Running Head: DESCRIPTIVE EXPERIENCE SAMPLING DURING GOLF

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On Investigating Self-Talk: A Descriptive Experience Sampling Study of Inner Experience During Golf Performance

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Abstract

Although self-talk has been shown to be an effective performance enhancement tool, accessing athletes' ongoing inner experiences, including self-talk, has proven difficult. This study investigated the feasibility and desirability of using Descriptive Experience Sampling (DES) to sample athletes' inner experiences during competition, thus avoiding potential distortions that arise from retrospective reports and questionnaires. Golfers ($N = 10$) were trained as DES participants in their natural environments; then their experiences were sampled during a golf tournament. More self-talk occurred during tournament play than in natural environments. Self-talk was a frequent but not ubiquitous component of experience during tournament play; inner-speaking self-talk was 6 times as frequent as speaking aloud self-talk; and effortful System 2 self-talk was rare. The results of this research demonstrate that DES can be feasibly implemented in sport settings and may be a useful approach for researchers exploring athletes' inner experiences.

Keywords: self-talk, sport psychology, presuppositions, open-beginninged methods

On Investigating Self-Talk: A Descriptive Experience Sampling Study of Inner

Experience during Golf Performance

Although self-talk has been widely advocated as a performance enhancement tool,

and the role of self-talk in enhancing sport performance has been well documented, there

are still key concerns about the way self-talk is defined (Hardy, 2006), elicited, accessed,

and measured (Brinthaupt, Benson, Kang, & Moore, 2015). External observation of

athletes' self-talk during performance allows assessment of verbalized self-talk but not of

inner self-talk (Van Raalte, Brewer, Rivera, & Petitpas, 1994; Van Raalte, Cornelius,

Hatten, & Brewer, 2000). Self-talk questionnaires with demonstrated reliability have

been developed (Hardy, Hall, & Hardy, 2005), but the ability of questionnaires to provide

accounts of actual inner experience has been questioned (Hurlburt & Heavey, 2015), and

the correspondence of questionnaire self-talk such as that measured by the Automatic

Self-Talk Questionnaire for Sports (Zourbanos, Hatzigeorgiadis, Chroni, Theodorakis, &

Papaioannou, 2009) and the Thought Occurrence Questionnaire for Sport

(Hatzigeorgiadis & Biddle, 2000) to actual self-talk in sport has not been demonstrated.

Clearly, alternative methods are needed to allow a window into the "black box" of

athletes' self-talk during sport performances (Theodorakis, Hatzigeorgiadis, &

Zourbanos, 2012).

Some researchers have collected and analyzed retrospective accounts of self-talk,

expecting that athletes can recall and describe their self-talk with reasonable accuracy

weeks after the event (e.g., Latinjak, Zourbanos, Lopez-Ros, & Hatzigeorgiadis, 2014).

Others have sought to improve the accuracy of retrospective recall of self-talk by

showing during the interview video footage of the target incident (e.g., Miles & Neil,

2013). However, there is a substantial body of research that concludes that retrospective

observations are unreliable, particularly when those observations rely on the ability to notice and to recall inner events (Koriat & Bjork, 2005).

To avoid the potential distortions of the retrospections required by self-report and questionnaire methods, think aloud methods have been used: participants report their thoughts aloud continuously while performing tasks such as skill acquisition (Hare & Graber, 2000), analog sport situations (McPherson, 1993), or during intervention (Ram & McCullagh, 2003). Most think-aloud studies occur in laboratory settings, but some have taken place in ecologically valid competitive sport performance settings, interrupting performance during tennis (Fuhrer, 1985), bowling skills acquisition (Langley, 1995), golf (Whitehead, Taylor, & Polman, 2015), or shortly after performance in running (Samson, Simpson, Kamphoff, & Langlier, 2015). However, think aloud methods presume that thinking translates easily and contemporaneously into words, typically focus on thoughts at the expense of other inner experiences such as emotions or sensations, lack random and representative sampling in favor of ongoing, continuous real-time reporting (Hurlburt, 2011), and may be reactive, requiring participants to report on inner experiences while they are happening (Genest & Turk, 1981).

To avoid those issues, some researchers have turned to either the Experience Sampling Method (ESM), or Ecological Momentary Assessment (EMA). ESM uses a quasi-random signal to cue the participants to rate their thinking, mood, and aspects of the environment on a series of Likert scales (Stone, Shiffman, & DeVries, 1999). Ecological Momentary Assessment (EMA) also prompts participants to report about inner experience and the environment (Stone et al., 1999), and uses natural environments, but is typically less prescriptive and more flexible than ESM, using either event-contingent or random sampling (Scollon, Kim-Prieto, & Diener, 2009). Both ESM and EMA increase ecological validity, decrease potential reactivity, and overcome some

limitations of retrospective self-report and think-aloud methods, but they are limited by

the demands implicit or explicit in their pre-defined questions (Hurlburt & Heavey,

2015), and few ESM and EMA studies have been conducted with athletes. Furthermore,

there is a wide variability in the actual methods that are called ESM. The original ESM

was designed to assess experience that was ongoing immediately as the beep sounded,

but some who have called their studies "ESM" or "thought sampling" have allowed two-

hour retrospections (e.g., Brinthaupt et al., 2015) or retrospections across a month

(Latinjak et al., 2014).

Further complicating the study of self-talk is the fact that widely differing

definitions of self-talk have been used (Hardy, 2006), ranging from internal dialog

(Hackfort & Schwenkmezger, 1993) to any kind of thinking including visual imagery

(Bunker, Williams, & Zinsser, 1993), sometimes including nonverbal behavior such as a

smile or frown (Theodorakis, Chroni, Laparidis, Bebestos, & Douma, 2001). In an

attempt to provide self-talk definitional clarity, Van Raalte, Vincent, and Brewer (2016),

building on Hardy (2006), focused on the linguistic and self-directed aspects of self-talk,

defining self-talk as "the syntactically recognisable articulation of an internal position

that can be expressed either internally or out loud, where the sender of the message is

also the intended receiver" (p. 141). In this paper we adopt Van Raalte et al.'s (2016)

definition, which requires that self-talk be syntactically recognisable as self-directed

language. Thus self-talk is part of what Hurlburt (2011; Hurlburt & Akhter, 2006) calls

pristine inner experience (thoughts, feelings, sensations, seeings, any phenomena that are

directly apprehended). The observation may be private, as in inner speech, but an

instance of self-talk must involve syntactically recognisable language, not an inferred

cognitive or meta-cognitive state. Otherwise, for example, Bunker et al.'s "anytime you

think about something, you are in a sense talking to yourself" (1993, p. 226) could still be

counted as self-talk even when there is no talk.

Adopting Van Raalte et al.'s (2016) definition does not solve the problematics of

retrospective reports, questionnaires, ESM, EMA, and think-aloud methods discussed

above. The present study considers whether it is possible and desirable to apprehend

self-talk using Descriptive Experience Sampling (DES), a method that is designed to

confront those problematics head on.

DES, like ESM and EMA, uses a random beeper in participants' environments

and instructs them to respond to the beeps by immediately noting the characteristics of

their inner experience that was ongoing at the moment of the beep. However, DES

differs from ESM and EMA (Hurlburt & Heavey, 2015) in that DES assiduously seeks to

bracket presuppositions about the nature of experience (Hurlburt, 2011) and to provide

high fidelity descriptions of experience, whatever that experience might be. Hurlburt

(2011) maintains that experience inheres in moments, that people are often mistaken

about the characteristics of their own inner experience, and that therefore researchers may

be mistaken about research participants' inner experiences, including self-talk. Hurlburt

and his colleagues (Caracciolo & Hurlburt, 2016; Hurlburt, 2011; Hurlburt &

Schwitzgebel, 2007) have argued that the DES method provides a framework for

investigating pristine inner experience, including self-talk as Van Raalte et al. (2016) and

we define it, while avoiding many of the problematics of other methods. DES studies

have shown high inter-observer reliability (Hurlburt & Heavey, 2002) and have been

validated with Functional Magnetic Resonance Imaging (fMRI) data (Kühn, Fernyhough,

Alderson-Day, & Hurlburt, 2014). Thus, DES has the potential to provide high fidelity

reports of inner experience during sport performance; however, the feasibility of DES in

sport settings has yet to be demonstrated. We used a golf tournament as an example to explore the feasibility of using DES with athletes during sport competition.

Method

Participants

Five highly skilled (registered handicaps ranging from 2 to 7; $M = 4.20$, $SD = 2.28$) and five moderately skilled (handicaps ranging from 13 to 26; $M = 17.60$, $SD = 5.03$) golfers participated in this study. Definitions of skill level were in line with Hayslip, Petrie, MacIntire, and Jones (2010). All were male; average age was 41.80 ($SD = 13.27$) years; nine self-identified as Caucasian and one as African American. All golfers were assigned pseudonyms to protect participant confidentiality.

Materials

Beeper. Custom built $4.15 \times 2.40 \times 0.85$ inch beepers typically used in Descriptive Experience Sampling (DES) studies that can be clipped at the waist or placed in a pocket were used. At random (mean 25 min, maximum 50 min) intervals, the beeper emits a 700 Hz tone until it is terminated by push of a button. Volume can be adjusted by the user.

Notebook. A 3×5 inch notebook was issued to each participant to jot down notes about the details of inner experience that had been occurring at the moment of the beep. Each notebook page had a sticker attached for the participant to note hole, stroke and what they were doing at the moment of the beep (e.g., waiting, hitting the ball, etc.).

Demographic Form. Demographic information including age, gender, and race/ethnicity as well as handicap and telephone number(s) was collected.

Procedure

After Institutional Review Board approval was received, each golfer individually gave informed consent, completed the demographic form, and was fully instructed about the project.

Phase 1: Natural environment DES Training. In phase 1, participants individually were given two to four sampling days of iterative training in DES: on each day, participants collected six samples in their natural environment and then were interviewed for approximately one hour about those samples. The object of DES is to prepare a high fidelity description of each sampled experience. Apprehension of each experience, and each description thereof, is intended to be an idiographic portrait of the experience that was ongoing at the moment of the beep, with the explicit aim of bracketing presuppositions about the nature of experience in general and the nature of experience in each individual. Therefore, this study pursued what Hurlburt and Heavey (2006) called the one legitimate question about inner experience: What, if anything, was in your experience at the moment of the beep? That is, this study was open-beginninged (Hurlburt & Heavey, 2006; Hurlburt, 2011): it was not specifically *about* self-talk, not specifically *about* imagery, not specifically *about* any predetermined feature, characteristic, phenomenon, or content, but instead began with whatever kind of experience that presented itself to the participant. The aim was to get each individual experience apprehended in high fidelity, one at a time, with each experience intended to be kept independent of the next, in the sense that if the first sampled experience happened to involve self-talk, we carefully bracketed that experience so that the interview about it did not influence the likelihood that the interview about the second sampled experience would lean toward (or away from) self-talk.

Following the DES instructions provided by Hurlburt and Heavey (2006, chapter 6) and Hurlburt (2011), each participant was asked to wear the beeper during non-golf

times of his choosing until he had responded to six random beeps (requiring

approximately 3 hours). Immediately after each beep, the participant was to jot down

notes about the experience that was ongoing when the beep sounded. Within 24 hours of

collecting samples, the participant met jointly with two researchers (first author and third

author) for a DES expositional interview about their beeped experiences. The

expositional interview consisted of open-beginninged (Hurlburt & Heavey, 2006), open-

ended, non-leading questions to explore participants' inner experiences as described in

Hurlburt (2011) and Hurlburt and Heavey (2006). All interviews were videotaped.

Disagreements/differing understandings/discrepant interpretations between interviewers

were valued rather than discouraged and were openly discussed between the interviewers

and with the participant. As usual in DES, participants were not expected to be skilled at

apprehending their inner experience, so this sample/expositional interview procedure was

"iterated" (skill gradually acquired; Hurlburt, 2011) across a total of two to four sampling

days/expositional interviews, as each participant learned what was and was not

experience and how to apprehend it. At the end of each interview, the participant was

instructed to bracket the results of that interview—that is, he was reminded about the

random nature of the process, that there was no reason to believe that the next sampling

day's samples would be similar to or different from the ones just described. The specific

number of training sessions required for each golfer depended on that golfers' ability to

master the skills of apprehending and describing their inner experiences, which was

determined via agreement between two researchers.

    A contemporaneous description of each moment of experience was written within

24 hours of the interview and passed back and forth between the interviewers to ensure

that the written description reflected each interviewer's understanding. Disagreements

were sometimes resolved, sometimes left explicitly unresolved in the written description,

never swept under the rug. In short, the aim was to get every single sample of every single sampling day apprehended and described on its own terms.

Phase 2: Golf Tournament Sampling. Golfers trained in Phase 2 participated in DES while competing in groups of 1, 2, 3, or 4 in an 18-hole golf tournament arranged for this research project. Standard tournament rules were followed except that when interrupted by the beep, golfers noted the features of their experience that had been ongoing when beeped, jotted down notes about that experience per their DES training, and then filled out the sticker noting their current action. If the beep had occurred when a participant was in the act of swinging, that shot didn't count; regardless of its outcome, he took a "do-over" shot from the same place. Participants also completed a record of their tournament scores and submitted it to the researchers. Each golfer participated in an hour-long standard DES expositional interview within 24 hours. The winner of the tournament received a $50 prize.

Participant (idiographic) salient characteristics. When a participant had finished participation, the interviewers wrote (passing back and forth as before) a description of the (idiographic) salient characteristics that emerged from that participant's samples (see idiographic results section for an example). The written contemporaneous descriptions were used as tools in this regard, but the process was *not* an analysis of the written contemporaneous descriptions. The object was to use the contemporaneous description to reawaken the recollection of the individual experience and to serve as a constraint on the recollective process. That is, if we noted in the recollection of an experience a hint of the possibility of discrepancy between the interviewers, or between one (or both) of the interviewers and the written contemporaneous description, then we returned to the videotape to clarify the issue. Occasionally that return to the videotape discovered that the contemporaneous description was inadequate in some way. For

example, we might discover on, say, the third sampling day, that when a participant said

X (something that had also been said on previous days but not fully appreciated there), he

actually meant what could be rendered more straightforwardly in plain language as *Y*. If

we made such a discovery, we would repair (replace *X* with *Y*) in the original description.

Such repairs were always made conservatively in the sense that if there was any doubt,

the original description was left standing. More often, the return to the videotape showed

that the contemporaneous description was correct and the reawakened recollection was

inadequate, in which case the recollection was repaired.

      Group-level salient characteristics. After we had completed writing all the

participant (idiographic) salient characteristics, we considered the entire set (across all

participants) of samples to allow the emergence of group-level salient characteristics.

The written descriptions of participant (idiographic) salient characteristics facilitated this

process, each pointing backward to its own (possibly repaired) contemporaneous

description, which in turn pointed backward to the actual at-the-moment-of-the-beep

samples. That is, the aim was now to provide a characterization of the set of sampled

experiences, *not* a characterization of the descriptions of those samples. Very

occasionally, this across-participant consideration might cause us to reconsider one or

another of the written participant (idiographic) descriptions, and they were allowed to be

repaired in a manner similar to that described above, always constrained by the video

recordings of the original interviews.

      Quantification. After all the (idiographic) salient characteristic descriptions and

the group-level salient characteristic descriptions had been written, then (and only then),

we coded each sample for the presence or absence of particular characteristics. DES

research has shown that there are five frequently occurring phenomena (dubbed the *5FP*

by Kühn et al., 2014) in DES studies: inner speaking (Hurlburt, Heavey, & Kelsey,

2013), inner seeing (Hurlburt, 2011), unsymbolized thinking (Hurlburt & Akhter, 2008), sensory awareness (Hurlburt, Heavey, and Bensaheb, 2009), and feelings (Heavey, Hurlburt, & Lefforge, 2012). We returned to each sample for each individual and coded it for the presence or absence of each of the 5FP. Furthermore, we rated each sample for the presence or absence of each of the group-level salient characteristics that had emerged in the group-analysis process (golf-related content and mental preparation strategies).

Additionally, we rated each sample for the presence or absence of other characteristics of interest, characteristics that could arise from our knowledge of the literature, and so on. In the present study, we rated each sample for (a) the presence or absence of self-talk, which we defined to include inner speaking (one of the 5FP described above) and speaking aloud to oneself; and for the presence or absence of System 1 and System 2 self-talk. System 1 self-talk was defined as self-talk that occurs spontaneously and is intuitive and experience-based, reflecting gut feelings and basic emotions. System 2 self-talk was defined as self-talk that is intentional and requires working memory and cognitive effort (Van Raalte et al., 2016).

In short, this study aimed at fidelity, period. It bracketed any interest in self-talk until the very end of the study. All the steps of the present study (recruitment, first sampling, first interview, first contemporaneous description, second sampling, second interview, second contemporaneous description, third sampling, third interview, third contemporaneous description, tournament sampling, tournament interview, tournament contemporaneous description, participant (idiographic) salient characteristic description, group salient characteristic description) were taken before quantification of self-talk.

Results

DES is fundamentally an idiographic method—designed to provide high fidelity glimpses of the inner experience of one individual at a time. Such idiographic characterizations can then be combined to allow quantitative across-participant analysis. We illustrate each.

Idiographic Results Example—"Mike"

To illustrate the richness of data collected using DES, we describe the inner experience of one golfer during the golf tournament. "Mike" was a 50 year-old highly-skilled Caucasian golfer, in the highly skilled group with a handicap of 7. In the golf tournament, Mike finished a net 1st, shooting 74 (2 over par, 5 strokes lower than his handicap of 7). Nearly all of Mike's inner experiences sampled during the tournament (80%) contained golf-related content. Examples include watching another golfer and simultaneously innerly seeing his own previous shot; experiencing an indeterminate thought about the badness of the shot he had just made; actively focusing visually on his ball while simultaneously unsymbolized thinking that he had putted it way too long; saying aloud to himself something like "Nice and slow, nice and slow tempo, tempo, rhythm" as part of his process of preparing for his next shot; unsymbolized thinking about going to a golf meeting; innerly saying to himself "fairway…fairway…fairway" after hitting a shot; and planning where to hit the ball by actively looking down the fairway. One could quibble about whether one or another of these should be called golf-related (for example, the thought about the golf meeting was *not* related to the tournament he was in), but no matter how you count it, Mike (the tournament winner), thought about golf very often during the tournament. Further, that is an *idiographic* fact about Mike—it is true that Mike frequently thought about golf regardless of whether it is true for any or all other golfers in the tournament.

One of Mike's golf-related samples involved an explicit mental preparation routine (the saying "Nice and slow tempo"). That was one of Mike's two instances of self-talk during the tournament (the other was "fairway…fairway"). Other samples included sensory awareness, unsymbolized thinking, perceptual awareness, and an indeterminate kind of experience that was somewhere between a thought and a feeling.

Quantitative Results

Ten participants sampled in the natural environment in Phase 1 and in the golf tournament in Phase 2. Two of the participants, despite our request that their natural environment sampling take place away from the golf course, performed all or most of their training (Phase 1) sampling while golfing. Therefore, we omitted their samples from consideration as natural environment samples and the results are based on 101 natural environment samples from 8 participants and 94 tournament samples from 10 participants.

Table 1 shows the frequencies of the 5FP in the natural environment and during the golf tournament. For comparison purposes, Table 1 also shows the frequencies obtained in a stratified random sample of students from a large urban university (Heavey and Hurlburt, 2008). Our own participants had somewhat less inner speaking and inner seeing than did the Heavey and Hurlburt sample. However, our own percentages were not close to zero, indicating that the sampling and rating process that the present investigation used was prepared to describe the phenomena found in other DES investigations.

The present study's primary focus is experience during the tournament, as shown in Table 2. Self-talk included inner speaking (one of the 5FP also shown in Table 1) and speaking aloud to the self. All instances of inner speaking were counted as self-talk, regardless of content. For example, "Will," who was just starting to relax after chipping

onto the green from behind a tree, innerly said to himself "not enough options (for a good

shot). In another example, "Ryan" was looking at the backyard landscaping and innerly

said, "Look at that piece of shit!" Because this was innerly said by Ryan (and therefore

arguably to Ryan), it was considered self-talk even though it was not golf-related. Mike's

"Nice and slow" is an example of aloud self-talk because he was speaking to himself.

However, speaking aloud to others was *not* counted as self-talk. For example, at the time

of one beep, Mike was saying to one of the other golfers, "Damn! I hit it in the left trap!"

Because this talk was directed to someone else, it was not considered self-talk even

though the content was self-related.

Inner speaking and speaking aloud self-talk frequencies are displayed in Table 2.

It can be seen that self-talk was frequent (31%) but not ubiquitous during the tournament,

and that inner-speaking self-talk (27%) was approximately six times as frequent as aloud

self-talk (4%). Speaking aloud (whether to self or others) was rare, occurring in seven

samples (7%), so inner self-talk was more frequent than outer self-talk, no matter how it

was defined.

Participants had on average significantly more self-talk in the tournament ($M =$

31%) than in the natural environment ($M = 8\%$; dependent-samples $t(7) = 2.85$, $p = .02$).

The correlation between self-talk in the natural environment and in the tournament was

$r(6) = -.93$, $p = .001$: the two individuals who had lowest (zero) frequencies of self-talk in

the natural environment had the highest frequencies during the tournament (64% and

55%).

To examine the self-talk more fully in relation to skill level and performance, we

categorized self-talk into System 1 and System 2 in accord with the sport-specific model

of self-talk (Van Raalte et al., 2016). As can be seen in Table 2, System 2 self-talk was

rare in our tournament sample, occurring in only two (or at most four) samples. In accord

with the DES procedure, the interviews had been conducted without a specific focus on

any pre-determined characteristic (including without a focus on System 1 and System 2).

The two unambiguous instances of System 2 self-talk included that of "Chris"

when he was going through a mental checklist, thinking that he had 280 yards to the hole,

a 2 iron would leave him 60 to 80 yards to go, and that he wanted to start from the left

side of the course as it cuts a little from left to right. At the moment of the beep, he was

saying to himself internally "start it left edge, and it should work right" in his own normal

inner voice. System 2 self-talk involves cognitive effort directed at key aspects of play,

thus, Chris' internal "start it left edge, and it should work right" was categorized as

System 2 self-talk. In the other System 2 instance, Aaron had addressed the ball to putt

and was innerly saying to himself "this is left to right" while looking at the line where he

will hit the ball.

There were two samples (out of 29 self-talk samples) where the subsequent

analysis of the experience was not conclusive with respect to System 1 and 2. In one

instance, "Will" was preparing to swing but a tree hindered his swing; Will was saying to

himself internally "tree's in the way." This self-talk may have reflected a System 1

observation of the situation. However, in the interview Will mentioned that he may have

said "tree's in the way" as a means of reducing his frustration; if so, it should be called

System 2. DES has shown that people are not usually adept at providing inferences about

the causation of their experience, so we cannot know whether this sample was System 1

or 2. In the other instance, Mike had been playing too fast and was saying aloud "Nice

and slow, nice slow tempo" as part of his process of preparing for his next shot. This

self-talk may have been Mike's automatic routine System 1 process, but it may have been

Mike's intentional exhortation to slow down, a System 2 self-talk in response to playing

too fast. Whether two, three, or four instances, System 2 self-talk was rare in our

participants (2 to 4% of tournament samples).

Table 2 shows that golf-related content was frequent, occurring in 74 percent of

the tournament samples. For example, Mike's "Nice and slow" was considered golf-

related content, but a sample where "Caleb" was attracted to the brightness of his marker

was not considered golf-related—his interest was in the sensory aspect (the brightness) of

the coin, not its golf-related aspect. Golf-related content included thoughts and

awareness about the golf course and its conditions, the characteristics of the hole they

were on (e.g., tee box, grass, green, hole), other groups golfers on the course (e.g., if they

are out of range to begin addressing a shot), the characteristics of their own or others'

golf equipment (e.g., clubs, ball, tee, bag), the characteristics of their own or others'

performance (e.g., swing, result of a shot), and mental preparation strategies (e.g.,

internal planning ahead for performance). The high and moderate skill groups did not

differ significantly in terms of golf-related content (83% vs. 67%; $t(8) = 1.571$, $p = 0.15$),

but this was a very small n study so the difference was not significant even though the

effect size was large: ($d = .99$). A qualitative difference in golf-related content was

observed between the two skill groups, however: the golf-related content of highly skilled

participants tended to be more elaborate and sophisticated than that of the moderately

skilled participants. For instance, the highly skilled participants had more mental

preparation strategies and more detailed golf-related content experiences than did the

moderately skilled participants.

We also counted the occurrences of mental preparation strategies (a subset of

golf-related content that serve the purpose of preparing for a golf performance task).

Mental preparation strategies appeared in 13 percent of all tournament samples. For

example, Mike was on the driving range before the tournament. At the moment of the

beep he was in his backswing and was innerly saying "tempo...tempo…tempo"
rhythmically. Also at the moment of the beep, Mike was actively visually focused on the
ball, paying attention to its center. The high skilled group had more mental preparation
strategy samples (20%) than did the moderate skill group (6%). This difference was not
significant ($t(8) = 2.168$, $p = .06$) even though the effect size was large ($d = 1.37$). The
frequency of mental preparation strategies was correlated with gross tournament golf
score, however, $r = -0.64$, $p = 0.04$, indicating that more frequent mental preparation
strategy use was related to better golf performance.

Discussion

A main goal of the present study was to determine whether it was possible to use
Descriptive Experience Sampling (DES) during sport performance, and the answer was
an unqualified Yes. Participants showed openness and interest toward the study of inner
experience and toward using DES to explore it. They diligently adhered to the DES
sampling method. Based on their verbal reports and our direct behavioral observations,
they showed very minimal observable reactivity. After the first sampling day, only rarely
(1 natural environment sample; 2 golf samples) did the expectation of a beep make its
way in to actual inner experience.   Individual differences in the ease of using DES
appeared to be related to the nature of their inner experiences; that is, participants with
clearer inner experiences had an easier time apprehending and describing their inner
experiences. There was no attrition: all 10 of the participants who began the study
completed it. Overall, this study demonstrates that DES can be feasibly implemented
during golf performance. The individual, one-at-a-time nature of golf competition
simplified some aspects of DES; other types of competition might present different
challenges. However, we think that with some creativity and control over the process,
DES might be implemented in non-golf environments. For example, DES beeps could be

delivered via loudspeaker during a basketball game, with play stopping to allow players

to jot down aspects of experience that was ongoing at the moment of the loudspeaker

beep.

We found self-talk to be frequent (31%) during the tournament. Other researchers

have held that self-talk is ubiquitous; there are at least three possible explanations for this

discrepancy. First, some researchers hold a broad definition of self-talk (e.g., "anytime

you think about something, you are in a sense talking to yourself"; Bunker, Williams, &

Zinsser, 1993, p. 226) and therefore will by definition maintain that self-talk occurs all

the time. Second, retrospective reports often mistakenly misclassify as inner speech

phenomena that actually were inner seeing, unsymbolized thinking, or sensory awareness

(Hurlburt, Heavey, & Kelsey, 2013). Third, responses to questionnaires that ask for

generalizations about inner experience often are more influenced by presuppositions

about experience than by experience itself (Hurlburt & Heavey, 2015).

Against the criticism that DES interviews lead participants away from describing

self-talk, the two participants who had no self-talk in their natural environment had the

highest frequencies of self-talk during the golf tournament beeped experiences. These

findings are consistent with the sport-specific model of self-talk (Van Raalte et al., 2016),

which highlights how self-talk is related to both personal and contextual factors. That is,

some people may self-talk frequently and others not at all, a reflection of individual

differences (personal factors). Further, the amount of self-talk any individual uses is

affected by the context, with, for example, some golfers using no self-talk in their natural

environments but much self-talk when competing in a tournament.

Our participants' tournament experiences included both inner and spoken-aloud

self-talk, a distinction that has been mentioned but seldom studied, perhaps due to

measurement difficulties. Using the retrospective Self-Talk Use Questionnaire, Hardy

and colleagues (2005) found that athletes reported using inner self-talk about twice as frequently as spoken aloud/muttered self-talk. Our participants' tournament experiences included inner self-talk about six times as frequently as aloud self-talk.

Our participants' tournament self-talk was almost entirely System 1, with only one (or a few) System 2 examples. The sport self-talk literature has been heavily focused on System 2 self-talk, perhaps due to the ubiquity of research designs where the experimenter assigns particular self-talk and then measures related constructs (e.g., Hatzigeorgiadis, Zourbanos, Galanis, & Theodorakis, 2011) rather than investigating naturally occurring self-talk. Self-talk on demand is not necessarily the same thing as self-talk in the natural environment. Hurlburt, Alderson-Day, Kühn, and Fernyhough (2016) showed in an fMRI study that the neural correlates of task-initiated inner speaking were different from the neural correlates of spontaneously occurring inner speaking.

Self-talk interventions are useful for enhancing sport performance. However, the utility of those strategies may or may not arise from actual talk at the time of performance or preparation: the fact that an effective intervention *putatively* targets self-talk does not necessarily mean that the intervention *actually* involves the experience of self-talk; and if it does, the putative interest in altering self-talk does not necessarily mean that actual self-talk changes as expected. Perhaps self-talk interventions highlight and differentiate important aspects of sport performance, and whereas it appears that the talk itself is the efficacious factor, the highlighting and/or differentiation is actually efficacious. This study does not answer that question but shows that it can be raised.

Mental preparation strategies emerged as salient inner experiences across our participants (13%) and were more frequent among the highly skilled golfers. The most frequent strategy (25% of that 13%) was externally looking to find a line along which to make a putt ("spot-putting"). The relationship between mental preparation strategies and

the quality of golf performance is consistent with other sport psychology findings (Cohn, Rotella, & Lloyd, 1990). For instance, golfers with lower handicaps report greater mental preparation than do those with higher handicaps (Thomas & Over, 1994). Our results are, we believe, the first to show that naturally occurring (rather than experimenter prescribed) mental preparation strategies may be associated with higher performance.

This study highlights potential methodological issues in sport psychology. Following Van Raalte et al. (2016), it demonstrates the desirability of limiting the definition of self-talk to actually occurring *talk* (whether inner or outer). If self-talk includes non-experienced cognition, non-experienced metacognition, physical gestures, and/or visual imagery, then the concept seems too broad or too loose to be investigated constructively.

We suggest that the term "thought sampling" be reserved for studies that try to examine thoughts as they contemporaneously occur. For example, Latinjak and colleagues (2014) asked athletes

> to *recall any sport-related situation during the last month when they experienced sadness, anger, resignation, anxiety, relief, euphoria, confidence and excitement*. Once they remembered a corresponding sport-related situation, they were asked to write down in the designated space things they said to themselves or thoughts that occurred to them in these situations. (2014, p. 550, italics in original)

They referred to this retrospect-across-the-last-month procedure as "thought sampling regarding participants' self-talk" (p. 548). We think that it is misleading to refer to this as thought "sampling," because the term "sampling," as it is used in modern experience sampling paradigms, refers to the explicit methodological emphasis on reducing retrospection to the order of seconds rather than months.

Hurlburt and Heavey (2015) suggested the desirability of distinguishing carefully between sampling studies that bracket presuppositions, sampling studies that do not bracket presuppositions, retrospective reports of phenomena, and general self-characterizations. The present study is the first of its (bracketing presuppositions) kind, and it illustrates the painstaking nature of such procedures. The present study began by focusing idiographically on each individual sample of experience from each individual participant, one sample at a time, trying to produce a high fidelity description of each single sample. Only after we were committed to the particulars of each individual sample (describing it contemporaneously, etc.), did we attempt to generalize by considering all samples and their emergent salient characteristics.

Sampling studies that do not adequately bracket presuppositions may not faithfully characterize self-talk (Hurlburt, 2011). Many people have strong presuppositions about the nature of experience, leading to dramatically mistaken (we think) sentiments such as "Human beings talk to themselves every moment of the waking day" (Baars, 2003). Presuppositions are delusions (Caracciolo & Hurlburt, 2016; Hurlburt, 2011, chapter 21; Hurlburt & Schwitzgebel, 2011) and therefore stubbornly resist being bracketed, much less eliminated, so research that attempts to apprehend inner experience must develop effective tools to assist both researchers and participants to bracket their presuppositions. Most sampling studies fail to bracket presuppositions (or even to *attempt* to bracket presuppositions), and therefore produce descriptions whose fidelity is questionable (Hurlburt & Heavey, 2015).

The present study, as is typical of DES studies but unusual otherwise, used prompts that were both open-ended and open-beginninged (both behaviorally and in the interview). Open-ended prompts (that provides a stem but allow a free response) are common. For example, Latinjak and colleagues' instruction to "write down in the

designated space things they said to themselves or thoughts that occurred to them in these

situations" (2014, p. 550) is open-ended: it provides a stem (things they said to

themselves) but the responses can be free-ranging. The present study's prompts were

both open-ended and open-beginninged. We asked "What, if anything, was in your

experience at the moment of the beep?" (Hurlburt & Heavey, 2006). "What, if anything"

allows a participant to report self-talk, but it does not *request* the participant to report

self-talk. Hurlburt and Heavey (2006) maintained that sampling studies that try to

bracket presuppositions have to be open-beginninged, and that applies not merely to the

questions but to the *entire study*.

　　　　Therefore, carefully considered, the present investigation was not an investigation

of *self-talk* during golf; it was an investigation of whether DES might be useful as a

method for exploring experience during golf (as an example of sport performance),

whatever that experience happened to be, including the possibility of self-talk. As is

typical of DES, even the "golf-ness" of this investigation was as open-beginninged as

possible. Part of the explanation to participants was that we were *not* particularly

interested in golf-related experience—we were interested in a high fidelity account of

experience as it exists, whatever that experience is. Toward that end, each participant

began with two to three days of sampling in their natural environments—while they were

at work, or making lunch, or fixing the sprinkler system. That is, we explicitly

undermined the golf-ness of the study, eliciting their interest in and ability to report

experience as it exists, without reference to any rationale for participation. Then in the

tournament, we explicitly instructed participants that we were *not* particularly interested

in golf-related experience—we were interested in whatever experience happened to be

ongoing while on the golf course. That might or might not be golf-related, and either

way would be fine with us. We have reason to believe that this instruction was effective

because (a) we had repeatedly modeled an open-beginninged interest in the two to three days of natural environment sampling, and (b) 26% of experiences were not golf-related.

Trying to bracket presuppositions does not guarantee success in bracketing presuppositions. Hurlburt (2011) discussed the requirements for high fidelity apprehensions of experience (he called them "constraints"), but understanding those constraints and trying to conform to them does not guarantee success. The purpose of this paper is *not* to claim that the present study was adequate, but instead to attempt to show that it might be useful to use DES to ascertain self-talk (and other aspects of inner experience) in high fidelity, to attempt to raise the possibility that what is taken for granted in the sport psychology literature about self-talk (and inner experience in general) might profit from careful consideration. In particular, we are *not* intending to claim that DES is the best method for investigating experience. In this regard, we claim only that DES takes the constraints surrounding the exploration of experience seriously and works to operate effectively within those constraints. We would welcome a science of experience that develops better ways of apprehending experience.

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Table 1

Percentages of Five Frequent Phenomena (5FP)

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	Inner speaking	Inner seeing	Unsymbolized thinking	Sensory awareness	Feelings
Present study					
Natural environment	8	17	17	18	21
Golf tournament	27	13	12	11	12
Heavey & Hurlburt (2008)[1]	31	32	21	22	24

_____

[1] Displayed for comparison

Table 2

Inner experience percentages in the golf tournament

_____

Inner speaking	Aloud self-talk	Total self-talk	System 1 self-talk	System 2 self-talk	Golf content	Mental preparation
27	4	31	29	2	74	13

_____