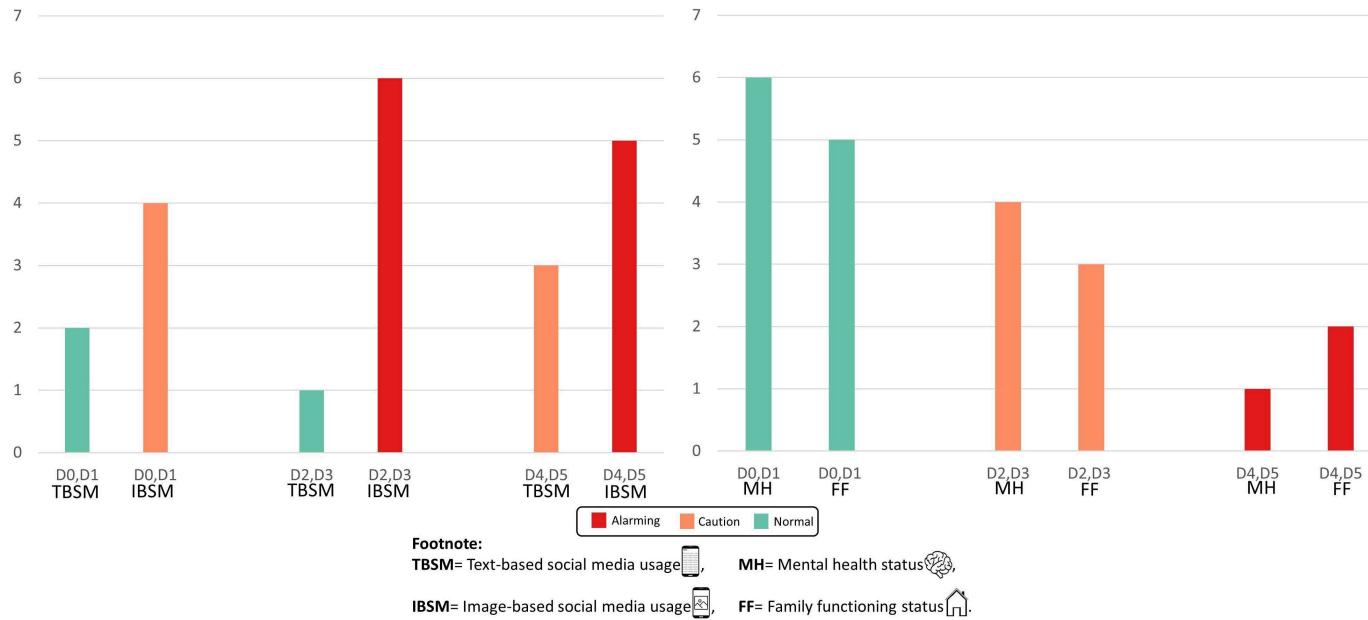


Based on the above chart, which category and what days have the Worse values? The options provided to you in the format of (Category-days)

- (IBSM - D3,D4,D5) and (FF - D0,D1,D2)
- (IBSM - D0,D1,D2) and (MH - D3,D4,D5)
- (TBSM - D0,D1,D2) and (FF - D3,D4,D5)

## Block 20, Repetition 1, Level 3 of complexity, Design 1

## Relationship Between Levels of Social Media Use, Mental Health, and Family Functioning

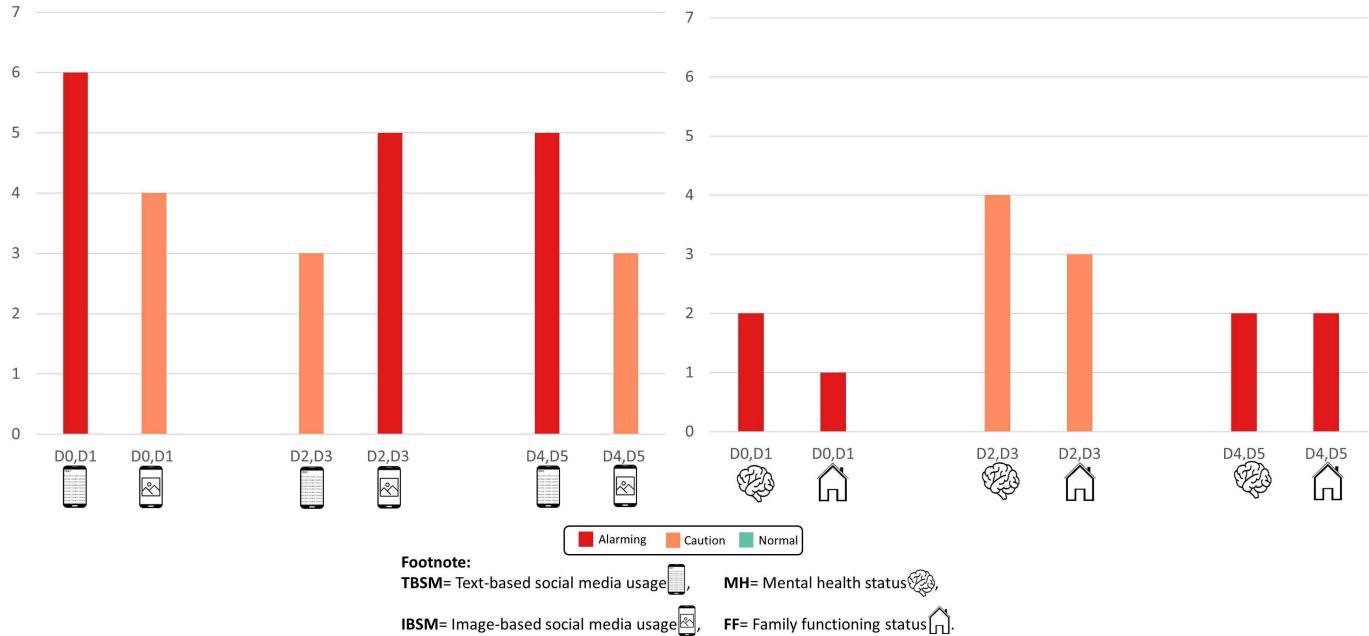


In the chart above, what are the numerical *Normal* values for each individual column in different categories, where '&' represents the logical 'and' operation?

- TBSM & IBSM >6 and MH& FF >4
- TBSM & IBSM <3 and MH& FF >4
- TBSM & IBSM <3 and MH& FF >1

## Block 21, Repetition 1, Level 3 of complexity, Design 2

## Relationship Between Levels of Social Media Use, Mental Health, and Family Functioning

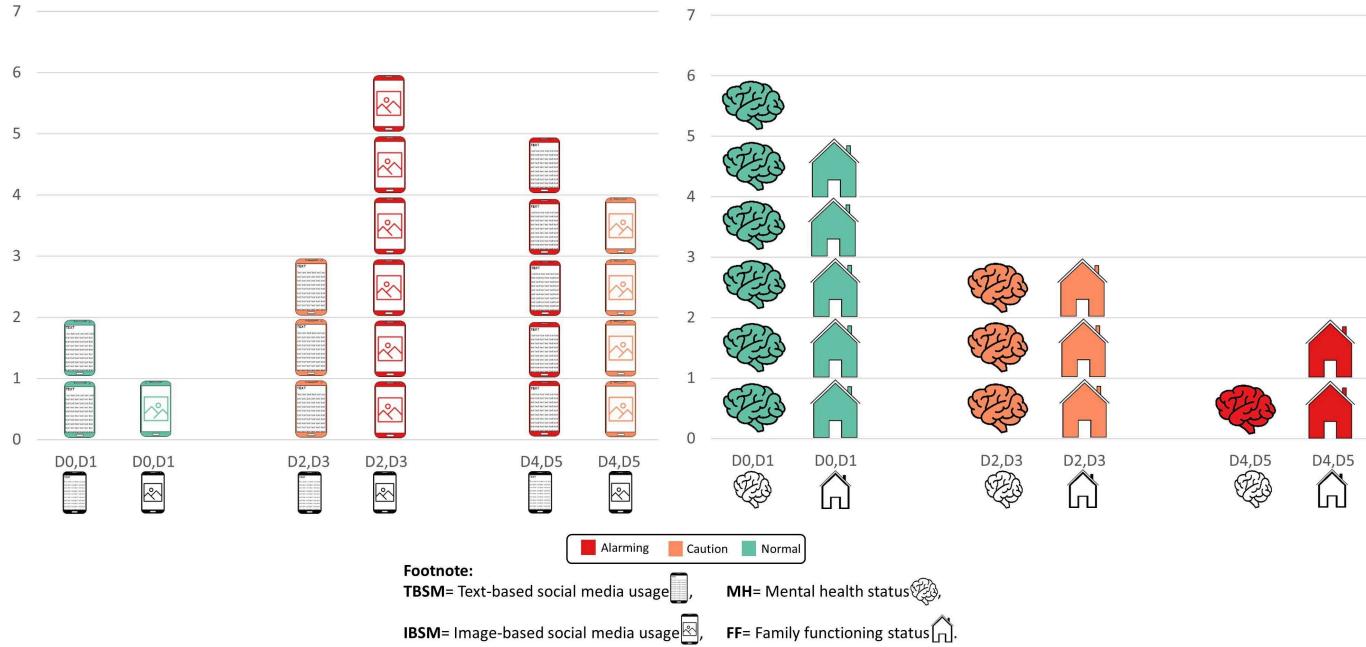


In the chart above, what are the numerical *Caution* values for each individual column in different categories, where '&' represents the logical 'and' operation?

- TBSM & IBSM >2 and MH& FF < 5
- TBSM & IBSM >2 and MH& FF > 6
- TBSM & IBSM <1 and MH& FF < 5

## Block 22, Repetition 1, Level 3 of complexity, Design 3

## Relationship Between Levels of Social Media Use, Mental Health, and Family Functioning

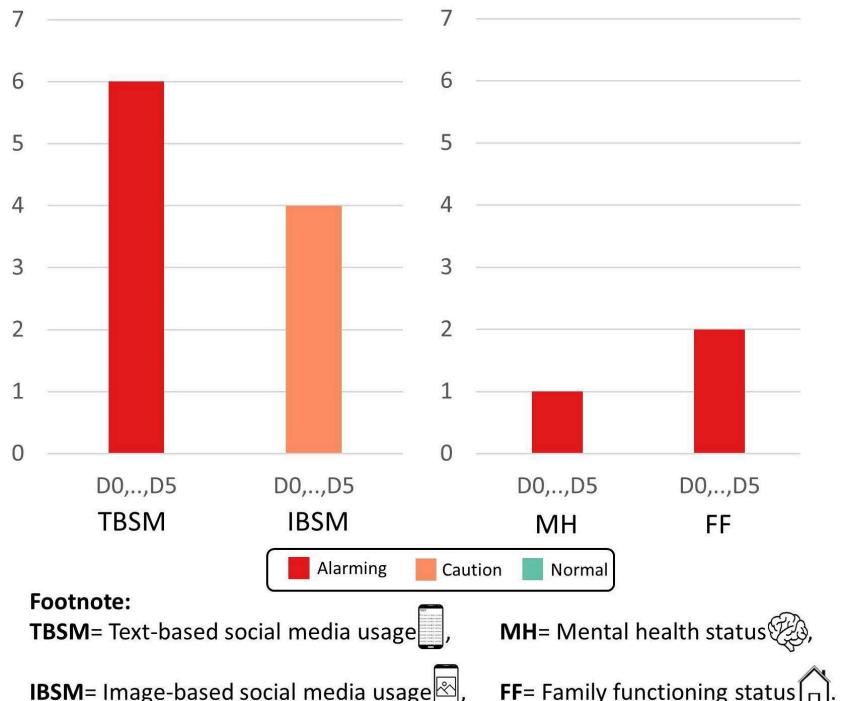


In the chart above, what are the numerical *Alarming* values for each individual column in different categories, where '&' represents the logical 'and' operation?

- TBSM & IBSM >4 and MH& FF >5
- TBSM & IBSM < 3 and MH& FF < 3
- TBSM & IBSM >4 and MH& FF < 3

## Block 23, Repetition 2, Level 1 of complexity, Design 1

## Relationship Between Levels of Social Media Use, Mental Health, and Family Functioning

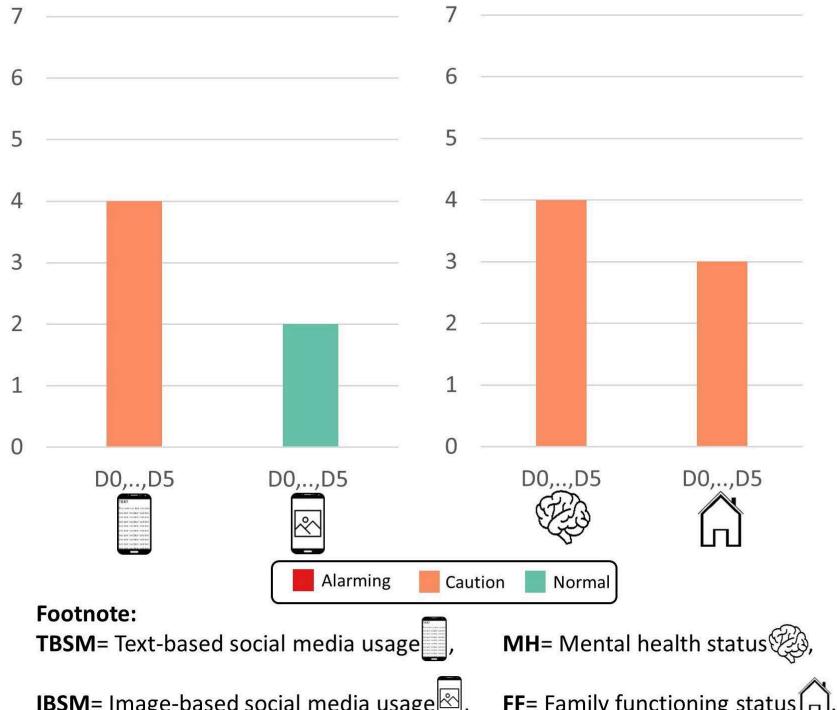


According to the above chart, is IBSM Worse, The Same, or Better than TBSM?

- IBSM is Worse than TBSM
- IBSM is The Same as TBSM
- IBSM is Better than TBSM

## Block 24, Repetition 2, Level 1 of complexity, Design 2

## Relationship Between Levels of Social Media Use, Mental Health, and Family Functioning



According to the above chart, is IBSM Worse, The Same, or Better than TBSM?

- IBSM is Worse than TBSM
- IBSM is The Same as TBSM
- IBSM is Better than TBSM

## Block 25, Repetition 2, Level 1 of complexity, Design 3

## Relationship Between Levels of Social Media Use, Mental Health, and Family Functioning

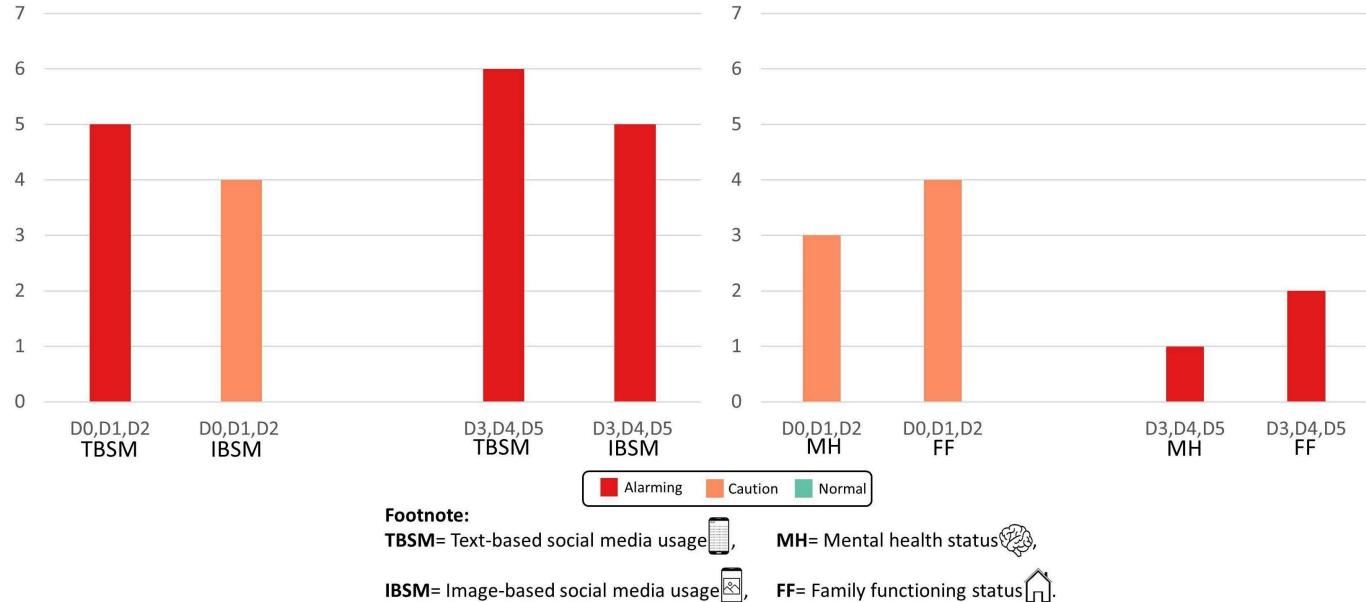


According to the above chart, is IBSM Worse, The Same, or Better than TBSM?

- IBSM is Worse than TBSM
- IBSM is The Same as TBSM
- IBSM is Better than TBSM

## Block 26, Repetition 2, Level 2 of complexity, Design 1

### Relationship Between Levels of Social Media Use, Mental Health, and Family Functioning

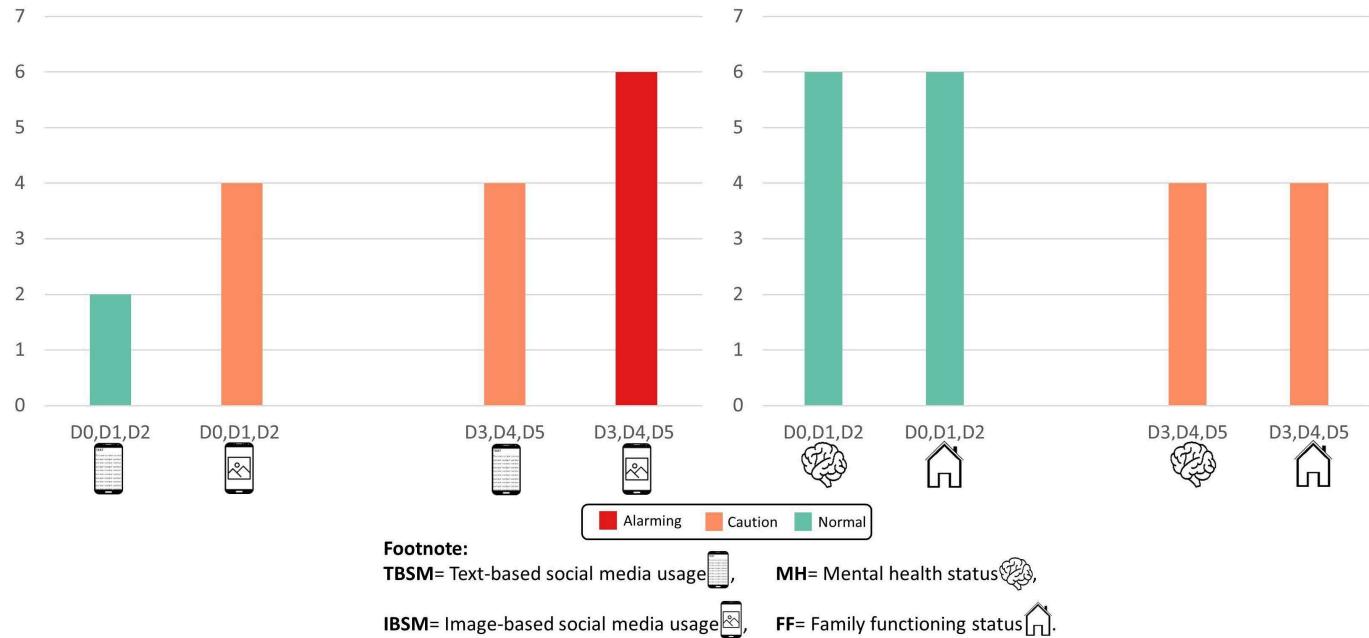


Based on the above chart, which category and what days have the Worse values? The options provided to you in the format of (Category-days)

- (TBSM - D0,D1,D2) and (FF - D0,D1,D2)
- (IBSM - D0,D1,D2) and (MH - D0,D1,D2)
- (TBSM - D3,D4,D5) and (MH - D3,D4,D5)

## **Block 27, Repetition 2, Level 2 of complexity, Design 2**

### Relationship Between Levels of Social Media Use, Mental Health, and Family Functioning

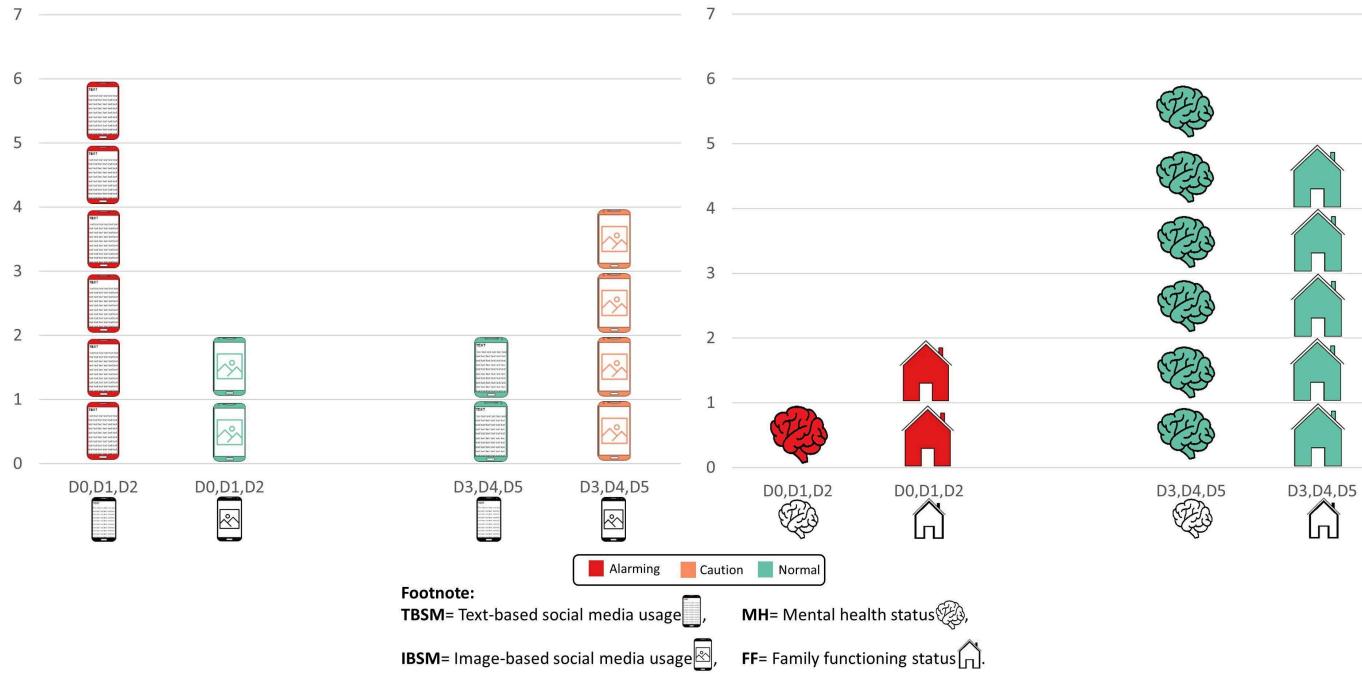


Based on the above chart, which category and what days have the Better values? The options provided to you in the format of (Category-days)

- (IBSM - D3,D4,D5) and (FF - D0,D1,D2)
- (TBSM - D0,D1,D2) and (FF - D3,D4,D5)
- (TBSM - D0,D1,D2) and (FF - D0,D1,D2)

## **Block 28, Repetition 2, Level 2 of complexity, Design 3**

### Relationship Between Levels of Social Media Use, Mental Health, and Family Functioning

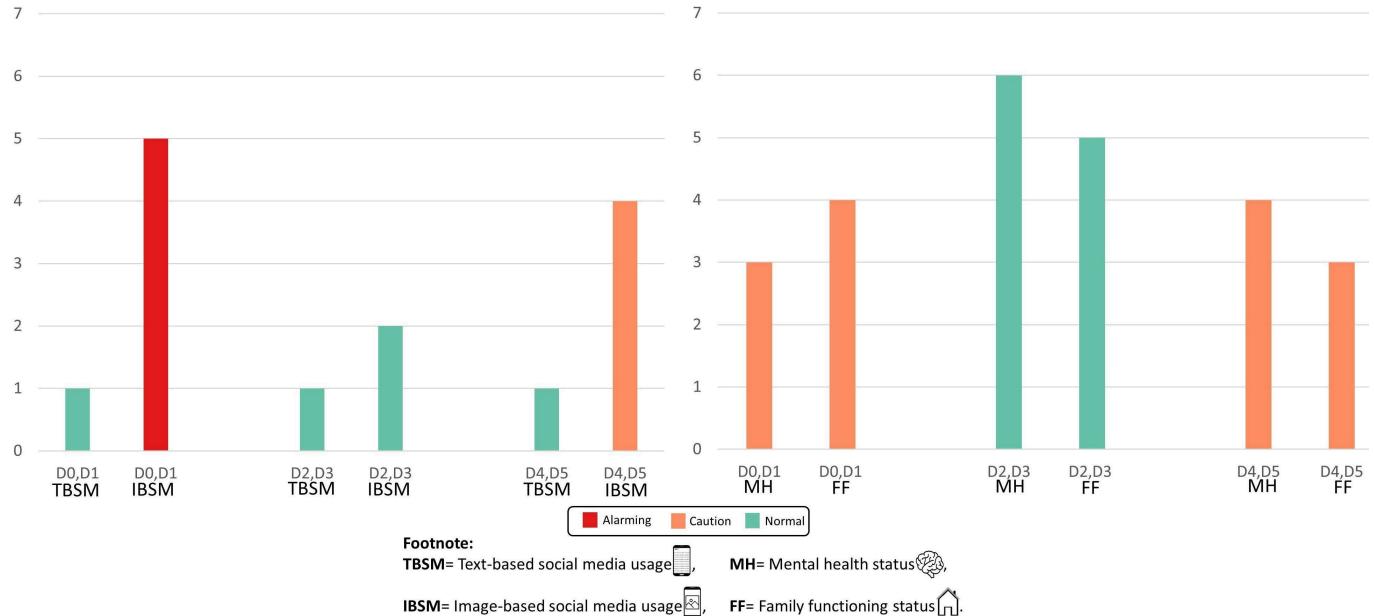


Based on the above chart, which category and what days have the Worse values? The options provided to you in the format of (Category-days)

- (TBSM - D0,D1,D2) and (MH - D0,D1,D2)
- (IBSM - D0,D1,D2) and (MH - D3,D4,D5)
- (IBSM - D3,D4,D5) and (MH - D3,D4,D5)

## **Block 29, Repetition 2, Level 3 of complexity, Design 1**

## Relationship Between Levels of Social Media Use, Mental Health, and Family Functioning

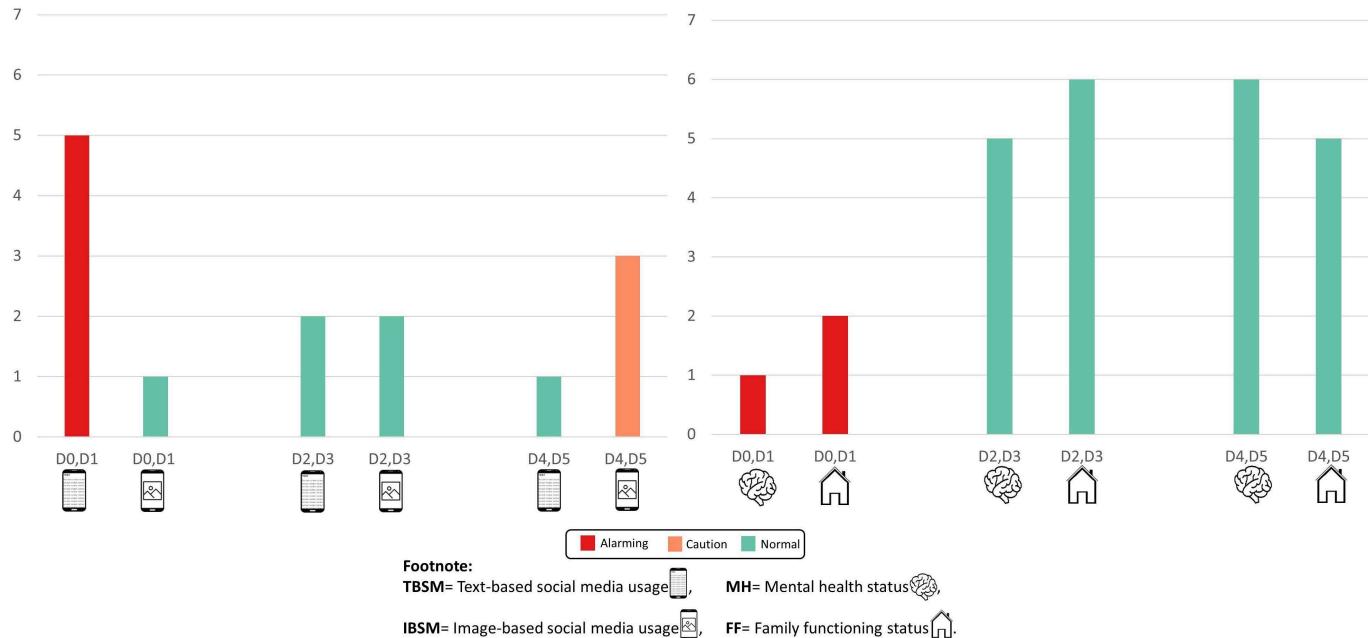


In the chart above, what are the numerical *Normal* values for each individual column in different categories, where '&' represents the logical 'and' operation?

- TBSM & IBSM >6 and MH& FF >4
- TBSM & IBSM <3 and MH& FF >4
- TBSM & IBSM <3 and MH& FF <2

## Block 30, Repetition 2, Level 3 of complexity, Design 2

## Relationship Between Levels of Social Media Use, Mental Health, and Family Functioning

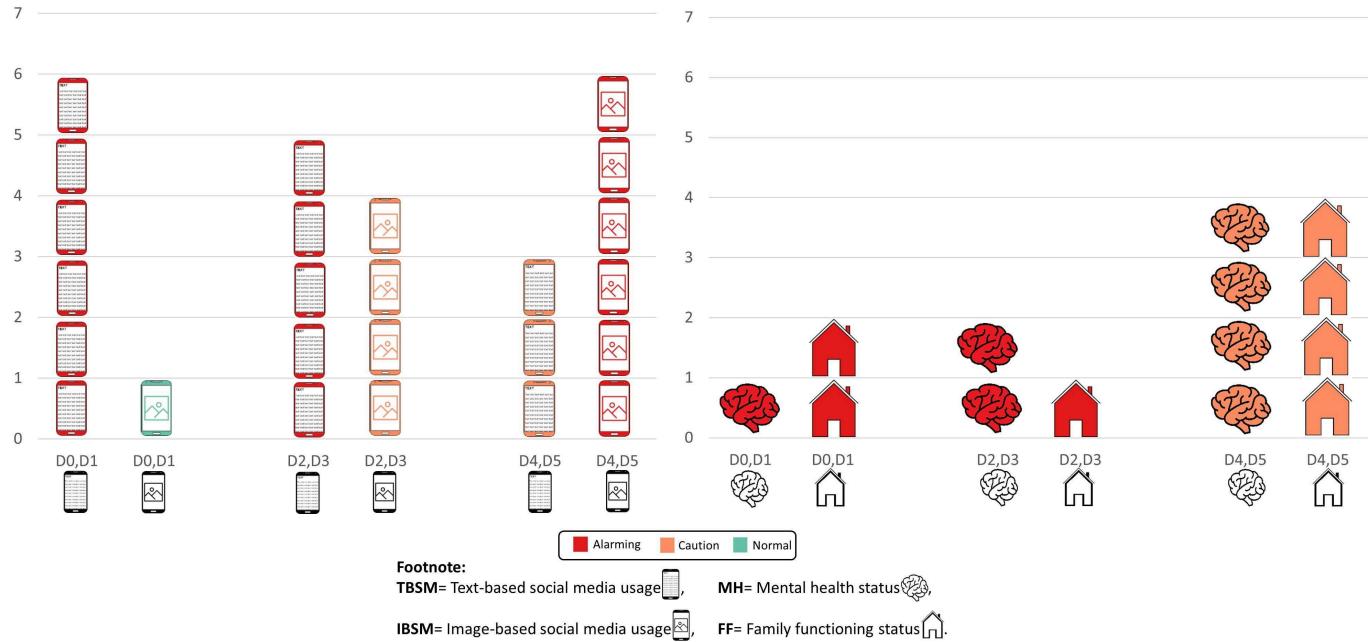


In the chart above, what are the numerical *Alarming* values for each individual column in different categories, where '&' represents the logical 'and' operation?

- TBSM & IBSM >4 and MH& FF <3
- TBSM & IBSM <3 and MH& FF <3
- TBSM & IBSM >4 and MH& FF >6

## Block 31, Repetition 2, Level 3 of complexity, Design 3

### Relationship Between Levels of Social Media Use, Mental Health, and Family Functioning



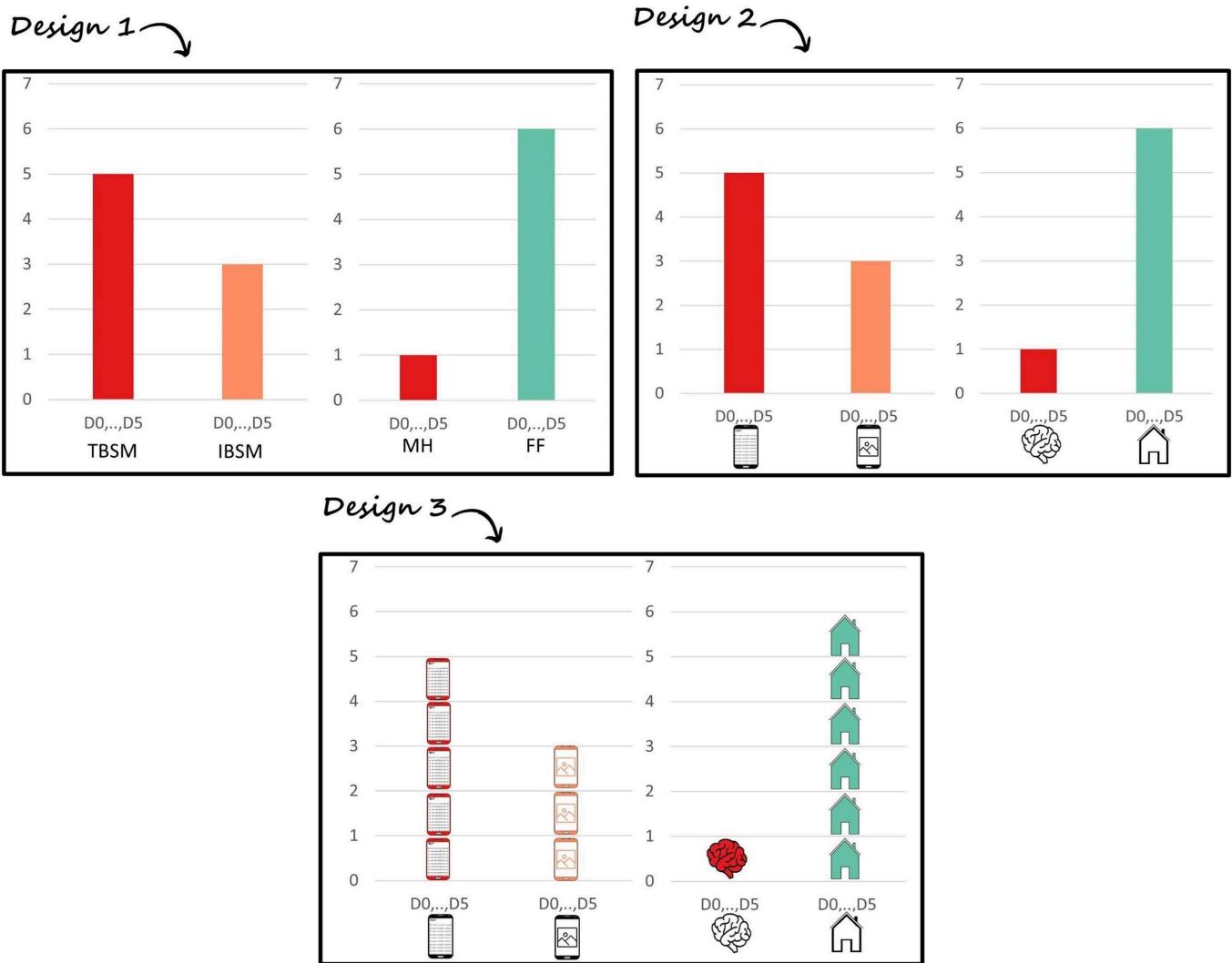
In the chart above, what are the numerical *Caution* values for each individual column in different categories, where '&' represents the logical 'and' operation?

- TBSM & IBSM >2 and MH& FF < 5
- TBSM & IBSM < 2 and MH& FF< 5
- TBSM & IBSM >2 and MH& FF < 2

## Block 32, Qualitative post-VIS questions

### Last Section:

In this section we ask you some questions to evaluate the chart designs.



Based on the charts above answer the following:

Design 1

Design 2

Design 3

None

Which design is your favorite?

Design 1

Design 2

Design 3

None

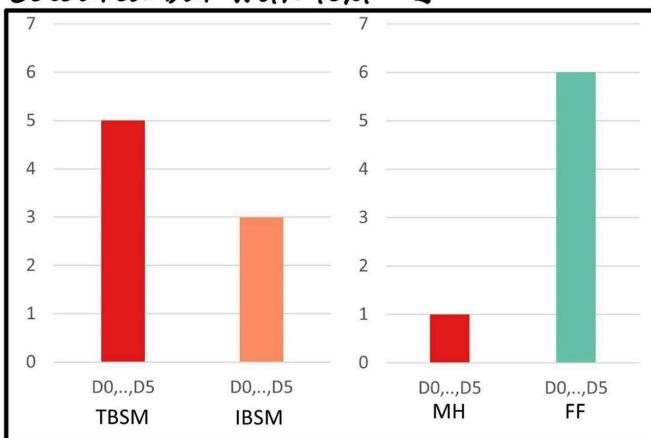
Which design is easier to understand?

Which is the most appealing design?

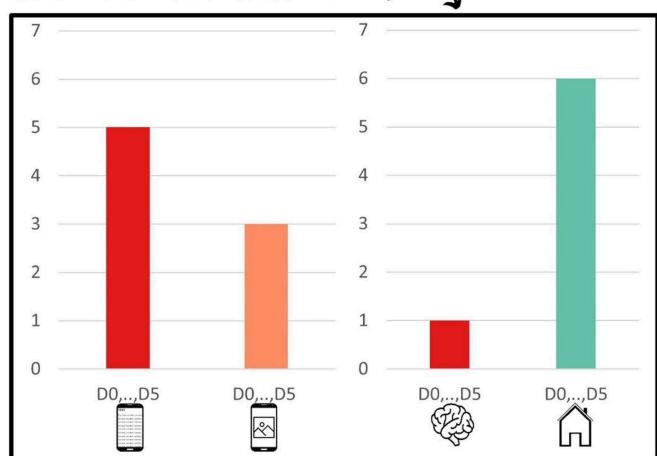
Which design is most memorable?

Which design do you think may trigger behavioural change?

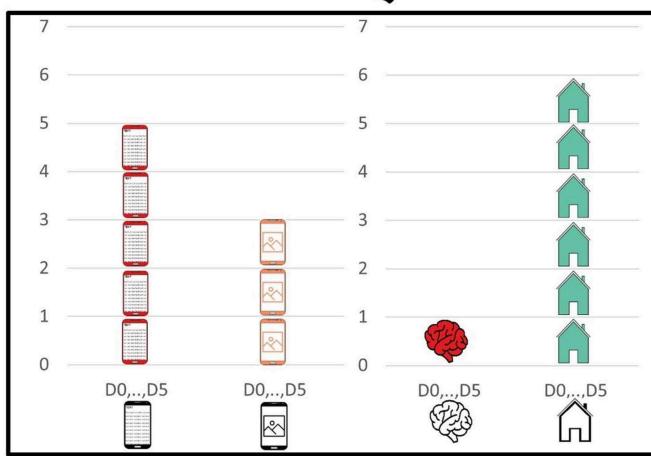
Coloured bar with text ↗



Coloured bar with icons ↗



Icons bar with icons ↗



Which specific feature did you rely on the most when answering questions in the study?

- Coloured bar with text
- Coloured bar with icons
- Icons bar with icons
- Other (please specify)

What specific suggestions or feedback do you have to improve our study?

### **Block 33, confirmation of participation**

Thank you for taking part in this survey. If you would like to verify your participation in this study with prolific, please copy the following code:

CJ4QZVXN

