



# MIND THE NET GOALTENDING

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## The Psychology of Goaltending

At the elite level of goaltending, what makes the difference between one goalie making the team and the other getting cut? The talent level is usually equal, so what variables are taken into account to choose between the goaltenders? Sometimes the chosen goaltender might even be at a slightly lower physical level than the other. Could psychological factors possibly be the difference?

Much of what we see in the game of hockey, and particularly, the goaltender, seems to include speed, strength, and quickness of reflex. However, watch closely and you will notice that most of what you see is thinking! The goaltender is constantly adjusting depth, selecting saves, and anticipating the shot, for instance. Most of that thinking and the reactions involved are dictated by the goaltender's vision. The goaltender must work hard to understand game tactics, the puck's view, the shooter's view, puck trajectories, and more. These, in turn, can help the goaltender to make their save commitment at the last possible moment. Well worn, long practiced actions are utilized so that they become ballistic. Individual elements are molded together into one fluid unit. The complex chain of movements all occur in exactly the right order and at exactly the right time.

Psychology can help the goaltender understand what, where and how they respond to the situations they see on the ice.

For example, how can the goaltender save a puck shot at a speed moving so fast that they would be hard pressed to see it, let alone save it? Or, how does the goaltender easily figure out where a puck (a ballistic missile) will enter the net and position their bodies accordingly?

Goaltending can be organized around two broad principles:

1. Nature of skill
2. Variability of performance

Variability of performance comes in two forms as well:

1. Variability between the individual
2. Variability within the individual

### **Goaltending is 50 % Mental**

Think about saving a puck shot at over 90 MPH. The average person takes a minimum of two tenths of a second to move their eyes from one point to another. In that time, the goaltender must read the shot release, the elevation of the shot, where it is going, when it will get there, and decide on what save selection and positioning they must make.

Using all the information that the goaltender can muster, the goaltender must predict not only the speed of the puck but how much the puck is elevated by the time it gets to them. The timing of the save requires that there be a prediction - a purely psychological process.

## **Keep your eye on the puck?**

The goaltender must predict where the puck will be when it reaches them in order to intercept possible entrance to the net. Therefore, the advice to “keep your eye on the puck” is impossible to achieve.

The rate the eyes must move to track the puck depends on the puck’s velocity and the distance from the goaltender. We measure the size and speed of what we see in visual angles and angular velocity. When you watch a shot from the stands, the distance between the shooter and the goaltender is shorter, in terms of visual angle, than it is when you are in the net. When you are in the net, the puck’s angular velocity will change as it gets closer.

Because the puck is traveling fewer degrees of visual angle in the same amount of time, it is easier for the goaltender to track the puck from the release of the shot than it is as it nears the net. A puck’s angular velocity can be more than 500 degrees per second, a speed so great that the eyes cannot track that part of the puck’s flight. Humans can only normally track moving objects at rates up to about 70 degrees per second.

From this information, the goaltender can use one of two strategies to track the puck.

1. **Optimal save strategy:** Watch the puck from the release until its angular velocity is too great, which maximizes the information the goaltender has for making and updating their prediction of the puck’s final location.
2. **Optimal learning strategy:** The goaltender watches the puck release off the stick, but then moves their eyes rapidly to a spot in front of them where they can see the puck’s arrival.

We do not see what happens when our eyes make these rapid **saccadic** jumps. If we did, we would only see a smear as our eyes passed rapidly over the world in front of us.

*\*Saccades: are rapid eye movements that bring the point of maximal visual acuity onto the fovea of the eye so that it can be seen with clarity. During saccades, information is suppressed; however, the brain pulls from an object-file transsaccadic memory that allows us to perceive scenes that are cohesive and meaningful.*

Using either strategy, the goaltender does not and cannot see the entire flight of the puck.

## **Predicting the Point of Contact**

Shouldn’t seeing where the puck is and where it is going be a relatively simple process? The answer is no because the optical image is not simple. Additionally, the field of view is not constant as both the puck and the goaltender are moving and sometimes only a partial sighting can be used by the goaltender (i.e., screens/deflections).

The limits of reaction time mean that the goaltender must make a prediction about where they will make contact with the puck. How does the goalie make this prediction?

The judgments that the goaltender uses can be described in formal mathematics and tactical game knowledge. Unknowingly, they must use those principles to be in position (vertical/horizontal angles, depth) to present something, either equipment or body part, to the puck as it nears them.

Goaltenders use cues in their judgment required to make the save. These cues could be one of geometric relationship between the goaltender and the shooter or puck, the player with the puck and/or the situation the goaltender faces (two on ones, power play, point shots, etc). The goaltender, therefore, depends on his

or her ability to detect small differences in speed and whether the puck's trajectory is straight or not. The goaltender moves in such a way that the path the puck traces into the goaltender is a straight line or a linear optical trajectory. This linear optical trajectory means that the goaltender will either get to where the puck will be at the same time or before the puck does.

### **Recap**

As you can see, there is more to be explored; however, one thing is certain. Goaltending is impossible without psychology – impossible to play and impossible to appreciate fully as a player, coach, scout, or fan. The physical demands of the position are intense and the physical abilities of the goalie, as extraordinary as they are, cannot by themselves meet those demands. Working alone, even the fastest of reflexes would be insufficient. The reflexes must be supported by the goaltender's intellect. The goaltender's intellect, in turn, is shaped by those cognitive and emotional forces that are psychology. Psychology mediates the demands of the position and the capabilities afforded by those who play it.

### **References:**

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