Part I

- Project Title: The effects of self-controlled video feedback on motor learning
- Researcher and Department: Phillip G. Post; HPDR
- Rank and Initial Appointment Date: Assistant Professor; August 16, 2010

Part II

- Impact on Applicant's Personal Research and Development:

Over the last four years I have become interested in examining the role of self-regulation in motor skill acquisition settings. I recently published a paper examining the effects of learner self-controlled amount of practice and I am currently in the process of completing a follow up to this initial study. The results of these investigations suggest that learners benefit from regulating aspects of their instructional settings. If awarded the COE grant, I will be able to continue this research agenda of examining the effects of self-regulation on motor skill acquisition.

The COE grant will also enhance my ability to attract futureexternal funding. Demonstrating thecapabilityto manage funds, meet deadlines, and present follow-up reports will enhance my likelihood of acquiring future national grants. I alsobelieve that if awarded this grant, I will be able to successfully apply for a National Institutes of Health (NIH) grant within the following year.

- Impact on the Field of Study:

The proposed study will extend current motor learning research by examining if theself-control (SC) benefits of video feedback observed with a self and expert modelseparately generalizes to video feedback containing a self/expert model simultaneously. In addition to examining the effects of SC over a self/expert model, the investigation will explore the mechanisms underlying the benefits of SC (i.e., increased motivation and tailoring the practice setting).The proposed study also has applied implications. Traditionally practitioners make decisions regarding the learning experience, which includes when instructional supports such as video feedbackare implement. If the proposed research demonstrates a benefit for allowing learners to have SC over self/expert modeling, it would encourage practitioners to allow learners to make decisions regarding when this instructional support is implemented during training sessions.

- Brief Review of Relevant Literature:

With advances in video technology,movement practitioners are increasingly using video to facilitate skill acquisition. Video feedback has been used with some success in motor learning experiments (Guadgnoli, Holcomb, & Davis, 2002). This research has either provided learners with a video replay of an expert (i.e., video of an expert model) or self-model (i.e., video of the learner; Starek&McCullagh, 1999). However,recent research suggests the greatest benefits of video feedback may be observed when the performer is provided with aself/expert model simultaneously (Baudry, Leroy, &Chollet, 2006).By providing performers with a side-by-side demonstration it may facilitate their recognition of the essential differences between their performance and that of an expert.

One limitation of the prior research has been that the implementation of the video feedbackhas been instructor-controlled. Motor learningresearch suggests that allowing learners to control when video feedback is delivered facilitates skill acquisition. The benefits of SC video feedback have been observed when using a self (Janelle et al., 1997) or expert modelseparately (Wulf, Raupach, & Pfeiffer, 2005). Chiviacowsky and Wulf (2002) argued that SC facilitates learning because learners are able to modify the practice setting to meet their individual needs and preferences. Other authors posit that

SCenhances motivation, which improves learning (McNevin, Wulf, &, Carlson, 2000). However, the exactmechanism underlying the benefits of SC is still uncertain.

Taken together,these studies suggest that learners controlling when they view video feedback of their own performance and/or of an expert model facilitates motor learning. However,recent research suggests that the greatest benefits of video feedback occur when a self and expert model is presented simultaneously. Thus the purpose of the purposed studyis to examine the effects of SC self/expert modeling to that of a yoked (YK) group on the learning of a novel motor skill. Additionally, the study will explore the underlying mechanisms associated with the benefits of SC (i.e., enhanced motivation and tailoring the practice setting).

<u>Part III: Research Plan</u>

- Setting/Facilities: All data will be collected in the Rentfrow gym
- Procedures (data collection, data analysis):

Upon arriving to the experiment setting participants will fill out an informed consent form. Before practice begins participants will be given instructions on the chip shot technique and informed that they will be chipping a golf ball to a circular target (45cm r) 15 m away. To measure error, five concentric circles with radii of 1, 2, 3, 4, and 5m will be placed around the target. Participants will be randomly assigned into one of two groups: (a) self-control group (SC) or (b) yoked (YK) group. Participants in the SC group will be allowed to view the self/expert modelon a laptop computer whenever they want. Participants in the YK group will be presented with the video feedback based on their SC counter part. Thus, participants in the SC group will be the sources of the yoked schedule for one participant in the YK group.

The study will consist of an acquisition, retention, and transfer phases, as well as an exit interview. The acquisition phase will consist of 6 blocks of 10 trials for a total of 60 practice shots. During acquisition participants who have SC will be informed that they can request the video feedback whenever they need it. When the video replay is requested participants will be able to view their previous trial alongside an expert model on a lap top computer. YK participants will be given the same information before the practice session, but will be told that they may or may not view the video feedback after each trial.At the completion of the acquisition phase participants will fill out a post-training questionnaire to assesstheir perceptions of their assigned practice condition.

Retention and transfer phases will take place 24-hr after acquisition. The retention test will consist of 10 shots using the acquisition task. The transfer phase will take place 10 min following the retention test and will consist of 10 shots at a distance of 17m. To assess participant motivation, the Intrinsic Motivation Inventory (IMI; Ryan, 1982) will be used. Participants will fill out the IMI at thestart, middle, and end of acquisition.

Data Analysis: Dependent measures for learning will include form and accuracy. Participants' form will be rated using a scale from 0-10 (ten being perfect). Accuracy will be scored using a 6-point scale (target = 6, 1st zone = 5, 2nd zone = 4, 3rd zone = 2, 4th zone = 2, 5th zone = 1, outside zone = 0). Separate 2 (Group) x 6 (Blocks) ANOVAS with repeated measures on the second factor will be used to evaluate form and accuracy during acquisition. One-way ANOVAs will be used to evaluate form and accuracy during retention and transfer.The post-training questionnaire will be analyzed qualitatively. The IMI will be analyzed using a2 (Group) x 3 (Questionnaire) repeated measures ANOVA.

• Study Timeline: Data collection will begin and end during the 2012 school year.

• Use of Findings/Dissemination of Results:

Findings will be presented at a national conference and through a journal publication.

Part IV: Budget and Budget Justification

Equipment	Cost
Dell MM6600 Laptop Computer *Justification*: A high-speed laptop is needed to display the video feedback to participants. The Dell MM660 has the correct video ports and a graphics card need to support the video feedback.	$1958
Total Cost:	**$1958**

Part V: References

Baudry, L., Leroy, D., &Chollet, D. (2006). The effect of combined self-and expert-modelling on the performance of the double leg circle on the pommel horse.*Journal of Sports Sciences*, *24*, 1055-1063.

Chiviacowsky, S., &Wulf, G. (2002). Self-controlled feedback: Does it enhance learning because performers get feedback when they need it? *Research Quarterly for Exercise and Sport, 73*, 408-415.

Guadagnoli, M., Holcomb, W., & Davis, M. (2002). The efficacy of video feedback for learning the golf swing. *Journal of Sports Sciences*, *20*, 615-622.

Janelle, C. M., Barba, D. A., Frehlich, S. G., Tennant, L. K., &Cauraugh, J. H. (1997). Maximizing performance feedback effectiveness through videotape replay and a self-controlled learning environment. *Research Quarterly for Exercise and Sport, 68*, 269-279.

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Starek, J., &McCullagh, P. (199). The effect of self-modeling on the performance of beginning swimmers.*Sport Psychology*, *13*, 269-287.

Wulf, G., Raupach, M., & Pfeiffer, F. (2005). Self-controlled observational practice enhances learning. *Research Quarterly for Exercise and Sport, 76*, 107-111.