

ATHLETE RESPONSES TO USING A REAL TIME OPTICAL NAVIGATION FEEDBACK SYSTEM DURING SKI TRAINING

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INTRODUCTION: Feedback has been shown to be important for all aspects of motor behavior (Shea et al., 1993) and is our brain's link to the body and to the environment. To date, sport scientists have used video analysis of alpine ski racers as the primary tool for providing athletes with feedback related to technique and tactics. However, many racers and coaches perceive the delay between performance and video feedback (often many hours) as detrimental to the effectiveness of video as a feedback tool. This project investigated the athlete responses to using a real time audible feedback system during training.

METHOD: An Optical Navigation Feedback system (ONFS), which measured forward speed and lateral displacement and gave immediate audible feedback on the lateral displacement, was used by 12 alpine ski racers (n=12). The ONFS measured forward speed and lateral displacement using high speed (6500 fps) CMOS photo sensor arrays linked to a pattern tracking engine. In particular, the ONFS transmitted audible signals to the athlete on the degree of lateral displacement of the ski whilst skiing. Lateral displacement is regarded as a negative action and generally slows the skier. Each skier completed between 3 and 6 runs in gates while listening to the feedback during one training session. At the completion of the runs, skiers were asked to complete a questionnaire to determine what they learned about their lateral displacement or "carving" skills and if they believed they had improved.

RESULTS: Results from the questionnaire are summarized in Table 1. These results showed that 83% of subjects stated that real time audible feedback of their lateral displacement definitely helped them to better understand their carving skills. In addition, 50% of subjects stated that the real time feedback definitely helped them improve their carving skills on the first day they used the system.

DISCUSSION: The purpose of this study was to investigate the perceived learning effects following real time feedback during alpine skiing. The benefits of real time feedback were clearly demonstrated with 83% of subjects stating that real time feedback had a positive effect on their understanding of ski performance. Further research should focus on the effects of continual use of real time feedback using the ONFS over several training sessions.

CONCLUSION: This study showed that the use of the real time ONFS by alpine skiers during training was perceived to be helpful by skiers to better understand their performance and was perceived to be immediately beneficial by athletes as an effective feedback tool.

REFERENCES

Shea, C.H., Shebilske, W.L., and Worchel, S. (1993). *Motor Learning and Control*. Published by Englewood Cliffs, NJ: Prentice Hall.

Table 1 Subject responses following the use of a real time optical navigation system attached to the skis during training

Did the real time feedback help you better understand your carving skills?	Frequency (%)
1. Definitely helped	83
2. Probably helped	17
3. Not Sure	0
4. Didn't help	0

Did the real time optical navigation system help your carving skills on the first day?	Frequency (%)
1. Definitely helped	50
2. Probably helped	33
3. Not Sure	17
4. Didn't help	0