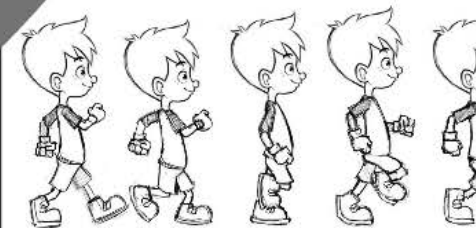
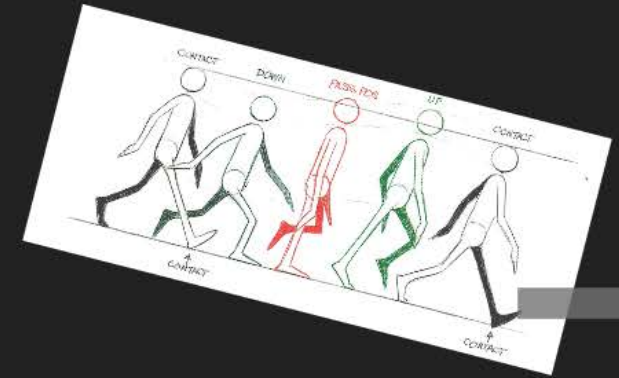
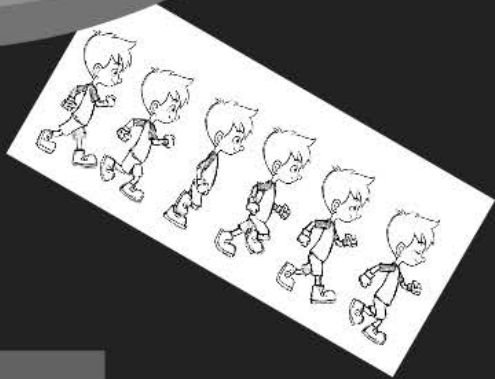


12

Principles of Animation

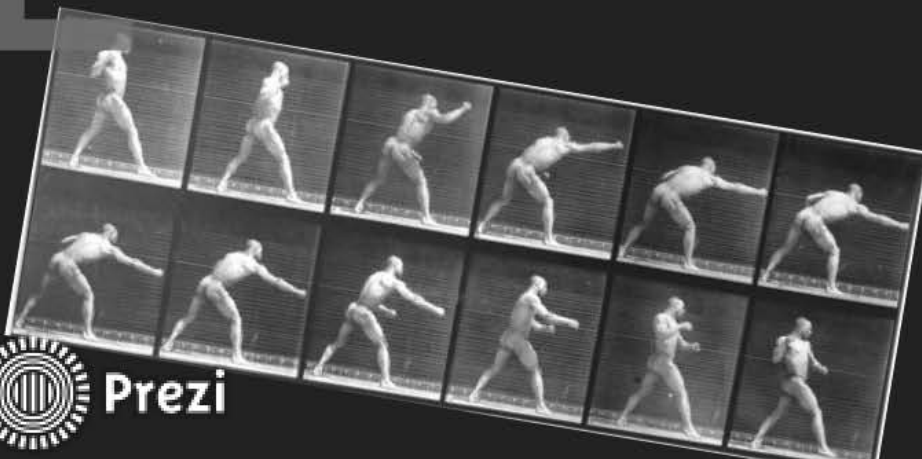




12 Principles of Animation

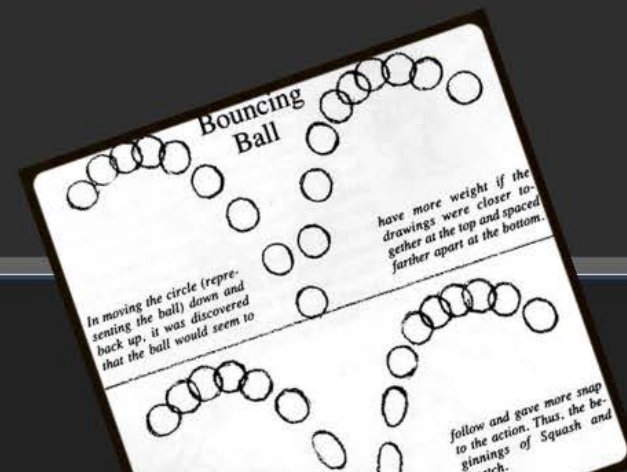
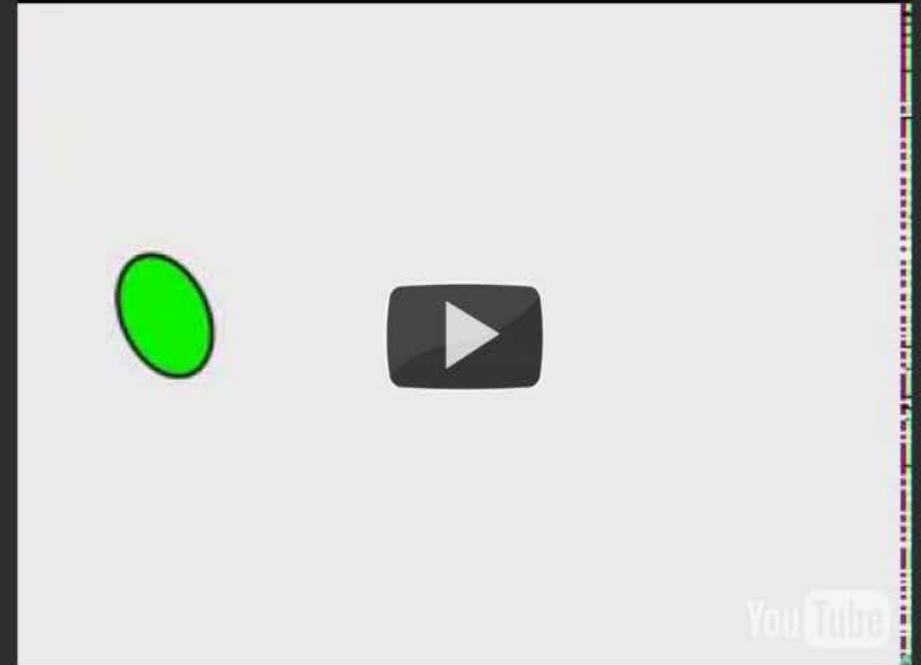
The Illusion of Life: Disney Animation by Ollie Johnston and Frank Thomas

1. Squash and stretch
2. Anticipation
3. Staging
4. Straight ahead action vs pose to pose
5. Follow through & overlapping action
6. Slow in & slow out
7. Arcs
8. Secondary action
9. Timing
10. Exaggeration
11. Solid drawing
12. Appeal



1. Squash and Stretch

The purpose of Squash and Stretch is to give a sense of weight and flexibility to drawn objects. It can be applied to simple objects, like a bouncing ball, or more complex constructions, like the musculature of a human face. Taken to an extreme point, a figure stretched or squashed to an exaggerated degree can have a comical effect. In realistic animation, however, the most important aspect of this principle is the fact that an object's volume does not change when squashed or stretched. If the length of a ball is stretched vertically, its width (in three dimensions, also its depth) needs to contract correspondingly horizontally.





2. Anticipation

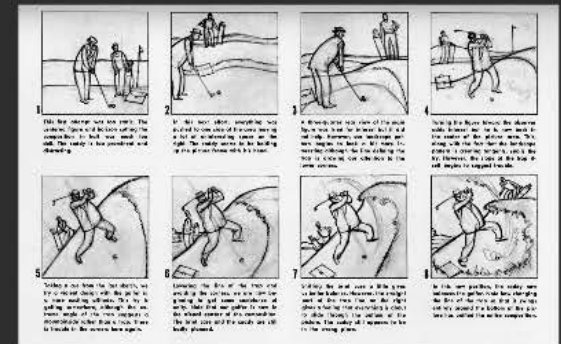
Anticipation is used to prepare the audience for an action, and to make the action appear more realistic. A dancer jumping off the floor has to bend his knees first; a golfer making a swing has to swing the club back first. The technique can also be used for less physical actions, such as a character looking off-screen to anticipate someone's arrival, or attention focusing on an object that a character is about to pick up.





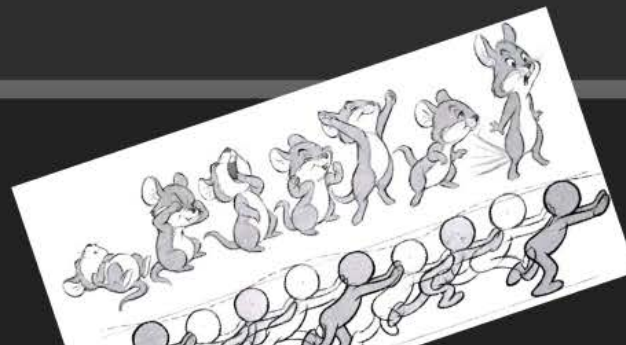
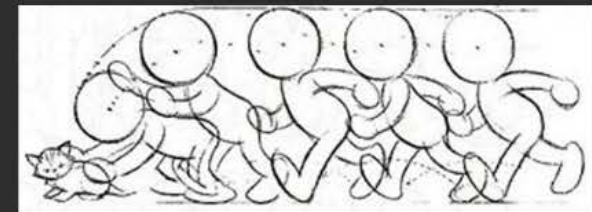
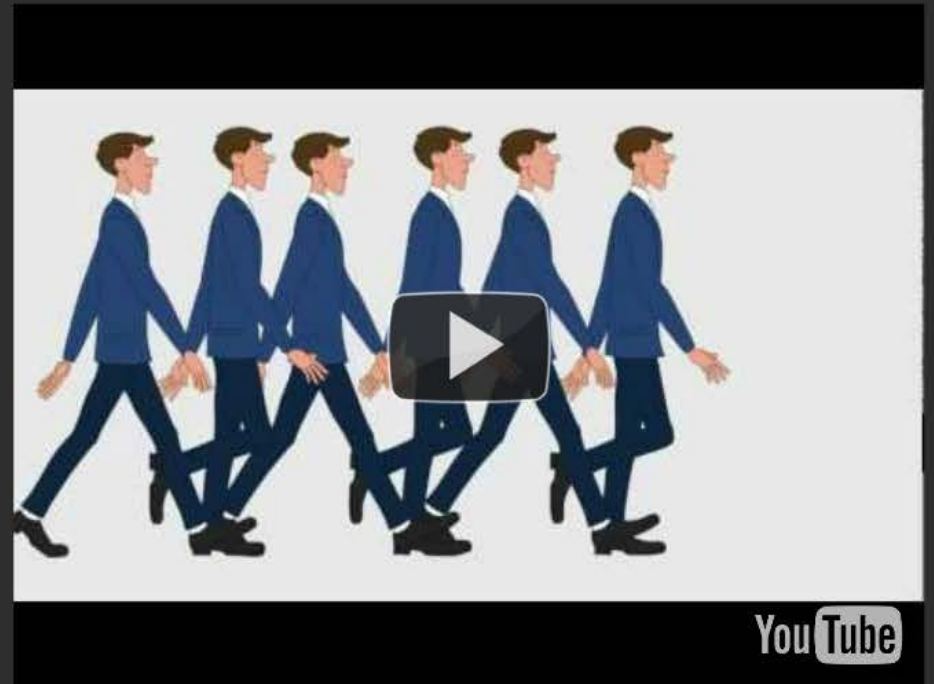
3. Staging

The purpose of staging is to direct the audience's attention, and make it clear what is of greatest importance in a scene; Johnston and Thomas defined it as "the presentation of any idea so that it is completely and unmistakably clear", whether that idea is an action, a personality, an expression or a mood...The essence of this principle is keeping focus on what is relevant, and avoiding unnecessary detail.



4. Straight ahead action vs pose to pose

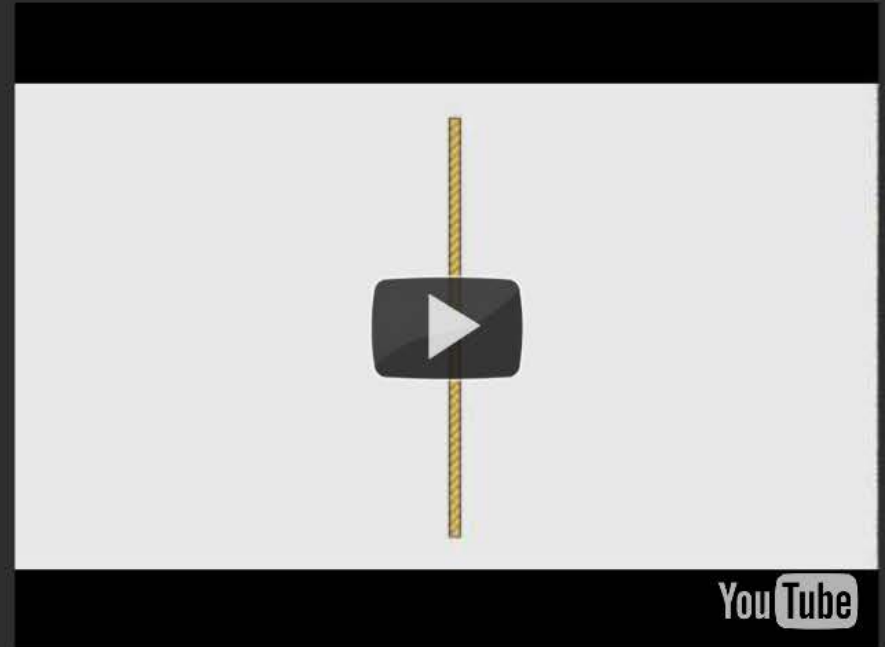
These are two different approaches to the actual drawing process. "Straight ahead action" means drawing out a scene frame by frame from beginning to end, while "pose to pose" involves starting with drawing a few key frames, and then filling in the intervals later. "Straight ahead action" creates a more fluid, dynamic illusion of movement, and is better for producing realistic action sequences. On the other hand, it is hard to maintain proportions, and to create exact, convincing poses along the way. "Pose to pose" works better for dramatic or emotional scenes, where composition and relation to the surroundings are of greater importance.

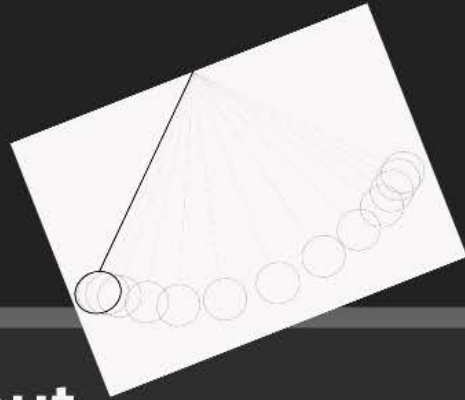


5. Follow through and overlapping action

Follow through and overlapping action is a general heading for two closely related techniques which help to render movement more realistically, and help to give the impression that characters follow the laws of physics, including the principle of inertia. "Follow through" means that loosely tied parts of a body should continue moving after the character has stopped and the parts should keep moving beyond the point where the character stopped to be "pulled back" only subsequently towards the center of mass and/or exhibiting various degrees of oscillation damping.

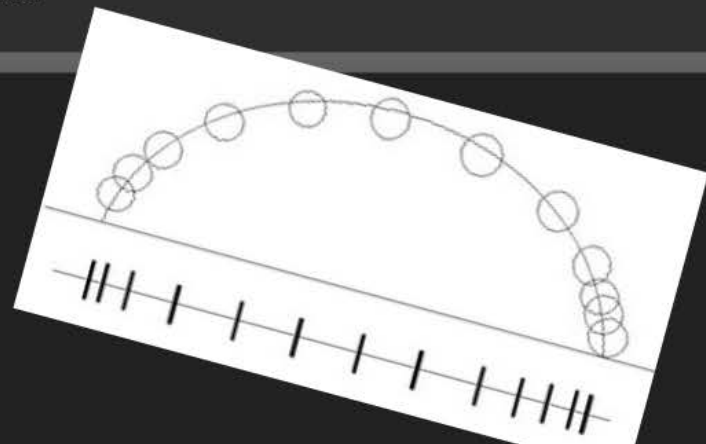
"Overlapping action" is the tendency for parts of the body to move at different rates (an arm will move on different timing of the head and so on).

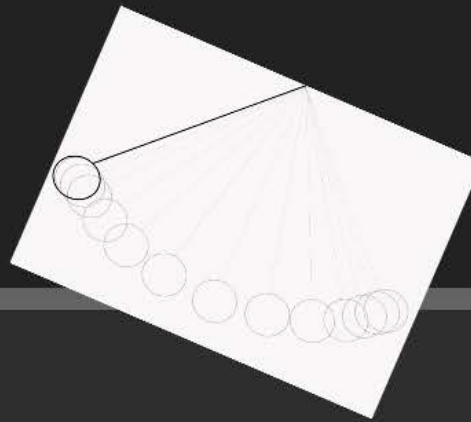




6. Slow in and slow out

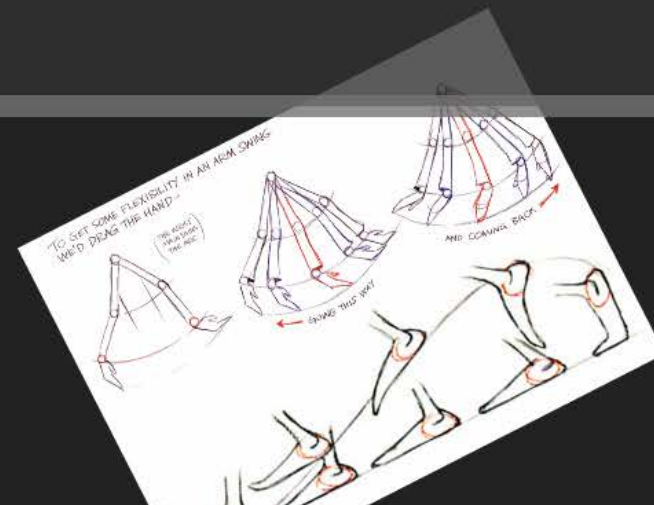
The movement of the human body, and most other objects, needs time to accelerate and slow down. For this reason, animation looks more realistic if it has more drawings near the beginning and end of an action, emphasizing the extreme poses, and fewer in the middle. This principle goes for characters moving between two extreme poses, such as sitting down and standing up, but also for inanimate, moving objects, like a bouncing ball.





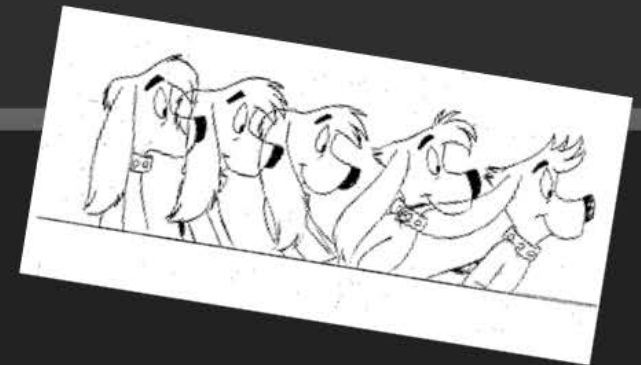
7. Arcs

Most natural action tends to follow an arched trajectory, and animation should adhere to this principle by following implied "arcs" for greater realism. This can apply to a limb moving by rotating a joint, or a thrown object moving along a parabolic trajectory. The exception is mechanical movement, which typically moves in straight lines.



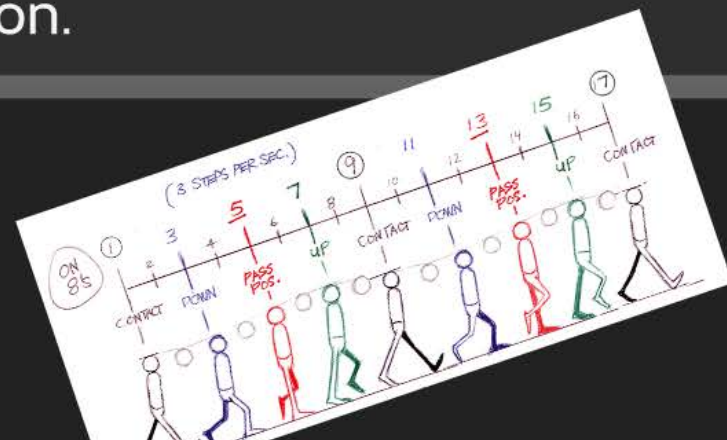
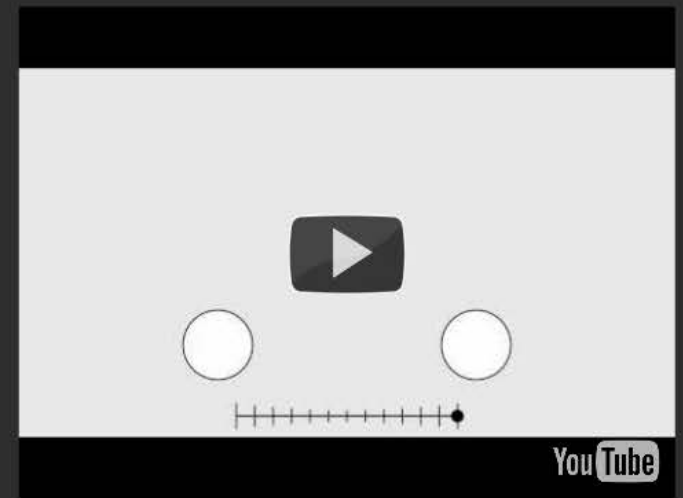
8. Secondary action

Adding secondary actions to the main action gives a scene more life, and can help to support the main action. A person walking can simultaneously swing his arms or keep them in his pockets, he can speak or whistle, or he can express emotions through facial expressions. The important thing about secondary actions is that they emphasize, rather than take attention away from, the main action.



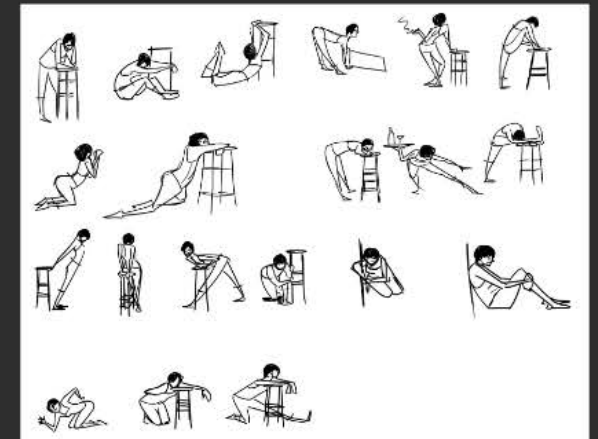
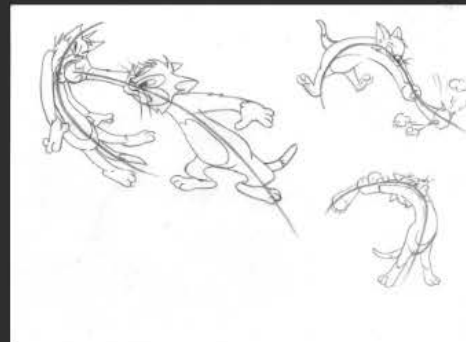
9. Timing

Timing refers to the number of drawings or frames for a given action, which translates to the speed of the action on film. On a purely physical level, correct timing makes objects appear to obey the laws of physics; for instance, an object's weight determines how it reacts to an impetus, like a push. Timing is critical for establishing a character's mood, emotion, and reaction.



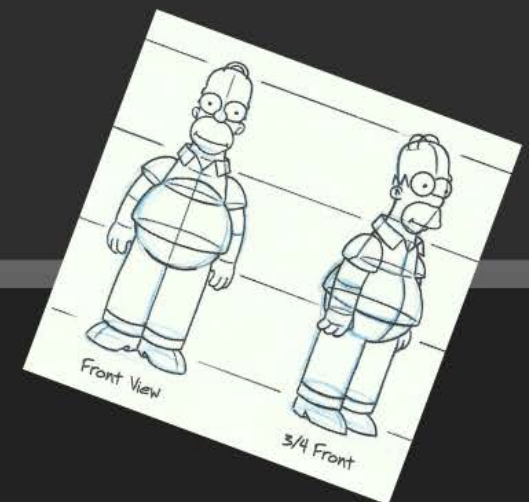
10. Exaggeration

Exaggeration is an effect especially useful for animation, as perfect imitation of reality can look static and dull in cartoons. The level of exaggeration depends on whether one seeks realism or a particular style, like a caricature or the style of an artist. The classical definition of exaggeration, employed by Disney, was to remain true to reality, just presenting it in a wilder, more extreme form. Other forms of exaggeration can involve the supernatural or surreal, alterations in the physical features of a character, or elements in the storyline itself



11. Solid drawing

The principle of solid drawing means taking into account forms in three-dimensional space, giving them volume and weight. The animator needs to be a skilled draughtsman and has to understand the basics of three-dimensional shapes, anatomy, weight, balance, light and shadow, etc.





12. Appeal

Appeal in a cartoon character corresponds to what would be called charisma in an actor.[35] A character who is appealing is not necessarily sympathetic – villains or monsters can also be appealing – the important thing is that the viewer feels the character is real and interesting.

