# Substitutions

Animation Pro is a 2D animation App.  When you create a figure in Animation Pro, it is created in two dimensions and, as a result, it can only be rotated around its Z-axis (imagine the Z-axis as a line coming directly out of your iPad screen).

So if you wish to make a figure rotate, for example, around its Y-Axis (i.e. appear to turn to the left or to the right) then you'll need to create different 'versions' of that figure and **substitute** them into your animation (see right).

Fortunately, Animation Pro has a few tricks up its sleeve to make this a little easier for you.
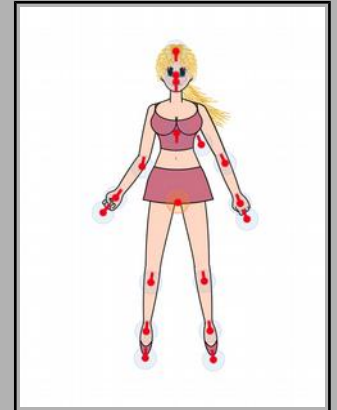
## TOPICS

**Creating Substitutions**
    Onion Skin
    Saving a Substitution

**Using Substitutes in an Animation**
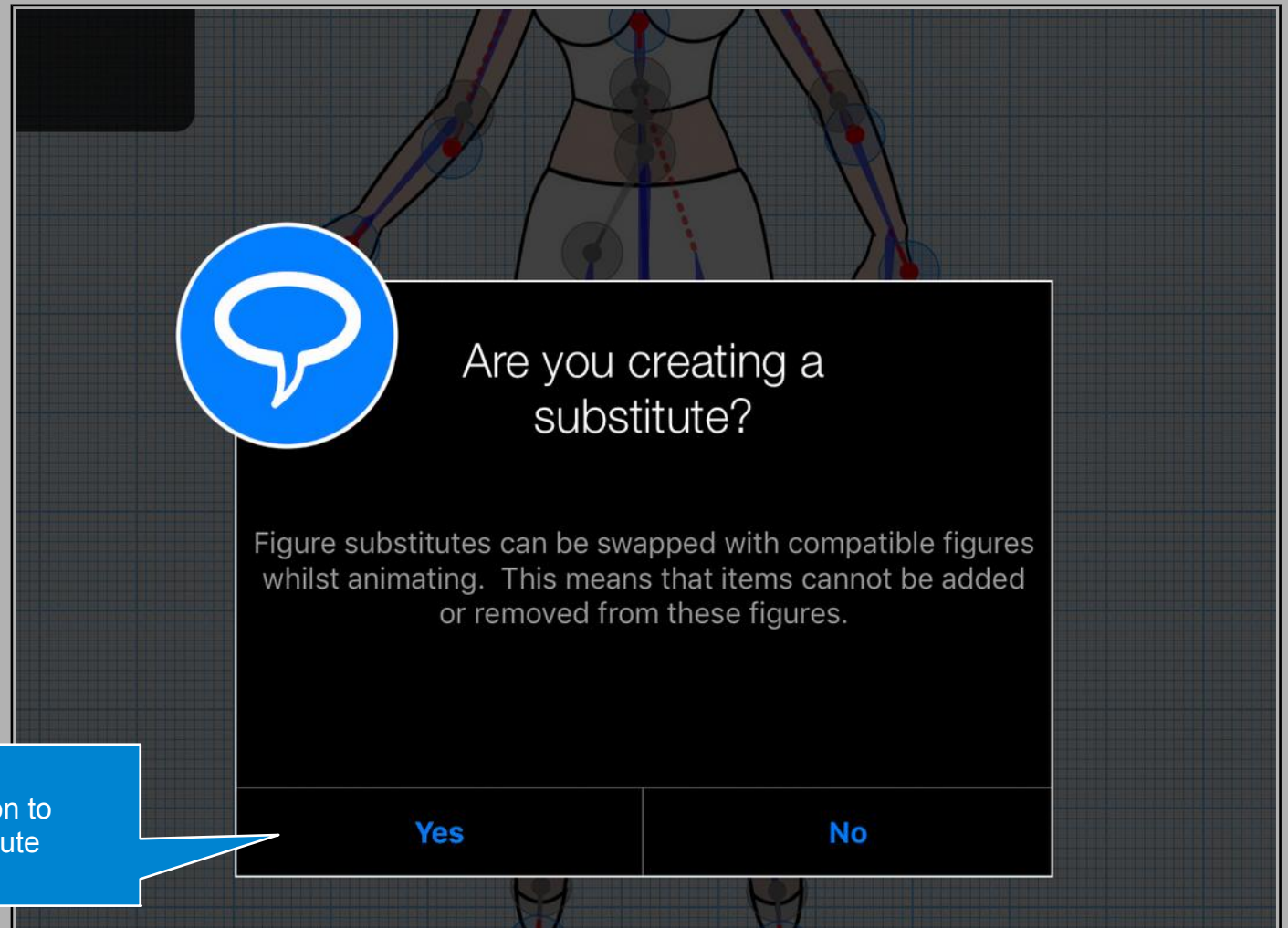
**Important Considerations**

# Creating Substitutes

OK, so what's the big deal here?  Why not simply create another figure and swap it whilst animating?  Well, that's certainly possible, but Animation Pro won't know that they're actually the same figure.  So if the figure is in the process of changing colour, for example, Animation Pro won't be able to create 'tweens' for the transition.  Furthermore, certain adjustments made to the original figure, such as colours and tints, won't be automatically carried across to the new figure.  In other words, there's quite a few reasons why its best to create 'substitutes'.

Whenever you open a figure in the 'Figure Editor' or save a figure in the 'Figure Editor', Animation Pro will ask if you are creating a substitute (see right).

If you haven't checked out the 'Figure Editor' yet, please click on the 'Creating Figures' topic, left, and check out the documentation.  It's a good read (although I suspect that it will never makes the New York best seller list).

## Are you creating a substitute?

Figure substitutes can be swapped with compatible figures whilst animating.  This means that items cannot be added or removed from these figures.

Tap on this button to create a substitute

Yes

No

**Please note:** When creating a substitute a number of controls will be removed from the 'Figure Editor' screen:



Substitutes must have the same number of items as in the figures they're replacing. Those items must also be of the same 'type' (i.e. 'static', 'flexible', 'bendable', 'stretchable' etc). So all of the controls for adding or removing items, or changing the item types, will no longer be available (as shown above).
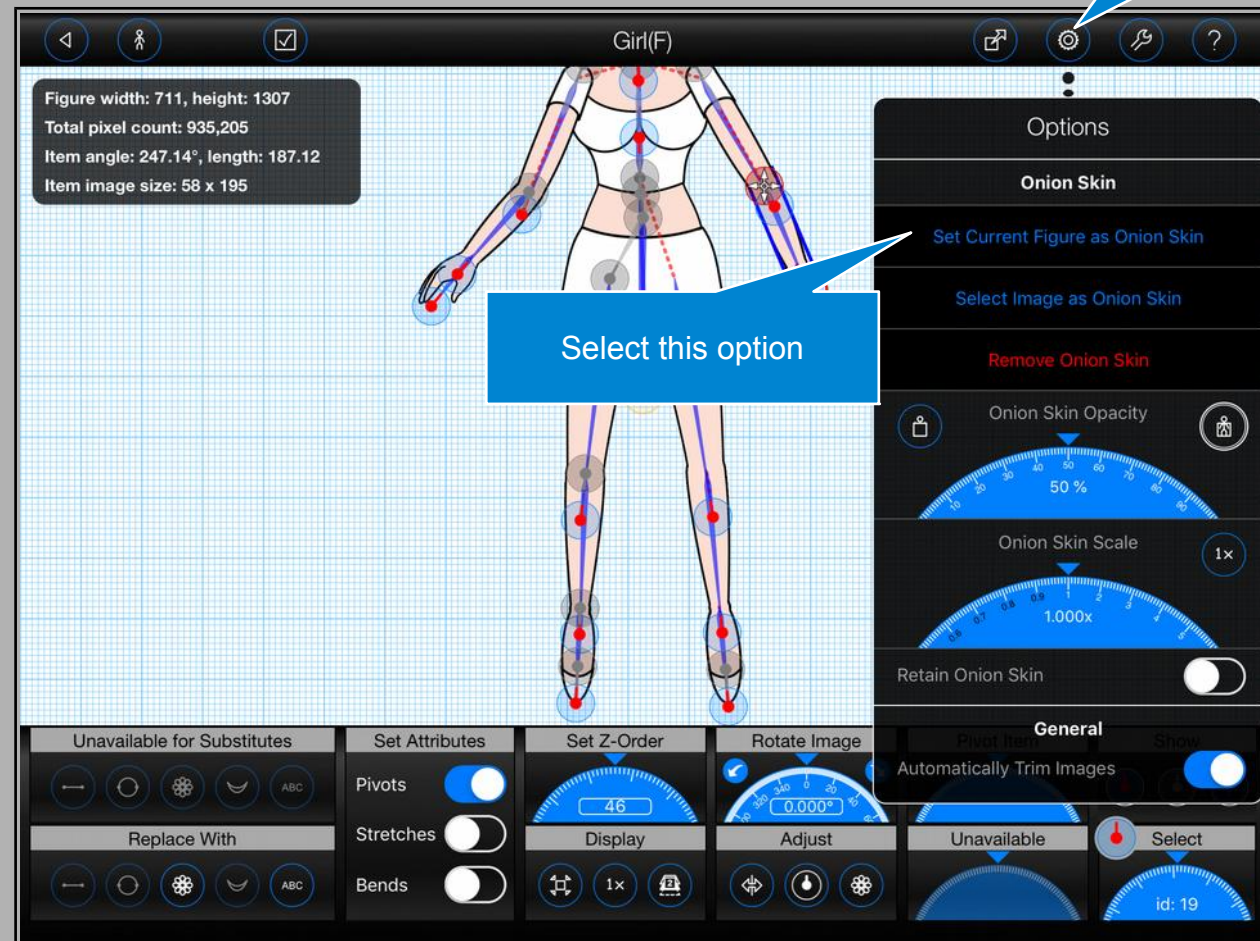
## Onion Skins

When creating a substitute, it can be helpful to see what the original figure looks like whilst making your changes. If, for example, you are creating a side-on view of an existing character, it can be useful to see whether the character, and all of the items that make it up, are the same size.

This can be achieved by turning the existing figure into an 'onion skin' before making any changes to it.
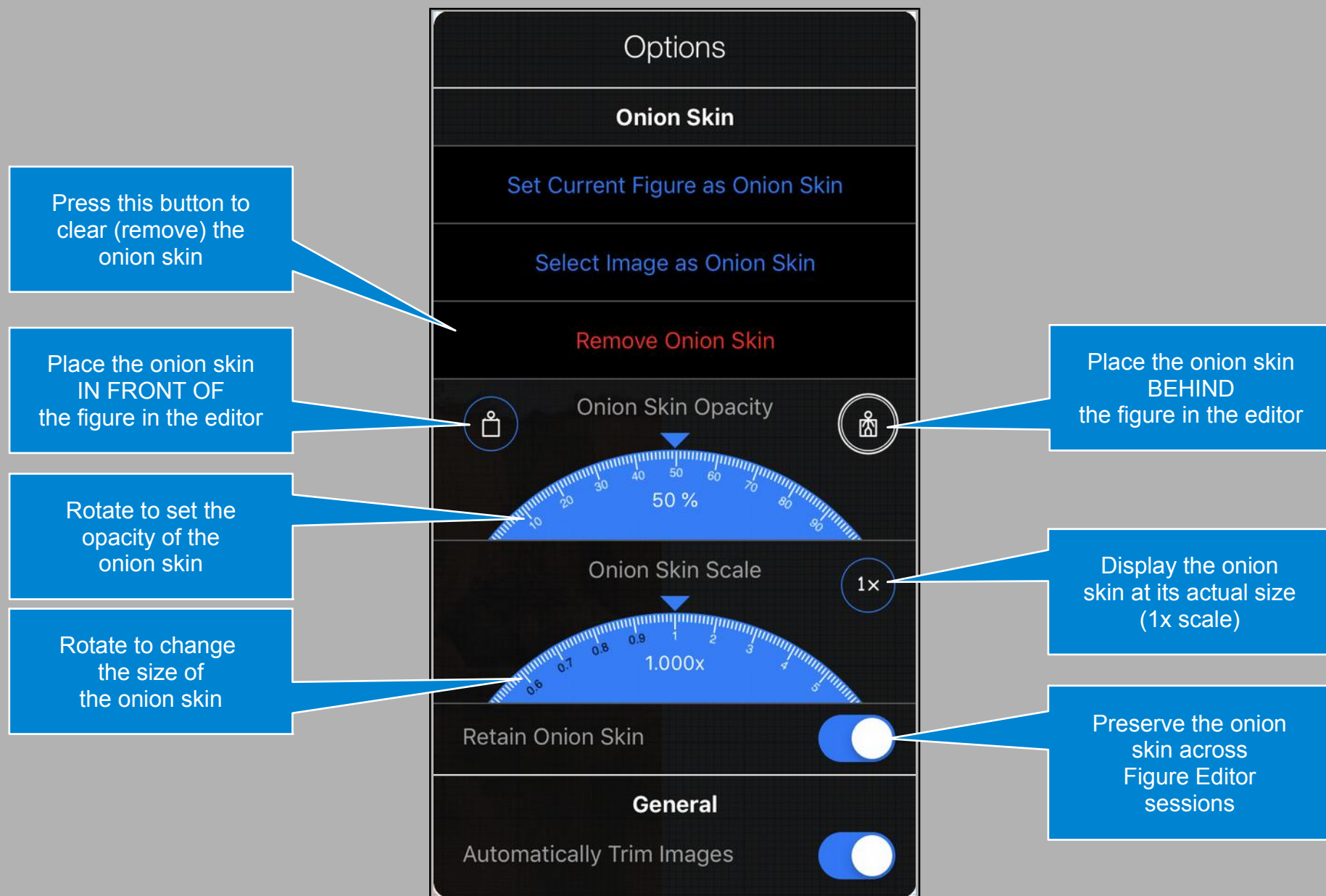
**1.** Select 'Set Current Figure as Onion Skin' from the 'Options' menu:

It may seem like nothing happens as, by default, onion skins will be placed beneath the figure. So you may need to move the figure, or an item within the figure, to see its onion skin.



Press this button

Select this option

Girl(F)

Figure width: 711, height: 1307
Total pixel count: 935,205
Item angle: 247.14°, length: 187.12
Item image size: 58 x 195

Options

**Onion Skin**

Set Current Figure as Onion Skin

Select Image as Onion Skin

Remove Onion Skin

Onion Skin Opacity
50 %

Onion Skin Scale
1.000x

Retain Onion Skin

**General**

Automatically Trim Images

Unavailable for Substitutes

Replace With

Set Attributes
Pivots
Stretches
Bends

Set Z-Order
46
Display

Rotate Image
0.000°
Adjust

Pivot Item          Show

Unavailable          Select
id: 19

Here, the substitute's arm has been moved to reveal the onion skin underneath

# Onion Skin Options

A bunch of other onion skin options exist in the 'Options' menu as shown below:

**Options**

**Onion Skin**

Set Current Figure as Onion Skin

Select Image as Onion Skin

Remove Onion Skin

Onion Skin Opacity

50 %

Onion Skin Scale

1×

1.000x

Retain Onion Skin

**General**

Automatically Trim Images

Press this button to clear (remove) the onion skin

Place the onion skin IN FRONT OF the figure in the editor

Rotate to set the opacity of the onion skin

Rotate to change the size of the onion skin

Place the onion skin BEHIND the figure in the editor

Display the onion skin at its actual size (1x scale)

Preserve the onion skin across Figure Editor sessions

## Saving a Substitute

Press the ⬀ button at the top of the screen:



Press this button

Output

Save Figure

Save Figure As

Share Figure

Email Figure (with Preview)
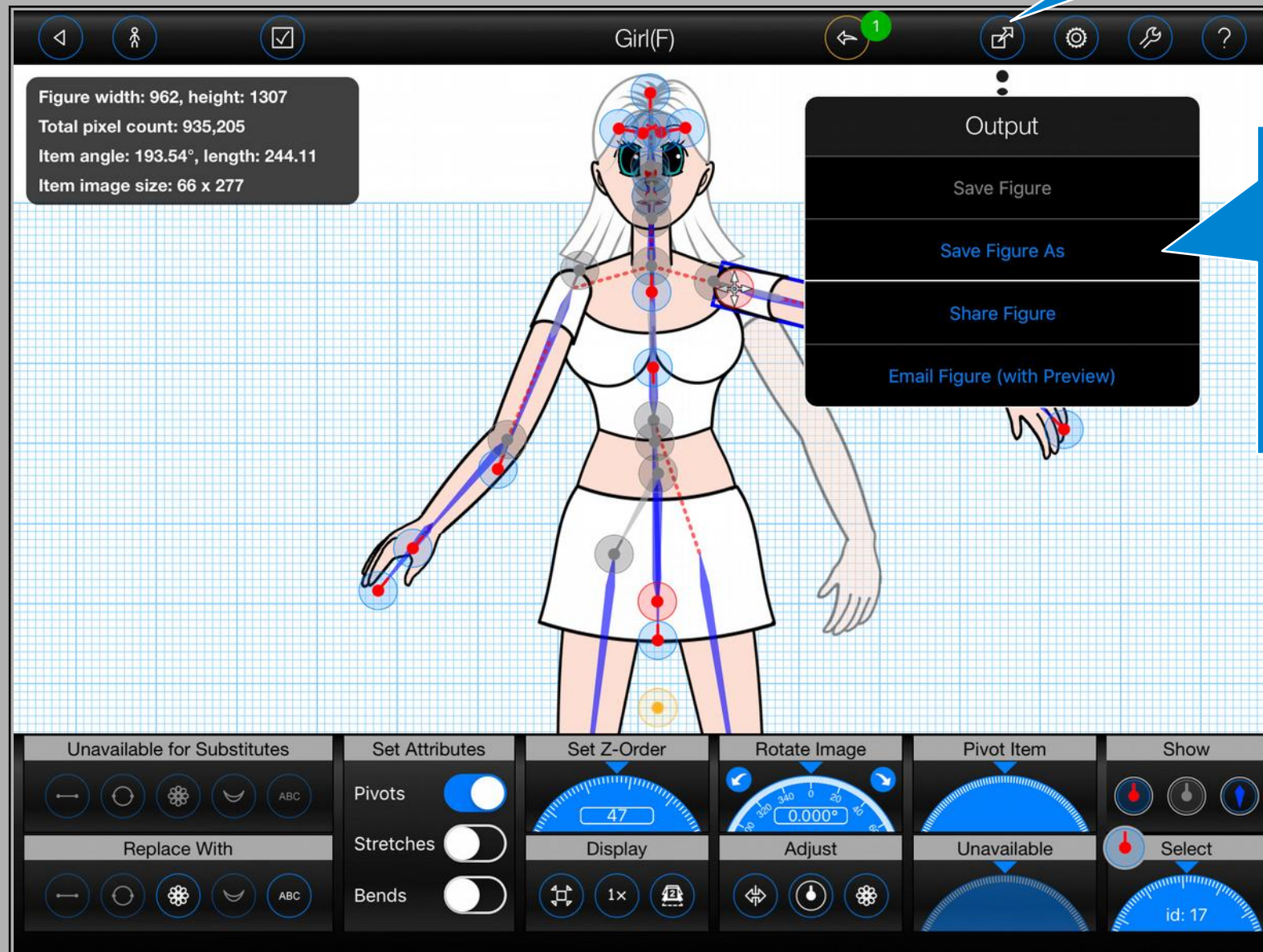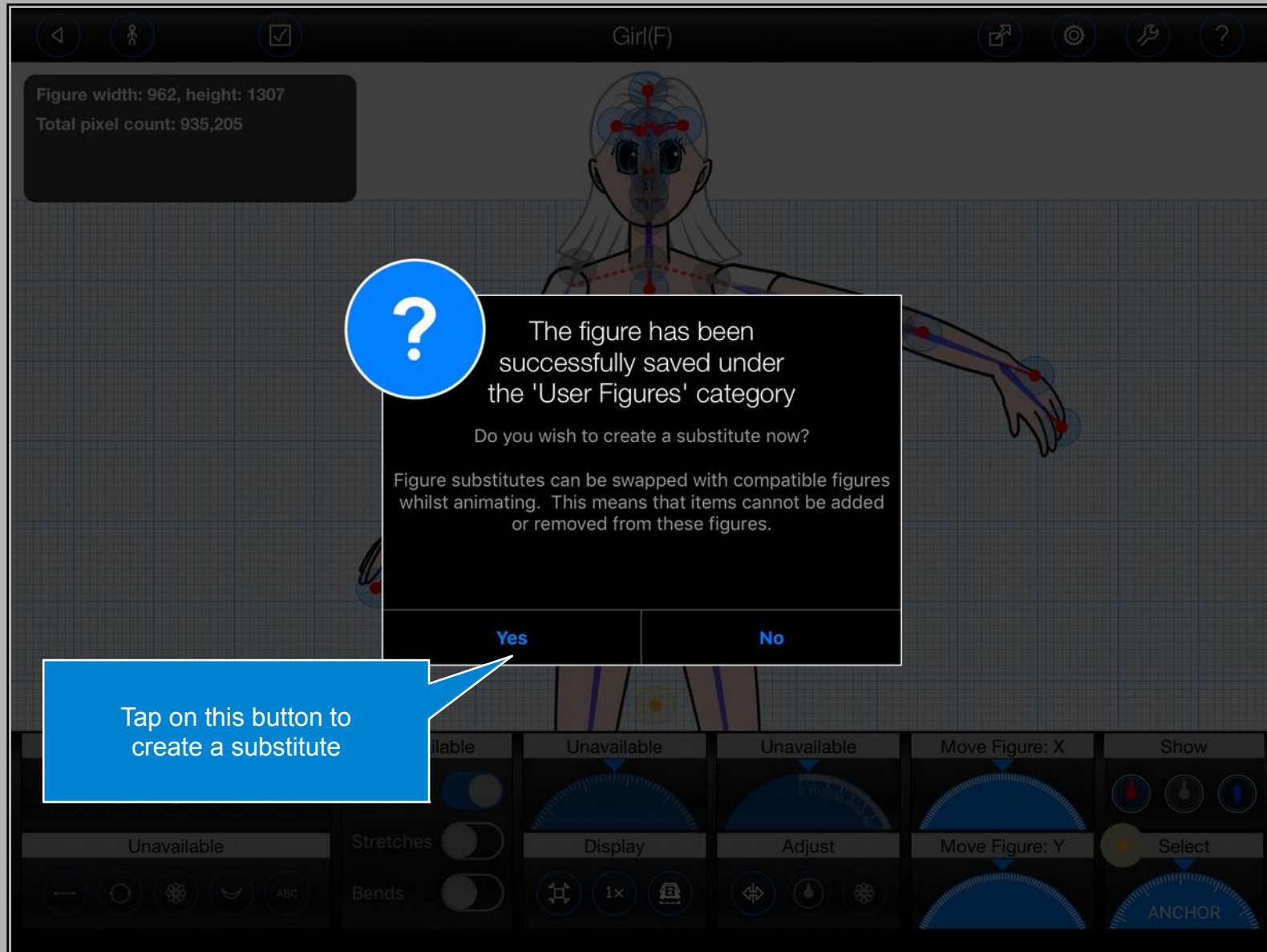
Tap here to save your Substitute.

Once saved, you can choose to overwrite the same figure file by choosing 'Save Figure'.

The substitute will be saved under the 'User Figures' category within the file manager (see 'File Manager', left, for more information).

Again, you will be prompted to create a substitute. Select 'Yes' if you'd like to create another substitute:



Girl(F)

Figure width: 962, height: 1307
Total pixel count: 935,205

**The figure has been successfully saved under the 'User Figures' category**

Do you wish to create a substitute now?

Figure substitutes can be swapped with compatible figures whilst animating. This means that items cannot be added or removed from these figures.

Yes                    No

Tap on this button to create a substitute

Unavailable

Unavailable                    Stretches                    Display                    Adjust                    Move Figure: Y                    Select

Bends

ABC                    1×                    ANCHOR

## Using Substitutes in an Animation

Let's assume that we've used the 'Figure Editor' to create a side-on view (substitute) for the 'Original Figure' shown right:

Let's also assume that we're now in the process of creating an animation and wish to substitute the original figure with the side-on view of that figure:
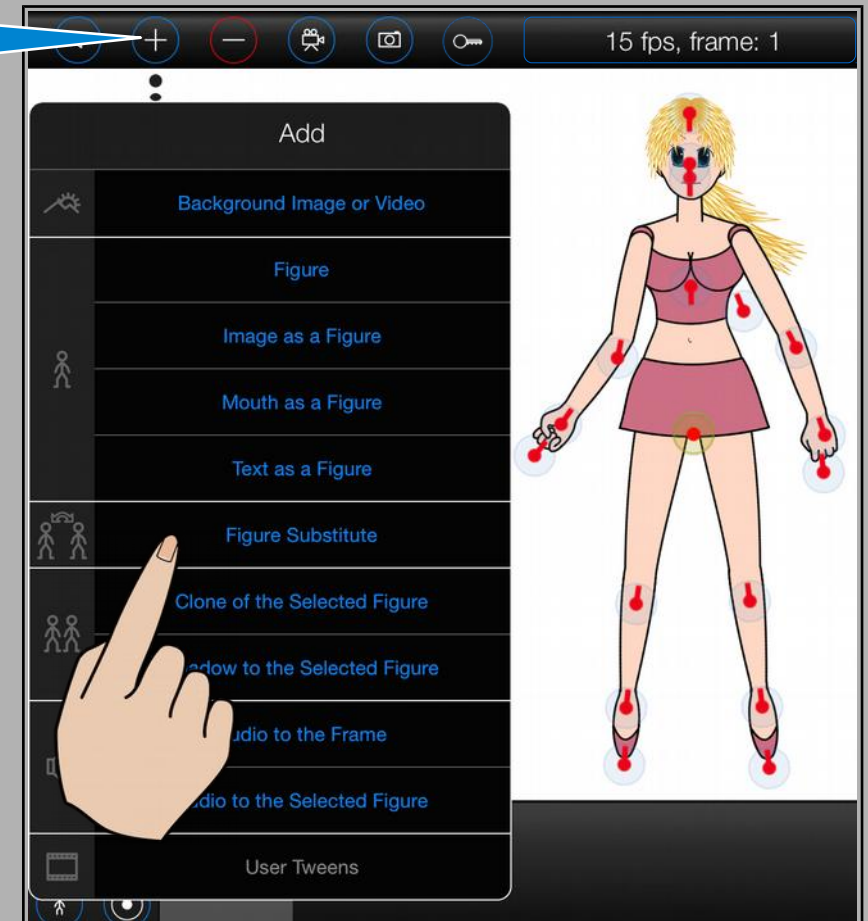


Original Figure



Substitute

**Press this button**

1. Tap on the figure's anchor point, ⊙, to select it.

2. Tap on the ⊕ button to open the 'Add' menu.

3. Select 'Figure Substitute' from the 'Add' menu.

### Add

- Background Image or Video
- Figure
- Image as a Figure
- Mouth as a Figure
- Text as a Figure
- Figure Substitute
- Clone of the Selected Figure
- ...dow to the Selected Figure
- ...dio to the Frame
- ...dio to the Selected Figure
- User Tweens

15 fps, frame: 1

By default, Animation Pro will open the 'Substitute Selection' file manager and will display all of the substitutes, for the currently selected figure, that have been added to the animation. In this example, below, there is only one figure (which is actually the figure that we wish to substitute as it is the only 'compatible' substitute already in the animation):



This category contains all of the compatible substitutes already added to the animation
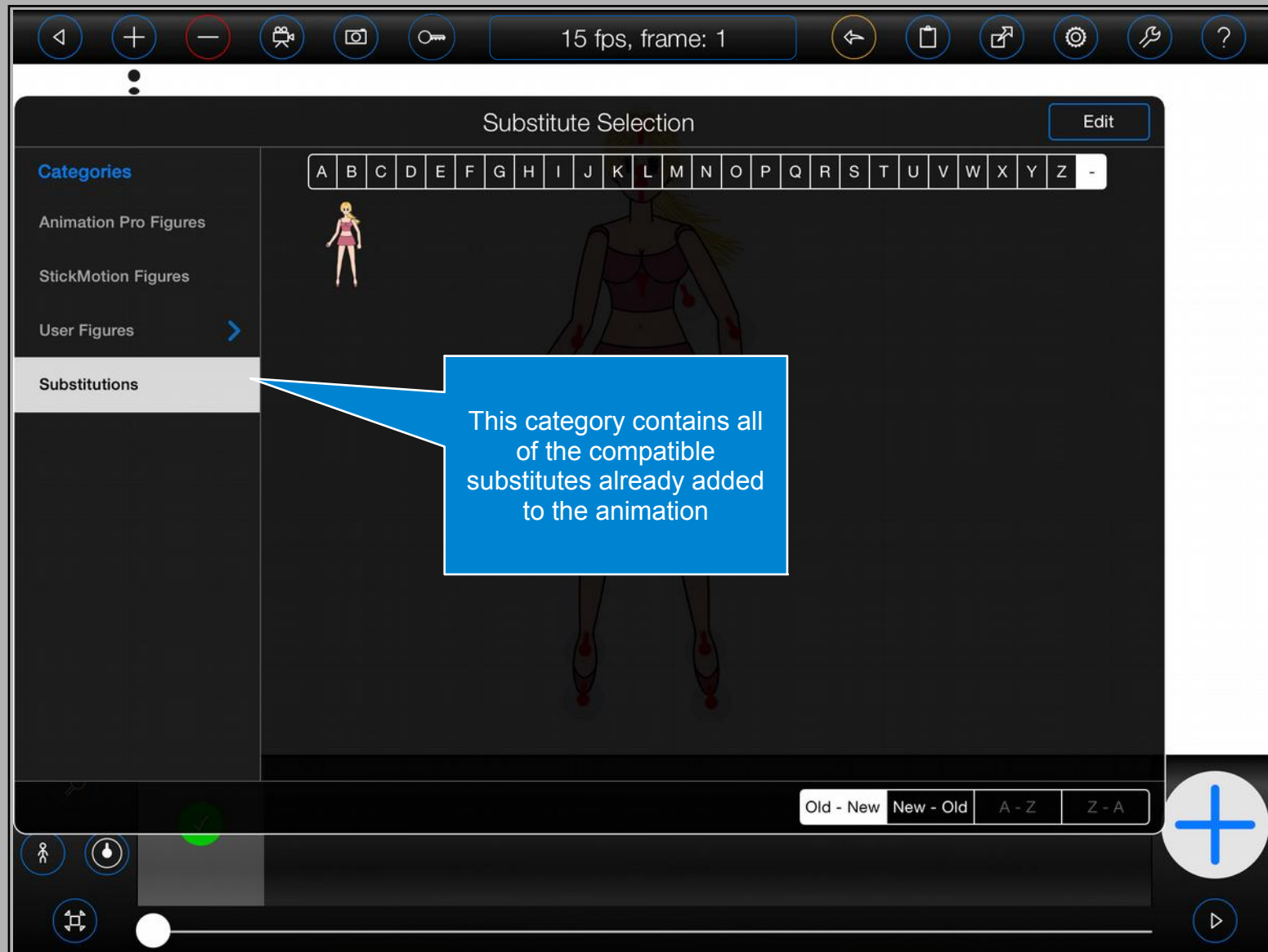
Tap on the other categories to find the compatible substitutes not already present in your animation. In this case, we will select the 'User Figures' category (as that is where we've saved the side-on view of our figure):
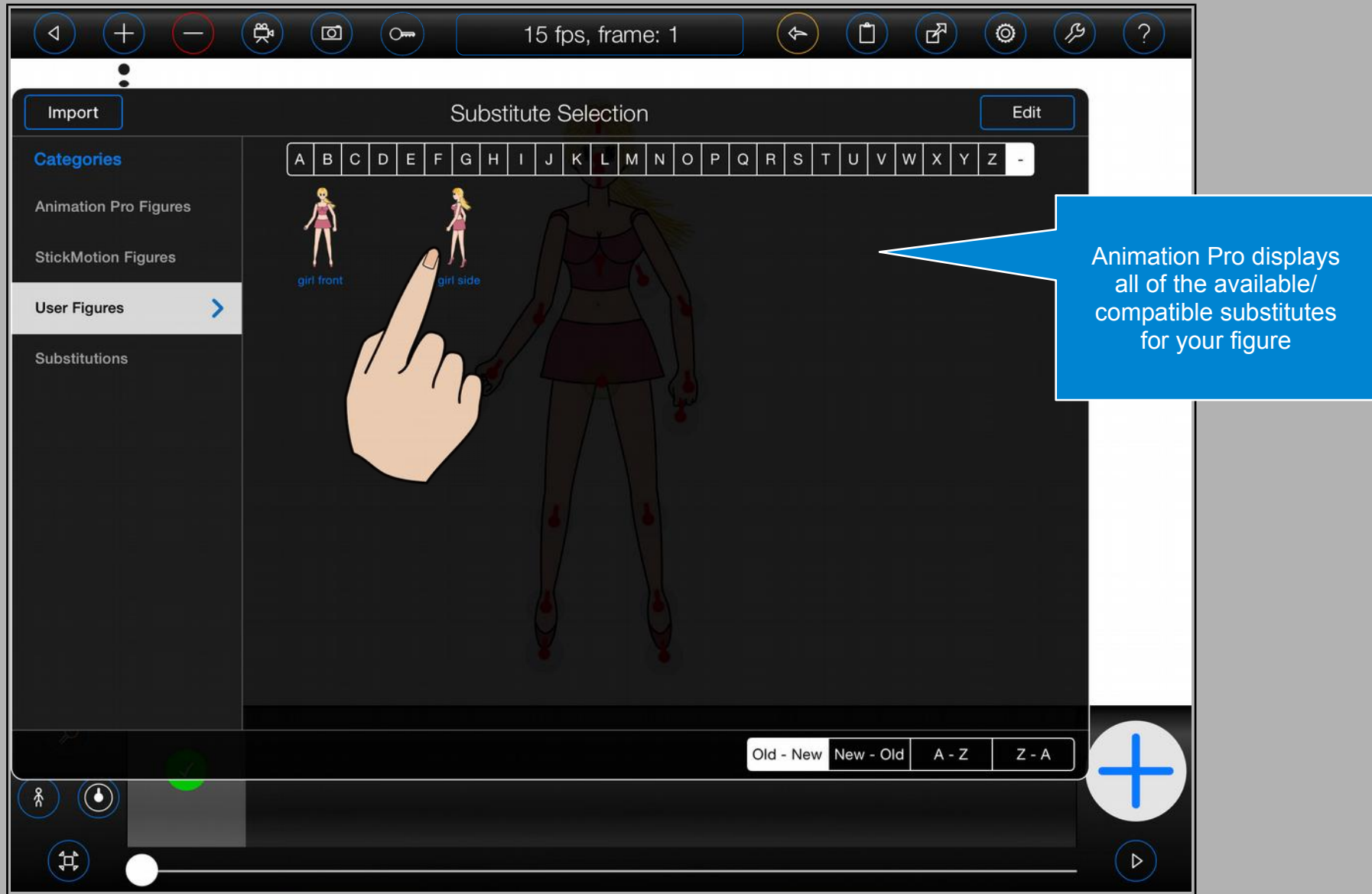


4. Tap on a figure to select it.

Animation Pro will replace the figure with the selected substitute:
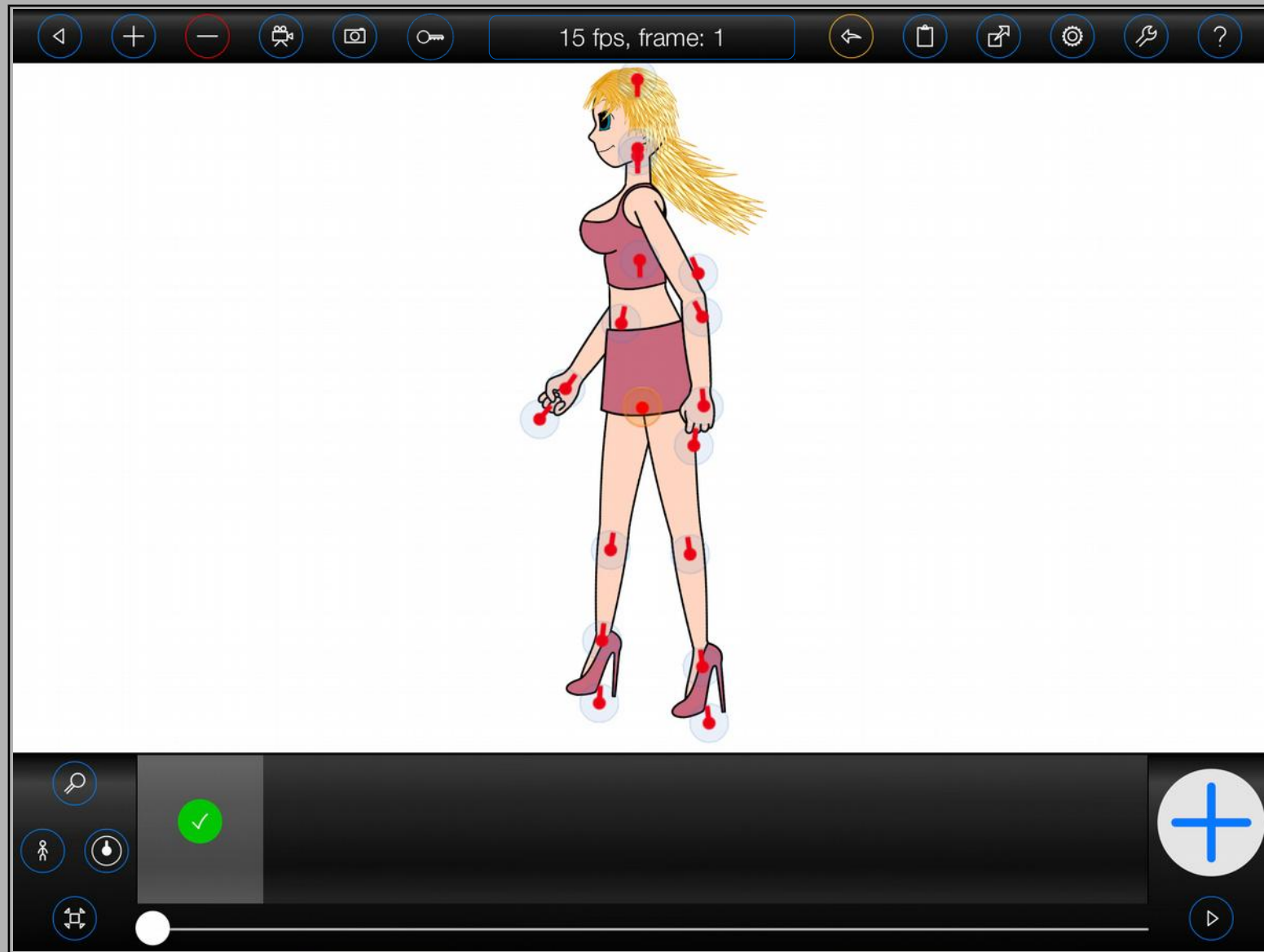


This figure will be automatically added to the 'Substitutions' category in the file manager. In other words, as you add substitutions it will become quicker to toggle between them.

## Important Considerations

When a figure is substituted, Animation Pro tries to retain the state of the original figure. In other words, Animation Pro transfers as many of the changes made to the original figure over to the substitute as possible.

### This includes:

1.  Clone and tween settings
2.  Highlight settings
3.  Figure opacity, colours and tints
4.  Item opacity, colours and tints
5.  Effects – highlights, shearing, scaling, blurs, distortions

### Not included:

Any adjustments that would most likely ruin the geometry of the substituted figure, such as the position, size or rotation of the items in a figure (many of these items would have been adjusted whilst creating the substitute).
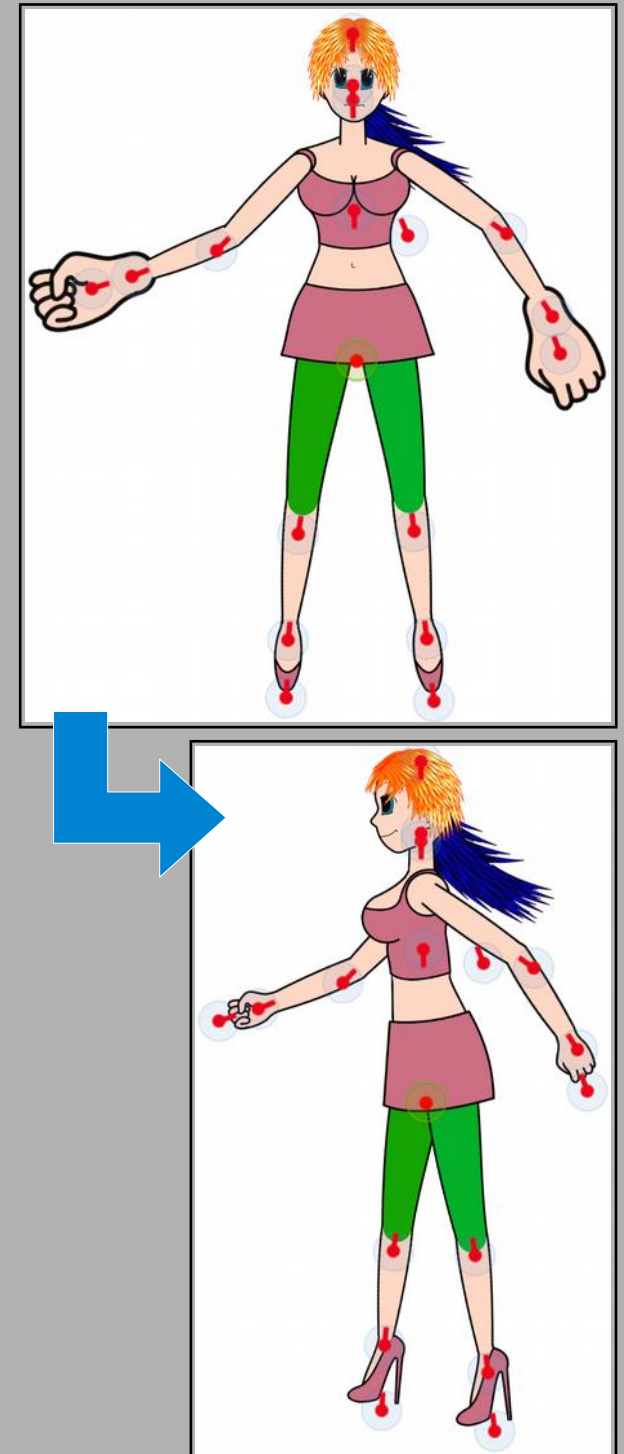
Finally, consider what would happen if Animation Pro automatically 'tweened' from Figure A to (substituted) Figure B below:

| Figure A | Tween | Tween | Figure B |
|----------|-------|-------|----------|



In most cases, as shown above, the results would be less than desirable.  So Animation Pro does not attempt to 'tween' across figure substitutions.  The down side of this is that your figures may appear to 'pause' briefly across the substitutions when 'tweening' is turned on:

| Figure A | Tween | Tween | Figure B |
|----------|-------|-------|----------|



To get around this issue, Animation Pro allows you to create your own 'tweens', known as 'user tweens'.  For more information on 'user tweens' please refer to the 'Tweening' topic (left).